Overdose, personality correlates and treatment utilization in opioid use disorder

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Abstract

Opioid use disorder (OUD) and fatal opioid overdose are significant public health problems. As part of this PhD, I have used mixed methods to investigate multiple aspects of OUD. The investigations described in this thesis include a literature review of personality traits associated with OUD; routine linked-data analysis to identify the sociodemographic and service use characteristics of high-risk opioid users; an interview study to identify factors which facilitate help seeking for OUD; and a literature review and survey study to identify obstacles to adherence for treatment for OUD. The findings from this program of study suggest that there is an enduring personality trait configuration associated with OUD; that high-risk opioid users use health services often but infrequently use substance use treatment services; that help seeking is a values-based behaviour based on rejection of the addiction lifestyle; and that barriers to treatment adherence include comorbid mental health and substance use problems but that more needs to be done to understand obstacles to treatment adherence in this population. It is hoped that the findings of the studies reported in this thesis will be used to inform and develop further studies to help improve outcomes for people with opioid use disorder.

Declarations

1. This thesis has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.
2. This thesis is the result of my own investigations, except where otherwise stated and all sources are acknowledged by footnotes giving explicit references where appropriate, and a bibliography is appended.
3. A thesis abstract and metadata have been made available in the University repository to outside organisations. Access levels to the full-text are managed according to the Swansea University library services e-thesis deposit agreement.
4. The University's ethical procedures have been followed and, where appropriate, ethical approval has been granted where necessary.

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ACT	Acceptance and Commitment Therapy
ALF	Anonymised Linkage Field
ASSIST	Alcohol, Smoking and Substance Involvement Screening Test
BDP	Bristol Drugs Project
BMT	Buprenorphine Maintenance Treatment
CBT	Cognitive Behavioural Therapy
CI	Confidence Interval
COPD	Chronic Obstructive Pulmonary Disorder
CNS	Central Nervous System

DALYs	Disability Adjusted Life Years
DAST	Drug Abuse Screening Test
DSM	Diagnostic and Statistical Manual for Mental Disorders
ED	Emergency Department
EDDS	Emergency Department Dataset
EF	Executive Function
EU	European Union
HAT	Heroin Assisted Treatment
GABA	Gamma Aminobutyric Acid
GAD	Generalised Anxiety Disorder
GDPR	General Data Protection Regulation
GRADE	Grading of Recommendations, Assessment, Development and Evaluations
GP	General Practitioner
HCSW	Health Care Support Worker
HIV	Human Immunodeficiency Virus
ICD	International Classification of Diseases
IGRP	Information Governance Review Panel
IOTOD	Improving Outcomes in the Treatment of Opioid Dependence
IPA	Interpretive Phenomenological Analysis
IQR	Interquartile Range
ISS	Impulsive Sensation Seeking
LSOA	Lower Super Output Area
MAT	Medication Assisted Treatment
MeSH	Medical Subject Headings
MMPI/MMPI-2	Minnesota Multiphasic Personality Inventory/2
MMT	Methadone Maintenance Treatment
MPR	Medication Possession Ratio
NAcc	Nucleus Accumbens
NHS	National Health Service
NWIS	National Welsh Informatics Service
NOP	Nociceptive or Orphanin
OBOT	Office Based Opioid Treatment
ONS	Office for National Statistics

OOD	Opioid Overdose Death
OR	Odds Ratio
ORD	Opioid Related Death
OUD	Opioid Use Disorder
PDC	Proportion of Days Covered
PEDW	Patient Episode Database for Wales
PECOTS	Population Exposure Comparison Outcomes Timings Settings
PNS	Peripheral Nervous System
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PTSD	Post-Traumatic Stress Disorder
Q-SSP	Quality of Survey Studies in Psychology
RCT	Randomised Controlled Trial
RODS	Rapid Opioid Dependence Screen
SAIL	Secure Anonymised Information Linkage
SBIRT	Screening, Brief Intervention and Referral to Treatment
SD	Standard Deviations
SMDS	Substance Use Dataset
SOCRATES	Stage of Change Readiness and Treatment Engagement Scale
SMART	Specific, Measurable, Agreed-upon, Realistic and Time-limited
SPSS	Statistical Package for the Social Sciences
SQL	Structured Query Language
SS	Sensation Seeking
SUD	Substance Use Disorder
THN	Take Home Naloxone
UK	United Kingdom
UNODC	United Nations Office on Drugs
USA	United States of America
USB	Universal Serial Bus
VTA	Ventral Tegmental Area
WDS	Welsh Demographic Service
WHO	World Health Organisation
WIMD	Welsh Index of Multiple Deprivation

Chapter 1 – Introduction

In writing this thesis I will not attempt to cover the depth and breadth of opioid use disorder (OUD) as too expansive to be within the scope of a single body of work. Rather, I attempt to introduce the reader to prerequisite concepts necessary to contextualise the study of OUD. I will begin with a brief overview of opioid drugs and their mechanism of action down to a cellular level, and I will briefly investigate the fatal consequences of high-risk opioid drug use on an aggregate level. I will however focus for the most part on the individual level, investigating the personality factors associated with OUD, and the psychological and social factors which contribute to the experience of OUD.

1.1 What are Opioids?

Opioids are broad spectrum analgesic drugs commonly used to treat nociceptive and neuropathic pain (1). Opioids are also traded as illicit drugs of abuse, most notably heroin (2). In the UK, opioid analgesics are commonly prescribed for long-term pain relief in primary care, despite scant evidence to support the efficacy of opioids for chronic non-malignant pain (3,4). Morphine is often given in

emergency settings due to its effectiveness in relieving cardiac and trauma pain (5), as well as the drug's actions as a pulmonary venodilator and as an anxiolytic (6).

The use of opioid drugs, either those originally designed to be analgesics, or those specifically manufactured as drugs of abuse, represents a major public health problem. Opioids are more often involved in accidental death than any other drug (7), and opioids are considered to have high abuse potential due to their pleasurable psychotropic effects. Opioid drugs are habit forming, and are associated with a comparatively rapid onset of symptomatic physical dependence (8).

Chemically, opioids can be divided into organic (e.g. morphine, heroin, codeine), synthetic (e.g. methadone, fentanyl, meperidine, tramadol) and semi-synthetic compounds (e.g. hydromorphone, hydrocodone, oxymorphone, oxycodone) (9).

Upon ingestion, opioid drugs bind with receptor molecules which sit atop nerve cell membranes in the central nervous system (CNS) and peripheral nervous system (PNS). There are four major subtypes of opioid receptors known as the μ (mu), δ (delta), κ (kappa), and the nociceptive or orphanin (NOP) receptors (9). Opioid drugs are agonists to these receptors in that these receptors are stimulated when opioid drug molecules bind with them in isolation or in combination with other agonists. When binding takes place at the μ receptors physiological responses including analgesia, sedation, respiratory depression, bradycardia, nausea, vomiting and reduced gastric mobility take place. Binding at the δ receptors causes reduced gastric mobility as well as spinal and supraspinal analgesia. Binding at the κ receptors causes spinal analgesia, diuresis and dysphoria. Finally, binding at the orphanin receptors causes analgesia, hyperalgesia, and in great enough concentrations allodynia and other anti-analgesic effects (9).

The intensity and duration of the effects of a particular opioid upon the nervous system depend on several factors. Firstly, the specific opioid drug's 'affinity', which describes the ability to be bound to and activate a receptor at any given moment will influence subjective intensity of effect and duration of action. The second factor to influence intensity and duration of effect is the drug's intrinsic efficacy which describes the degree to which the drug molecule activates the receptor and therefore produces a change in cellular activity after binding to it (10). The third factor is the potency of the drug. The potency of a drug is defined in pharmacological terms as the 'effective concentration' of the drug needed to activate 50% of available receptors, often abbreviated as EC50 in the relevant literature. If all available receptors are activated this is known as 'maximal response', and so EC50 can be described as 50% maximal response. The lower the concentration required to achieve EC50, the higher the potency of the drug (11). Affinity, intrinsic efficacy and potency are

determined by chemical structure, and so synthetic, semi-synthetic and naturally occurring opioid drugs vary in these respects.

Partial agonists bind to opioid receptors as do full agonists but elicit only a partial response no matter the amount of the drug administered. This means that partial agonists can produces analgesic effects at lower concentrations via interaction with one set of receptors (e.g. μ) but anti-analgesic effects at high concentrations at others (e.g. κ, δ NOP) (12). In practice partial opioid agonists can exhibit improved side effect profiles and reduced risk of serious adverse consequences (13).

Additionally, different opioid drugs vary in their bioavailability and serum half-life. Bioavailability refers to the proportion of the drug metabolised by the liver and the rate of metabolism. Serum half-life refers to the time it takes for the concentration of the drug to reduce to half its original value via bodily secretion following ingestion. Both these processes can vary dependent on the drug formulation and route of administration. For example, a specific opioid analgesic can be formulated for a gradual release into the bloodstream compared with a traditionally formulated version of the same drug (14). A well-known example of route of administration modulating bioavailability of an illicit opioid is the increased bioavailability of heroin by way of intravenous injection compared to foil smoking (15).

1.1.1 Heroin – the most widely used illicit opioid

Though the prevalence of prescription opioid use (excepting prescription diamorphine) is estimated to be greater than that of heroin use, heroin remains the most widely used illicit opioid drug (7). Due to its illicit nature, heroin use carries risks of infection, injury and overdose that the use of pharmaceutical opioids do not (16–23). However, use of opioid analgesics appears to be a risk factor for 'graduation' heroin use, with an estimated 76-86% of heroin users reporting use of opioid analgesics prior to trying heroin (24).

Heroin (or diamorphine) is a powerful opioid receptor agonist readily binding to the μ, κ and δ receptors, with a rapid half-life of around 3 minutes due to heroin immediately converting to morphine – which itself has a half-life of around six hours (25). Heroin is commonly intravenously injected and so enters the blood stream immediately, but can also be inhaled via foil smoking where in heroin powder is heated on an aluminium foil with the vapours inhaled using a straw (19). Compared to morphine, it is highly solubility in lipids which means that it can pass through the blood–brain barrier rapidly, producing subjectively powerful feelings of euphoria and relaxation lasting for around an hour (26). Morphine can also be delivered intravenously but is often orally administered in both standard and extended-release formulations (27).

Following cessation of heroin use, withdrawal symptoms arise soon and peak between 48 and 72 hours after the last dose. Symptoms of withdrawal such as nausea, abdominal discomfort, sweating, tremor, and extreme variations in mood usually subside after about a week, but intense cravings and isolated symptoms of withdrawal have been reported months or years following cessation of chronic usage (28).

Heroin exists in a spectrum of coloured forms of solid block black heroin and powdered brown and white heroin. The intensity of the effects of heroin, the duration of the effects, the side effect profile, as well as the profile of withdrawal symptoms are all modulated by the form the heroin takes (29).

Black 'tar' heroin is the free base form of heroin. That is to say that black tar heroin comes in the form of a crudely processed, darkly coloured block, not too dissimilar from crude opium drawn from the seed pods of the poppy flower. Originating in Mexico, this form of heroin has been refined through a repeated process of reduction by boiling raw opium with various inorganic compounds followed by filtration to obtain a morphine base, followed by heating of the morphine base, and adding a suitable reagent compound. It is commonly found for sale in the Western United States. It is the lowest purity form of heroin and is heat stable, burning at a comparatively high heat compared to powdered heroin (29). Though this form of heroin is of lower purity than the powdered forms available, lower purity heroin may still be of higher potency due to adulterants such as fentanyl (30). Qualitative data suggests that heroin users associate black tar heroin as being more potent and of producing a longer duration of effect than higher purity powdered heroin (15).

The process of refining morphine base in to a brown powder or white salt form heroin increases in complexity, and is thus associated with increased cost to the producer and consumer (31). Brown powder heroin is the form of heroin most often found in circulation in the UK and Europe to the point of near exclusivity, though this form of heroin exclusively originates in Afghanistan. It is of a higher purity than black tar heroin, but impure compared to white heroin. It burns at a higher heat than black heroin but lower than white and so can be vapourised. It is the only type of heroin which is chemically basic, and so requires the addition of acid and heat to dissolve into an aqueous injectable form.

White heroin originates in Southeast Asia and is the highest purity, and thus the most expensive to produce and purchase. It does not readily burn so it unsuitable for smoking. It is acidic and easily made into an injectable aqueous solution without the addition of other acids to dissolve (15). Aggregate level data suggests that incidence of overdose in a given geographic area positively correlates with powdered heroin market share (32).

1.2 What is Opioid Use Disorder (OUD)?

Diagnostically speaking, and from a syndromic point of view, Opioid use disorder (OUD) is an example of a substance use disorder (SUD). These are behavioural disorders characterised by ongoing use of a psychoactive substances despite recurrent and significant negative consequences for the user. The negative consequences which arise as a result of SUDs can be varied, and may include interpersonal or other social difficulties, financial problems, legal issues, or long-term physical or mental distress (33).

When a person is unable to exert sufficient control over the use of a substance sufficient to reduce or cease usage, despite the adverse consequences of continuing use, they are said to be addicted. Addiction is sometimes used interchangeably with the word 'dependence'; however, each term describes different though related phenomena:

Addiction refers to the problematic behaviours which characterise SUDs including the repeated seeking out and consuming of drugs despite negative consequences, as well as the powerful urge to do so (34). However, debate remains around the true definition of addiction (35). Addiction is associated with short-term changes in brain chemistry, most notably dysregulation of the mesocorticolimbic dopaminergic system(36), which includes two dopaminergic pathways known as the mesolimbic (or reward) pathway and the mesocortical pathway. Dysregulation in these neural pathways are associated with an affective urge to engage in a psychologically rewarding behaviour such as drug use, though whether such dysregulation is a product of or a predictor of chronic drug use is unclear (37).

Dependence refers to the subjectively, experientially adverse physical changes which take place due to repeated administration of a drug, and which give rise to withdrawal symptoms when said drug is no longer administered (34). Compared with addiction, dependence is associated with longer-term changes in neurocircuitry including bilateral grey matter deficits in frontotemporal regions of the brain, as well as in the midbrain, thalamic, and limbic regions (38–41). These grey matter deficits are associated with unpleasant symptoms of withdrawal such as negative affect and anxious preoccupation with physical sensations (39) and working memory deficit (42). The available evidence suggests that such changes take place following chronic opioid use, typically heroin, over periods of between 4 and 15 years (38). However, there are experimental data to suggest that limited grey matter deficit is detectable in the brain after just one month of regular morphine administration (1). In terms of the reversibility, there is imaging study evidence to suggest that such deficits are reversible following comparatively short periods of abstinence of one month or less, including in cases where an individual is maintained on methadone or buprenorphine (38).

People with OUD often experience dependence, but unlike addiction, it is not actually a prerequisite for the presence of diagnosable OUD.

1.2.1 The 'addiction cycle'

Upon ingestion of an opioid drug, neurochemical responses take place within the central nervous system (CNS) and the peripheral nervous system (PNS) with not only physiological effects, but psychological consequences also. To better understand the addictive potential of opioid drugs, we must look at these consequences in slightly greater detail:

The previously mentioned μ opioid receptors which are associated with analgesia and sedation are always located on cells which output gamma-aminobutyric acid, known as GABAergic cells. When these receptors are activated, they disinhibit connecting GABAergic interneurons, increasing their excitability and therefore increasing activity with connected dopaminergic neurons, resulting in increased production of dopamine (43,44). It is by this process that opioid drugs activate the mesolimbic 'reward pathway' incorporating the ventral tegmental area (VTA) and the nucleus accumbens (NAcc). By binding to a μ receptor situated on a GABAergic neuron in the VTA, the opioid drug disinhibits the activation of an interneuron projecting into the NAcc. This GABAergic interneuron is now excited, meaning that it is more likely that it will activate other dopaminergic neurons in the NAcc, thus increasing dopamine output in this area. The consequence of this for the individual is a dopaminergic 'rush', subjectively experienced as pleasurable or blissful affect characterised by euphoria and anxiolysis (45). This sustained but comparatively brief period of increased dopamine mediated activity represents the first step of the addiction cycle (36).

As the blood serum concentration of the opioid drug decreases over time following intake of the drug, and the psychotropic effects wear off, a second step in the neurobiological cycle of addiction kicks in. This involves activation of neural circuits in the basal forebrain and the extended amygdala, mediated by release of various anxiety and stress response related neurotransmitters including corticotropin-releasing factor, norepinephrine and dynorphin. This can be described as the withdrawal stage. It is subjectively experienced as a shift from a primarily euphoric to a primarily dysphoric affective state (46).

What is traditionally thought of as the third and final component of the neurobiological cycle of opioid addiction includes glutamatergic activation of neural circuits in the prefrontal cortex and in various projections of the limbic system. This neural activity appears to give rise to the affective state of drug craving, to cognitive preoccupation with the drug and its effects, and the subsequent motivation to seek out repeated doses (46).

This proposed ‘addiction cycle’ of euphoria, dysphoria and craving as described here correlate with psychological models of OUD, which are described latterly in this text.

1.2.2 Downregulation and upregulation

On a neurobiological level, the neurochemical and psychological processes of the addiction cycle are thought to be mediated by processes known as ‘downregulation’ and ‘upregulation’. These are processes of cellular sensitisation and desensitisation to exposure to the drug molecule.

Downregulation occurs when opioid drug molecules bind with opioid receptors repeatedly over prolonged durations, resulting in desensitisation of opioid receptors to the action of not only exogenous opioids (e.g. drugs) but also endogenous opioids. This desensitisation gives rise to a decrease in the availability of opioid receptors on nerve cell surfaces, the consequence of which is an increased tolerance to the psychotropic effects of the drug in question. As such chronic opioid users are often motivated to increase their dosages to sustain the psychotropic effects to which they are accustomed. Further to this, downregulation is an example of chronic opioid drug induced dysregulation in the endogenous opioid system which is itself associated with stress intolerance (47), inhibitory control dysfunction (48), depression (49,50) and personality disorders including borderline (51) and antisocial types (52).

The reverse process to downregulation is upregulation, which results in over-sensitised opioid receptors. Upregulation usually occurs after prolonged abstinence, or repeated exposure to an opioid antagonist such as naltrexone, following a period of chronic opioid drug use. As upregulation results in a decrease in tolerance, the risk of overdose is increased. This is of particular concern due to an increased risk in fatal overdose following a prolonged period of abstinence during incarceration (53) or following opioid antagonist therapy (54).

The ‘incentive salience’ or ‘incentive-sensitisation’ theory of addiction refers to the process of sensitisation of dopaminergic meso-limbic neural networks by way of downregulation and upregulation (37). This theory posits that sensitisation of these neural networks represent long-lasting plastic change (e.g. grey matter deficit in the frontotemporal regions of the brain) meaning that the subjective affective state of ‘craving’ in response to intrinsic and extrinsic drug related cues can persist for years, even in complete abstinence. Thus this theory offers explanation for relapse following periods of abstinence amongst OUD patients (37,54–56).

Incentive-sensitisation theory is reliant on the assumption that changes in the brain dictate the progression from relatively infrequent or irregular drug use to drug usage reflective of addiction. If this is the case then extended access to psychotropic drugs would predict the neurophysiological

changes associated with sensitisation. Though there are evidence to support this claim, the evidence itself is limited to rat models (57,58), and subtle differences in animal and human physiology have the potential to produce significantly different physiological responses to drug administration (59).

1.2.3 The psychology of OUD

The psychological processes underlying how OUD develop can be understood according to several competing and overlapping theories of addiction (60). I present the dominant models under two broad categories of 'conditioning theory' and the 'inhibitory control dysfunction theory'.

1.2.3.1 Conditioning theory

Conditioning theory refers to both operant and classical conditioning. Operant conditioning describes the processes by which a behavioural response such as drug taking becomes conditioned by way of positive and negative reinforcement. Positive reinforcement refers to the increased motivation to engage in a voluntary behaviour based upon the association between said behaviour and a positively reinforcing stimulus which follows it and is perceived to be contingent with it. According to reinforcement theory, OUD can be understood as being maintained simply because the user is motivated to continue usage due to the pleasurable euphoric effects of the substance.

Negative reinforcement refers to the process by which behaviour is maintained by the removal of aversive stimuli. From this perspective OUD can be understood as being maintained by way of negative reinforcement if the opioid drug user seeks out the drug to avoid negative affect or physical pain, the absence of which serves as the negative reinforcer (61).

Conditioning theory assumes that voluntary behaviours are more likely to be repeated when they are readily associated with a reinforcing stimulus, or the removal of an adverse stimulus. They are less likely to be repeated when no reinforcing stimuli is perceived as contingent with the behaviour, and potentially completely extinguished if the behaviour is associated with adverse stimuli (62). A conceptualisation of operant conditioning often (but not exclusively) applied to the study of addictions is known as 'opponent process theory' (63). Opponent process theory states that addictions are maintained by the pairing of the opposing affective states of pleasure and withdrawal. Following the initial pleasurable effects of the drug, the user habituates comparatively rapidly to the effects thus building tolerance. After the pleasurable effects of the drug have subsided, negative withdrawal associated affect takes hold, gradually increasing in intensity and duration with repeated use. Thus, the drug user initially takes the drug to experience the euphoric effects, which reduce in duration and intensity, before progressing to using the drug primarily to avoid the dysphoric effects associated with withdrawal (64).

Critics of conditioning theory as applied to addiction question the utility of positive reinforcement as a means on explaining addictive behaviour when highly addictive drugs, such as nicotine, do not produce markedly euphoric effects (65). Positive reinforcement appears to be associated with casual or recreational drug use more so than negative reinforcement (66). Based on these data, multi-stage theories of addiction posit that substance use moves from being primary positively reinforced to primarily negatively reinforced, and that this transition correlates with severity of addiction and associated harms (67,68). However, survey data involving people addicted to methamphetamine, a drug with high abuse potential and unfavourable risk profile, found that most user's reasons for usage could be understood as being positively reinforced (69). Another survey study of intravenous heroin users found that close to 50% of participants reported primary motivation of usage as being positively reinforced (70). These data are difficult to explain within a positive-negative reinforcement theory framework such as multi-stage transition or opponent process theory but are subject to response bias which are exacerbated when researchers are tasked with expounding on the primary motivations behind reported reasons for engaging in drug taking behaviour as being positive or negative and to what extent.

Some proponents of conditioning model theories of addiction are focussed more on the stimulus-response dimension of conditioning, rather than the behavioural responses to positive and negative reinforces. These theories propose that classical conditioning is of greater importance in understanding SUDs than operant conditioning and are less susceptible to criticisms regarding the lack of positive reinforcement in development of habitual drug taking, or the lack of negative reinforcement in chronic addiction.

Classical conditioning refers to involuntary behavioural responses which are triggered by specific behaviour-related stimuli. This response is then, by way of exposure, associated with neutral non-related stimuli. The neutral stimuli then trigger the response originally associated with the original stimuli. For example, a person may involuntarily experience drug craving in response to drug related stimuli such as the sight or smell of drugs or drug paraphernalia, and over time the same drug craving response may become associated with previously neutral stimuli which are reliably present in the context of drug taking. Examples could include people, sounds, and objects alone or in combination. Classical conditioning theorists argue therefore that the outcome of drug use – that is the pleasurable psychoactive effects of the drug itself - are of less importance than the habitual behaviour of obtaining and taking the drug (71).

The evidence supporting the role of classical conditioning in addiction are based on 'cue-reactivity' which describe physiological response data such changes in heart rate, skin temperature or galvanic

response (72). Placing emphasis on the relationship between drug associated cues and physiological markers of reactivity does fail to take in to account differences between subjective drug craving as experienced by the user and their physiology. This is a considerable limitation given that meta-analyses of experimental data suggest that physiological reactivity and the subjective experience of drug craving differ significantly (73).

1.2.3.2 Inhibitory control dysfunction theory

The inhibitory control dysfunction theory of understanding addiction is primarily focussed on the personality configuration of drug users. Personality be determined by genetic predisposition and environmental factors during psychosocial development (74). It is theorised that persons who exhibit elevations above the norm in certain personality traits are predisposed to drug use. Such individuals may have trouble in suppressing behavioural responses (that is, drug taking behaviour) to drug related stimuli, even when negative consequences of drug taking are clear.

Personality traits thought to be of importance in explaining SUDs are those associated with weak executive function (EF). EF itself refers to a set of top-down cognitive-behavioural processes which include response inhibition (e.g. suppressing urges and regulating emotions), interference control (e.g. paying selective attention to salient stimuli) working memory (e.g. the ability to temporarily hold information in conscious awareness for immediate use) and psychological flexibility (e.g. dialectical thinking and changing thoughts and behaviours to suit situational demands) (75).

Amongst the available literature, specific personality traits most often associated with weak EF and SUDs are impulsivity, sensation seeking (SS), and neuroticism (76–79):

Impulsivity refers to the propensity to act with little or no forethought, and to avoid considering the consequences of one's actions either prospectively or retrospectively (80). The role of impulsivity in SUDs is chronologically dependent in that drug taking may begin as an impulsive action, but as substance use continues the drug taking behaviour may be better described as compulsive (71). Though the differences between impulsivity and compulsivity are contested, a universally dividing feature is that impulsivity describes reward focused behaviour whereas compulsivity may apply to behaviour in absence of reward (81). There is imaging evidence to suggest that downregulation of D2 dopamine receptors in the prefrontal regions of the brain are associated with impulsivity (1), which may explain the maintenance of impulsive drug taking in chronic substance use. Additionally, inhibitory control dysfunction theory supports the notion that exogenous opioid use induces dysregulation of cortico-striatal circuitry (52).

Sensation seeking (SS) is the tendency to seek out novel experiences and intense emotional states (82). The two personality traits of impulsivity and Ss correlate so strongly on various measures of personality, that although they are considered discrete phenomena, they have also been conceptualised as components of a composite trait known as 'impulsive sensation seeking' (ISS) (83).

Neuroticism is the tendency to readily experience subjectively intense and prolonged negative affect in response to negative stimuli such as interpersonal conflict, criticism, or loss. High trait neuroticism may manifest as anger, anxiety, irritability, or more cognitively as notable propensity for self-criticism or worry (82). Neuroticism therefore can play a role in craving the effects of a drug as a means of avoiding negative affect.

Unlike conditioning theory, inhibitory control dysfunction theory offers explanations as to why certain individuals are at risk of developing SUDs which are supported by evidence. For example, high trait impulsivity, SS and neuroticism in children and adolescents have been found to predict incidence of SUDs in later life (84,85).

Much of the evidence to support inhibitory control dysfunction theory come from neuroimaging studies, which are prone to the variation in findings typical of small sample sizes (86), and often retrospectively test for neuroimaging predictors. For example, researchers will retrospectively create groups for baseline imaging based on a known clinical outcome such as abstinence. This type of analysis can inflate observed differences (87). Additionally, though Inhibitory control dysfunction theory is useful in understanding individual risk of developing SUDs, it is less useful in explaining current addiction psychopathology, especially in respect to OUD. Large scale meta-analysis of inhibitory control testing data involving people addicted to various substances found no evidence to support the theory that deficit in inhibition is instrumental in the maintenance of OUD (88). The same review did find that deficit in inhibitory control was instrumental in the maintenance of other SUDs including alcohol, psychostimulants and tobacco use disorders.

To summarise, no psychological or neuropsychological theory of addiction is sufficient to fully explain the phenomena of SUD, or of OUD specifically. Models of addiction which draw on multiple theoretical viewpoints are necessary to build a nuanced understanding. Examples include the interaction model of addiction which takes in to account the genetic and psychosocial predispositions of the user (taking into account reinforcement theory and incentive sensitisation and the strengths limitations of each), the addiction potential of the drug, and environmental factors such as availability and peer-influence.

1.3 Prominence of OUD amongst SUDs

OUD is of special interest to researchers, clinicians, and policy makers due to the prevalence of the disorder, the mortality and morbidity associated with the disorder, and finally the social and economic cost. Though all SUDs cause some degree of mental and physical harm, OUD is harmful to a degree seldom witnessed in relation to other SUDs for a variety of reasons:

1.3.1 Prevalence of OUD

Worldwide, the prevalence of OUD has increased dramatically since the 1990s due to a series of causal factors. The factors which have caused and maintained the increased prevalence of OUD in the United States have been described as observable over three 'waves' (89). The first wave describes a period of increased opioid analgesic prescribing in the USA during the late 1990s lasting until the early 2010s (90). These patterns of increased opioid prescribing have been recognised in other countries including the UK (91), Canada (92) and Australia (93). The second wave describes an increase in illicit heroin use noticeable from the early 2000s (94), and the third wave describes a shift to increased fentanyl use towards the end of the 2010s (95). The second and third waves have been attributed to the first, in that addiction to prescribed opioids motivated certain at-risk people to seek out illicit opioids when the prescriptions came to an end (94). However, evidence of heroin becoming increasingly popular as a first opioid substance over the second wave time-period also exists (96).

It is difficult to estimate the prevalence of OUD in the UK, as although England and Wales have seen the numbers of people entering treatment for OUD falling since 2005, the numbers of people dying from opioid overdose has increased over the same period (97). Additionally, the numbers of people in treatment are also likely to reflect a minority of the number of people in the country with OUD (98). The number of 'high risk' opioid users, who could feasibly satisfy diagnostic criteria for OUD has been estimated to be 8.4 per 100,000 people in England and Wales, and 16.2 per 100,000 people in Scotland (99).

The regional differences in the UK between Scotland and the rest of the country are stark, with Scotland's OUD prevalence comparable to that of the USA's. The fact that the USAs opioid crisis has not been experienced in the rest of the UK in the same way is difficult to explain. Opioid prescribing is common and has increased over the past decade in both countries, for example (100). However, a recent retrospective cohort study found that American prescribers tend to prescribe stronger opioids at more frequent dosing schedules than their counterparts in the UK, Canada and Taiwan (101).

In Australia, a shortage of heroin in the early 2000s reduced the number of people trying heroin for the first time over the following decade (102). The Australian heroin shortage also seemed to impact access to heroin in Canada too (103). The lingering aftereffects of this shortage may explain to some extent why fentanyl use has increased in these places more so than in the UK (104,105). However, fentanyl deaths in the UK have increased in the past two decades, though admittedly from a significantly lower baseline than can be found in the US, Australia and Canada (106).

Despite the reduction in opioid analgesic prescribing in America, the Australian heroin shortage and other heroin shortages around the world, data compiled by the United Nations Office on Drugs and Crime (UNODC) as for 2020 shows that the availability of opioid drugs, the prevalence of OUD, and the incidence of OOD show no signs of decreasing internationally (7). This is not to say that OUD is the most prevalent SUD, nor opioids the most ubiquitous of illicit drugs. For example, many more millions of people use cannabis yearly (estimated by the UNODC at 200 million people) than opioids (estimated at 62 million), however the harms associated with pathological opioid usage are disproportionately high (107).

1.3.2 Mortality and morbidity

Opioid drugs kill more people by overdose than any other drug (7), and the use of opioid drugs accounted for over 70% of the 18 million "healthy" years of life lost in terms of 'disability adjusted life years' (DALYs) attributed to all drug use (107). Regionally, North America, sub-Saharan Africa and eastern Europe experience the highest per capita OOD (108).

The UK experiences the most deaths of any European nation in absolute terms (109), though the prevalence of OOD is unevenly distributed amongst the member nations of the UK with OODs are as much as five times more common in Scotland than in England and Wales (110). A recent systematic review concluded that Scotland fared worse than England and Wales due to a combination of factors including polydrug use, increased age of high-risk opioid users, more high-risk users per capita and less treatment coverage (1). However, these findings inspire further questions rather than providing concrete, practicable answers to the question of why some countries and regions within countries experience more opioid related deaths than others. Polydrug use of opioids and other depressants including benzodiazepines, Z-drugs and gabapentin which increase the risk of fatal respiratory depression has become increasingly common amongst high-risk opioid users (111,112).

Compared with the general population and those with other SUDs, people with OUD are at an increased risk of premature death from physical health problems. These include hypoxic and traumatic brain injury (113); HIV (Human Immunodeficiency Virus), hepatitis C and bacterial endocarditis (16,17,114).

Opioid users who inject heroin, as opposed to foil smoking or insufflating, are most at risk of physical health complications including infections, overdose, and venous injury (16,18). However, smoking heroin does carry with it a risk of bronchospasm, and rarely white-matter disease (19). Additionally, the risk of injecting is mediated by the type of heroin being prepared for injection.

People with OUD are disproportionate risk of dual-diagnosis, with depression, anxiety disorders such as generalised anxiety disorder (GAD), and panic disorder comparatively common in this population compared to the general population (95, 96). Survey data suggests that over 60% of people with OUD may have some other diagnosable mental health condition (117). Women who use opioid drugs are more likely to suffer from comorbid mental health problems than men (118). For both genders, the risk of developing comorbid mental health problems, and symptom severity correlate with level of opioid usage (119,120). For the most part the relationship is likely bi-directional, as OUD has been found to develop due to attempts at self-medication of existing mental health problems (121).

Other comorbid SUDs are also commonplace amongst people with OUD. Recent estimates range from 10% to 73% of people with OUD also habitually use other harmful drugs, most usually benzodiazepines and cannabis (117,122). This is alarming considering the risk of overdose death when combining opioids and benzodiazepines (123).

1.3.2.1 Heroin specific risk factors

As elucidated on under heading 1.1.1, in the UK heroin is usually sourced from Afghanistan and refined in Pakistan, arriving in the UK in a brown powder form. As brown heroin is not highly soluble and requires acid to break down into an injectable solution, users often resort to using lemon juice, vitamin C sachets, or other easy to obtain acidic solutions. This then puts users at risk of vein damage and Candida endophthalmitis eye infections (21,22). Black tar heroin, which is not powder form, is less easily made into an injectable solution than white or brown heroin. As such it is often non-intravenously injected by 'skin popping' which is the practice of injecting heroin or other drugs subcutaneously. This method is purported by users to allow for slower absorption, a decreased risk of overdose (124). This practice carries with it a risk of potentially serious skin infections, including wound botulism (20). However, skin popping may explain why populations who use black tar heroin are at reduced risk of HIV compared with populations who use brown or white heroin (125). White heroin is the purest form of powdered heroin. The relatively high purity of white heroin means that it is highly soluble, negating the need for acidic emulsifiers to prepare the substance for injection and thus avoiding the associated risks. However, the high purity of white heroin also correlates with an increased risk of overdose (23).

1.3.3 Social and economic costs of OUD

The social and economic costs associated with OUD are thought to be significant, both for the individual and for communities. OUD is associated with individual psychosocial harms such as insecure housing (126); reduced quality of life (127); poor living conditions and higher risk of poverty (128). People with OUD are also more likely than people with other SUDs to become involved in crime (129).

On a community level, OUD is thought to be disproportionally costly for the taxpayer compared to other SUDs. In the UK the total costs associated with all illegal drugs (including treatment for SUDs, as well as secondary health problems, and crime related costs) are estimated at close to £20 billion a year (130). Over half (52%) of all people entering treatment for SUDs in the UK name opioid drugs as the primary problem substance (97). In 2021 Dame Carol Black published a review into the state of UK SUD treatment policy. The review was published in two parts, with the first part outlining the current situation in terms of funding for treatment services, regional variation in problematic drug use, death and other associated harms, and the drug trafficking situation in the country. The second part included recommendations to tackle the various areas where UK drug policy was failing. The report is comprehensive, but perhaps the most notable recommendations as far as OUD is concerned relates to increased funding for treatment services including the hiring of more qualified staff to roll back an over reliance on untrained and unpaid peer-mentors, and increased collaboration between treatment services and law and justice departments, housing agencies and local health authorities (131).

In the United States the overall burden of OUD (taking in to account the costs associated with policing drug related crime; incarcerating offenders; treating addicts; and lost labour due to incarceration and death) was estimated at $51.2 billion per year in 2015 (132). To put this into context, using comparable methodology, the total cost of COPD (chronic obstructive pulmonary disorder) was estimated to cost $38.50 billion for the same year (133) despite affecting over five times as many people as OUD (134). This suggests that the per capita cost to society of OUD is significant in comparison to other chronic health conditions.

Governments around the world have responded to the considerable burden placed on society by OUD and opioid overdose, however political and law enforcement approaches have been unsuccessful. In June 2011, the Global Commission on Drug Policy released a critical report on the War on Drugs, declaring: "The global war on drugs has failed, with devastating consequences for individuals and societies around the world" (135).

1.4 Screening and diagnosis of OUD

Screening for OUD can take place in all tiers of the healthcare system including primary care, in-hospital care, and emergency care. Most of the widely used screening measures one might use to screen for OUD are not OUD specific but are designed to screen for SUDs more generally. The most ubiquitous are brief measures which can be administered or completed by patients themselves. Notable examples include the 10 or 20 item Drug Abuse Screening Test (DAST) (136), or the eight item Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) (137). Both have demonstrated good specificity and sensitivity for a range of SUDs in primary care and inpatient settings (138,139). However, all brief measures have limitations. The DAST has been criticised for not covering all of the problems related to drug use according to DSM criteria (140) and of exhibiting high face validity elevating the risk of respondents 'faking good' and giving socially desirable but untruthful answers (138). The ability of the ASSIST tool in discriminating between low, moderate or high risk has been found to vary depending on the problem substance in question meaning it may not be the optimal choice for all persons experiencing SUDs (139,141).

A brief screening tool specific for OUD is also available called the Rapid Opioid Dependence Screen (RODS), which was found by the authors to demonstrate good diagnostic sensitivity and specificity, reliably identifying presence of OUD in a sample of newly incarcerated men (142).

Given that the opportunity to screen for OUD may arise in time-pressured clinical environments – most obviously emergency departments or prehospital settings – single question screening techniques may be appropriate. The "How many times in the past year have you used an illegal drug or used a prescription medication for nonmedical reasons?" query has proved to demonstrate good sensitivity and specificity in primary care settings, comparing favourably to the DAST (143).

1.4.1 Diagnostic criteria for OUD

The two most often applied diagnostic criteria for OUD (and SUDs more generally) are the Diagnostic and Statistical Manual for Mental Disorders (DSM) (33) (which is now in its fifth edition), and the International Classification of Diseases (ICD) (now in its eleventh revision) (144). The DSM criteria state that to make a diagnosis of OUD at least two of the following eleven criteria should be satisfied within a twelve-month period:

- Opioids are often taken in larger amounts or over a longer period than was intended.
- There is a persistent desire or unsuccessful efforts to cut down or control opioid use.
- A great deal of time is spent in activities necessary to obtain the opioid, use the opioid, or recover from its effects.
- Craving, or a strong desire or urge to use opioids.

- Recurrent opioid use resulting in a failure to fulfil major role obligations at work, school, or home.
- Continued opioid use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of opioids.
- Important social, occupational, or recreational activities are given up or reduced because of opioid use.
- Recurrent opioid use in situations in which it is physically hazardous.
- Continued opioid use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.
- Patient exhibits tolerance to opioids (this is a need for markedly increased amounts of opioids to achieve intoxication or desired effect, or a markedly diminished effect with continued use of the same amount of an opioid).
- Patient exhibits withdrawal symptoms upon cessation of or significant reduction in use (e.g. dysphoric mood; nausea or vomiting; muscle aches; lacrimation or rhinorrhoea; pupillary dilation, piloerection, or sweating; diarrhoea; yawning; fever; or insomnia).

Based on these diagnostic criteria, the severity of the presentation is determined based on the number of criteria met. For example, if 2 to 3 criteria are satisfied a mild severity would be assumed, a moderate severity assumed if 4 to 5 are met, and a severe presentation assumed if 6 to 11 criteria are met.

The ICD-11 diagnostic criteria are not directly comparable to the DSM-V criteria as the ICD system recognises separate categories of 'harmful use' and of 'dependence syndrome' rather than a unified classification of 'substance use disorder'. However, there is significant overlap in terms of the individual criterion which make up the categories. For this reason, and because it is the most often applied in the literature, DSM-V criteria will be applied for the purposes of this PhD rather than the ICD-11 criteria.

1.5 Management of OUD

For the purposes of this PhD the management of OUD is understood according to the WHO's 'International Standards for the Treatment of Drug Use Disorders' (145). In reference to WHO standards, this section of the text describes how OUD can be treated using a range of pharmacological and behavioural interventions. These interventions aim to stop or reduce drug use, improve health, well-being, and social functioning, and prevent future harms such as health complications or relapse.

1.5.1 Treatment settings

Depending on the severity of the problem, the WHO recommend a hierarchy of treatment system levels incorporating specific interventions. These range from informal support through friends and family to pharmacological treatment in an outpatient setting, to inpatient treatment programs and dry housing.

Traditionally, treatment would be delivered via specialist SUD treatment clinics. In the UK such services can be run by NHS trusts, by third sector organizations which are typically charities, or less commonly by private healthcare providers. In other parts of the world where private or private-public hybrid healthcare systems operate, private providers are much more common.

Increasingly treatments for OUD are being delivered via Office Based Opioid Treatment (OBOT) programs which seek to integrate the treatment of OUD with general primary care services. Generally, OBOT is a setting for maintenance and detoxification treatment. There are clearly benefits to delivering treatment via OBOT, the most obvious of which is that doing so expands options for a clinical population which rarely seeks help via traditional clinic settings (146,147). Additionally, a 2019 systematic review of the available evidence has found that OBOT is associated with greater adherence to maintenance treatment compared with traditional clinic settings (148). Downsides of this approach are high rates of practice variability compared to traditional clinic settings (149,150).

Irrespective of whether treatments are delivered via specialist clinic or OBOT patients will usually go through at least one of three stages of therapeutic intervention:

1.5.2 Stages of intervention

1.5.2.1 Screening, assessment, and treatment planning

People experiencing OUD may contact health services in a variety of settings including primary care, in-hospital care and in and out of hospital emergency care settings. They may not immediately disclose problems with opioid drugs or may not disclose the extent of the problems they are facing, and so it is vital for clinicians who come in to contact with people using opioid drugs to be able to screen for, assess and help patients plan the initial stages of treatment. Depending on the clinical setting, and the role of the clinician serving the patient brief screening measures might be used such as the aforementioned DAST (136) or ASSIST measures (137).

According to the UK department of health (DoH) clinical guidelines (151), a comprehensive assessment should begin with assessment of risk to self and others related to drug use (e.g. injecting practices, ability to care adequately for dependents). The assessor should ascertain the quantity and frequency of use of problem substances and administration methods, any comorbid physical or

mental health problems, and ongoing social problems including those related to relationships, childcare, or criminal proceedings. The assessor should complete a history of family substance abuse, assess motivation to change and identify strengths which could help the patient engage with treatment such as supportive networks of family and friends or previous successful attempts to change problematic behaviour.

Following assessment with a suitably qualified clinician, patients should be assigned a 'keyworker', who can be from any professional background with suitable training in working with SUDs, who will work with them to identify their individual treatment goals framed as milestones in their recovery journey. Examples might include reducing the frequency of use, changing methods of administration, improving relationships with loved ones, or complete abstinence. Goals should be SMART (specific, measurable, agreed-upon, realistic and time-limited), and be integrated into a comprehensive treatment plan which should incorporate risk planning to keep the patient and those close to them safe in the face of unforeseen setbacks.

1.5.2.2 Maintenance therapy

The first stage is opioid maintenance (also known as substitution or stabilisation). The basic premise of maintenance therapy is that of substituting an illegal opioid, usually heroin, with a legal one. The patient undergoing maintenance therapy is maintained on a dose of the licit opioid agonist sufficient to eliminate withdrawal and ameliorate craving, but which does not induce sufficient euphoria to become habit forming (152). Length of treatment depends on the individual need of the patient. Ideally, patients move on to detoxification treatment when this is clinically viable. Maintenance medications include:

Methadone

Methadone is a synthetic full μ -receptor agonist, which has a long elimination half-life of between 20 and 37 hours, allowing for daily dosing. Compared to other opioids, Methadone is much less capable of activating the dopaminergic systems, which explains the lack of euphoria compared with other opioids (74). This said, at higher doses (usual dose range of between 60-120mg daily (153)) use and diversion potential exist where patients are not undergoing supervised administration.

The prescribing of methadone as a maintenance treatment (often referred to as MMT) is associated with significant reduction in mortality compared with continued use of illicit opioids such as heroin (154,155). Methadone is taken orally, so the risks of infection and injury associated with injecting are negated. Unknown purity is also not a concern with methadone, and unlike with heroin, patients need not engage in potentially risky and antisocial criminal behaviour to obtain the methadone once they are enrolled on MMT.

Despite being the most often prescribed maintenance treatment (13), methadone prescribing has been falling over recent decades in the UK (156), most likely due to increased use of buprenorphine.

MMT has received the lion's share of research attention due to its longevity and wide application. Meta-analytic data suggests that MMT is an effective means of reducing illicit opioid use; as well as HIV transmission; overdose death; and criminal activity by opioid users (157). This effectiveness appears to be positively associated with higher methadone dosage, and the tailoring of dosing to individual patients (158). Clinicians and patient should be aware however that the risk of overdose increase during induction in to MMT (152) due to over-sensitisation of opioid receptor carrying neurons via the process of upregulation (54). Clinicians should exercise close care and respond rapidly the patient need during this period, and patients should be offered overdose awareness training and take home naloxone (THN) (151). However, most methadone overdose deaths occur in people not undergoing maintenance treatment and so can be attributed to diversion (159,160).

Buprenorphine & buprenorphine-naloxone

Buprenorphine is used for buprenorphine maintenance therapy or BMT and is a partial μ-receptor agonist and a κ- receptor antagonist which is used not only in the treatment of OUD but also for chronic pain. Being a partial μ-receptor agonist, buprenorphine appears to partially bind with μ-receptors involved with respiratory depression, but fully bind with μ-receptors involved in analgesia causing a ceiling effect where in buprenorphine ceases to induce respiratory depression with increase in dose but does continue to provide increased analgesia (161). Therefore, the drug poses less risk as a respiratory depressant and thus poses less risk of overdose and a favourable side-effect profile compared to full μ-receptor agonist drugs (e.g. methadone). Like Methadone it has a long elimination half-life of between 24 and 42 hours, allowing for daily and sometimes less-than daily dosing (162).

Unlike methadone, which is almost exclusively taken orally in liquid form, buprenorphine can be administered by various routes for the treatment of OUD. Methods of administration can include sublingual films, buccal films, subcutaneous implants, extended-release injection, or tablets (78).

At higher doses buprenorphine has use and diversion potential (usual dose 12-16mg daily but can be increased to 32mg (163)). For this reason, higher doses are prepared as a mixture with naloxone, which is a full opioid antagonist binding readily to the μ, κ, and δ receptors (164).

Buprenorphine production and consumption has steadily increased over the previous two decades. It is currently a commonly prescribed maintenance medication internationally, though still lagging behind methadone in most markets (13,165). However, this may change with programs such as the

Scottish government's recent (2021) rollout of long-acting monthly buprenorphine by injection (marketed as Buvidal) to replace methadone as the treatment of choice for heroin dependent prisoners (166). An evaluation of Buvidal in Wales is currently open to tender as of 31st December 2022 (167).

Meta-analysis shows that retention in BMT is associated with reduced use of illicit opioids, and reduced risk of fatal overdose. However, there are insufficient data of a sufficient quality to determine an overall difference in efficacy between the two maintenance treatments of BMT and MMT (118,168,169).

Dihydrocodeine (DHC)

Dihydrocodeine is an opioid analgesic which is widely used for mild to moderate pain, and as an antitussive. It is an agonist which binds to the μ, δ, and κ opioid receptors, and exhibits a short elimination half-life of between 3.5 and 5 hours (170).

As there is only limited meta-analytic evidence suggesting that DHC is as effective as methadone or buprenorphine in maintenance treatment for OUD (171), DHC is not prescribed as a first-line treatment in the UK. When DHC is prescribed for the treatment of OUD, such treatment can be controversial. In such cases caution has been advised due to the role of DHC in fatal opioid and polydrug overdose (172).

Naltrexone

Naltrexone is an opioid antagonist of the μ, κ, and to a lesser extent the δ receptors. It has a variable elimination half-life of between 3.9 and 10.3 hours (173) necessitating daily administration via pill. However, sustained release formulations are available by monthly depot injection, or by sub-cutaneous implant which have advantages over oral administration in terms of increased bioavailability and patient compliance (174).

Naltrexone does not cause euphoric states, and as such there is little use or diversion potential associated with the drug (175). Despite the absence of these risks however, naltrexone is not considered a first-line maintenance medication as methadone and buprenorphine due to the necessity for a detoxification period prior to administration, and an increased risk of overdose following this period compared with methadone or buprenorphine (176).

Though meta-analytic data of a sufficient quality is limited, the data that is available suggests that naltrexone performs well in terms of reduced usage compared to control and placebo groups, but lacks effectiveness compared to methadone and buprenorphine maintenance (177,178).

Effectiveness may be improved with addition of contingency management to increase retention (179).

1.5.2.3 Detoxification

The second treatment stage is detoxification. Detoxification refers to the clinically managed withdrawal of maintenance treatments. Maintenance medication doses are gradually reduced, and often adjunctive behavioural treatments are offered to help patients navigate this phase of treatment, which are outlined under heading 1.5.3. Additionally, Lofexidine, and less commonly clonidine, can be prescribed to treat opioid withdrawal symptoms:

Lofexidine

Lofexidine is an adrenergic receptor agonist, and so does not work on the endogenous opioid system, but instead binds to receptors in the adrenergic system. This binding to adrenergic cells inhibits release of norepinephrine which decreases sympathetic stress response thus reducing results in reduced heart rate, blood pressure and sympathetic muscle tone (180). As a non-opioid drug, it is an ideal choice for detoxification rather than maintenance, though historically it has been used to reduce blood pressure.

Although there is limited high quality experimental evidence, it is now most often prescribed as first-line treatment for opioid withdrawal, often alongside naltrexone (181). A recent systematic review suggests that lofexidine is effective in treating withdrawal following detoxification (182).

Another drug, clonidine, works in a similar way to lofexidine but is not ordinarily prescribed for the treatment of opioid withdrawal despite similar efficacy, due to worse a side effect profile (99) which commonly include hypotension and malaise like symptoms such as weakness and fatigue (183).

1.5.2.4 Rehabilitation and relapse prevention

The third and final stage is rehabilitation and relapse prevention. This stage of treatment is often referred to as ‘recovery support’ and includes group based psychosocial interventions which aim to help patients maintain abstinence following initial treatment (184). Approaches to rehabilitation and relapse prevention include:

Behavioural couples therapy

Behavioural couples therapy or BCT is an approach which focuses on maintaining abstinence for one half of a married or co-habiting couple whilst improving relationship functioning. BCT assumes that problematic interactions within the relationship can maintain SUDs. Similarly, to CBT, ‘destructive cycles’ of behaviour are identified and replaced with ‘constructive cycles’; and cognitions underlying said behaviours are examined and challenged. Empathic communication is encouraged so that the

needs of each partner are met without recourse to substance use. When relationship functioning is optimal, and abstinence has been maintained, a recovery contract is drawn up and agreed upon by both partners. This contract could include regular discussions of relationship health, adherence to maintenance medication, and sharing affirmations to help motivate the partner with the substance problem to maintain changes. As it is an abstinence based treatment, and involves use of contractually agreed changes to behaviour, BCT is considered to be compatible with the 12-step approach (185).

BCT is built on three sets of theoretical models for use in understanding SUDs within the context of family relationships. These include the 'family disease model' which views SUDs as illnesses of the family. Although one individual family member may be the primary patient, other family members are seen as an individual codependent in the presentation. The 'family systems model' differs in that family members are not seen as individual codependents. Rather, this model pays particular attention to the ways in which family members interact in relation to the SUD, and how these interactions maintain a balance between the SUD and how the family functions. Finally BCT draws on a number of related models which assume that family interactions reinforce SUDs through negative reinforcement of drug taking behaviour (186).

Meta-analytic data suggests that BCT is an effective treatment for SUDs including OUD, producing small to medium effect sizes (187,188). Although not ideal for all patients, for those in cohabiting relationships with a non-using partner, BCT is considered an effective treatment.

Community Reinforcement and Family Training

Community Reinforcement and Family Training (CRAFT) is a cognitive-behavioural approach designed to help otherwise treatment-refusing patients of SUDs to engage with conventional treatment for their disorder. The approach aims to teach family members to influence a treatment-refusing SUD to the point where the patient voluntarily engages in treatment, and to look after their own wellbeing (189).

Meta-analytic data to suggest that CRAFT is effective when it comes to treatment entry and retention, as well as in improving the wellbeing and perceived coping ability of patient's family members (190,191).

SMART (Self-Management and Recovery Training)

SMART is recovery support initiative, which at the time of writing is made up of a global community of chapters, like that of the more well-known 'twelve-step' community which will be described

latterly. Unlike the twelve-step, SMART is based on cognitive-behavioural principles, which are in themselves evidence based. However SMART as an intervention in and of itself lacks experimental data to support its efficacy. The cognitive-behavioural skills aspect of SMART as a mechanism for change in the treatment of SUD is not yet established by empirical data, though use of cognitive-behavioural skills by SMART group participants has been found to be mediated by group cohesion (192).

Meta-analytic data is consigned to systematic review of the literature by Beck et al. (193), with the focus on alcohol use. In this review of twelve studies, small treatment effects are observed in relation to OUD, but there is insufficient data to conclude the efficacy of the approach.

Twelve-step

The twelve-step program was developed in the 1930's by a Bill Wilson and Robert Smith as a means of treating alcoholism using Christian spirituality. Wilson and Smith first described the twelve-step approach in a book titled "Alcoholics Anonymous: The Story Of How More Than One Hundred Men Have Recovered From Alcoholism" (194) in 1934. The twelve steps were developed in reference to multiple influences from a broad range of disciplines. The theories of psychiatrist William Silkworth were of particular importance in shaping the twelve-step approach. Silkworth viewed addiction – or more specifically alcoholism – as an 'allergy' which cannot be cured and as such abstinence from alcohol is the regarded as the only means of ensuring sobriety (195). His views are compatible with the 'incentive-sensitisation' theory of addiction as described under heading 1.2.2.

Wilson and Smith also drew on the ideas of the psychotherapist William Peabody, and of Carl Jung, who in a letter to Bill Wilson, compared the craving of an alcoholic to a spiritual thirst for a relationship with God (196).

Since its initial development, the twelve-step method has been applied in different contexts including gambling, self-harm, sex addiction, and substance use disorders including OUD. It is also now delivered in forms which remove the Christian spiritual dimension, instead replacing God with a 'higher power', which can be analogous the patient's own conscience.

Twelve-step treatment for OUD is commonly delivered via chapters of Narcotics Anonymous (NA), which is a sister organization to the widely known Alcoholics Anonymous (AA). Both bodies are regarded as 'mutual aid organizations' in the UK. The approach is widely applied, as there are well over a thousand NA meetings are held each week in the UK (197).

The twelve-steps according to NA are as follows:

1) To admit powerlessness over addiction and admit that life has become unmanageable.

2) To come to believe that a Power greater than oneself could restore us to sanity.
3) To decide to turn one's will and one's life over to the care of God as we understand Him.
4) To make a searching and fearless moral inventory of oneself.
5) To admit to God, to ourselves, and to another human being the exact nature of our wrongs.
6) To be entirely ready to have God remove all one's defects of character.
7) To humbly ask Him to remove our shortcomings.
8) To make a list of all the people we have harmed and become willing to make amends to them all.
9) To make direct amends to such people wherever possible, except when to do so would injure them or others.
10) To continue to take personal inventory and promptly admit wrongdoing.
11) To seek, through prayer and meditation, to improve one's conscious contact with God as we understand Him, praying only for knowledge of His will for us and the power to carry that out.
12) To have had a spiritual awakening as the result of these steps, and try to carry this message to addicts, and to practice these principles in all one's affairs.

Evidence suggests that twelve-step treatment for OUD is effective. Data from six RCTs, pooled and analysed by Humphrey's et al. (104) found that twelve-step attendance predicted lower drug and alcohol usage at follow up. Similarly secondary data analysis from multiple substance use disorder treatment services found that twelve-step participation significantly predicted abstinence at follow up (198). Meta-analysis has found that twelve-step programs are associated with better outcomes than behavioural interventions which included CBT and MI (199).

1.5.3 Adjunctive treatments

Adjunctive treatments for OUD are not considered first-line primary treatments in the same way as maintenance therapy, but are designed to improve adherence to maintenance therapy and there by improve outcomes (184). There are several options for adjunctive, all of which are rooted to a greater or lesser degree in the cognitive-behavioural tradition, and include:

CBT

During traditional 'second wave' CBT patients are coached to recognize patterns of cognition, behaviour, affect and physiological response to aversive stimuli (200). The patient is coached to notice the interaction between these processes, and to seek out exposure to aversive stimuli relevant to their presentation whilst engaging in an altered behavioural repertoire designed to reduce experiential avoidance. Aversive stimuli may be extrinsic or intrinsic, and so therapy may involve gradually increased exposure to external stimuli such as feared situations (e.g. crowded

public places) or to phobic objects (e.g. spiders); or therapy may involve exposure to internal stimuli such as physiological sensations (e.g. elevated heartbeat) or cognitive states (e.g. purposeful recall of traumatic memories). Primarily, the purpose of exposure to aversive stimuli is to facilitate habituation – that is an increased tolerance of negative affect and associated physiological response, along with a corresponding decrease in the subjective intensity of said affect and associated somatisation.

CBT also targets cognition more directly, and patients will often engage in exercise designed to challenge the utility or verisimilitude of thoughts related to their presentation. This may include the challenging of conditioned thoughts in the presence of aversive stimuli, as well as the challenging of deeply held beliefs and attitudes which are not usually verbally accessible, but which serve to maintain the pathology in question. This process is usually achieved through Socratic questioning to elicit said cognitions, the framing of said cognitions as hypotheses, and the engaging in behavioural experiments to challenge the cognitions, followed by further Socratic dialogue to explore alternative cognitions based on the results of the experimentation.

CBT is a broad church however, and therapies which fall under the umbrella of CBT can deviate markedly from the brief overview offered here. An exploration of CBT, including traditional 'second wave' CBT (second wave refers to the addition of cognitive change strategies to a first wave of purely behavioural approaches to the treatment of mental disorder) and more recent 'third wave' CBT (third wave refers to the reduced emphasis on direct challenging of maladaptive cognition in favour of employing relational and meta-cognitive strategies) is thus beyond the scope of this chapter and of this thesis.

When applied to the treatment of SUDs, traditional CBT focusses on recognizing and addressing dysfunctional beliefs about the self, and about drugs and drug use (201). Beliefs about the self are often negative e.g. "I'm not good enough" or "I am a bad person", whilst those regarding drug use may often be positive e.g. "drugs help me cope" or "drugs make me more interesting". These beliefs give rise to 'permission-granting' thoughts e.g. "one more won't hurt, then I'll stop for sure, or "I need it or I will be so horrible to my family, it would be selfish not to". The treatment often encourages a meta-cognitive perspective in challenging maladaptive thoughts related to problematic drug use by way of behavioural experimentation. Examples might include challenging the thought that 'once I get the idea in my head [that I want to use] I can't get it out until I do [use]" by eliciting the thought, then employing some form of conditioned relaxation task, and then encouraging the patient to monitor changes in the subjective urge to use over time and the subjective difficulty of the task. This process could be repeated regularly, first under therapist supervision and then 'in the field'

to demonstrate that cognitive and affect states (both verbally accessible thoughts and urges) are time limited, and that the patient can delay their behavioural response to both over time.

CBT typically involves structured exercises aimed at challenging cognitions by recognizing biases in problematic situations (e.g. “I often overestimate my control over my drug use. I am unable to stop at just one. I will feel worse if I do this”) and encouraging behavioural changes including avoiding behaviours that are likely to increase the likelihood of drug use occurring and engaging in behaviours antithetical to drug use.

In the treatment of SUDs, therapists increasingly employ a third wave approach to CBT known as Acceptance and Commitment Therapy (ACT). ACT is based on a theory of human language and cognition known as Relational Frame Theory (RFT) and was developed by Stephen Hayes at the University of Nevada (202). ACT and RFT will be described in more detail under heading 4.2.2.

Of course, other third wave approaches exist apart from ACT, though they receive less attention in the literature in relation to the treatment of SUDs.

There is a robust evidence base to suggest that traditional CBT is effective not only in the treatment of mood and anxiety disorders as per the previous example, but also in the treatment of SUDs including OUD (203,204). According to meta-analytic data CBT alone has a small to medium treatment effect in relation to OUD (203) and is associated with improved outcomes for pharmacological maintenance treatments (205,206). ACT has been found to either be as effective as traditional ‘second wave’ CBT in the treatment of SUDs (207,208), or in some cases superior to traditional CBT (209).

Contingency management

Contingency management (CM) operates on the basic principles of operant learning theory. It seeks to counteract the reinforcement of drug use behaviours with rewards for evidence of positive behavioural change; thereby reinforcing behavioural counteractive to drug usage (210). CM is also built upon the premise that ongoing variation in motivation to change is a maintaining factor in SUDs, and so it aims to systematically ensure that patient’s behaviour towards treatment – for example their adherence to medication, or their attendance at appointments – has reliable consequences through positive reinforcement. Means of positive reinforcement commonly involve vouchers for goods or food, and entry in to prize lotteries (211).

CM is suitable and effective as a means of improving treatment adherence and retention in OUD, rather than a means of treatment in and of itself (210,212). Meta-analysis by Dutra et al. found that

CBT alone returned small to medium effect sizes, but CBT in combination with CM returned large effect sizes, and significantly improved retention (203). CM has also been found to be effective in reducing harmful behaviours secondary to primary OUD such as comorbid tobacco or cocaine use (213,214).

Motivational interviewing

Motivational Interviewing (MI) is an approach to structuring conversations so that an interlocutor talks themselves in to committing to a behavioural change. It is values based, using the patient's values and attitudes as motivators for commitment to change (215). It is a person-centred approach which, similarly to CM, assumes that ambivalence is a maintaining factor in SUDs. MI is also patient-centred, if the patient has ultimate responsibility for change, is not 'right' or 'wrong' to prioritise other things over their health, and that health professionals do not automatically know what the best option is for the patient. MI views change, such as reduction or cessation of problem substances in the context of SUDs this would be, as a continual process, not an event.

In its delivery, MI follows four principles:

1) Expressing empathy with the patient using open ended Socratic dialogue, reflection, and applying the philosophy of unconditional positive regard.

2) developing discrepancy between the patient's values and beliefs more generally, and the consequences of their drug taking behaviour.

3) to roll with resistance where in the therapist does not seek to talk to the patient in to change, but to reflect and summarise the cognitive dissonance already underway in the patient's mind to help them come a to conclusion themselves.

4) Supporting self-efficacy by encouraging the patient to consider times when they have gone without a problem substance, and how doing so has helped them. The therapist will also help the patient become aware of or discover new ways of improving their ability to avoid using.

Meta-analysis suggests that MI is effective in the treatment of various SUDs, most notably alcohol, tobacco and marijuana use disorders, as well as pathological gambling. The evidence to support MI's efficacy in the treatment of OUD however, is lacking (216). MI for OUD may be improved through the application of an enhanced versions of MI known as Motivational Enhancement Techniques or METs, which include CBT components (116,216,217).

1.5.4 Harm reduction

For patients receiving treatment for OUD and for those opioid users who are not receiving any form of treatment, death, and injury because of opioid use remains a potential reality. To keep people at risk of death or injury because of opioid drug use, harm reduction strategies can be employed. According to the WHO, harm reduction refers to "policies or programmes that focus directly on reducing the harm resulting from the use of alcohol or drugs without necessarily affecting the underlying drug use" (145). Harm reduction can include:

Needle and syringe exchange programs (NSP)

Heroin is commonly administered via injection. The proportion of heroin users injecting has increased in recent years, resulting in increased transmission of infectious diseases including HIV and HCV (16,114), especially amongst young adults in the US (218). In addition, fentanyl is commonly administered via injection, putting users at increased risk of infectious disease (219).

NSPs refer to services where in people who inject drugs can take used needles and associated paraphernalia, safely dispose of them, and acquire sterilized replacements to reduce the risk of infectious disease. NSPs have been found to be effective in achieving the aim of reducing infectious disease associated with the use of contaminated needles when self-administering heroin, fentanyl or other drugs (220). However, such measures cannot protect against disease from contaminated drugs, such as right sided endocarditis (17).

Take Home Naloxone (THN)

Take Home Naloxone usually refers to the distribution of a THN kit to reverse potentially fatal opioid overdose. Kits are comprised of one or more doses of naloxone (which is a short acting opioid antagonist), an intramuscular needle and syringe for administering the dose, and written or pictorial instructions to opioid users or those who live or work with opioid users. Instructions explain to the recipient how to prepare and administer the dose, perform basic life support, and communicate to the recipient the importance of calling the emergency services in the event of an opioid overdose.

Increased access to THN kits via specialist drugs services in the UK and internationally has been motivated by recommendations from influential bodies, including the World Health Organisation (WHO) (221) and the British Advisory Council on the Use of Drugs (ACMD) (222). Across the UK the uptake of THN kits in at-risk populations has been found to be low (98), but increasing (223).

Experimental data on THN as an effective method of reducing opioid death are lacking, but observational studies suggest that THN programmes involving the training of emergency are safe and effective (224,225).

Supervised Injecting of Diamorphine (HAT)

Heroin assisted treatment (HAT) involves the prescription of medical grade diamorphine for patients who do not respond to the first line maintenance treatments of methadone or buprenorphine, which is then injected by the patient in a clean safe environment under the supervision of medical professionals. HAT has a limited availability with only a small proportion of clinicians in the UK holding the appropriate license to prescribe the medication. The prescribed daily dose can range extensively from 5-1500mg (226), and it is usually delivered conjunction with a low dose of oral methadone (227).

Despite being in use in the UK for over a century, HAT is considered a controversial treatment for OUD. Research shows that the public perception of HAT is negative, with man believing that this method of treatment is associated with increased crime (228). Though the available evidence suggests that HAT decreases criminal activity amongst addicts (229) and in areas where safe injecting facilities are located (230).

Despite limited availability and poor public perception, HAT is associated with a decreased risk of fatal overdose (231) especially amongst refractory heroin addicts (232). Meta-analyses show that HAT is effective at reducing illicit heroin usage (233).

Drug Checking

The practice of point of care drug checking has been employed in various countries around the world since the first national drug checking system was rolled out in the Netherlands in the early 90s (234,235). In the UK, there are two drug checking services. These are WEDINOS (Welsh Emerging Drugs & Identification of Novel Substances) service allows for members of the public to post drug samples for analysis, the results of which are posted online (236); and The Loop, which is an organization which operates a pop-up service at various events and venues across the country (237). The Loop, along with other drug testing services elsewhere in the world, can be based at permanent locations within cities, or facilities can be made available at venues where drug use is likely, such as music festivals (238). The most accurate, and most expensive methods of drug checking technologies are situated in static purpose built laboratories, so that the accuracy of drug checking data will be reduced when comparing pop-up event drug checking to laboratory based checking (239).

The aims of testing illicit drugs are to reduce harm to the individual by proving information about the purity of the drug they intend to take and thus reduce harm associated with dangerous adulterants and to give counsel and advice regarding drug use generally (239). Drug testing also aims to give service providers a better idea of the kinds of harmful substances circulating in a given area so as to issue mass alerts often via social media (240).

Downsides of drug testing have been theorised. A study of 828 Canadian fentanyl addicts who used drug checking services found that drug dealers made comparatively frequent use of the service to check the purity of their product (241), which may well benefit users but also may solidify the drug trade itself. Though drug checking has been found to be well accepted amongst people who use drugs (242,243), some clinicians and researchers have raised the concern that drug checking may encourage drug use (244). However, at the current time there is little evidence to support the effectiveness of drug checking, or to support the counter arguments against drug checking either.

1.6 Measuring recovery from OUD

In relation to OUD, and to SUDs in general, the term recovery is a matter of debate and controversy. Recovery is often conceptualised as a 'journey' (245) where in individuals can progress through different stages in their usage. This can be full abstinence from problem substances which lasts the duration of their lifetimes following a period of successful treatment, or it can mean periods of abstinence and repeated episodes of relapse, or it can mean prolonged periods of reduced usage without full abstinence.

The WHO definition states that recovery is 'maintenance of abstinence from [problem substance] by any means' (145). When used in the context of OUD, abstinence can refer to either abstention from using a problematic opioid substance, or abstention from any narcotic. For example the 12-step program traditionally classifies abstinence as living a life where no narcotics are ingested (246). This is because this approach assumes that addiction is a lifelong condition, and so it is assumed that any problem substance use is unsafe as it will more than likely lead to relapse and regular use of the problem substance will renew. However, there are researchers and clinicians in the field of OUD who consider adherence to maintenance medications and avoidance of problem substances e.g. heroin as a state of abstinence (247). Indeed the UK Drug Policy Commission (UKDPC) emphasizes that recovery 'maximizes health and wellbeing, and participation in the rights, roles and responsibilities of society', without stating that abstinence necessarily be a prerequisite (248).

As there is a lack of consensus regarding the definition of recovery in the treatment of SUDs treatment for SUDs should include goal setting at the outset, and this process should include a share understanding of what constitutes improvement and recovery (249).

Recovery may relate to abstinence from the problem substance, which can be established by objective (though intrusive) methods such as urine analysis or mouth swabs, or subjectively by self-report. There are both quantitative and qualitative data to suggest that patients often express a favour for abstinence as a measure of recovery (250,251).

Alternatively, recovery can be conceptualised in a more functional way which may include controlled use of potentially harmful substances. In such cases various psychometric measures such as those found in the 'minimum data set' (252) can be employed to measure psychopathology and functioning in general terms. The use of SUD specific measures can also be used, such as the Treatment Effectiveness Evaluation (TES) (253) which takes measurements related to general wellbeing, lifestyle and engagement in community as well as to frequency of substance use.

1.7 In summary

OUD carries with it considerable disease burden, risk of death, and societal and economic costs. The prevalence of OUD, and so that of opioid overdose, has increased over recent decades. Political and law enforcement approaches to the problem of OUD and opioid overdose have been unsuccessful. Traditional treatment approaches can be effective, but a many people do not enter treatment, and of those who do many do not adhere to treatment sufficiently to recover.

Perhaps in response to the worsening international situation regarding OUD and opioid overdose, the failure of the 'war on drugs', and the limit effectiveness of traditional treatments, governments and health care providers are increasingly focussed on harm reduction strategies. However, the effectiveness of strategies like THN and safe injecting in reducing the harms associated with OUD on an aggregate level remain unclear.

Considering the harms associated with OUD, the shortcoming of the political and law enforcement approaches to tackling the problem, and the limited effectiveness of available treatments, important questions regarding OUD and opioid overdose remain unanswered.

1.8 Aims and objectives

The aims of this PhD are to:

1) Identify personality traits associated with OUD.
2) Provide an overview of the incidence of fatal opioid overdose in Wales along with the characteristics of opioid overdose decedents.
3) Describe facilitators of help-seeking amongst people experiencing OUD.
4) Describe the treatment landscape for OUD and identify barriers to adherence to the different modes of treatment available.

These aims are to be satisfied by completing the following objectives:

1) Describe the personality traits associated with OUD by systematically reviewing the existing research literature in this area.

2) Describe the sociodemographic characteristics of OUD decedents and the epidemiology of fatal OOD by carrying out a series of observational studies using routinely collected health data.

3) Describe the factors which motivate help seeking through an in-depth interview study with substance use disorder treatment service users.

4) Describe factors associated with treatment non-adherence amongst OUD patients by reviewing the literature and surveying SUD treatment service workers.

In the following chapter I will address my first aim by identifying personality traits associated with OUD by carrying out a systematic review of the relevant extant literature.

Chapter 2 – The Relationship Between Personality and Opioid Use Disorder

2.1 Background

Although personality is an accepted phenomena in the field of psychology, there is only partial consensus amongst researchers about what constitutes personality. A discussion of the history of personality psychology, and descriptions of the competing theoretical schools for understanding psychology is beyond the scope of this chapter, however. So, for the purposes of this text, I will be using the definition of personality as posited by Professor John Mayer when summarising the definitions offered by the dominant theorists in the field of personality psychology as “a system of parts (parts non exhaustively including motives, emotions, mental models, and the self) that is organized, develops, and is expressed in a person’s actions” (254). This definition has functional value as far as this text is concerned in that is compatible with the dominant contemporary theory of personality – the trait model.

Traits describe a person's typical and enduring patterns of thinking, feeling, and behaving. Traits can be organised according to a hierarchical overarching typology, falling under broader categories of ‘facets’ which themselves fall under increasingly broader categories often termed ‘domains’ (though the term ‘trait’ is often used to describe personality at the domain level). An example of this hierarchical structure would be to observe the trait of ‘commitment to work’ under the facet of ‘industriousness’ under the broader domain of ‘conscientiousness’ (255). However, the relationships between the component processes in personality configuration are, in practice, more complexly arranged, and there is much debate in the literature concerning the structure of personality generally. The question of how traits relate to facets and to domains in general terms and in specific contexts is ongoing as research reveals a multitude of ways in which domains break down into facets and facets to traits. For example, impulsivity has been viewed as a compound trait between high

extraversion and low conscientiousness (256), and also as an umbrella term for a collection of 'impulsigenic traits' which represents multiple related but distinct behaviours (257). This is of course not to say that the field of trait theory does not have useful, practical applications in the here and now. Indeed, personality trait configuration has been found to be predictive of developing OUD (258), and personality traits measured using 'big 5' criteria can reliably discriminate between OUD and healthy comparators (259). Additionally, personality trait configuration has been found to predict SUD pathology (260,261), including incidence of fatal OOD amongst people with OUD (262,263) and treatment outcomes (264,265).

The trait theory of personality developed based on a method of statistical analysis known as factor analysis. Factor analysis seeks to reduce set of variables, which can be extensive, into a limited number of factors. Factor analysis can be used to calculate the common variance between all variables and produce a value which can be used to estimate the strength of the correlations between each variable and the factors they can be reduced to. Factor analysis can also be used to identify latent variables which may not be immediately observable as relational to other visible variables or factors. The technique was first used in the field of trait personality by the psychologist Raymond Cattell, who's 16 factor model of personality was uniquely influential in the development of the field (266).

The five factor model (FFM), or 'big 5' model of personality developed in the 1980s is the dominant trait model of psychology in use today (267). This conceptualisation of personality as posited by Costa & McCrae (268) is concerned with five core interrelated domains of aggressiveness, psychoticism, constraint, neuroticism, and extraversion, each measured along continua. Within these domains lie more specific personality facets and traits.

Given the prevalence of OUD, there is a surprising lack of literature reviews concerning personality traits related to OUD. A notable exception is a review of limited scope carried out by Robert Craig published in the late 1970s (269). In response to this paucity of available summaries, I aimed to answer the question: "what personality traits are associated with opioid use disorder?" by surveying available literature and synthesising the findings into a concise summary.

2.2 Method

A systematic review of personality traits associated with OUD as measured using an established and appropriate psychometric tool was carried out. The protocol for this systematic review was developed in reference to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist (270). Findings from this review were reported in reference to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (271).

2.2.1 Development of a search strategy

A PECOTS table (see Table 1) was drafted to help in the development of a search strategy. A basic search based on this PECOTS table was drafted using text terms and Boolean operators as:

("substance use" OR addict OR depend*) AND (opioid OR opiate OR heroin OR fentanyl) AND ("personality traits" OR traits)*

No limiters related to study design, language or date of publication were used, and results were sorted by Pubmed's 'best match' filter. The search was run on 10.12.18 using the Pubmed database only.

TABLE 1 : PECOTS TABLE

Population	Opioid users as diagnosed according to DSM criteria as suffering from opioid use disorder or enrolled in treatment for opioid use.
Exposure	Psychometrically validated inventory of personality traits.
Comparison	No comparison, or opioid naïve drug or alcohol users, or substance naive controls.
Outcomes	Multi-trait personality inventories.
Timings	Single or repeated measures.
Settings	Any.

The search returned n=171 records. Pubmed's 'best match' search information includes controlled vocabulary terms known as Medical Subject Headings (or MeSH terms), which are used to index records in Pubmed and certain other databases. The following MeSH terms were found attached to records returned in the search: heroin; fentanyl; and analgesics opioid. The best match search information also included the following text terms: personality traits; actiq; abstral; fentora; opioid; lazanda; opiate; substance use; duragesic; ionsys; traits; sublimaze; recuvyra; subsys; heroin; fentanyl; opioid analgesics; and analgesics.

The most relevant terms listed in Pubmed's 'best match' search information, plus the most used MeSH terms (those which were used to index more than one third of the records) were added to the search strategy as summarised in Table 2.

TABLE 2: SEARCH STRATEGY

#1	*(adult [mh] OR female [mh] OR male [mh] OR human [mh] OR "opioid-related disorders" [mh] OR "heroin dependence" [mh] OR "substance-related disorders" [mh] OR "substance use" [tiab] OR addict*[tiab] OR depend* [tiab])*
#2	*(heroin [mh] OR fentanyl [mh] OR methadone [mh] OR "Opioid Analgesics" [mh]) OR opioid* [tiab] OR opiate* [tiab] OR heroin [tiab] OR fentanyl [tiab] OR "opioid analgesic*" [tiab] OR analgesic* [tiab])*
#3	*(personality [mh] OR "personality disorders" [mh] OR "personality inventory" [mh])*

#4	*(personality [tiab] OR "personality traits" [tiab])*
#5	*#3 AND #4*
#6	#1 AND #2 AND #5

A second search was run on 05.04.2019 using Pubmed, Medline, Psycinfo and Psycarticles databases, all of which use the same controlled vocabulary language (MeSH) as Pubmed. No limiters in terms of study design, language or date of publication were used and the results sorted using the 'best match' filter. Field tags such as [mh] or [tiab] when using Pubmed differed depending on which of the databases were being used. The search returned n=487 records and each interrogation are summarised in Table 3.

TABLE 3: INTERROGATED DATABASES

Database	***Search queries with field tags***	***n=***
Pubmed	*Field 1:* *(adult [mh] OR female [mh] OR male [mh] OR human [mh] OR "opioid-related disorders" [mh] OR "heroin dependence" [mh] OR "substance-related disorders" [mh] OR "substance use" [tiab] OR addict*[tiab] OR depend* [tiab])* *Field 2:* *AND (heroin [mh] OR fentanyl [mh] OR methadone [mh] OR "Opioid Analgesics" [mh]) OR opioid* [tiab] OR opiate* [tiab] OR heroin [tiab] OR fentanyl [tiab] OR "opioid analgesic*" [tiab] OR analgesic* [tiab])* *Field 3:* *AND ((personality [mh] OR "personality disorders" [mh] OR "personality inventory" [mh]) AND (personality [tiab] OR "personality traits" [tiab]))*	487
Medline	*Field 1:* *(MH (adult OR female OR male OR human OR "opioid-related disorders" OR "heroin dependence" OR "substance-related disorders")) OR (AB ("substance use" OR addict* OR depend*))* *Field 2:* *AND (MH (heroin OR fentanyl OR methadone OR "Opioid Analgesics")) OR (AB (opioid* OR opiate* OR heroin OR fentanyl OR "opioid analgesic*" OR analgesic*))* *Field 3:* *AND (MH (personality OR "personality disorders" OR "personality inventory")) AND (AB (personality OR "personality traits"))*	256
PsycInfo	*Field 1:* *(MA (adult OR female OR male OR human OR "opioid-related disorders" OR "heroin dependence" OR "substance-related disorders")) OR (AB ("substance use" OR addict* OR depend*))* *Field 2:* *AND (MA (heroin OR fentanyl OR methadone OR "Opioid Analgesics")) OR (AB (opioid* OR opiate* OR heroin OR fentanyl OR "opioid analgesic*" OR analgesic*))* *Field 3:* *AND (MA (personality OR "personality disorders" OR "personality inventory")) AND (AB (personality OR "personality traits"))*	361
PsycArticles	*Field 1:* *(MA (adult OR female OR male OR human OR "opioid-related disorders" OR "heroin dependence" OR "substance-related disorders")) OR (AB*	14

	("substance use" OR addict OR depend*))* *Field 2:* *AND (MA (heroin OR fentanyl OR methadone OR "Opioid Analgesics")) OR (AB (opioid* OR opiate* OR heroin OR fentanyl OR "opioid analgesic*" OR analgesic*))* *Field 3:* *AND (MA (personality OR "personality disorders" OR "personality inventory")) AND (AB (personality OR "personality traits"))*	
		Total: 1118

Once database searches had been carried out, duplicate records were removed using Zotero reference management software (272), and article titles were screened independently by two researchers (myself and Emma Phillips, an MSc student with our mutual supervisor Dr Ceri Bradshaw). Article titles or abstracts which were not relevant to the review with reference to the PECOTS table (Table 1) were excluded. This included all articles which described evidence synthesis or case studies, or were editorials, conference abstracts, book chapters or editorial letters were excluded. If eligibility were not apparent at title or abstract, then full texts were obtained and reviewed, and disagreements between the researchers were resolved by consensus on an on-going basis (see Figure 1).

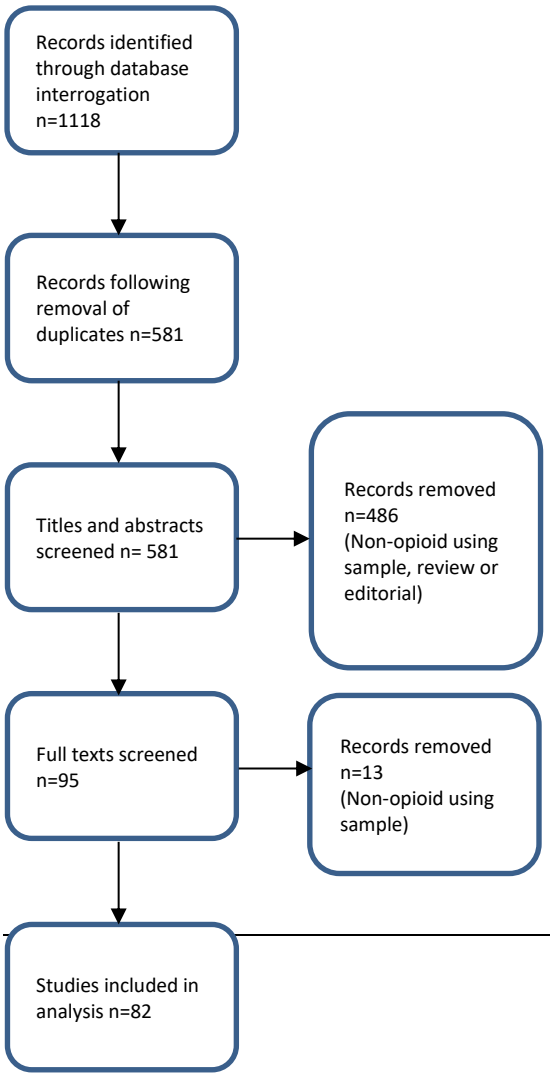


FIGURE 1: PRISMA FLOWCHART 1

Upon review of the full text articles deemed possible for inclusion at analysis, it was observed that several different measures of personality traits were employed. Different personality measures are often based on different theories of personality, and although some agreement has been found to exist between scales of different measures purporting to reflect the same trait, facet or domain, (273), pooling data from multiple different measures is generally contraindicated by the problem of non-equivalence (274). Therefore, I made the decision to limit the search to include only versions of the most often employed measure in the sample, which was the Minnesota Multiphasic Personality Inventory (MMPI) (275) or revisions thereof which was used in 17 of 82 studies. This measure will be further elucidated on under heading 2.2.3

In light of this decision regarding the MMPI, the search was narrowed to focus on studies employing only this measure and its revisions. This change is represented in an updated PRISMA flowchart (Figure 2) and PECOTS table (Table 4).

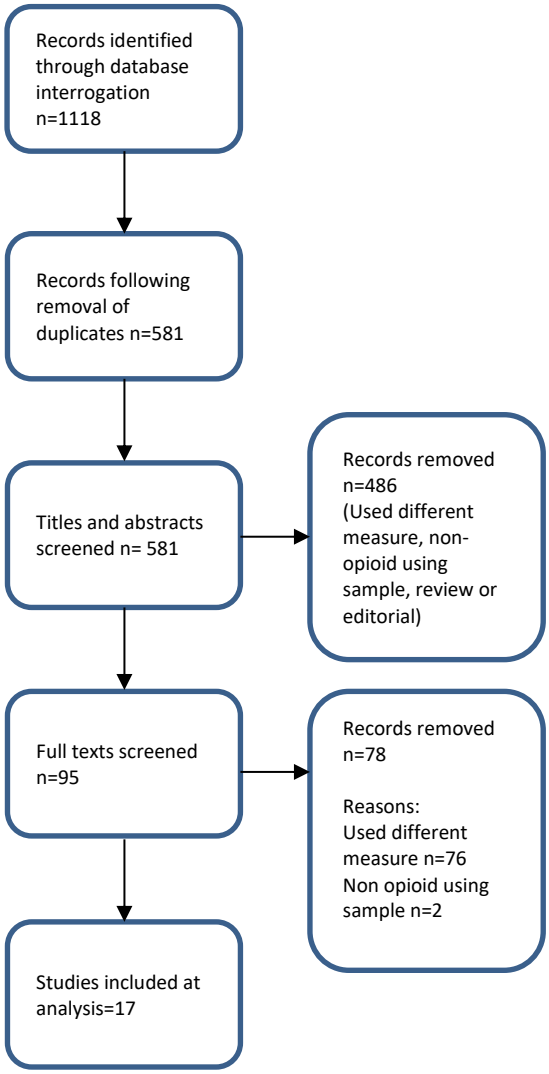


FIGURE 2: PRISMA FLOWCHART 2

TABLE 4: REVISED PECOTS TABLE

Population	Opioid users as diagnosed according to DSM criteria as suffering from opioid use disorder or enrolled in treatment for opioid use.
Exposure	Any revision of the MMPI.
Comparison	No comparison, or opioid naïve drug or alcohol users, or substance naive controls.
Outcomes	Personality trait measurements using one or more versions of the MMPI.
Timings	Single or repeated measures.

Settings	Any.

2.2.2 Repeating searches

On 20.05.2022, to account for the possibility of more recently published papers suitable for inclusion in the review (especially those which might make use of the MMPI-3) the searches were repeated. The repeated searches returned additional results and were subject to the original inclusion criteria as found in the updated PECOTS table (Table 3). Ultimately, no additional articles were included after the searches were repeated. The process is summarised in Table 5:

TABLE 5: REPEATED SEARCHES

Database	Additional results
Pubmed	54
Medline	25
PsycInfo	20
PsycArticles	2
Total=	101
After duplicates removed=	62
Removed after stage 1 (titles and abstracts) =	54
Removed after stage 2 (full text review) =	8 n=5 Different measure used n=3 Didn't assess personality
Included in analysis=	0

2.2.3 The Minnesota Multiphasic Personality Inventory

The Minnesota Multiphasic Personality Inventory or MMPI is a self-report questionnaire originally developed in the 1940s to measure a broad range of mental health problems (275). Additional content scales have been added to the original core of clinical and validity scales over the years, and in 1989 the original MMPI instrument itself was revised. Thereafter this revised version was referred to as the MMPI-2 (276). Further specialist revisions have included the MMPI–A (Adolescent) and the restructured version of the MMPI-A known as the MMPI-A-RF (277). The most recent revision of the measure, the MMPI-3, was published on 15/12/2020 (278).

The original MMPI was originally intended for use in clinical populations, however, the instrument and its revised version have now been widely used to measure personality traits in non-clinical populations. Applications of the MMPI and MMPI-2 outside of psychiatric testing include clinical research and occupational vetting.

The original MMPI contains 550 true or false question items over several scale compositions (279). The MMPI-2 includes some additions and alterations to the clinical scales and boasts 17 additional

items taking the total items to 567 (280). The MMPI-3 includes 72 new and 24 updated items (278). The ten original and most widely used of the clinical scales of the MMPI and it's revisions are:

1) Hypochondriasis (exaggerated concern for one's health)

2) Depression (mental and physical symptoms of depressed mood)

3) Hysteria (awareness of personal problems and vulnerabilities)

4) Psychopathic Deviant (propensity for boredom, anhedonia, interpersonal conflict, and lack of respect for society's rules)

5) Masculine-feminine (measure of stereotypical masculine and feminine interests and behaviour);

6) Paranoia (propensity for distrust, suspiciousness and over-sensitivity)

7) Psychasthenia (propensity to worry and experience anxiety, tension, doubtfulness, and obsessiveness)

8) Schizophrenia (a tendency towards bizarre thoughts and social alienation)

9) Hypomania (propensity for excitability and histrionic behaviour)

10) Social Introversion (asociality and negative orientation toward social interaction).

As well as clinical scales the MMPI includes nine validity scales. These assess how likely it is that the respondent is lying, exhibiting defensiveness, or 'faking good or bad' by providing answers in the interest of securing a favourable outcome of some description. The three original and most often used of these scales are the L-scale (also known as the 'uncommon virtues scale' or the 'lie scale'), the F-scale and the K-scale:

1) The L-scale is intended to detect when a respondent is not answering in an honest and frank way by reporting an unusual number of uncommon virtues. In this way a respondent can be thought of as 'faking good' by opting to appear more virtuous than they are, or 'faking bad' to achieve the opposite effect.

2) The F-scale is used to identify when a respondent is disengaged from the process and answers questions at random giving strange or atypical answers.

3) The K-scale is designed to detect evidence of psychopathology in respondents who might normally on other clinical or content scales by way of strategic responses. It includes items related to self-control, interpersonal relationships, and defensiveness.

There are also multiple additional content scales designed to increase the incremental validity of the clinical scales. Some of examples of which include the demoralization scale, which is a general measure of distress; the cynicism, somatic and medically unexplained symptoms scales and the low positive emotion scale, which is analogous to anhedonia.

2.2.4 Scoring and interpreting the MMPI

The numerical score for each MMPI scale depends on the number of 'true' or 'false' responses, which in turn are determined by the scale 'key' of true or false. For example, the depression clinical scale includes an item that reads "I am happy most of the time". This item is keyed false as it is in antithesis with the symptomatology of depression. The scale also includes the item "I cry a lot", which is keyed as true for the same reason. The number of true responses to true keyed items and to false keyed items and vice versa are assigned numerical values which total the scale score. This total 'raw' score is then transformed to a Z-score by taking the raw score away from the known population mean score for that scale, and then dividing this value by the standard deviation. This Z-score is then converted to a T-score using the formula $T = 10z + 50$.

T-scores are like a Z-statistic in that they represent a measurement of the number of SDs away from the statistical mean that a given value lies, however, unlike the Z statistic, the mean T-score is always 50 and so the score is always positive.

Generally, in reference to the original and revised normative data, when interpreting MMPI or MMPI-2 data, a T-score of 65 or above or below 35 are considered abnormal. The implications of an elevated or depressed score differ depending on the difference between said score and the normative mean, and the scores for other scale scores which serve to contextualise the value of interest. Therefore, simply being slightly outside of the normal range of scores does not necessarily convey any clinical significance (281).

2.2.5 Psychometric validity and reliability

Interpreting the results of any psychometric measure of psychological phenomena including personality is dependent on the psychometric properties of the measurement tool in question. This is a complex task, as psychometric measures are intended to measure phenomena which cannot be directly observe (e.g. attitudes, beliefs, proclivities) and so must infer measurement of these latent constructs from observable behaviour or physiological determinants.

In establishing the usefulness of a particular measure researchers are generally interested in the properties of measures related to validity and reliability. Generally speaking, validity be understood as the degree to which a specific tool measures what it purports to measure, and reliability as the degree of precision, accuracy, and replicability said tool exhibits in making said measurements (282)

There are considered to be four main types of validity: content validity, criterion-related validity, construct validity (broken down in to convergent and discriminant validity), and face validity.

Content validity refers to the degree to which a measure incorporates all the possible observable dimensions of the phenomena it purports to measure (283). For example, a measure of schizophrenia would have low content validity if it measured only positive symptoms, and higher content validity if it measured both negative and positive symptoms, and higher still if it measured negative symptoms, positive symptoms, and interpersonal sequelae.

Criterion-related validity refers to how well a measure performs against an independent current or future standard. As such criterion-related validity is often described as being either concurrent or predictive. A measure exhibits good concurrent criterion-related validity when it can predict a respondent's scores on another established measure of a related construct. For example a novel measure of negative attitudes towards oneself reliably predicting Beck Depression Inventory scores (284). A measure exhibits good predictive criterion-related validity if the measure reliably predicts future behaviour or other outcomes. For example, a measure of anti-social behaviour which reliably predicts future receipt of anti-social behaviour orders.

Construct validity relates to the ability of a tool to differentiate between respondents who demonstrate different characteristics. For example, if a measure which is designed to measure general life satisfaction can reliably differentiate between people who report general dissatisfaction with life versus people who report general satisfaction with life can be said to have good construct validity.

Establishing construct requires the prerequisite establishment of convergent and discriminant validity. Convergent validity refers to how well two measures of the same phenomena correlate, for example how well the brief Liebowitz Social Anxiety Scale (LSAS) (285) correlates with the Social Phobia Inventory (SPIN) (286). Discriminant validity refers to the degree to which a measure negatively correlates with an existing measure of an opposing construct. For example, a measure of hostility negatively correlating with a measure of altruism would be evidence of each tool's discriminant validity.

Finally, face validity refers to how a measure looks and reads on a surface level, and to the degree to which these superficial characteristics of the measure inspire confidence as to whether the tool in question measures what it purports to measure. For example, a measure of depression would be expected to include words such as 'sad', 'low', or 'down', and be presented in a functional and clinical manner, not incorporating fonts or images incongruent with the topic of depression.

As with validity, there are considered to be four principal types of reliability. These are parallel-forms reliability (also known as inter-method reliability), internal consistency reliability (broken down into inter-item correlation and split-half reliability), inter-rater reliability, and test-retest reliability.

Parallel-forms reliability refers the degree to which the items of a particular measure can be split in to two alternative forms and can be used to measure the same when given to the same sample. For example, the items of a measure of performance anxiety could be split in to two alternative measures – a short form and a long form - and the strength of correlation between the two forms used to establish the parallel form reliability of the measure as a whole.

Internal consistency refers to the extent to which a measure's individual items each measure the same phenomena.

Most commonly internal consistency is calculated as inter-item consistency, which is an average of all the possible correlations between each item and the measure's total score. Inter-item consistency is reported statistically as Cronbach's coefficient alpha.

Internal consistency can also be calculated in terms of split-half reliability. This is similar to parallel-forms reliability, but instead of splitting a measure in to two alternative forms, the same form of the measure is randomly split in half and the strength of correlation between the two randomly assigned halves are analysed.

Inter-rater reliability applies to measures utilised by an observer, for example a structured clinical interview may exhibit good inter-rater reliability if separate clinicians using the same interview schedule and prompt sheet report the many of the same observations. Inter-rater reliability is not applicable when raters are not involved, such as is the case with self-report measures such as the MMPI.

Test-retest reliability refers to the strength of correlation between the responses of an individual when completing a particular measure at two different time points, assuming that the respondent's answers to the measure's items would not be liable to change significantly over time. For example a measure of agreeableness may demonstrate good test-retest reliability if a respondent's answers did not differ significantly when they completed the measure in the same setting at one week intervals.

A psychometric measure can be reliable in that it can produce robust measurements which are stable over repeated measurements, and still lack validity. In order to ensure that our utilisation of a specific tool is valid for the context in which it is applied one must first establishes a baseline distribution. This baseline distribution of responses is considered 'normative', and so a measure can be applied to different subsets of the population (e.g. youth offenders, trauma patients, or undergraduate students) and their scoring profiles compared to the normative data.

2.2.6 Psychometric properties of the MMPI and revisions

The normative sample on which the original MMPI was developed was made up of 1500 Caucasian people from Minnesota, most of whom were married, aged between 16 and 55 and who lived in rural or smaller urban areas during the 1930s. The gender ratio was slightly in favour of female participants (275). Normative data were captured for use with additional content scales used with the MMPI in 1957, but these did not include revisions of the original scales (287). Considering the heterogenous normative sample, one would assume that the original MMPI normative data would lack external validity over time and place. However, when applied to different ethnic groups within the United States, a literature review by Greene in 1987 (288) found that other factors such as income, intelligence and educational attainment were more reliable moderators of MMPI scale scores than ethnic group membership. Similarly, the original MMPI norms have been found to be valid when applied to populations in other countries, including Thailand and the Philippines, though native normative data have been found to be of necessity in other nations such as China and Korea (289).

In 1984 Colligan et al. (290) captured new population norms from a sample of n=1408 healthy people aged between 18 and 99 from Minnesota, Iowa and Wisconsin, and compared these to the original norms for the clinical and content scales of the MMPI. This population differed from the original in that it was comparatively ethnically diverse, included people of higher educational attainment, and the age range was extended. Means for all the clinical scales and validity scales, save the L scale, were significantly higher for male respondents. Most of the clinical scales' means were higher for female respondents also.

Following this evaluation of the original normative means against a contemporary population, the updated MMPI-2 was released in 1989 (276). The MMPI-2 normative data sample involved n=2600 people from seven American states. Compared to the original, the sample for the MMPI-2 is heterogenous in terms of education, ethnicity, and age. As with the original MMPI, gender ratio is slightly in favour of females.

As with the original MMPI, MMPI-2 normative data from the United States has been found to be applicable in Thailand the Philippines but not applicable in China or Korea (289).

The MMPI-2 retains most of the original MMPI scales, and although many of the clinical, content and validity scales were revised, most of the items remain the same across the two measures. Though revisions are clearly necessary so that the measure reflects contemporary norms, differences in reported T-scores are for the most part statistically insignificant when the original and the revised version of the test are applied to the same sample, and scale agreement remains high (276,291,292).The content validity of the MMPI and MMPI-2, like that of all personality measures, has been neglected amongst the literature due to disagreement amongst researchers as to the practical value of such a concept in the context of personality (293–295). The content validity of the MMPI scales is also dependent on how well the scale items represent the construct of the personality traits they purport to measure. Currently, the most widely accepted and thus dominant model of personality is the 'big five' model of openness, conscientiousness, extraversion, agreeableness and neuroticism. MMPI scales have been found to correlate well with measures designed specifically to measure 'big five' traits (296–298), with the exception of conscientiousness (297), which could be considered a weakness in respect to MMPI and MMPI-2 content validity.

Rojdev et al. (299) assessed criterion-related validity of the MMPI and MMPI-2 clinical scales in a non-clinical population by correlating the clinical scale responses with comparable responses on the widely used Symptom Checklist-90 item (SCL-90) (300). The authors found that correlations for the MMPI and SCL-90 ranged from r=0.33 to 0.52; and ranged from r=0.11 to r=0.42 for the MMPI-2.

The MMPI has demonstrated excellent convergent validity with the Symptom Checklist 90 (SCL-90) (301,302), and the MMPI-2 has demonstrated excellent correlation with the MCMI-III (Million Clinical Multiaxial Inventory third revision), with each clinical scale on the MCMI demonstrating at least one strong (r=0.6>) correlation with a corresponding MMPI scale (303). The validity scales of the MMPI-2 have demonstrated excellent agreement with those of the NEO-PI (Neuroticism, Extraversion, Openness Personality Inventory) ranging from 81.1.% (Cohens k=0.33) to 82.4% (k=0.3) (304).

Face validity can be difficult to measure owing to the difficulty in conceptualising face validity as distinct from item subtlety. Item subtlety refers to a lack of an obvious relationship between a measure's item content and the construct it is purporting to measure, which is similar to face validity as the contextual relevance of the items making up a measure. In regards to the MMPI, research has shown that inconsistencies in scoring between different groups are more likely to be attributable to item-subtlety rather than poor face validity (305–307), though there is no clear consensus amongst the limited available literature (308).

Data related to the parallel-forms reliability of the MMPI or MMPI-2 are scarce. A study carried out by Fekken et al.

Internal consistency of the original MMPI has been found to range from 0.34 to 0.87 amongst the normative sample (276). internal consistency estimates for the MMPI-2 range from 0.34 to 0.85 for men and from 0.39 to 0.87 for women amongst the normative sample (309).

The interrater reliability of the original MMPI was calculated by Schoenfeld et al. (310) as weak (Cohen's K -0.39) but statistically significant (p=<0.05) by comparing the ratings of two independent psychologists for n=424 MMPI profiles of police recruits. The MMPI-2 has been assessed using computer-based test interpretations or CBTI programs. Deskovitz et al. (311) assessed interrater reliability by allocating n=20 archived MMPI-2 profiles to four experienced clinical psychologists using six commercially available CBTI programs. The authors reported interrater alpha values ranging from $\alpha = 0.82$ to $\alpha = 0.88$ with an average alpha of 0.85 [0.79, 0.90].

MMPI clinical scale test-retest reliability has been found to range from r=0.67 to 0.89 for males and 0.59 to 0.91 for females. In both gender groups the weakest correlation with the original MMPI was for the paranoia scale, and the strongest correlation was for the psychasthenia scale (312). Clinical scale one-week stability coefficients range from r=0.67 to r=0.92 for men and r=0.58 to r=0.91 for women.

2.2.3 Analysis plan

In relation to the current review, I made a data extraction table to aid the process of data capture and synthesis, which would take place in six stages.

1) The sample characteristics for each study would be captured and reported; including age, gender and problem substances used by the sample, and the main findings of the studies.
2) Study characteristic would be captured and reported, including the date of publication for each study; the study authors and the country in which the study took place.

3) Comparisons would be made between the MMPI and MMPI-2 means as reported in each of the included studies.
4) A narrative review of the findings by the original ten clinical and three validity subscales.
5) T-scores for each scale as reported in each study would then to be used to calculate a weighted mean (an average of averages weighted by sample size).
6) Comparisons would be made between any opioid using sub-populations apparent in the data.

2.2.3.1 Study quality

Study quality was assessed using the Q-SSP (quality of survey studies in psychology) checklist (313). The Q-SSP is comprised of 20 yes or no question which pertain to four research domains of: Introduction (including rationale and variables), Participants (e.g. sampling), Data (including collection, measures, analysis, results and discussion) and Ethics. An example question related to the Introduction domain and regarding rationale would be "Was the problem or phenomenon under investigation defined, described, and justified?" Study quality score is calculated by dividing the number of 'yes' answers by the total number of items applicable to the study in question and multiplying this by 100. This checklist tool was selected over other quality assessment tools for use in reviews primarily due to it being designed specifically for the purposes of establishing methodological quality and risk of bias in survey studies, including those which involve the use of psychometric instruments such as the MMPI.

Secondarily, the application of the Q-SSP as opposed to, for example, the widely applied STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist (270), was due to the specific purpose of this review to identify personality traits associated with a disorder aligning with the purposes of the Q-SSP. As the authors note there is no other quality assessment checklist specifically designed for survey studies (313) despite the commonality of survey designs in psychological research especially.

The authors of the Q-SSP found that the criterion validity of the pilot version of the checklist was sound using a sample of 10 expert assessors using the checklist to assess 20 survey studies. The inter-rater agreement for each study across the experts was good, returning an ICC of 0.75, ($p=<0.001$). The authors revised the checklist following a review of the tool by a separate expert panel, and then tested the criterion validity of the revised Q-SSP checklist scores on a selection of survey studies from a previously carried out meta-analyses which involved the use of other more general quality assessment tools and subjective assessments. They found that evidence to support good criterion validity was lacking, however, the final iteration of the Q-SSP checklist was found to

exhibit good agreement among experts. As such, it is recommended by the authors for use in evidence synthesis.

The Q-SSP checklist completed for each article which is available in Appendix A.

2.2.4 Ethics

No ethical approval was necessary for carrying out this review.

2.3 Results

2.3.1 Sample characteristics

The combined sample of case participants in this review was n=1878. Of these, a minority (n=152, 8.09%) were female. Median age of case participants was 30.9 years [6.09] with a range of 23-48.8 years. The sample was made up of predominantly American, male heroin users.

2.3.2 Study characteristics

Author, study title and year of publication, sample size (n), administration and setting, and study quality are summarised in Table 6. Of the seventeen studies included at analysis, three studies were of 'acceptable quality', whilst the remaining fourteen studies were of 'questionable quality'.

The study quality and individual results of all the included studies, including sample size, age and gender ratio for comparators and control participants are summarised in Appendix B. Statistical values including standard deviations, p-values or confidence intervals are included where these data were available.

TABLE 6: STUDY CHARACTERISTICS 1

Sutker 1971. Personality differences and sociopathy in heroin addicts and nonaddict prisoners (314)	40 heroin addicts, 40 incarcerated controls	Single administration, forensic	Questionable quality	Overall Quality Score (%): 38.9 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 3/10 Ethics score: 0/3
Kojak and Canby. 1975. Personality and behaviour patterns of heroin-dependent American servicemen in Thailand (315)	25 heroin dependents, 50 controls	Single, military inpatient rehabilitation	Questionable quality	Overall Quality Score (%): 65 Domain Quality Scores: Introduction (Rationale/Variables) score: 2/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 8/10 Ethics score: 1/3
Gerra et al. 2008. Relationship of Personality Traits and Drug of Choice by Cocaine Addicts and Heroin Addicts (316)	85 heroin addicts, 60 cocaine addicts, 50 controls	Single administration, MMT	Questionable quality	Overall Quality Score (%): 50 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 4/10 Ethics score: 1/3
Penk et al. 1979. Personality characteristics of compulsive heroin, amphetamine, and barbiturate users (317)	65 heroin dependents, 45 amphetamine users, 34 barbiturate users	Single administration, military inpatient rehabilitation	Questionable quality	Overall Quality Score (%): 55.6 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 4/10 Ethics score: 1/3

Craig et al. 2004. Predicting Methadone Maintenance Treatment Outcomes Using the Addiction Severity Index and the MMPI-	Husband & Iguchi. 1995. Comparison of MMPI-2 and MMPI clinical scales and high-point scores among methadone maintenance clients (328)	Roszell and Calsyn1986. Personality and demographic characteristics associated with the prescribing of psychoactive medications for methadone maintenance	Zeng et al. 2016. The similarities and differences in impulsivity and cognitive ability among ketamine, methadone, and non-drug users (326)	Haertzen et al. 1969. Changes in personality and subjective experience associated with the chronic administration and withdrawal of opiates (325)	Gerra et al. 2000. Neuroendocrine correlated of temperament traits in abstinent opiate addicts (324)	Gerra et al. 2004. Aggressive responding in abstinent heroin addicts: neuroendocrine and personality correlates (323)	McKernan et al. 2015. Further Evidence of Self-Medication: Personality Factors Influencing Drug Choice in Substance Use Disorders (322)	Dolan et al. 1983. Personality differences among black, white, and Hispanic-American male heroin addicts on MMPI content scales	Marsh et al. 1988. Psychopathology of Opiate Addiction: Comparative Data from the MMPI and MCMI (320)	Glankin et al. 2018. Psychological features of abstinent heroin users before and after rehabilitation in Saint Petersburg	Penk et al. 1980. MMPI factor scale differences among heroin addicts differing in race and admission status (318)
108 methadone maintenance patients	51 methadone maintenance patients	67 methadone maintenance patient, 11 methadone users prescribed antidepressants, and 26	59 MMT patient, 51 ketamine users, 60 drug naïve controls	15 heroin addicts	22 abstinent heroin addicts, 22 controls	20 abstinent heroin addicts, 20 controls	96 opioid drug users, 236 other drug (depressants and stimulants) users	423 heroin addicts, 268 of minority ethnic background and 154 Caucasian	157 heroin addicts	164 heroin addicts	260 treatment seeking heroin addicts, 67 addicts legally mandated treatment
Single administration, MMT	Single administration, MMT	Single administration, MMT	Single administration, MMT	Repeated administration in experimental setting: During abstinence, during chronic administration	Single administration, post inpatient rehabilitation (discharged)	Single administration, post inpatient rehabilitation (discharged)	Single administration, inpatient rehabilitation	Single administration, military inpatient rehabilitation	Single administration, MMT	Single administration, inpatient rehabilitation	Single administration, inpatient rehabilitation
Questionable quality Overall Quality Score (%): 66.7 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 7/10 Ethics score: 0/3	Acceptable quality Overall Quality Score (%): 72.2 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 6/10 Ethics score: 3/3	Questionable quality Overall Quality Score (%): 38.9 Domain Quality Scores: Introduction (Rationale/Variables) score: 1/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 5/10 Ethics score: 0/3	Acceptable quality Overall Quality Score (%): 83.3 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 7/10 Ethics score: 2/3	Questionable quality Overall Quality Score (%): 20 Domain Quality Scores: Introduction (Rationale/Variables) score: 2 Participants (Sampling/Recruitment) score: 0 Data (Collection/Analyses/Measures/Results/Discussion) score: 2 Ethics score: 0	Questionable quality Overall Quality Score (%): 61.1 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 5/10 Ethics score: 1/3	Questionable quality Overall Quality Score (%): 44.4 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 3/10 Ethics score: 1/3	Questionable quality Overall Quality Score (%): 66.7 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 6/10 Ethics score: 0/3	Questionable quality Overall Quality Score (%): 68.4 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 6/10 Ethics score: 1/3	Questionable quality Overall Quality Score (%): 50 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 0/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 6/10 Ethics score:0/3	Acceptable quality Overall Quality Score (%): 84.2 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 9/10 Ethics score: 2/3	Questionable quality Overall Quality Score (%): 66.7 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 5/10 Ethics score: 1/3

Study authors and title	N (cases and controls/comparators)	Administration and setting	Quality
Sutker 1973. Incarcerated and street heroin addicts: A personality comparison (330)	82 heroin addicts in mandated treatment, 35 incarcerated addicts, 87 incarcerated controls	Single administration, forensic	Questionable quality Overall Quality Score (%): 33.3 Domain Quality Scores: Introduction (Rationale/Variables) score: 2/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 3/10 Ethics score: 0/3

2.3.2.1 Scale reporting

Of the seventeen studies included four did not report the ten clinical and three validity scales which are standard to the MMPI. Penk et al. (318), Dolan et al. (321), McKernan (322), and Craig et al. (329) exclusively applied additional content scales. As this review is focused on the clinical and validity scales which are standard to the MMPI, the findings of these four studies have not been included in this data analysis, but their findings can be found in Appendix B.

In addition to the study data excluded due to exclusive use of additional content scales, Roszell and Calsyn (327) reported clinical and validity scale scores for MMT patients prescribed anxiolytics, antidepressants, and those with no additional prescription. Only those participants who received no additional prescription were included at analysis to remove the influence of comorbid mental illness on MMPI scale scores where possible.

Kojak and Canby (315) and Zeng et al. (326) reported raw scores. Prior to analysis these values were converted to T-scores (K-corrected where the K-scale was reported) with reference to the MMPI and MMPI-2 manuals.

2.3.3 MMPI and MMPI-2 comparison

Of the seventeen included studies, nine used the original MMPI only and seven used the MMPI-2 only. One study, carried out by Husband & Iguchi (328), used both measures completed by the same sample. They found that both scales correlated well with one another (Spearman's r for individual scales ranging from 0.69 to 0.87, p=<0.001).

To assess whether the means reported in the included studies (see Table 7) differed depending on whether the MMPI or MMPI-2 were used I sought to compare the scale means of participants who had completed the MMPI and those who had completed the MMPI-2. Three of the ten clinical (masculinity-femininity, paranoia, schizophrenia) and two of the three validity scale (L and F) were not normally distributed. Therefore, I opted to use a non-parametric test (Mann -Whitney U) test to compare reported means completes using the MMPI and MMPI-2.

The Mann-Whitney U test returned a value of 0 (p=0.037) for both masculinity-femininity scale scores and K-scale scores. This was because all masculinity-femininity scores using the MMPI-2 (n=2) were higher than those using the MMPI (n=8), and all K-scale scores using the MMPI-2 (n=2) were lower than those using the MMPI (n=8). There were no significant differences between the MMPI, and the MMPI-2 means for any of the other subscales. The SPSS output data and syntax for this analysis can be found in Appendix C.

2.3.4 Results by scale

In reporting scale scores, terminology has been retained in line with the original article text. That is, where cases are described as 'addicts' or 'dependents' or 'users' by the author, so too are they described in this narrative synthesis of the findings.

2.3.4.1 Clinical scales

Hypochondriasis scale:

Of the eleven studies which reported hypochondriasis clinical scale data, seven made comparisons between groups, five of which found statistically significant differences. Sutker et al. 1971 (314) and 1973 (330), and Gerra et al. 2000 (324) and 2004 (323) found significantly higher scores for heroin dependent cases versus healthy controls. Kojak and Canby (315) found no significant differences between heroin dependents and healthy controls amongst a sample of military veterans. In a later study Gerra et al. (316) found that heroin addicts reported lower hypochondriasis scores in comparison to both cocaine addicts and healthy controls, and Penk et al. (317), who found no statistically significant difference in scores between heroin dependents and amphetamine or barbiturate users.

Four studies made within group comparisons or reported data from a single administration of the MMPI or MMPI-2. Of these, Roszell and Calsyn (327) found significantly lower hypochondriasis scale scores for methadone-maintained patients who were either prescribed or not prescribed antidepressants compared with those prescribed anxiolytics. Haertzen et al. (325) found significantly lower hypochondriasis scores for heroin users in abstinence versus the same users whilst actively using and whilst in withdrawal. Husband & Iguchi (328) found no significant difference in scores between the hypochondriasis scale of the MMPI and MMPI-2, with both measures being applied to the same sample of methadone-maintained heroin addicts. Galankin et al. (319) found that a sample of heroin addicts scored a mean 61.0 on the hypochondriasis scale, or just over 1 SD above the scale's normative mean.

Depression scale:

Of ten studies which captured depression scale data, eight made between group comparisons. Kojak and Canby (315) found that depression scores were not significantly higher for heroin dependents versus controls. Gerra et al. in 2000 and 2004 (323,324) found significantly higher depression scores for abstinent heroin addicts compared to healthy controls. Sutker et al. (314) also found that incarcerated heroin addicts scored significantly higher than healthy inmates. In a later study (published two years later in 1973) Sutker et al. (330) found that heroin addicts in mandated maintenance treatment scored significantly lower than incarcerated addicts and incarcerated controls. Roszell and Calsyn (327) found that MMT patients prescribed anxiolytics scored significantly higher than those not prescribed anxiolytics or who were prescribed antidepressants. In a later study Gerra et al. (316) found that heroin addicts and cocaine users scored significantly higher than healthy controls, and Penk et al. (317) found that depression scores were significantly lower for heroin addicts compared to amphetamine and barbiturate users.

Two studies measured depression scale scores within a single group. Husband & Iguchi (328) returned a T-score ≥1 SDs above the normative mean using the original MMPI, and a T-score at the higher end of the normal range using the MMPI-2. Marsh et al. (320) found that heroin addicts scored over ≥1 SDs above the normative mean, which was slightly over the normative cut-off of 65.

Hysteria scale:

Of nine studies reporting on the hysteria scale, six compared scores between groups. Kojak and Canby (315) found no significant difference between heroin dependent servicemen and controls. Roszell and Calsyn (327) found significantly lower hysteria scores for MMT patients who were not prescribed anxiolytics compared to those who were. Sutker et al. (314) found significantly higher hysteria scores for incarcerated addicts versus incarcerated control subjects. In a later study Sutker et al. (330) replicated these findings by identifying significantly higher scores for incarcerated heroin addicts in mandated maintenance treatment than both incarcerated addicts receiving no treatment and incarcerated control subjects. Gerra et al. (316) found heroin addicts to return significantly higher scores than both cocaine addicts and healthy controls, and Penk et al. (317) found that heroin dependent men scored lower than amphetamine and barbiturate users.

Haertzen et al. (325), Marsh et al. (320) and Galankin et al. (319) all reported hysteria scale scores within a single group. Haertzen et al. (325) found significantly lower scores for heroin dependents when routinely using heroin than when in a state of withdrawal. Marsh et al. (320) returned hysteria scores for heroin addicts ≥1 SDs over the normative mean, but not over the recognised cut-off of 65. Galankin (319) reported mean hysteria scale scores from a sample of heroin users which was within 1 SDs of the normative mean.

Psychopathic Deviate scale:

Of thirteen studies which reported psychopathic deviate scale scores, nine made between group comparisons. Kojak and Canby (315) did not find a significant difference between heroin dependent servicemen and healthy controls. Sutker (1971 & 1973) (314,330) and Gerra (2000, 2004 & 2008) (316,323,324) both found significantly higher scores for heroin addicted participants versus healthy controls (Sutker's addicts and controls were incarcerated at the time of administration). Roszell and Calsyn (327) found that MMT patients prescribed anxiolytics scored significantly higher than MMT patients with no additional prescription, or who were prescribed only antidepressants. Zeng et al. (326) found that MMT patients scored significantly higher than healthy controls, but no difference was found between MMT patients and ketamine users. Penk et al. (317) found no statistical difference between heroin addicts and barbiturate and amphetamine users, but Gerra (2008) found heroin addicts scored significantly lower than cocaine addicts.

Of the four studies which measured psychopathic deviate scale scores within a single group, Husband & Iguchi (328) tested MMT patients and returned a T-score of ≥2 SDs above the normative mean using the original MMPI, and ≥1 SDs above the normative mean using the MMPI-2. Haertzen et al. (325) found that psychopathic deviance scores amongst heroin addicts were ≥2 SDs above the normative mean and did not change significantly during active usage of heroin, periods of abstinence, or during withdrawal. Marsh et al. (320) found T-scores ≥2 SDs above the normative mean in heroin addicts, whereas Galankin et al. (319) found scores ≥3 SDs above the normative mean.

Masculinity-Femininity scale:

Eight studies reported on the masculinity-femininity scale. Of these, six compared scores between groups. Kojak and Canby (315) found no significant differences between heroin dependent servicemen and healthy control subjects. Roszell and Calsyn (327) found no differences between MMT patients prescribed anxiolytics, antidepressants, or no additional prescription. Sutker et al. (314,330) found no significant difference between incarcerated heroin addicts and incarcerated controls in either of their studies. Gerra et al. (316) found that heroin addicts reported scores higher than both cocaine addicts and healthy controls whilst Penk et al. (317) found heroin addicts scored significantly lower than barbiturate and amphetamine users.

Two studies measured masculinity-femininity within a single group. Galankin et al. (319) found scores amongst heroin users just short of 2 SDs above the normative mean, whilst Marsh et al. (320) found that heroin addicts returned scores which were close to the normative mean.

Paranoia scale:

Eight studies reported paranoia scale data, six of which compared scores between groups. Kojak and Canby (315) found no statistically significant difference between heroin dependent servicemen and healthy controls. Sutker et al. (314) found that paranoia scores did not differ significantly between incarcerated addicts and incarcerated control subjects. In a later study (1973) (330) the same authors found that incarcerated MMT patients scored slightly lower than incarcerated controls, but that this difference was not significant. Roszell and Calsyn (327) found no differences in paranoia scale scores between MMT patients prescribed anxiolytics, antidepressants, or no additional prescription. Gerra et al. found that heroin addicts, along with cocaine addicts, scored significantly higher than healthy controls, whilst Penk et al. (317) found that heroin addicts scored significantly lower than amphetamine users, and slightly lower than barbiturate users.

Of the two studies which made within group comparisons, Galankin et al. (319) found T- scores for heroin dependent participants to be ≥2 SDs over the mean, and Marsh et al. (320) found scores for heroin addicted participants of ≥1 SDs over the mean.

Psychasthenia scale:

Ten studies applied this scale, six of which found between group differences. Kojak and Canby (315) found no difference in scores between heroin dependent servicemen and other servicemen who acted as healthy control subjects. Sutker (314,330) found higher scores for heroin addicts versus incarcerated controls in either of their studies. Roszell and Calsyn (327) found that MMT patients who were not prescribed additional medication scored slightly lower than MMT patients prescribed antidepressants, and significantly lower than those prescribed anxiolytics. Gerra et al. (316) found that heroin addicts, as well as cocaine addicts, scored significantly higher on this scale than healthy controls. Penk et al. (317) found that heroin dependents scored slightly lower than barbiturate users, and significantly lower than amphetamine users.

Four studies also returned psychasthenia scale scores within single groups. Husband & Iguchi (315) returned a T-score ≥1 <2 SDs above the mean using the original MMPI, and a T-score at the higher end of the normal range using the MMPI-2. Galankin et al. (319) found that heroin addicts scored just under 2 SDs above the normative mean, whilst Marsh et al. found that heroin addicts scored ≥1 SDs above the mean but lower than the cut-off of 65. Haertzen et al. (325) found mean scores remained within 1 SD of the normative mean for heroin dependent participants when actively using, and when in abstinence, but that the sample mean was above the cut-off of 65 during withdrawal.

Schizophrenia scale:

Of the ten studies which applied the schizophrenia scale, six made between group comparisons. Kojak and Canby (315) found no significant difference between heroin dependents and healthy controls. Sutker (1971) (314) found heroin addicts scored higher than incarcerated controls but found no significant difference when carrying out a similar study in 1973 (330). Roszell and Calsyn (327) found that MMT patients who received no additional prescriptions, or who were prescribed antidepressants scored similarly, but that those who received a prescription of anxiolytics scored significantly higher than both these former groups. Penk et al. (317) found that heroin dependents scored lower than amphetamine and barbiturate users, and Gerra et al. (316) found that heroin addicts scores were similar to those of cocaine addicts, but significantly higher than healthy control scores.

Four studies applied this scale to a single group. Husband and Iguchi found that methadone maintenance patients produced T-scores ≥1 <2 SDs above the mean using both the original MMPI and the MMPI-2. Galankin et al. (319) and Marsh et al. both returned scores >2 SDs above the normative mean. Haertzen et al. (325) found that heroin addicts produced similar scores during periods of usage and abstinence, but significantly higher scores during periods of withdrawal.

Hypomania scale:

Ten studies used the hypomania clinical scale. Six of these studies made between group comparisons. Kojak and Canby (315) found that any differences between dependents and controls were not significant. Sutker et al. (314,330) did not find significant differences between incarcerated heroin addicts and incarcerated control subjects in either of their studies. Roszell & Calsyn (327) found that MMT patients with no additional prescriptions, as well as those prescribed antidepressants, scored significantly lower that MMT patients prescribed anxiolytics. Gerra et al. (316) found heroin addicts did not differ significantly from cocaine addict comparators and healthy controls. Similarly, Penk et al. (317) did not find significant differences between heroin dependent participants and amphetamine not barbiturate users.

The remaining four made comparisons within a single group. Husband & Iguchi (328) recorded scores ≥1 SDs above the mean using the MMPI-2 and >2 SDs above the normative mean using the original MMPI, whilst Galankin et al. (319) returned scores ≥2 SDs above the normative mean. Marsh et al. (320) found that heroin addicts scored ≥1 SDs above the normative mean. Haertzen et al. (325) did not find significant differences between hypomania scores for heroin dependent participants recorded during periods of usage, periods of abstinence, or during withdrawal.

Social Introversion scale:

Ten studies in total captured social introversion scale data. Six studies applied the social introversion scale to more than one group and compared the results. Kojak and Canby (315) did not find mean social introversion score differences between heroin addicts and healthy control subjects. Sutker et al. (314) found that incarcerated heroin addicts scored higher than incarcerated control subjects, but in a later study the same authors found no significant difference in scores between incarcerated heroin addicts in mandated MMT and healthy addict controls. Roszell and Calsyn (327) did not find any significant differences between heroin addicts prescribed antidepressants, anxiolytics, and those who did not receive any additional prescriptions. Gerra et al. (316) found that heroin addict scores were significantly higher than cocaine addicts scores and healthy control subject scores. Conversely, Penk et al. (317) found mean scores significantly lower for heroin dependent participants than for amphetamine or barbiturate users.

Four studies recorded scale scores within a single group. Husband & Iguchi found MMPI/2 means ≤ 1 SDs of the normative mean, as did Marsh et al. (320), whilst Galanin et al. (319) returned mean scores exactly 1 SD above the normative mean. Haertzen et al. (325) found no significant difference between mean scores for heroin addicts taken during phases of active usage, during abstinence, and during withdrawal.

2.3.4.2. Validity scales

L-Scale:

In total, nine studies reported L-scale scores. Of these, five studies reported L-scale scores and compared these means between groups. Kojak and Canby (315) reported L-scale means which did not differ between heroin dependents and healthy control subjects. Sutker et al. (314) found that incarcerated heroin addicts scored lower than incarcerated controls. In a later study, the same authors (330) found that incarcerated heroin addicts mandated MMT scored significantly lower than incarcerated control subjects, but that there was no difference between incarcerated MMT patients and incarcerated addicts not receiving MMT. Roszell and Calsyn (327) found that L-scale score were significantly higher for MMT patients who did not receive additional prescriptions or antidepressants compared with MMT patient prescribed anxiolytics. Penk et al. (317) found no difference in scores between heroin addicts and amphetamine and barbiturate users.

Four studies looked at L-scale scored in relation to a single group of participants. Galankin et al. (319) found L-scale scores within 1 SDs close to the normative mean, as did Marsh et al. and Husband & Iguchi (328). Haertzen et al. (325) found generally low L-scale scores amongst heroin addicts, which were significantly lower during withdrawal than during active usage or abstinence.

F-Scale:

Of eight studies which applied the F-scale, five made between group comparisons. Kojak and Canby (315) found no significant difference between heroin dependent participants and healthy control subjects. Sutker et al. (314) found no difference in mean scores between incarcerated addicts and incarcerated control subjects, and in a later study (1973) (330) found no difference between mean incarcerated addicts, prisoners undergoing MMT, and healthy controls. Roszell & Calsyn (327) found that MMT patients with no additional prescriptions, as well as those prescribed antidepressants, scored significantly lower than those prescribed anxiolytics. Penk et al. (317) however found that heroin addict's scores were significantly lower than those returned by amphetamine and barbiturate users.

Three studies administered the F-scale to one group of participants. Galankin et al. (319) found that heroin addicts returned scores ≥ 4 SDs above the normative mean, whilst Husband & Iguchi (328) found heroin addicts scored ≥ 1 SDs above the mean and above the normative cut-off of 65. Haertzen et al. (325) recorded F-scale means for heroin addicts during periods of usage, abstinence and withdrawal and found no significant differences at each administration.

K-Scale:

Eight studies reported K-scale data, five of which made between group comparisons. Kojak and Canby (315) found differences between heroin dependents compared to control subjects were not significant. Sutker et al. (314) found no difference in mean scores between incarcerated addicts and incarcerated control subjects; or between incarcerated addicts, prisoners undergoing MMT, or healthy controls when reporting a later study (330). Roszell & Calsyn (327) did find that that MMT patients with no additional prescriptions, as well as those prescribed antidepressants, both scored significantly higher than those prescribed anxiolytics. Penk et al. (317) found that heroin addicts mean scores were not significantly different to those of amphetamine and barbiturate users.

Three studies administered the F-scale to one group of participants. Galankin et al. (319) found that heroin addicts returned scores slightly but not significantly below the normative mean, and Husband & Iguchi (328) found the same. Haertzen et al. (325) recorded F-scale means close to the normative mean for heroin addicts during periods of usage, abstinence and withdrawal.

2.3.4 Scale means

The total sample results including scale means weighted by sample size are summarised in Table 7. Mean T-scores of over 65 represent the recognised cut-off point in accordance with the MMPI normative data.

TABLE 7: SCALE MEANS WEIGHTED BY SAMPLE SIZE

Study	n=	Hypo	Dep	Hys	Pd	Masc	Para	Psych	Schiz	Hyp	Socl	L-scale	F-scale	K-scale
Gerra et al. 2000.	22	63.1	62.2	-	71.6**	-	-	-	-	-	-	-	-	-
Gerra et al. 2004.	20	-	64.9	-	70.2	-	-	-	-	-	-	-	-	-
Gerra et al. 2008.	85	47.2	58.7	59.1	60	68.2*	59.5	61.2	64.5	58.8	62.2	-	-	-
Glankin et al. 2018.	164	61	62	58	81.6***	69*	75.3**	69*	87***	76.4**	60	49	97.9***	46
Haertzen et al. 1969.	15	52.7	61.4	53.6	73.8**	58.4	57.4	55.5	60.7	67.5*	49.7	31.8	59	55.4
Husband & Iguchi. 1995. MMPI	51	61.1	66.9*	58.5	72.7**	-	65.9*	62.7	70**	71.2**	56.4	45.5	66.4*	47.1
Husband & Iguchi. 1995. MMPI-2	51	59.7	59	53.5	64.6	-	59.8	59.6	62.7	64.1	52.2	51.3	65.5*	42
Kojak and Canby. 1975.	25	56.7	60.9	57	63.6	57.2	61.4	60.4	62	62.7	50.1	48.8	58.8	49.8
Marsh et al. 1988.	157	63	67.5*	63.2	74.6**	56.5	60.6	62.5	62.6	65.3*	53.9	49	-	-
Penk et al. 1979.	65	49.4	51.6	48.4	68.4	55.4	59.4	63.8	64.3	69.9*	47.9	50.1	69.1*	51.2
Roszell et al. 1986.	104	61.9	68.1*	61.9	72.1**	63.9	60.7	62.9	62.7	60.9	52.4	50.7	62.4	52.1
Sutker. 1971.	40	64.2	74.5**	65.2*	81.3***	57.8	62	69.9*	68.8*	68.2*	55	47.4	62.2	49.4
Sutker. 1973. Incarcerated	35	53.1	63.5	55	76.5**	58.3	59.1	52.9	62.4	68.4*	50.3	48.6	62.4	50.3
Sutker. 1973. Mandated MMT	82	67.2*	73.4**	65*	78.9**	57.7	61.3	68.9*	68.5*	68.9*	55.2	47.9	63.4	50.3
Zeng et al. 2016.	59	-	-	-	66.6*	-	-	-	-	-	-	-	-	-
All study mean	-	58.5	63.9	58.2	71.8**	60.2	61.9	62.4	66.4*	66.9*	53.8	47.3	66.7*	49.4

*n= sample size, Hypo=hypochondriases, Dep=depression, Hys=hysteria, Pd=psychopathic deviance, Masc=masculinity-femininity, Para=paranoia, Psych=psychasthenia, Schiz=schizophrenia, Hyp=hypomania, Soci=social inclusion, *1* ≥ SDs above normative mean, **2≥ SDs, ***3≥ SDs

The scale elevations can be put into context in reference to MMPI norms, and in reference to available data for another clinical subgroup. There are limited meta-analyses where in MMPI scale scores have been pooled and averaged as in the current study, but a notable example (and to my knowledge the only example) is that of Novo et al. (331) who report a meta-analysis of MMPI/-2 scores in the context of fibromyalgia. Figure 3 is a radar chart which presents the personality trait configurations for the current study's pooled opioid using sample, the pooled fibromyalgia patient sample as described in Novo et al.'s work, and the MMPI-2 normative scale scores for contextual comparison.

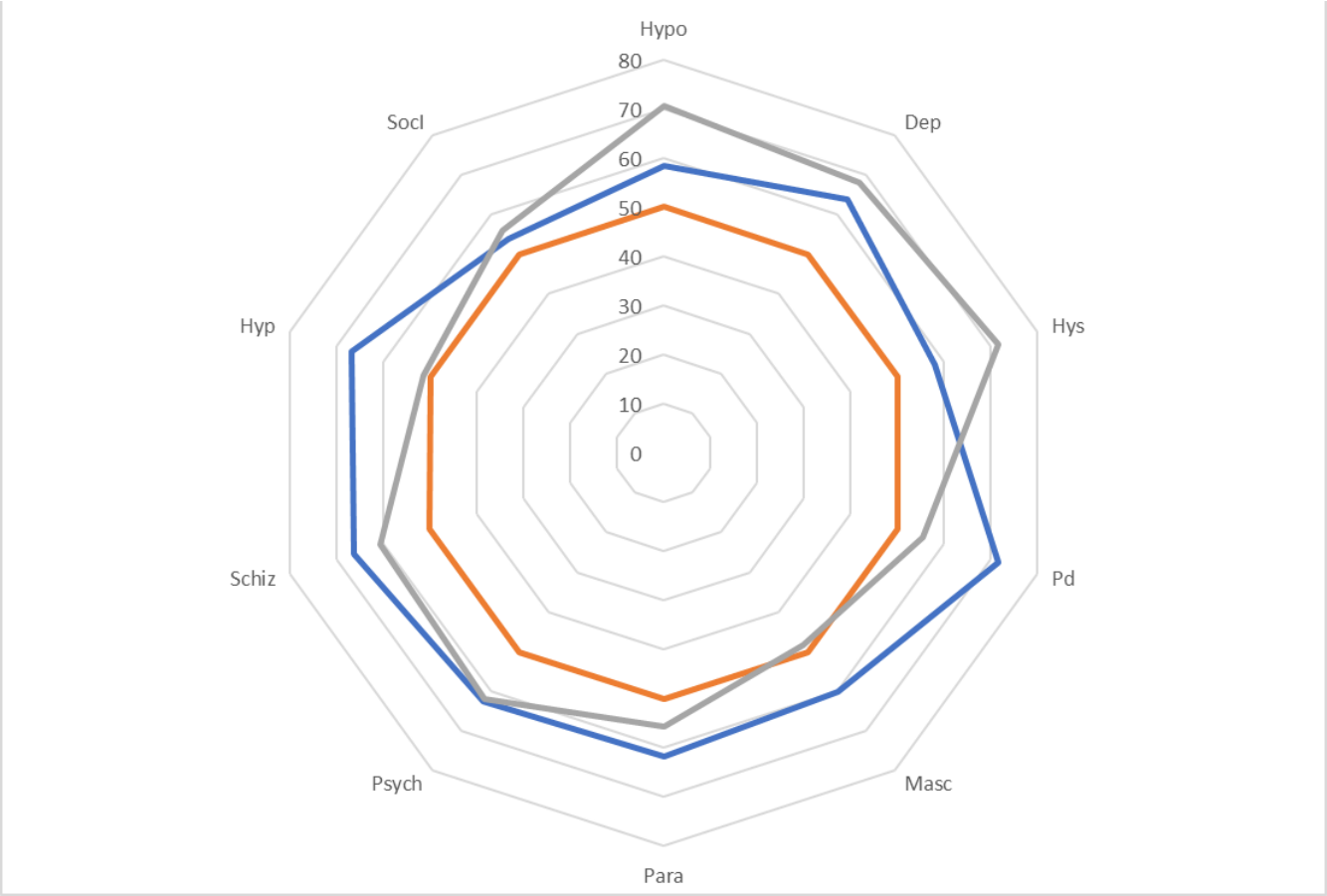


FIGURE 3 - AVERAGE SCALE MEANS FOR OPIOID USERS, FIBROMYALGIA PATIENTS, AND MMPI (MINNESOTA MULTIPHASIC PERSONALITY INVENTORY) NORMS (BLUE = OPIOID, GREY = FIBROMYALGIA, ORANGE = NORMATIVE)

2.3.5 Results by sub-grouping

To consider OUD participants personality measure scores in relation to their usage at the time of data collection, I split the total combined sample in to three sub-groups apparent in the data. These groups were: 'actively using'; 'maintained' (including those who were mandated maintenance treatment); and 'abstinent' (including those who were incarcerated).

Considering non-normality of five of the thirteen included scale means, to identify differences in scale means between sub-groups Mann-Whitney tests were run. Results showed that there were no significant differences between the groupings identified in the data and mean scores reported in the included studies.

2.4 Discussion

2.4.1 Sample

Demographically, the sample is reflective of the wider literature concerning OUD patients (332,333). The lack of female participants is problematic in that any potential gender difference in mean scale scores remains unobserved.

2.4.2 MMPI versus MMPI-2

Scale means were reported using both the MMPI and the revised MMPI-2. Comparison of the means using a non-parametric test found that they are comparable, confirming previous research (276,291,292). This means that despite revisions in scale structure, item terminology and the addition and subtraction of scale items, the two measures remain psychometrically similar and comparably applicable as measures of personality and psychopathology.

2.4.3 Narrative Synthesis

The narrative synthesis revealed that statistically significant scale elevations for the Hypochondria, Depression, Psychopathic Deviant, and Psychasthenia scales were common among cases in comparison to control subjects. When cases were compared with other drug users however, (including cocaine, barbiturate, amphetamine, and ketamine users) most cases scored similarly to their comparators, or lower. It may be that much of the abnormal elevation seen amongst the MMPI scales reported in this review can be attributed to people suffering with SUDs rather than OUD specifically. As only three of the papers in this review made case to other drug user comparisons, the data is perhaps too sparse to be confident in this assertion, and so further research is warranted.

The study by Roszell and Calsyn (327) compared MMT patients prescribed anxiolytic or antidepressant medications with those receiving no additional prescriptions. The data from this study found that those prescribed anxiolytics were reliably more likely to report elevated scale scores except for the K validity scale. For this group of participants, the multiple scale elevations, along with a reduced propensity to answer defensively, are likely mediated to some degree by an underlying anxiety disorder.

2.4.4. Scale means

Mean scale scores are interpreted for discussion with reference to the interpretation manuals for the MMPI and the MMPI-2 (280,334). Pooled Social Introversion clinical scale scores, as well as the L and K- validity scale scores were within a T value of 45-54, and thus require no interpretation.

Of the scales for which the pooled average lay between 55-64, the Hypochondriasis scale is associated with lethargy, frequent somatic complaints, and general dissatisfaction. Depression scale scores in the same range are also indicative of general dissatisfaction with life and a propensity for making demands, social withdrawal, introversion, a limited range of interest and low self-confidence. Hysteria scale scores in this range suggest propensity for somatic complaints, as well as a propensity for making demands, immaturity, suggestibility, and self-centredness but with a desire for social connection. Paranoia scale scores in this range suggest over sensitivity, being guarded and distrustful of others, as well as a propensity for anger and resentment. Scores within this range for the Psychasthenia scale suggest anxiety and hypervigilance; low self-confidence, feelings of insecurity, shyness, and introversion, as well as meticulousness and difficulty making decisions. Masculine-femininity scale scores in this range suggest that the participant reliably exhibits interests in line with most people with whom they share their gender.

Three clinical scales and one validity scale were in the 65-74 range. Psychopathic deviance scale scores in this range are suggestive of a propensity for rebellious, non-conforming behaviour and creativity, as well as impulsivity, anger, and irritableness. Scores in this window also correlate with poor family relationships, difficulty engaging in work, and educational underachievement. Schizophrenia scale scores suggest a schizoid lifestyle, unusual beliefs and eccentric behaviours, confusion, and disorganisation, and low-mood and frequent somatic complaints. They do not necessarily suggest the presence of diagnosable schizophrenia, though scores ≥2 SDs above the mean can be suggestive of this.

F-Scale scores remain elevated above the accepted normative cut-off of 65, suggesting overreporting of symptoms of distress, both psychological and somatic. In this context provided by the clinical scale elevations described, elevated F-scale scores can be suggestive of maladaptive attempts toward social reward (e.g. sympathy, concern, or care) by drawing attention to the 'specialness' of one's physical or psychological complaints.

It is important to note there were no significant differences when comparing scale means between sub-groupings of actively using participants, maintained participants, and abstinent participants. Therefore, it appears that the personality configuration identified in these data is characterised by a triadic elevation psychopathic deviancy, schizophrenia and hypomania scores which presented in

Figure 3. This configuration is broadly stable irrespective of heroin usage at the time of measurement.

2.4.5 Limitations

A limitation common to literature review is that of potential publication bias. Reviewing studies which have been peer-reviewed should theoretically ensure a high standard of reporting, however n=14 of the n=17 included studies were found to be 'questionable quality' using the Q-SSP checklist. Only three studies were found to be of 'acceptable' quality. This should be considered when making sense of the findings.

This review reports findings from the use of one type of measure over two revisions. This decision was made in the interests of avoiding non-equivalence as would have been the case using a variety of different measures, however the theoretical scope of the study is limited to that of the MMPI and MMPI-2 none the less. From the opposing critical perspective, using both revisions rather than one version could also be considered a limitation, though the decision to do so was taken in relation to the available evidence suggesting good agreement between the two measures, which was confirmed at analysis.

Although a small number of females were included in the pooled analysis, the total sample was male dominated. It is accepted in the field of personality psychology that male and female sex is associated with significant difference in personality due to biological factors (335). The extent to which these differences can also be attributed to culturally specific social determinants, and to measurement bias is a source of ongoing discourse (336,337). It remains therefore that important gender differences may remain overlooked, and so these findings should be interpreted in relation to male gender only

Caseness also differed between studies, with a minority of studies stating that they adhered to DSM criteria. A range of methods were employed to ascertain caseness most of which were subjective with objective methods of urine analysis and the presence of scarring due to intravenous drug use utilised in only two of the included studies.

2.4.6 Conclusions

The findings of this review suggest that OUD is associated with significant elevations in average scale scores most observable as a triad of psychopathic deviancy, schizophrenia and hypomania. The behavioural consequences of such elevations include social anxiety and low self-confidence, anger and irritability, a proclivity for somatic complaints, and a propensity towards a disorganised, rebellious lifestyle with which one is generally dissatisfied. These results are in keeping with the

literature suggesting that OUD is associated with social anxiety (338,339) and depression (114,115,118,119) as well as borderline (340) and antisocial personality disorders (341). These findings are also in keeping with the available literature which suggest that people at high risk of opioid overdose often live peripatetic lifestyles and make frequent use of both primary and emergency health services (98,342).

Further research to develop and evaluate screening measures based upon this trait configuration to see if this personality configuration is indeed predictive of the risk of developing OUD, and to what extent, is welcomed. Additionally psychotherapeutic intervention to aid in the treatment of OUD should take in to account this trait configuration, and explicitly address any and each of the associated behavioural and attitudinal states listed here as exhibited by the patient, should they serve to maintain the disorder.

In the next chapter I will satisfy my aim of providing an overview of the incidence of fatal opioid overdose in Wales whilst reporting the characteristics of opioid overdose decedent by carrying out a series of observational studies using routinely collected health data.

Chapter 3 – Opioid Use Disorder Deaths: The Sociodemographic Characteristics, Service Usage Patterns and Psychiatric Comorbidity of Decedents

3.1 Background

Fatal overdose has long been recognised as a problematic consequence of OUD (7). Over 45% of the 4859 drug related deaths recorded in 2021 involved an opioid drug (343). In comparison to her neighbours, the UK experiences the most opioid related deaths (ORDs) of any European nation both in total and per head of population (344). The current situation has led researchers to describe the deaths rate in certain parts of the UK, most notably Scotland and Northern Ireland, as comparable to the opioid death epidemic observed in North America (99).

The literature describing, the sociodemographic and service usage patterns of opioid overdose decedents has been restricted to investigating relationships between sociodemographic factors and limited healthcare or service use variables. For example, a retrospective study using routine data examined sociodemographic of opioid overdose decedents and prescription history (345). Another study of comparable methodology focussed on decedents who died primary from prescription or illicit opioids, and with or without recorded history of chronic pain (346). Other examples among the literature include studies which took place within single departments, and so were limited in their scope and in the volume of data they captured (347).

I aimed to describe the incidence and circumstances of death, sociodemographic characteristics, and service usage patterns of decedents of opioid overdose in Wales by carrying out a series of three retrospective cross-sectional autopsy studies using routine health and demographic data linked by anonymous identifiers. This, or similar methodology has been used to describe characteristics of decedent populations within the field of opioid overdose (345,346) and in other areas (348,349).

3.2 The circumstances of death and sociodemographic characteristics of opioid overdose decedents in Wales

3.2.1 Method

The aims and objectives of this initial study were to identify OOD decedents, to describe their sociodemographic characteristics and their health service usage patterns prior to death. People with OUD have been found to make frequent use of both primary and emergency health services (98,342).

A retrospective, cross sectional study was carried out using routinely collected health and demographic data. Data items were linked so that the health service usage history of individual decedents of opioid overdose could be observed over time. Numerous routine datasets (see Table 8) were interrogated, and health service data were captured for up to 3 years prior to death for each decedent.

TABLE 8: DATA SOURCES

Data	Source Database	Coding framework
Mortality: Event data	ONS (Office for National Statistics) Births, deaths and marriages	ICD-10
Sociodemographic: Decedent age and gender Residential ALF (Anonymised Linkage Field) and LSOA (Local Super Output Area)	ONS (Office for National Statistics) Births, deaths and marriages Welsh Demographic Service (WDS) database	ICD-10 NHS Wales Data Dictionary Version 4.9
Service Utilisation: ED attendance data Substance use service attendance data Hospital admission data	Emergency Department Dataset (EDDS) Substance Use DataSet (SMDS) Patient Episode Database for Wales (PEDW)	NHS Wales Data Dictionary Version 4.9 NHS Wales Data Dictionary Version 4.9 ICD-10

3.2.2 Inclusion criteria

I developed inclusion criteria according to the coding framework employed by the ONS, based on the International Statistical Classification of Diseases and Related Health Problems medical coding framework (ICD) (144) (Figure 4). The ICD coding framework, which is currently in its eleventh revision, was originally published by the World Health Organisation (WHO) in 1994 after over a decade of development and refining. It was introduced in the UK in 1995, and every three years the coding framework is updated, and a revised edition implemented. When deaths are recorded and added to the ONS births, deaths and marriages dataset, the deaths are coded using a string of alphanumeric values. These will include values denoting an underlying cause of death, which could include a disease or type of injury, and then other contributory causes of death in addition to the underlying cause. There can be up to six causes of death in any one record, each of which follow the underlying cause in order of assumed primacy. If the originating antecedent is an injury rather than a medical diagnosis, then the underlying cause of death will describe the circumstances in which the injury took place. For example, a decedent may be coded as having an underlying cause of death as W16.0 'fall into swimming pool', with the primary cause of death coded as W67.0 'accidental drowning', and the secondary cause of death as R09.1 'asphyxia'.

These inclusion criteria sought to define the study population as decedents of opioid overdose to include cases of death where in an opioid drug was the object of main injury and where the underlying cause of death was indicative of opioid overdose. Other-drug overdose death, or deaths resulting from injuries other than overdose which occurred under the influence of or at least post-ingestion of an opioid drug where thereby excluded.

Underlying Cause of Death codes:
F11–F19 = Mental and behavioural disorders due to psychoactive substance use
X40-44 = Unintentional poisoning by and exposure to narcotics and psychodysleptics
X60-69 = Intentional self-poisoning by and exposure to narcotics and psychodysleptics
X85 = Assault (homicide) by drugs, medicaments and biological substances
Y10-19 = Poisoning by and exposure to narcotics and psychodysleptics (undetermined intent)
(AND)

Cause of death codes 1 or 2:
T40. = Opium
T40.1 = Heroin
T40.2 = Other opioids (Morphine, Oxycodone, Hydrocodone)
T40.3 = Methadone
T40.4 = Synthetic opioids excluding methadone (Fentanyl, Propoxyphene, Meperidine)

FIGURE 4: INCLUSION CRITERIA

3.2.3 Observation period

I identified opioid overdose decedents by interrogating the UK Office for National Statistics (ONS) dataset recording births, deaths and marriages over a period beginning on 01/01/2012 and ending on 11/10/2018. This period was sufficiently recent to reflect the current incidence of OOD and sufficiently delayed ensuring that complete death registration data would be available.

All decedents included in the study would be observed over three years prior to their recorded date of death.

3.2.4 Data linkage

The data I needed to have access to carry out the study was routinely collected health data, sensitive in nature, and as such needed to be accessed in a secure environment. The data needed to be anonymised within this environment prior to analysis so that it would be impossible to identify any individual decedent. The secure environment was provided by the Secure Anonymised Information Linkage, or SAIL, databank which is situated at Swansea University (350) and accessed via a 'gateway'. The gateway is a virtual environment accessible on internet connected PCs using a security device known as a 'ubi-key', and a password known only to SAIL users. SAIL users include academic staff and students who have completed mandatory training in data governance and data security. Via SAIL I was able to interrogate the ONS births, deaths and marriages dataset and return anonymised records for all decedents of an opioid related death (or ORD) whose deaths occurred within the given timeframe. The ORD label lacks specificity as it can include deaths outside the scope of the coding framework which sought to identify OODs only. The coding framework would be applied to these records later prior to inclusion in analysis.

The linkage procedure involved the application of a matching algorithm which was devised at the National Welsh Informatics Service (NWIS) and applies deterministic and probabilistic routines in a logical sequence. This approach to linkage of routine NWIS data in the SAIL databank allows for

consistently accurate matching, demonstrating high specificity (>99%) and sensitivity (>95%) (350). Using this procedure, identifiable data such as name, home address, and NHS number are separated from routinely collected health service usage data and replaced with an Anonymised Linkage Field (ALF) number. The ALF number and is meaningless outside of SAIL.

Routine linked data have advantages in that it is highly representative and generalisable, and it is available in large datasets allowing for ample statistical power at analysis. However, the use of routine health data also has downsides. Such data is not collected with research in mind, and so may omit information important to researchers. Data linkage problems, misclassification of problems by data inputters such as clinical coders, and underreporting of certain problems due to lack of awareness on behalf of clinicians or lack of service usage on behalf of patients are all potential pitfalls (351,352).

Mortality data are subject to general limitations such as over or underreporting just as health data are (353), whilst UK specific limitations apparent in the literature include disparities between death dates as recorded by clinicians and as found in ONS datasets (354,355). However, possibly the most impactful limitation is the low proportion of deaths investigated by coroners. The current literature regarding clinician and coroner accuracy in determining cause of death suggests that autopsy is vital in ensuring that cause of death data remain accurate, especially in terms of intentionality (356–358).

Once the linkage procedure was complete and decedents were anonymised, I was able to search multiple service records relating to each individual decedent included in the wider sample of decedents of ORD during the given timeframe, and then exclude decedent records which did not meet inclusion criteria for the study.

3.2.5 Data analysis

After the necessary data were imported in to SAIL databank and made available in the gateway, I began to devise a data analysis plan. I aimed to describe the decedents of opioid overdose in Wales in terms of their demographic features and their service usage patterns prior to death by reporting means and standard deviations (SD) where data were normally distributed, and medians and interquartile range (IQR) where data were not normally distributed. Normality would be assessed using the Kolmogorov-Smirnoff test and if necessary, using visual inspection of qq-plots using SPSS (Statistical Package for the Social Sciences, IBM). I did not seek to report aggregate numbers of less than five to protect the anonymity of the subjects in line with SAIL standard operating procedures.

I aimed to report the following variables of interest:

1. The number of ORDs recorded in the observation period

2. The number of deaths which met the inclusion criteria
3. Age and gender of decedents
4. Most frequently involved substances (in death)
5. Proportion of deaths by intent (accidental versus suicidal)
6. Residential mobility (frequency of changes of address per decedent prior to death)
7. Socioeconomic deprivation of place of residency at time of death
8. Frequency of ED visits per decedent prior to death
9. Frequency of hospital stays per decedent prior to death
10. Frequency of substance use disorder treatment service attendances per decedent prior to death

As ICD-10 is a widely used and accepted coding standard I planned to report all data according to the original coding framework and not re-interpret any of the values using other terminology that I might consider analogous to the original phrasing.

Socioeconomic deprivation was to be measured in terms of multiple deprivation. This refers to the lack of access to services or other resources which are easily accessible and necessary for a reasonable quality of life to most people in a society. Welsh index of multiple deprivation (WIMD) scores are measures of relative deprivation within small geographic areas in Wales. As the measure is of relative deprivation, we cannot tell how deprived an area is in absolute terms from the WIMD score, but we can tell how deprived of certain amenities and opportunities it is relative to the other areas in Wales at the time the WIMD is calculated. The multiple indices of deprivation which make up the WIMD are income; employment; health; education; access to services; community safety; physical environment and housing. Each of these domains are weighted from between 5% and 22% as to how much they influence the total WIMD score. They are themselves a composite of various routine statistics including the proportion of people in receipt of benefit payments; or diagnosed with certain health conditions; having minimal educational qualifications; living in areas with access to amenities; are victims or perpetrators of crimes; or and living in places at risk of air or water pollution. The small geographical areas to which WIMD scored refer are known as Lower Super Output Areas (LSOAs). These are usually contiguous with postcode areas and on average have populations of around 1600 people. Wales is made up of 1909 LSOAs, each of which is allocated a WIMD score.

3.2.6 Ethics

The studies reported in this chapter were subject to review by an independent Information Governance Review Panel (IGRP) constituted by the SAIL databank, which gave the project a favourable opinion.

To adhere to GDPR (General Data Protection Regulation) all data analysis took place within the SAIL databank, which as previously mentioned was securely accessed using a USB (Universal Serial Bus) encryption device known as a Ubikey. The Ubikey recognises the user's thumbprint in order to grant remote access to data within SAIL. The restrictions of GDPR as it is applied to data within the SAIL databank means that the raw data used for analysis in the studies reported in this chapter cannot be made available for purposes of reproducibility (359).

3.3 Results

3.3.1 Sample

From 1/1/2012 to 11/10/2018, 1057 ORDs were recorded by the ONS. Of these, 638 (60.36%) deaths satisfied selection criteria, and were therefore considered primarily attributable to opioid overdose. A total of 419 ORDs were excluded as involving opioid drugs as a contributory or potentially contributory factor of varying or unknown weighting. I found that the sample were mostly male, with 27.43% (n=175) female. The mean age was 49.61 [20.72] years.

3.3.2 Linkage

All 638 included cases identified from the ONS mortality dataset were successfully linked to the Welsh Demographic Service (WDS) and the NHS service datasets. However, when data were imported from these datasets into the SAIL gateway to analyse, some of these imported datasets needed to be split up into subsets due to the number of data items in each. For example, the hospital admissions dataset was made available in the SAIL gateway as separate subsets, one including decedent's attendance data, one other including attendance data, and another including demographic data. Sometimes, due to the layout and format of the original NHS dataset, subsets such as these did not include the ALF numbers as a data item. This meant that a small proportion of records needed to be linked to their ALF numbers in another dataset where the same decedent's information was available along with the ALF number. Otherwise, not all the included decedent's records would be linkable with one another across all the datasets necessary for analysis. To rectify this, I needed to open any dataset lacking an exported ALF number and select two or more other identifiers (e.g. NHS number and primary care practice number) which when concatenated together would serve as a unique identifier. This unique identifier -was then linked to the patient's ALF number present in a neighbouring dataset. This concatenation and linkage were carried out using

the SQL coding language within a software suite known as 'Eclipse'. Eclipse is designed to allow users to interrogate databases using IBM's DB2 data management software using a graphical interface and a terminal for free-text commands.

3.3.3 Circumstances and incidence of death

The primary and secondary substances involved in each death were most often coded as T40.2 – 'other opioids'. According to the ICD-10 coding framework used by the ONS, other opioids refer to the opioid analgesics' morphine, oxycodone, hydrocodone and their derivatives. The least often involved codes were T40.4 - other synthetic opioids - which include fentanyl, propoxyphene, and meperidine.

In terms of intent, a minority of deaths were found to be intentional or undetermined with most recorded as accidental. These data are summarised in Table 9.

Multinomial logistic regression was carried out to determine predictors of intentional death as opposed to accidental or undetermined. Multinomial logistic regression is used to predict a nominal dependent variable based on multiple independent variables, which themselves may be nominal, ordinal or continuous (interval or ratio) data. It is an extension to binary logistic regression for use when there are more than two dependent variables. In my case these were accidental, intentional and unknown death. These outcomes variables are not ranked or ordered and satisfied the assumption of mutual exclusivity. The independent variables did not exhibit multicollinearity and did not include any extreme outliers which might preclude the analysis.

Regrettably, due to the timescales associated with the process of re-applying for access to SAIL data (including initial submission of application, awaiting IGRP (Information Governance Review Panel) meeting dates, receiving comments from the panel, actioning comments, resubmitting, and apportioning of data for access in the gateway) it was not possible to conduct further analyses of these data nor produce tables to summarise analysis described in this chapter.

The Independent variables consisted of categorical factors (substance use disorder treatment service attender, hospital admittee or ED attender) and covariates (number of substance use disorder treatment service visits, hospital admission episodes and ED visits). Regression revealed that being in the drug-service non-attender category significantly predicted death by intentional overdose OR=7.84, [95%CI[2.18-28.21], p=0.002. However, a wide confidence interval suggests that these data are imprecise, likely due to an insufficient sample size. No other statistically significant relationships existed between the dependent and independent variables.

TABLE 9: CIRCUMSTANCES OF DEATH

Substances and intent per decedent	
Primary substance contributing to death	Other opioids n = 217 (34.01%) Heroin n = 194 (30.41%) Methadone n = 84 (13.17%) Other synthetic opioids n = 51 (7.99%)
Secondary substance	Other opioids n = 48 (7.52%) Heroin n = 23 (3.61%) Methadone n = 12 (1.88%) Other synthetic opioids n = 9 (1.41%)
Intent	Accidental n = 553 (86.68%) Intentional n = 52 (8.15%) Undetermined n = 33 (5.17%)

3.3.4 Residency

Over the 3 years prior to death the sample of 638 decedents were registered as living at 1078 addresses in 648 LSOAs. In total, there were 1221 changes of address in this time, with more than half of decedents changing address at least once. The number of unique addresses per decedent was greater than the number of LSOAs, indicating that people had moved both between and within their local area. The number of unique addresses also outnumbered the number of times decedents changed address, indicating some decedents moved back and forth between addresses during the observation period. The data are summarised in Table 10.

TABLE 10: RESIDENTIAL MOBILITY

No. of unique addresses per decedent (in 3 years prior to death)	Median = 2 IQR (Interquartile range) = 1
No. of decedents living in more than one address over 3 years	320 (50.16%)
No. of unique LSOAs per decedent	Median = 1 IQR = 1
No. of decedents living in more than one LSOA	291 (45.61%)
No. of changes of address per decedent	Median = 2 IQR = 2
No. of decedents changing address at least once	337 (52.82%)
Decedents for whom no data Were available	8 (1.25%)

3.3.5 Service Usage

More than 80% of decedents visited the ED in the 3 years prior to death, with just under a quarter doing so within a month of death. The majority (n=426, 80.23%) were conveyed by emergency ambulance (constituting 1641 separate visits). Additionally, a sizeable minority were conveyed to the ED by police vehicle (n=102,19.21%). A total of 44 (8.29%) decedents died in the ED department.

Over 60% of decedents were admitted to hospital in the 3 years prior to death, with most staying in hospital for longer than a day but less than one month (n=340, 83.74%). Most were admitted more than once during the observation period, and 27 (6.65%) decedents died in hospital.

Under a third of decedents received substance use disorder treatment service support in the 3-year period prior to death. Decedents who did enter specialist SUD treatment were usually enrolled in separate treatment episodes more than once over the 3 years, indicating that decedents would often drop out and re-enrol. Over thirty five percent (n=62) of those attending substance use disorder treatment services died whilst enrolled in treatment. All service usage data are summarised in Table 11.

TABLE 11: SERVICE USE PATTERNS

No. of decedents who attended ED:	
3 years prior to death	531 (83.23%)
2 years	495 (77.59%)
1 year	423 (66.3%)
1 month	157 (24.61%)
	Median attendances per decedent=4 (IQR=5) Total attendances=3173
No. of decedents admitted to hospital:	
3 years prior to death	406 (63.64%)
2 years	362 (56.74%)
1 year	281 (44.04%)
1 month	98 (15.36%)
	Median admissions per decedent = 2 (4) Total admissions = 1549
	Median length of stay=2 (6) days
No. of decedents with substance use disorder treatment service episodes:	
3 years prior to death	175 (27.43%)
2 years	167 (26.18%)

1 year	142 (22.26%)
1 month	77 (12.07%)
	Median episodes per decedent=3 (3) Total episodes=554

3.3.6 Secondary analysis

In total, the intentional deaths in the sample made up 2.59% of all suicides in Wales during the observation period. For the purposes of discussion, using publicly available Welsh Government census data (360) I calculated the average percentage of all deaths in Wales deemed to be intentional over each year's registrations between 2012 and 2018 at 0.13%. In contrast, 8.15% of the decedents in this study died intentionally. Using an averaged Welsh population of 309762, N-1 Chi Squared test (361) suggests that the proportion of intentional deaths in the sample is 8.02% higher than the Welsh average (95% CI 6.14%-10.4%, p=<0.0001).

I also calculated the incidence of OOD per 100,000 people by taking the number OODs, dividing this by the mid-year estimated population of Wales and multiplying this by 100,000. I found that incidence increased over the observation period of 2012-2018 with the number (and rate) of deaths peaking in 2015 (see Table 12).

TABLE 12: OPIOID OVERDOSE DEATHS PER 100,000 PEOPLE

Incidence			
Year	Wales mid-year population	Deaths	per 100,000
2012	3074067	69	2.24
2013	3082412	79	2.53
2014	3092036	97	3.14
2015	3099086	117	3.77
2016	3113150	102	3.28
2017	3125165	101	3.23

3.4 Discussion

3.4.1 Sample

The sample characteristics were in line with the findings of a large data linkage study by Pierce et al. (332) which looked at causes of death amongst opioid users in England. In my study, as in Pierce et al.'s, over 70% of the sample of decedents were male, and on average aged close to 50 years. Pierce et al. also found that of all ORDs in England between 2005 and 2009, 43% were attributable to

overdose, which is 16% less than I found using a comparable coding framework. This difference may be attributable to Pierce et al. utilising a larger sample size.

3.4.2 Circumstances and incidence of death

Mortality coding related to cause of death was broad, with several different opioid drugs grouped by class. Though 'other opioids' accounted for more deaths than any other drug grouping, by dividing the number of different drugs by the number of deaths attributed to each class I can assert that heroin was the single largest contributor to death in the sample. The purity of heroin seized in Wales over the observation period increased from 18% to 46% (362), which may contribute to the increased deaths year on year as summarised in Table 12. In contrast with North American data (363), I did not find evidence to suggest that fatal fentanyl overdose presents a significant a proportion of opioid drug overdose deaths in Wales.

The data presented that suicidality is a problematic feature of OUD, with suicide more common within the cohort of high-risk opioid users than in the population at large. Furthermore, suicidality varies between service user groups in that decedents who were not substance use disorder treatment service attenders were more likely to die intentionally. These findings are in line with the recent literature suggesting that maintenance treatment for OUD is associated with decreased suicidality (364,365).

3.4.3 Residency

In the past researchers have struggled to follow up members of the high-risk opioid using population via traditional methods including post and telephone calls (366,367). The findings of this study suggest that difficulties in following up this population for research purposes can be at least partially attributable to high-risk opioid user's peripatetic lifestyles as the current study sample exhibit greater residential mobility than the general population. When the current sample is compared with the findings of the 2017-2018 English Housing Survey (368), the survey reveals that residents in England (being socio-demographically comparable to the population in Wales) change address every 11 years on average, with private renters moving more often (every 4 years) than council tenants (slightly over 11 years) or homeowners (18 years). Furthermore, prevalence of problematic heroin has previously been associated with unstable housing conditions (127). This problem may be exacerbated by two factors. Firstly, over the past 20 years the number of people under 40 who struggle financially living in privately rented accommodation has tripled, meaning poorer under 40's live in rented accommodation than in social housing and privately owned housing combined (369). Secondly, dry housing provision and availability has decreased over a comparable period (370).

3.4.4 Service Usage

NHS Digital and publicly available census data covering 2017–2019 shows that in Wales, around 26% of the population attended the ED per year (371). In comparison, our data suggest that people at high risk of fatal opioid overdose visit the ED disproportionately often, with 66% visiting in the year prior to death. To add further context, a study of 11875 palliative care patients found that 77.6% visited the ED over 1 year prior to death (372). In comparison then, high-risk opioid users visit the ED at a similar frequency to other groups with complex medical needs.

Most decedents in the study were admitted to hospital more than once during the observation period, with 44% being admitted in the year prior. NHS Digital and census data for the year 2018–2019 indicate that 29% of the general population of England were admitted to hospital per year (373). It therefore appears that high-risk opioid users are admitted to hospital comparatively frequently.

The findings from this study suggest that a minority of high risk opioid users contact substance use disorder treatment services, in line with the current literature (146,147), and also that attending substance use disorder treatment services was associated with decreased suicidality.

3.4.5 Limitations

In carrying out this linked data study I was able to describe the circumstances of death, and the service usage characteristics of opioid overdose decedents prior to death using multiple data sets over a prolonged observation period. I am at the time of writing unaware of an observational study into OOD which has been carried out utilising routine linked data from multiple sources in this way.

I was unable to collect diagnostic data or treatment data of a sufficient quality for report or waiting time data. Most data items in these datasets lacked coding necessary to identify a specific diagnosis or received treatment, with most data items coded as ‘unknown’, ‘not recorded’ or similar. Knowing why high-risk opioid users are visiting emergency departments, and how long they are waiting to be seen is potentially valuable in understanding why some opioid users die in department, and why some die after discharge.

Similarly, although I was able to report findings related to circumstances of death and intentionality, the accuracy of mortality coding can lack accuracy for a variety of reasons.

My study did not benefit from the inclusion of a control or comparator group. If resources had allowed, it would have been beneficial to carry out a case-control study comparing service usage and mortality data with matched control subjects. In the absence of such a group, I settled to carry out

secondary analysis comparing the sample with the general Welsh population regarding incidence of intentional death.

3.4.6 Conclusions

High risk opioid users are often men of around 50 years of age living peripatetic lifestyles. They use emergency medical services comparatively often but are less likely to visit substance use disorder treatment services. They are more likely to die intentionally than the general population, and group differences between high-risk opioid users who visit substance use disorder treatment services and those who do not visit such services appear to exist in relation to suicidality.

As high-risk opioid users are often in contact with the ED, and are often admitted to hospital, the local hospital offers a potential opportunity for harm reduction strategies. Previously reported ED-initiated interventions for patients with opioid use disorder include motivational interviewing, brief behavioural education, referral to SUD treatment services, and THN (374). Though local hospitals appear well suited to the delivery of harm reduction interventions for the benefit of high-risk opioid users, experimental evidence is lacking to confirm the effectiveness of harm reduction interventions delivered in this setting.

3.5 Opioid overdose decedent primary care utilisation prior to death

3.5.1 Method

The aims and objectives of this second study were to focus in on decedent's primary care usage prior to death, based on the potential benefits of primary care as a theatre in which to manage OUD, which has been commented upon on the literature (375–377).

The data for this study were collected using the same inclusion criteria as were applied under heading 3.2.1. As in this previous study, I sought only to include decedents of opioid overdose and to avoid decedents of ORD who may have died under circumstances where opioid drugs were ingested, but where cause of death could be attributable to another type of drug or injury. For this current study however deaths occurring between the 01/01/2012 to 31/12/2015 only were included, and the focus was specifically on decedent contact with primary care general practitioner (GP) services prior to death. The reduced observation period was necessary due to time and funding limitations.

I aimed to describe the primary care health service usage patterns of high-risk opioid users over a 3-year period prior to death. The objectives necessary to satisfy this aim were to identify commonly diagnosed problems and delivered treatments and establish the frequency of service contact. As OUD is often associated with alcohol and other drug use (378), I sought to pay special attention to

problems of this nature apparent in the data. High rates of cigarette smoking have been observed in opioid users using traditional methods of observational research (214), and so I sought to confirm these findings using routine GP data.

3.5.2 Data linkage

Mortality data were identified from the office of national statistics (ONS) birth, deaths and marriages dataset which were coded using the ICD-10 framework. GP data was captured from the NHS Wales GP Audit+ dataset. Individual records were linked by the NHS Wales Informatics Service (NWIS), using the linkage method outlined previously in this chapter and were analysed in the secure SAIL gateway.

3.5.3 Data analysis plan

The aim of this study was to understand the GP service usage patterns and the sociodemographic profile of opioid overdose decedents who use these services prior to death. To achieve this aim, I sought to capture data related to the following variables:

1. Demographics
2. Commonly coded diagnosis and interventions including prescribed medicines
3. Social deprivation
4. GP service use
5. Drug and alcohol specific service usage including smoking

3.6 Results

3.6.1 Sample

The sample was made up of n=312 decedents who were mostly male (n=228, 73.08%) with a mean age of 40.72 [11.92] years. The distribution of ages of decedents are broken down in detail in Table 13.

TABLE 13: SAMPLE AGE AND GENDER

	n=312	
	n	**%**
Decedents aged 16-24 years	14	4.49
Aged 25-34 years	90	28.85
Aged 35-44 years	110	35.26
Aged 45-54 years	55	17.63
Aged 55-64 years	28	8.97
Aged 65≥ years	15	4.81
Female gender	84	26.9

3.6.2 Coding of diagnostic and treatment data

The GP Audit+ data were recorded at input level in Read code format (379) using the second revision of the Read coding terminology framework. This framework is comprised of 4-to-5-digit alphanumerical codes along with trailing characters made up of punctuation marks. It is expansive and variable, and a plethora of terms may exist to describe similar, analogous or closely aligned events which are described as 'episodes'. Episodes can refer to several events ranging from in-person consultations with a GP or other practice staff, to administrative tasks and incidents of communication such as letters and phone calls. Due to the number of individual coded episodes attached to each decedent's record, it was infeasible to review all the data available. As a lone researcher, I was not able to spend the required time on this task. As such, I made the decision to scrutinise only the most frequently recorded 1% of Read codes attached to decedent records. It was hoped that the most frequently recorded Read codes over the three years prior to death would give insight into the ways in which the decedents made use of primary care services prior to their deaths. The top 1% of Read codes described the following eleven procedures on at least one occasion:

1. Smoking cessation advice given to 71.3% (n=184) of the sample
2. Routine blood investigation ordered for 68.9% (n=178) of the sample
3. Blood pressure readings recorded for 67.4% (n=174) of the sample
4. Weight recorded for 66.3% (n=171) of the sample
5. A telephone encounter involved 64.3% (n=166) of the sample
6. Body Mass Index calculated for 58.9% (n=152) of the sample
7. A case review was carried out for 55.8% (n=117) of the sample
8. Height was recorded for 45.4% (n=117) of the sample
9. A medication review was recorded for 39.9% (n=103) of the sample
10. A proton-pump inhibitor was prescribed to 31.8% (n=82) of the sample
11. Amoxicillin was prescribed to 31% (n=80) of the sample

3.6.3 Social deprivation

The WIMD values for the addresses of the decedents included in the sample are summarised in Table 14. WIMDs are reported as quintiles, with the 1st quintile representing the most deprived areas and the 5th quintile representing the least deprived. 63.79% of decedents lived in the two most deprived quintiles.

TABLE 14: INDICES OF MULTIPLE DEPRIVATION

	n=312

		n	%
WIMD	Quintile 1	129	41.35
	Quintile 2	70	22.44
	Quintile 3	47	15.06
	Quintile 4	25	8.01
	Quintile 5	26	8.33
No WIMD data		15	4.81

3.6.4 Service Usage

Over 82% (n=258) of the decedents were recorded as having at least one GP episode during the 36-month observation period prior to death (see table 15). The median number of episodes per decedent was 75 [38-118].

TABLE 15: GP EPISODES

	n=312	
	n=	%
1≥ GP episode in 36 months	258	82.69
In 24 months	253	81.09
In 12 months	245	78.53
In ≤1 month	213	68.27

3.6.5 Drug or alcohol related service usage

Less than 10% of the decedents were recorded as having been referred to, or to be undergoing substance use disorder treatment service treatment (n=24, 9.3%), and less than 4% were recorded as receiving medication assisted therapies (MATs) such as methadone detoxification (n=9, 3.48%). Less than 9% were known to be drug dependent (n=21, 8.14%), and less than 2% were coded as being a drug user (n=5, 1.94%). However, slightly over 10% (n=27, 10.47%) were coded as misusing alcohol. A majority of 66.98% of the decedents were smokers (n=209) at the time of their death, and close to 9% were ex-smokers (n=27, 8.66%).

3.7 Discussion

3.7.1 Sample

The sample's mean age was close to 9 years younger than that of the larger sample described under heading 3.3 which was carried out over a longer observation period. This needs to be take in to account when interpreting the findings as either the sample used in this study is insufficient to give

us a true picture of the demographic make-up of overdose decedents in Wales, or it could be the case that opioid decedents who visit the GP in the 3 years prior to death are younger than those who do not.

3.7.2 Coding of diagnostic and treatment data

In the UK primary care practices use the Read clinical coding system (379). Read code terminology has been around since the 1980s and has been updated twice in this time, with version 2 providing cross reference with the ICD coding frameworks and version 3 expanding the language to include descriptions of a broader range of activities than were initially included (380). Criticisms related to the overcomplicated and exhaustive nature of the Read system and lack of contextual information related to coded episodes have been raised in the literature over previous decades (379,381). The GP event data captured during this study did not contain sufficient contextual information to provide a meaningful understanding of the kinds of problems that high-risk opioid users most often seek GP input regarding.

Some data items were separated from the decedent's ALF, and so items such as NHS number and practice number needed to be concatenated to facilitate record linkage across datasets.

3.7.3 Social deprivation

Our findings are congruent with the long-established relationship between poverty and heroin usage (127,382). The aggregate level social deprivation indices data reported in the current study confirm the association with social deprivation and increased overdose mortality, however they do not provide adequate details to identify the aspects of social deprivation most strongly associated with death. Aspects of social deprivation as it is defined by the WIMD associated with increased opioid overdose mortality are unemployment (383), unstable housing (127), and lack of access to social care services (384).

3.7.4 Service usage

Although no data related to average consultations per primary care patients in Wales are available to help make sense of the data regarding the number or GP episodes per decedent, a comprehensive and extensive retrospective analysis of primary care consultations in England using routine data found that on average NHS primary care patients consult with their GP five times a year (385). Even accepting that our data do not allow us to know what proportion of episodes describe a face-to-face consultation, a median value of 75 GP episodes per decedent can still be said to suggest that people at high risk of OOD are in contact with GP services comparatively often, with close to 70% recording a GP episode in the month prior to death.

Over a third of decedents were prescribed a Proton Pump Inhibitor (PPI) medication (Omeprazole) during the observation period. This represents around a two-fold increase on period prevalence estimates of PPI prescribing in the general population (386) suggesting that high risk opioid users are especially prone to gastrointestinal complaints treatable with PPIs, such as indigestion or hyperchlorhydria. I also found that a similar proportion of decedents were prescribed Amoxicillin, though there lacks diagnostic data to ascertain what kind of infections decedents were experiencing to warrant these prescriptions. According to a large UK based linked-data study of prescribing practices in England, one-third of GP patients are prescribed a broad-range antibiotic at least once a year, suggesting that our sample do not differ from the population at large in this respect (387).

3.7.5 Drug or alcohol related service usage

Surprisingly few drugs use related codes were found in the GP records, suggesting that low referral rates may be due to a lack of awareness amongst GPs. Public Health England data shows that opioid users are rarely referred to SUD treatment services by their GPs (97), and a large scale study carried out in America found that primary care patients are rarely screened for drug or alcohol use problems (377). This state of affairs seems to represent a lost opportunity as evidence from both America and Europe suggest that primary care settings are optimal for the management of opioid use disorder (375,376). A qualitative study based in the UK found that lack of experience and time pressures may make GPs less likely to enquire about patient's drug issues (388). However, the researchers also found that GPs often expressed hesitancy in recording drug related problems in electronic patient records for fear of adverse consequences for the patient or for the patient-clinician relationship.

Additional factors aside from GP attitudes may help us understand the lack of substance use disorder treatment service-related coding, however. The shift from NHS control over substance use disorder treatment services to third sector control in 2012 has been associated with funding cuts and decreasing access to substance use disorder treatment services (389). A comparatively small proportion of high-risk opioid users appear to contact substance use disorder treatment services, and this, along with low rates of referrals may be attributable to a lack of available services.

We should also bear in mind the effects of the changing landscape of primary care services in Wales over the observation period. Primary care services in Wales have undergone changes in terms of practice size, number of practices, and in opening times over the observation period for our study. The average number of patients per practice has increased steadily over the observation period from 5804 in 2013 to 5976 in 2015, whilst the number of open practices fell, and the number of individual GPs employed at each practice remained near constant. The number of practices open between 08.30 and 18.30 every weekday also increased (390). These changes may well have meant that

identifying drug problems which were not the primary cause for attendance at the surgery and promoting awareness of risk in specific populations such as opioid drug users may have become more challenging for time-pressed clinicians, and thus less of a priority for GPs. This would explain the low proportion of decedents coded as being identified as problem drug users or being referred to substance use disorder treatment services.

The findings of this study suggest that high risk opioid users are significantly more likely to smoke than the general population, as ONS estimates suggest that approximately 15% of adults in the UK are current smokers compared with close to 70% of the study sample (214).

3.7.6 Limitations

As mentioned under heading 3.7.1 the sample size for this study may not be sufficient to give a true picture of the demographic make-up of opioid overdose decedents who visit the GP prior in the 3 years prior to death.

The Read code system presented a challenge to analysing and drawing inferences from data related to primary care service usage. Many of the coded episodes describe interventions or activities which may or may not be carried out as part of active care of a patient. In this sense much of the Read coded data available cannot be used to draw conclusions about the number of 'meaningful' contacts, such as face to face or telephone consultations involving a patient and a clinician versus less meaningful contacts such as automated letter dispatch. From my experiences in carrying out this study it appears that as the Read code system has expanded over multiple revisions clinicians are able to choose between related and often analogous but discrete codes to record identical episodes, and this has resulted in an unwieldy library of competing terms which may lead clinicians to favour certain diagnostic or intervention codes over others. This in turn leads to difficulty for researchers who wish to interrogate the resulting data retrospectively.

I was unable to capture data related to referrals from substance use disorder treatment services back to the care of GPs, and so was not able to comment on the incidence of substance use disorder treatment service to GP referrals over the observation period, if any such referrals were made. Additionally, no data regarding diversion of prescribed maintenance medications were available, and so the impact of diversion on mortality remains unknown.

3.7.7 Conclusions

Based on the findings from this study clinicians in primary care appear to have access to cases where a patient is at risk of opioid related death, but with less than ten minutes on average to complete consultations (391), they may well lack the opportunity. It may also be the case that GPs are often unaware of high-risk opioid use or are unlikely to record details of opioid use in patient notes, or

both. Further research is needed to understand to what extent GPs are unaware of high-risk opioid use amongst patients, and how to increase this awareness if warranted. Also, the factors which govern whether GPs record the existence of problematic opioid drug use in patient notes are not fully understood and should be given further attention in the literature.

Finally, factors which govern GP decisions to refer or sign-post high-risk opioid patients to specialist treatment services when they are aware of the problem should also be studied, as the most recent Adult substance use treatment statistics (392) from the ONS suggests that only 6% of SUD treatment service referrals from GPs, with a minority of these constituting OUD referrals.

3.8 Schizophrenia amongst decedents of opioid overdose

3.8.1 Method

The aims and objectives of were to identify the proportion of opioid overdose decedents who had received a diagnosis of schizophrenia prior to death, due to the known co-occurrence of schizophrenia and OUD (393,394).

The data for this study were collected using the same inclusion criteria as applied in Studies 1 and 2 as detailed under section 3.2.1. Deaths occurring between 01/01/2012 and 31/12/2015 only were included due to time and funding limitations. Once again, I sought to capture service usage data over an observation period of 3 years prior to death.

The focus of the current study was widened to include decedent contact with all health care services if contact events were related to schizophrenia diagnosis or treatment. As in the larger scale study

Schizophrenia is a syndrome consisting of positive and negative symptoms (395). Positive symptoms are observed as an excess in, or distortion of, normal perception and functioning. Examples include psychotic phenomena such as delusions or hallucinations, as well as chaotic or disorganised thoughts and behaviours. Negative symptoms are characterised by withdrawal, asociality, and anhedonia (396).

About 1% of the general population will be diagnosable with schizophrenia at any one time (395). Long term outcomes are poor, with only around 16% late-stage recovery (397). Around 20% of people with schizophrenia are homeless (398), and around 80% unemployed (399).

According to the available literature, there exists a significant relationship between schizophrenia and OUD (393,394), and SUDs more generally (400). Research suggests that the presence of OUD significantly increases the likelihood that prodromal schizophrenia states, including schizotypal disorder, progress to diagnosable schizophrenia or schizoaffective disorder (393,401). However,

genetic risk of schizophrenia as measured by polygenic scoring has been found to be associated with the development of SUDs over specific developmental periods in adult life (402). Therefore, it is possible that onset of schizophrenia could underly the development of SUDs.

A potential neurobiological modulator of the relationship between schizophrenia and proclivity for substance use has been identified in the form of dysregulated glutamatergic and dopaminergic signalling in the mesolimbic pathway (403). Such dysregulation in neurotransmitter signalling is linked to both genetic and environmental factors (404).

Based on the available in the literature concerning OUD and schizophrenia I aimed to describe the period prevalence of schizophrenia amongst opioid overdose decedents. To achieve this, I would conduct a cross-sectional, retrospective, observational study of both GP data and inpatient hospital data.

Deaths which took place between 1/1/2012 and 31/12/2015 were identified by searching Office for National Statistics (ONS) mortality records birth, deaths and marriages dataset, and the same inclusion criteria applied is Studies 1 and 2 and detailed under heading 3.2.1 were applied. Again, service usage data were collected for a 36-month period prior to death.

3.8.2 Data linkage

Mortality records were linked with two NHS Wales Informatics Service (NWIS) databases. The matching algorithm used to link data is the same as the linkage method outlined previously.

To identify schizophrenia related diagnoses made in primary care and hospital settings, I used a coding framework developed by John et al. (216) and found to be effective by the authors for this purpose. To help contextualise our findings, I also searched for diagnoses of depressive disorders using a coding framework also devised by John and colleagues (405).

3.8.3 Data analysis plan

The aim of this study was to describe the prevalence of schizophrenia related disorders opioid overdose decedents, and how this may relate to death. To achieve this aim, I sought to capture data related to the following variables:

1. Demographics
2. Proportion of decedents receiving a related diagnosis in GP or hospital settings
3. Frequency and circumstances of overdose death
4. Proportion of decedents receiving depression related diagnosis in GP or hospital settings

3.9 Results

3.9.1 Sample

The decedents were 73.68% male, with a mean age of 39.94 [13.59]. This is close to a decade younger than the larger sample described under heading 3.3. The demographic data here must therefore be interpreted as insufficient to give a true picture of the demographic characteristics of the population of interest.

3.9.2 Coding of schizophrenia related diagnosis

At analysis, I found that a limited library of diagnostic codes related to schizophrenia had been attached to decedent's hospital and GP records in the 3 years prior to death. A total of seven ICD-10 'F' codes describing schizophrenia, schizotypal and delusional disorders were found, and six Read CTV2 codes describing schizophrenia and schizophrenia spectrum disorder related diagnoses, including schizoaffective disorder; paranoid psychosis; and delusional disorder.

Of the seven ICD-10 codes one or more of the schizophrenia related ICD-10 and/or Read CTV2 diagnostic codes were attached to the hospital and/or GP records of 19 distinct decedents representing over 6% of our sample of decedents (n = 312) either prior to or during the 36 months prior to death.

Most decedents had received a primary diagnosis at hospital admission or had both GP and hospital contact (n = 8, 5.12%), whilst a minority were recorded as having GP contact only (n = 3, 0.96%). These results are summarised in Table 16.

TABLE 16: GP AND HOSPITAL DATA

GP and hospital record codes	***n* = 312**	
	n	**%**
GP Episode only	3	0.96
Hospital Admission only	8	2.56
Both GP and Hospital	8	2.56
Total	19	6.09

Over the 36 months observation period, 73.68% of the decedents who received a schizophrenia related diagnosis were diagnosed as having schizophrenia, paranoid or unspecified (n = 14,). Half (n = 7) of these overlapped with the next largest group, those who received a diagnosis of schizotypal disorder 57.89% (n = 11). The remaining diagnosis received were 15.79% (n = 3) schizoaffective disorder; 15.79% (n = 3) unspecified paranoid state; 10.53% (n = 2) unspecified psychotic disorder; and 5.26% (n = 1) folie à deux.

3.9.3 Coding of depression diagnosis

Amongst the sample 8.97% (n = 28) received a diagnosis of depressive disorder in the 3 years prior to their death.

3.10 Discussion

In 2008 McGrath and colleagues (395) carried out a comprehensive systematic review of observational studies of the epidemiology of schizophrenia. They identified 34 studies concerned with the period prevalence of schizophrenia in the general population. By abstracting data from these studies, the authors found a mean period prevalence of 5.7 per 1000 people, or 0.57%. Compared to McGrath et al.'s findings, which were congruent with a previous review by Torrey et al. (406), our data suggests that the prevalence of schizophrenia spectrum disorder in high-risk opioid users might be over 10 times the prevalence in the general population. It could be the case that due to McGrath et al.'s review including studies utilising differing criteria for the diagnosis of schizophrenia, direct comparison with our findings is subject to artificial exaggeration. However, even if this is the case, the difference in incidence still appears to be quite significant. Therefore the potential for such discrepancy between high risk opioid users and the general population in terms of schizophrenia prevalence raises several important questions related to the 'self-medicating hypothesis' of dual diagnosis presentations (407). Previous research has found that people with schizophrenia are more likely to self-medicate with alcohol or cannabis than with opioids (407–409), but our data seems to contradict these findings. Said contradiction could be due to changes in preference for psychotropic drugs amongst people with schizophrenia over time, or due to the fact that previous research in this area have historically used small sample sizes (407–409). Due to the lack of consensus in the data, and the lack of recent and larger scale observational studies, further research is needed to better understand the relationship between schizophrenia and OUD.

We found significant overlap between those who received a diagnosis of schizophrenia and those who received a diagnosis of schizotypal disorder. These data support the findings of Hjorthøj et al. (401), who found evidence for an association with opioid drug use and conversion of schizotypal disorder to schizophrenia.

The prevalence of depression amongst the total sample did not differ significantly from the European average prevalence of depressive disorder as estimated by the authors of the cross sectional European Outcome of Depression International Network (ODIN) study of over 8000 participants who found an average period prevalence of 8.56% (410). Therefore it is unlikely that the evidence of increased prevalence of schizophrenia amongst people with schizophrenia is due to comorbid depression, though depression is associated with OUD (115,118,119).

3.10.1 Limitations

In order to contextualise my findings, I reference the systematic review by McGrath et al. (395). However, in utilising John et al.'s (405) coding framework, I included cases of schizotypal disorder, schizoaffective disorder and unspecified paranoid and psychotic states. As such it could be argued that I was not making a direct comparison with schizophrenia as defined in McGrath et al.'s study.

The generalisability of this study is limited by the lack of a comparison or control group, and the reporting of simple descriptive statistics rather than predictors of OOD. It would have been technically possible to capture data belonging to all-cause decedents matched by age, sex, and other sociodemographic variables such as WIMD at time of death. Having this cohort would have allowed for the identification of statistically significant predictors of OOD through multiple logistic regression analysis of sociodemographic variables, health service use variables, and clinical variables such as the presence of various physical or mental health problems prior to death. Significant predictors could have then been included in a final stepwise regression to identify the most important variables and thus most promising variables to inform future work. Capturing the data necessary to undertake this work would have incurred costs, and I was not able to secure adequate funds to do so. Additionally, data preparation and analysis is a time-consuming set of tasks, and I would not have had the capacity to do this on my own and carry out the other research projects detailed in this thesis.

3.10.2 Conclusions

Although these data are inconclusive, they do raise questions related to high-risk opioid use and schizophrenia. The first is to what extent do people with schizophrenia spectrum disorders self-medicate with opioid drugs and place themselves at risk of overdose. There are certainly qualitative data to support the notion that illicit drugs including heroin are used by people with schizophrenia to self-medicate (411). Our data contradicts some (of the relatively scarce) quantitative data in this area suggesting that high-risk opioid use is either not associated, or is negatively associated with psychotic illness (412,413). Our findings therefore suggest that further research is needed to improve understanding of the relationship between schizophrenia and related disorders and OUD.

Secondly, these findings raise the question of whether enough is being done to address high risk opioid use in patients with schizophrenia. Certainly, the deleterious effect of comorbid substance use disorder on health outcomes related to schizophrenia have been recognised for some time (400), and yet specialist treatment pathways for opioid use in schizophrenic patients appear to have received little research attention or investment.

In the next chapter I will satisfy my aim of describing facilitators of help-seeking for OUD by identifying the factors which motivate help seeking through in-depth interviews with substance use disorder treatment service users.

Chapter 4 – Motivators for Help-Seeking Amongst People with Opioid Use Disorder: An Interpretative Phenomenological Analysis Through the Lens of Relational Frame Theory

4.1 Background

A minority of high risk opioid users contact substance use disorder treatment services (147,146,98). Those high-risk opioid users that do attend substance use disorder treatment services appear to be at a decreased risk of mortality (414,415). In addition, evidence suggests that expanding access to substance use disorder treatment services is associated with increased utilisation amongst people with opioid use problems (416).

In undertaking this research, I theorised that understanding why and how people come to seek help at substance use disorder treatment services could be of great significance and importance in developing methods to increase substance use disorder treatment service footfall, and so aimed to capture qualitative data to better understand the facilitators and obstacles to help seeking via specialist SUD treatment services. As my aim included gathering data related to how people experience help seeking on a micro-analytical level and given that I lacked a specific hypothesis about what influencing factors exist in relation to help seeking amongst people with OUD, a deductive line of inquiry which gathers information about the first-person experience of people with OUD who seek help was required. Given the difficulties which other researchers have found when accessing this population (366,367), a method of investigation which does not require large sample sizes would be ideal. Given the aims of the study and the characteristics of the study population, Interpretive Phenomenological Analysis (IPA) was the most suitable methodology for investigation (417).

4.1.1 Interpretive Phenomenological Analysis

Interpretive Phenomenological Analysis or IPA is a qualitative approach that seeks to explore the experience of participants who are undergoing or who have undergone a process or event. It is an idiographic approach concerned with capturing data related to individual experience of personal phenomena, in contrast with nomothetic approaches concerned with making observations of shared phenomena on an aggregate level. IPA was developed by Professor Jonathan Smith, alongside his colleagues Paul Flowers & Michael Larkin. The original theorists behind IPA have described the

approach as a “qualitative research approach committed to the examination of how people make sense of their major life experiences” (417).

IPA is built upon the foundations of phenomenological philosophy, which was pioneered by Edmund Husserl and his student Martin Heideggar in the first half of the 20th century (418). Husserl, Heideggar and their contemporaries were concerned with how human experiences are made sense of by the individual without conceptualising those experiences within pre-existing theories of perception and learning. We can best understand the phenomenological approach by contrasting it with the schools of constructivism and relativism. The constructivist philosopher seeks to understand how a person experiences events and creates meaning based on their previous experiences and prior knowledge. The relativist philosopher seeks to understand how a person experiences events in relation to the social and cultural norms within which the event occurred. Although the phenomenologist ‘brackets’ all other presuppositions and engages solely and directly with the experiences of the person, IPA methodology is often employed within a constructivist paradigm (419,420) due to the method’s inductive concern for how meanings are constructed by individuals (417). This sets IPA apart from positivist qualitative research methodologies such as grounded theory (GT) which set out to construct theories based on the analysis of data. The positivist researcher will seek to analyse an observable phenomena from an outside perspective, rather than understand personal experience (421).

Pragmatism is an approach to research where in aspects of other established qualitative methodologies are combined to satisfy an overarching aim for the researcher (422). This approach has been posited as a methodological bridge between positivist and constructivist paradigms and methods to qualitative research by drawing on what is meaningful from both approaches, using one to enrich the other (423). As my aims included understanding obstacles and facilitators to treatment seeking, there was an implicit intention to practically apply any meaningful findings for the improvement of service uptake amongst people at risk of opioid related harms. This potential application of findings to other peoples and settings was important to the aims of the research. Therefore, in the interests of potential generalisability of meaningful results, I opted to employ a pragmatic approach and include some positivistic aspects within my methodology (424).

The researcher who applies IPA draws on the principles of phenomenological psychology and uses it to shape idiopathic psychological investigation. They seek to learn about the participant’s perception of a particular process or event in sufficient depth so that they can report how the participant has made sense of their experiences. The application of IPA in the current research therefore regards seeking help for OUD via substance use disorder treatment services as a major life experience. The

use of IPA in the sort of context in which I am applying it here is not without precedent, as although originally applied in the field of psychological research (health psychology especially) IPA is increasingly being applied to health services research and public health research (425,426). Despite the different contexts in which IPA has and is being applied, IPA is fundamentally an application of applied psychology - or psychology in the 'real world' - hence the emphasis on experiential enquiry.

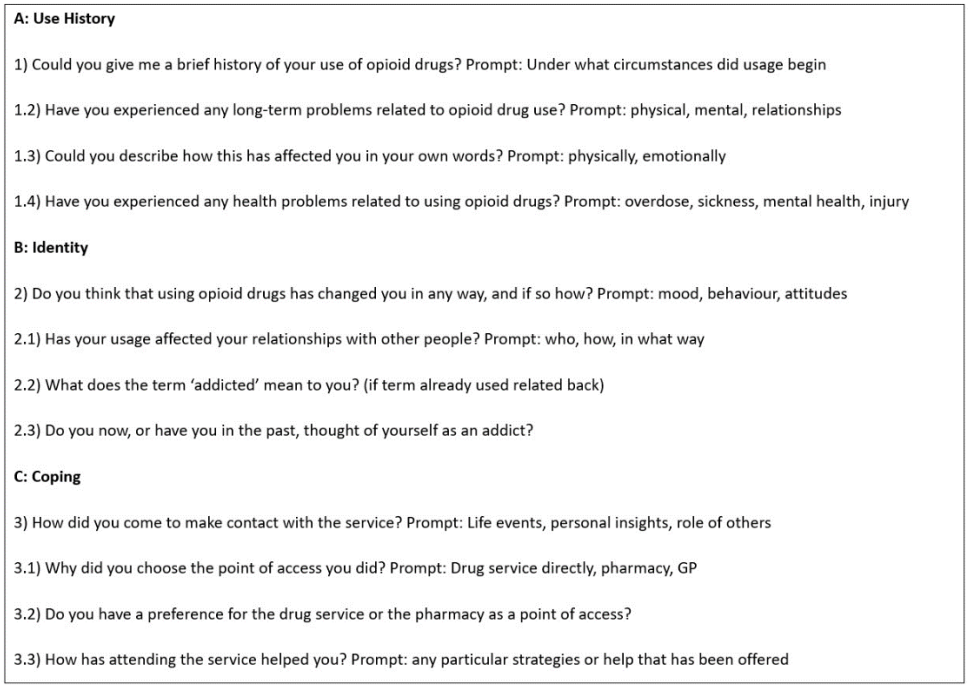
4.2 Method

4.2.1 Design development

According to the guidance as found in Smith & Osborne's 'Practical Guide to Research Methods' (427), I began formulating my research question by broadly posing a query as to how an individual makes sense of a particular situation, with the situation in question being help seeking for OUD. I then set about designing the interview schedule to be used in answering the question 'how does a person make sense of the experience of seeking help for OUD?'. This process involved the identification of the issues which my broad research question could be broken down in to. The first of these issues were 'usage history'. This meant the interview could begin with a line of questioning which represented the chronology of the participant's experiences of help seeking. I would therefore be beginning with the drug usage for which the help seeking was a consequence, proceeding to the first experiences of help seeking and the motivating factors behind these experiences.

The next issue was 'identity'. This included questions which prompted participants to think about how they viewed themselves prior to, during, and post development of OUD and help seeking for OUD – and how others within their immediate social environment viewed them.

The final issue to be covered was 'coping'. In relation to this issue questions were used to gather data regarding how the participant coped with the various consequences of OUD. This included personal, social, physical, and mental aspects of coping prior to, and post help seeking. The completed interview schedule is summarised in Figure 5.



A: Use History

1) Could you give me a brief history of your use of opioid drugs? Prompt: Under what circumstances did usage begin

1.2) Have you experienced any long-term problems related to opioid drug use? Prompt: physical, mental, relationships

1.3) Could you describe how this has affected you in your own words? Prompt: physically, emotionally

1.4) Have you experienced any health problems related to using opioid drugs? Prompt: overdose, sickness, mental health, injury

B: Identity

2) Do you think that using opioid drugs has changed you in any way, and if so how? Prompt: mood, behaviour, attitudes

2.1) Has your usage affected your relationships with other people? Prompt: who, how, in what way

2.2) What does the term 'addicted' mean to you? (if term already used related back)

2.3) Do you now, or have you in the past, thought of yourself as an addict?

C: Coping

3) How did you come to make contact with the service? Prompt: Life events, personal insights, role of others

3.1) Why did you choose the point of access you did? Prompt: Drug service directly, pharmacy, GP

3.2) Do you have a preference for the drug service or the pharmacy as a point of access?

3.3) How has attending the service helped you? Prompt: any particular strategies or help that has been offered

FIGURE 5: INTERVIEW SCHEDULE

In line with the limited pragmatic approach nested within the broader phenomenological methodology, the interview schedule contains some positivistic items. For example, I refer to problems related to drug use based on the context in which the interview is being carried out (e.g. the interviewee being a help-seeking drug user and the location being an addiction support service). Similarly, the concept of addiction as something that is an accepted phenomena familiar to both interviewer and interviewee.

4.2.3 Sample

Sample size in qualitative research has been the subject of debate (428). Phenomenological research, which includes IPA, has been described by experts in the field as benefitting from smaller sample sizes made up of participants which are homogenous in relation to their shared experiences (if not their base characteristics) (417). Polkinghorne is regarded as an accomplished contributor to the field of phenomenological research and has advised that researchers using IPA should look to recruit between five and 10 participants (429).

4.2.4 Ethics

The study was submitted to the Swansea Medical School Ethics board for consideration in July of 2018 and approved the same year.

4.2.5 Setting and procedure

Interviews were carried out at the Bristol Drugs Project (BDP) in central Bristol, which is a large third sector organisation offering an array of treatment and support mechanisms for people experiencing

SUD. I was able to spend a total of three afternoons at BDP's main resource centre and carry out interviews with clients who were waiting to see key workers to discuss supportive care, use the needle exchange, or to attend an appointment with nursing staff. Suitable clients were approached by BDP staff and asked if they would be willing to learn more about the study by reading an information leaflet or by speaking to me directly. Clients who responded positively were then approached by me and talked through the information leaflet and consent form (see Appendices D and E respectively). Upon obtaining verbal and written consent the interviews were then carried out in a private clinic room over 30-60 minutes and recorded using a digital Dictaphone. Participants were given a gift card for use in a national chain of shops and supermarkets as a thank you at the outset of the interview. All participants were aware that they could leave the interview at any time and that their care would not be affected.

4.2.5 Analysis

Once interviews had been completed, the audio files were uploaded via secure portal to a private transcription company. The company is a trusted partner of Swansea University and often works on Swansea Medical school projects. Once transcribed, interviews were analysed according to Smith, Larkin and Flowers' approach to data analysis in IPA (417):

The first step involved immersion in the data by listening to the audio recordings and reading the transcripts of each interview multiple times.

The second step of involved the identifying of themes. This stage began with a 'left-hand, right-hand margin' method of annotation where in each line of each transcript was summarised or paraphrased, and these line-by-line summaries were placed in the 'left hand margin' of the transcript. This process was carried out using both the annotation feature of NVivo qualitative analysis software and with a word processor application. The initial codes were identified using NVivo and then these initial codes were transformed into concise phrases describing emergent themes using a word processor. These emergent themes were related to psychological theory and captured the most prominent or vital aspects of each line. When carrying out this stage of analysis, I often expressed themes using technical terminology, which carries with it the danger of abstraction, and so I took care to ensure that the level of abstraction was not so high that a reader other than me would not be able to intuitively relate the identified themes to the verbatim words of the participant as found in the transcript.

After each line-by-line summary was transformed into emergent themes, these themes were listed in the 'right hand margin' of the transcript. Emergent themes were listed in the order in which they appear in the transcript within the document. Themes were reviewed for thematic clustering, and

where themes were thematically directly or indirectly related, they were clustered together and dubbed 'subordinate' themes. Connections between emergent themes were checked against the verbatim words of the participant as found in the transcript to ensure that the level of abstraction did not render the transcript itself unacceptably far removed as a source material.

Finally, subordinate themes identified in each of the transcripts were reviewed and thematically clustered in to 'superordinate' themes. This final process of the analysis aims to connect the subordinate themes as found in the transcripts as part of a series of higher-level convergences. As such the analysis is concluded at a higher level than can be achieved by limiting the analysis to each individual transcript in complete isolation from one another.

Each time these three processes of immersion in the data, identifying themes, and structuring the analysis is complete for an individual transcript, an effort is made to 'bracket' the themes identified in the previous transcripts. This helps to maintain the fidelity of the phenomenological approach when working through the sample. In the interests of pragmatically applied positivist data interpretation, I also aimed to report participant characteristics, frequency and distribution of identified themes, and to if possible, recommend some application of the study data in my conclusions.

4.3 Results & discussion

4.3.1 Sample characteristics

Six participants were recruited and interviewed. The sample characteristics are summarised in Table 17. The sample was entirely male, which is not unprecedented in the literature concerning OUD due to the considerably higher prevalence of the disorder in men (430). In so far as this this study is concerned the exclusively male sample recognised as a limitation under heading 4.4.1.

TABLE 17: SAMPLE CHARACTERISTICS

No.	Gender	Age	Usage history in years	Substance use disorder treatment service attendance history in years	Nationality
1	Male	39	15	7	Polish
2	Male	38	25	2	British
3	Male	40	24	10	British
4	Male	43	30	20	British
5	Male	43	17	20	British
6	Male	66	47	24	British
Median [SD] =		41.5 [10.57]	24.5 [11.51]	15.0 [8.73]	

4.3.2. Super and subordinate themes

Analysis revealed multiple subordinate themes were amalgamated under several superordinate themes related to the decision-making process behind seeking substance use disorder treatment

service help. The relationships between the subordinate themes and superordinate themes are presented in chronological order to where they appear in the transcripts and are presented in Figure 6.

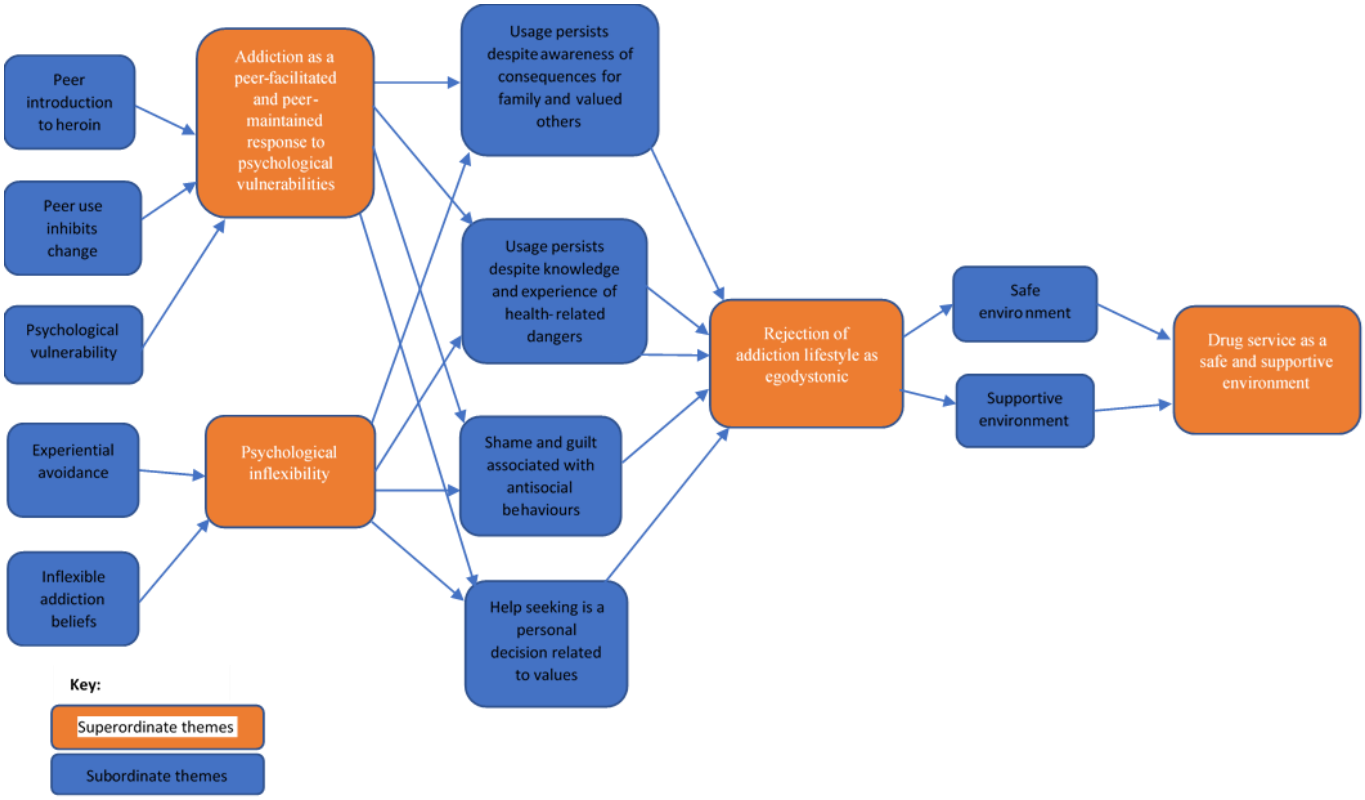


FIGURE 6: SUBORDINATE AND SUPERORDINATE THEMES

The transcripts for each participant interview, along with the themes identified at the end of each transcript can be found in Appendix F.

The general discussion of results will focus primarily on superordinate themes in chronological order, before addressing the subordinate themes undergirding them. The super and subordinate themes apparent in the text following analysis are summarised in Table 18.

4.3.3 Superordinate theme 1: Addiction as a peer-facilitated and peer-maintained response to psychological vulnerabilities.

The first superordinate theme that arose from the analysis concerned the role of peers in facilitating usage. Participants, perhaps unsurprisingly, did not describe seeking out heroin under their own volition, but rather described situations where in peers facilitated initial usage. Initial usage was described as either being inspired by peers using heroin in the same vicinity as the participant; as being motivated by a want to emulate older peers; or as being offered as a means of avoiding the

experience of acute withdrawal from other drugs. Sustained usage was associated with the usage of peers, with participants describing the need to change or leave their social group of peer users when attempting to reduce their own usage. Participants often described incidences of trauma or adverse life events, including loss of identity, prior to their initial usage. These experiences were regarded as important in the overall narrative of problematic opioids drug usage and subsequent help seeking.

4.3.3.1 Subordinate theme: Peer introduction to heroin

All participants described friendships with people using heroin, and struggling with the adverse consequences of this usage, prior to their own initial experiences with the drug. One participant described having:

> *"A friend [who] was very bad in that before [withdrawal symptoms], yeah, like sixteen years ago, and was doing nothing, you know. He was asking me for money and all that. I said, 'No, I'm not going to give you a single penny for drugs.'"* (Px 1, line 215)

This participant later explained his attitude towards this dilemma changed to that of the opposite point of view due to his own subsequent experiences of withdrawal:

> *"But when I had that same issue, yeah, I really understand better the influence, you know. It's like really – nothing compares to that [withdrawal symptoms]."* (Px 1, line 218)

Another participant described his introduction to heroin as being peer facilitated:

> *"one of the guys that I was with was doing gear, like do you know what I mean, so he offered me a little bit of smoke"* (Px 2, line 15)

A similar statement in the narrative was that:

> *"[my] friend was just doing it in his house and then I looked over and said, 'Oh give me a bit'."* (Px 5, line 27)

Another participant described a set of circumstances in which a single user of heroin introduced several people in his social group to the drug:

> *"Oh it was definitely peer pressure…there was this new thing on the street, called heroin, and everyone used to go upstairs into his room, only one at a time, and he'd [peer user] introduce you…and then we was all hooked, every one of us, yeah. So, it is peer pressure, a hundred percent it was for me yeah." (*Px 6, line 118)

Two participants describe emulating the behaviour of older party drug using peers in their younger years:

"…people I was hanging around with, which were a lot older lads than me, they were smoking heroin. They started smoking heroin to come down off of the party drugs, I looked up to them, and started doing the same."(Px 3, line 12)

"I had my first hit when I was thirteen with heroin for a come down off of three days up of speed, but come back from a rave, and I used to use Valium and weed to come down, and my sister's boyfriend at the time he told me, 'I've got something better'." (Px 4, line 17)

5.3.3.2 Subordinate theme: Psychological vulnerability

Most of the narratives included data related to childhood trauma of some description, and several of the participants described themselves as suffering from comorbid mental health problems. One participant described having a:

"*…very rough childhood and my father was very violent, so I started running away from him when I was like nine years old, 'cos I was fearful to be in the house…"* (Px 2, line 10)

Another participant described sexual abuse by two different perpetrators early on in life, though heroin use started in adulthood immediately following the traumatic loss of his brother:

"…that [traumatic bereavement] just completely sent me into meltdown, and yeah admittedly I did get on heroin". (Px 6, line 21)

Heroin use was directly related to experiences of living in an unsafe environment and being witness to domestic abuse, but not the direct recipient of abusive behaviour themselves:

"I think it's from my childhood sort of thing, things [domestic abuse], you know, that I witnessed and that". (Px 3, line 58)

One participant spoke animatedly about involvement in sports as a child. He reminisced:

"when I was at school we had the best rugby team in England and Wales, we had the best really. Miss them days." He described aspirations of being a professional footballer, inspired by his family history: "my dad was an athlete, his dad was an athlete, my mum's dad was an athlete, his dad was an athlete…my dad's side of the family they all played football, my mum's side of the family they were all rugby." (Px 4, line 162)

For this participant, initial usage was tired to the end of his hopes of playing football at a competitive level:

"I regret using it that first time, yeah, definitely… I was a pretty good sportsman when I was younger and I got picked for Torquay Academy, and I went and played and my dad told me

> *not to go and play this match…two weeks before I was meant to join up with Torquay Academy I went and played a rugby match and got my knee twisted, and they had to cut into my knee, take out the cartilage, and then they sewed it back up and basically that was the end of my football career."* (Px 4, line 39)

In this account we see that existing psychological vulnerabilities to problematic opioid use are tied not exclusively to traumatic events but may also be related to the loss of functioning and identity associated with physical injury.

5.3.3.3 Subordinate theme: Peer use inhibits change

A common theme also found in the narratives was that of peer use inhibiting individual's efforts to reduce or stop usage. All the participants reported multiple periods of abstinence throughout their usage history, with most mentioning peer-usage as contributing factor in reusing.

> *"I get off and on and off and on [using heroin]...[I] Can't stay off with the right people, yeah, and [I] get back again in."* (Px 1, line 167)

This same participant then explains how even when helping one another to abstain, the group dynamic appears to facilitate reusing:

> *"See, I helped my friends and all of this, and we abstain, yeah, like six, seven months, yeah, and then I don't know why, we all get involved again in this sort of stupid [heroin use]."* (Px 1, line 173)

Another observation on how one participant's social group began using together and maintained usage together was described thus:

> *"you kind of like stayed together and like egged each other on and fed each other's habits."* (Px 2, line 114)

A participant who was introduced to heroin by peers described comparing his own situation with peers who did not use heroin and listed this as a motivator in help seeking:

> *"[I] was looking at other people, seeing them moving on like, you know, and like you're still sort of kind of stuck."* (Px 3, line 150)

To make a commitment to change and to abstain from heroin whilst adhering to substitution medication, one participant described how they need to change their social group too:

> *"there's no point in me hanging about with the same people … so that's why I started all over again."* (Px 5, line 97)

4.3.4 Superordinate theme 2: Psychological inflexibility

Evidence of psychological inflexibility in the form of fixed beliefs regarding addiction and self-image, avoidance of negative experience, and habitual engagement in egodystonic non-values-based behaviour (431,432) were apparent in the transcripts. Participants demonstrated an attachment to a conceptualisation of themselves as addicts, which was described as existing independent of the usage of heroin or any other drugs. Participants described using heroin to avoid the experience of negative emotions, including the distress associated with cognitive dissonance. Heroin usage was described as reactionary to distress associated with adverse life events and interpersonal difficulties, and as a means of avoiding the experience of depressed mood and anxiety more generally.

One participant described an example of how introspection, which can be considered a cognitive process characteristic of increased psychological flexibility (433), motivated help seeking.

4.3.4.1 Subordinate theme: Inflexible addiction beliefs

Addiction was frequently understood without contextual variation. That is to say that some participants described their addiction as part of their 'make up' and which by chance happened to involve heroin. Thus, addiction was understood as an enduring personal characteristic, with little thought given to the addiction or harm potential of different substances or behaviours:

> *"I can swap my drugs for drink, driving motorbikes or cars or flying planes or diving whatever."* (Px 1, line 162)

> *"…addicted to me is me personally, is someone that has to get up in the morning and go out and get something that they need to use, it could be coffee, could be chocolate, could be shopping, could be meeting a friend, it could be riding a bike, it could be using drugs."* (Px 4, line 209)

One participant likened addiction with a drive to obtain high quality examples of consumer goods:

> *"…everything, whether it's PlayStation, whether it's clothes, whether it's – you know, whether it's clothes and everything's got to be fucking North Face or Berghaus, or everything, everything's got to be top notch."* (Px 6, line 189)

Addiction was also described in the absence of any substances, items or behaviours, but rather just as a state of being:

> *"[re: addiction] It's not being able to be comfortable being yourself, you know?"* (Px 3, line 126)

4.3.4.2 Subordinate theme: Experiential avoidance

Evidence for internal avoidance is apparent in the narratives of all the participants. Participants often describe cognitive dissonance related to this phenomenon. One participant describes the internal sensations he experiences when he attempts to abstain from using heroin by saying:

> *"…now you stop doing drugs and all that, you feel this massive empty gap, yeah"* (Px 1, line 161)

He then goes on to describe how the negative internal experience associated with cessation of usage develops over time:

> *"Imagine it starts becoming like a week, a month, half year like that, you do nothing, you're going to go twisted in your head, yeah?"* (Px 1, line 158)

However, this participant did highlight how occupation in another activity within the setting of the substance use disorder treatment service can provide respite from the distressing internal experiences:

> *"…with all these empty gaps, you know, when they do these recovery groups…people can do some groups or IT or something, yeah, they might be involved to doing something else, not just drugs."* (Px 1, line 282)

Another participant also describes the importance of occupational distraction by stating:

"it's an important thing to have something to do, or feel like I'm doing something, otherwise I'm just drifting around and swimming in my own head, so that ain't no good to nobody. I know where that leads to [relapse]." (Px 2, line 254)

However, the substance use disorder treatment service itself did not appear to provide a lasting strategy for use outside the substance use disorder treatment service:

> *"When I go out through the door, yeah, I'm back in reality, you know, and by the evening, yeah, maybe four, five hours later, yeah, I've completely forgotten about what we was chatting there [at the substance use disorder treatment service]."* (Px 1, line 286)

A participant also describes a conscious decision to abstain due to a rejection of his addiction related behaviour, but that he is unable to tolerate the experience of abstaining following this decision:

> *"I always reach a point where I just can't fucking deal with myself, what I'm doing, do you know what I mean. I just think, I can't fucking – I just can't keep doing it, and it's like – do you know what I mean. And then something changes in my head and makes it easy for me to*

like push through it, but it just never lasts, do you know what I mean. I can't get – I can't get the strength to do it." (Px 2, line 182)

When one participant experienced a degree of cognitive dissonance and accompanying distress related to his heroin use, he would engage in an inflexible 'one track' sequence of thoughts in response:

"I'd get a bit anxious about it and I'd think, oh, do I really want to do this [obtain heroin] and like, you know, and then it'd be, well you've got no choice mate, you have to do this, come on, make yourself, you've got no choice, you have to do it, and then yeah, but once I've had the hit it's usually okay." (Px 4, line 96)

Another participant describes using heroin as a means of avoiding the experiences of depressed mood and elevated anxiety in more general terms:

"I suffer from depression and anxiety and all that, so like that's what – with all my problems, because I've been using drugs flat out as obviously like, what's the right word, that was hard for me, like to cope." (Px 5, line 206)

This participant then goes on to describe experiential avoidance in relation to his awareness of problems arising in this life:

"cos I'm not using so much [currently], it's just all the problems, like just seems like stacking up one after another like." (Px 5, line 259)

One participant described how intolerance of negative experiences, specifically guilt and shame, and the use of heroin as a means of avoiding these experiences result in a 'vicious cycle' of regrettable behaviour and heroin use:

A: Yeah, definitely, I've definitely done things I would never have done without like the substance. It makes you have a need, like, do you know what I mean, and makes you morals go out the window, do you know what I mean. The people that I've stolen off, I've stolen off people that love me, people that I've loved. They can't understand it.

Q: And how do you cope with that?

A: By doing more [laughs]. Yeah, it's a catch twenty-two thing, innit? (Px 2, line 125 and 132)

This same process of experiencing and then avoiding negative emotion, namely shame and anger, resulting in repeated heroin usage was also highlighted by another participant:

Q: You mentioned the shoplifting, what kind of effect does that have on you?

A: Shame. Shame, shame, shame, more shame, anger, shame. You know, for the act of getting caught, you know what I mean?

Q: Does that make you – does that make you do anything? Did that –

A: It made me worse I suppose [re: usage], yeah. (Px 6, line 410)

Further evidence of experiential avoidance was described by this same participant when describing a suicidal reaction to an adverse life situation:

"I done one overdose, it was a deliberate one when I split up with my wife five years ago, it was a deliberate overdose…It was a deliberate one, 'cos I knew I'd die. I'd die 'cos I was depressed, I'd just split up with my wife, and lost my house." (Px 6, line 273)

In contrast to the above quotations, one participant's transcript demonstrates the positive consequences of engaging in a behaviour characteristic of psychological flexibility by engaging in introspection.

"Progressively over the years, as I've got older I've kind of got more aware, self aware like."

This process of increased self-awareness was then described as leading to his decision to seek help in relation to his addiction:

"…in the last ten years I've realised like it's been more about selfishness, and not thinking about other people first. But throughout like my twenties, and maybe like the early part of my thirties, I just thought that that's just who I was like, and kind of didn't think that – I didn't know how to change it, you know?" (Px 3, line 71)

Descriptions of introspection and purposeful engagement with internal cognitive experiences were also described as a positive response to stressors:

"I'll just think about why I'm stressed, and I just eat my food and then ten minutes later go, and you know, carry on with my day, but if I don't do that, and I just carry on with it, then I'll be stressed all day because I'll be continually thinking about it." (Px 4, line 341)

In keeping with the theme of psychological flexibility this participant described help seeking as a way to change their routine and try new things:

"[I visited the substance use disorder treatment service] just sort of like going to see checkout what they've got … "It was like trying something different, instead of the same old, same old." (Px 4, lines 254 and 260)

4.3.5 Superordinate theme 3: Rejection of addiction lifestyle as egodystonic

Participants described various adverse consequences to the lifestyle they maintained necessary to continue using heroin. These included the risk of fatal overdose, as well as other chronic health problems; namely Hepatitis C. Participants described interpersonal conflict and other social difficulties, often involving family and other loved ones. To maintain the funds necessary to buy heroin often enough to avoid withdrawal, participants described antisocial and reckless behaviour, include engaging in petty crime and taking out multiple loans. The behaviours which underly all these adverse consequences of the addiction were ultimately described as going against the values of the person, resulting in guilt and shame. For this reason, the lifestyle described can be thought of as egodystonic. According to the narratives of the participants, a personal decision to commit to a rejection of this lifestyle is often instrumental in help seeking from substance use disorder treatment services.

4.3.5.1 Subordinate theme: Usage persists despite awareness of consequences for family and valued others

The adverse consequences related to heroin use as experienced by family and valued others were described by participants.

> "*I've had my mum and my dad, friends of mine over the years, yeah, I've had a lot of people that it's caused problems for them. Especially my dad, it really caused problems for him at one point. It's caused problems, I've got daughters as well, so yeah, it's had like a big big ripple effect."* (Px 3, line 95)

However, this awareness did not necessarily equate to changes in usage:

> *"[I am] very well aware of the damage that it does to me [heroin] and everybody else that's around me, connected to me and, you know, I know what the dangers of it all are, and I know why I do it and whatever, but having that knowledge doesn't stop you doing it."* (Px 2, line 399)

The loss of valued relationships with family and friends, was cited as the primary reason for two participants when describing motivators for help seeking:

> *"You lose all your family, all your friends. You lose everything…"* (Px 2, line 476)

> *"…'cos it's been like the last year I've been calming down a bit, I don't know if I've just had enough, 'cos like messing – like it's just like ruining my family, like my kids, seeing my kids and that, so I'm just tired of it now anyway, yeah."* (Px 5, line 62)

Similarly, another participant described how family members can facilitate help seeking:

> *"I'll never forget my mum stood at the bottom of the stairs, looking up at me, 'cos of the weight loss. I'll never forget the day she blurts out, she says, "You're on fucking heroin. You're on fucking heroin ain't you?" And I just looked round and said yeah, and that was when about – she got me straight onto methadone, like her and the doctor, and within about eighteen months after that, I went straight in rehab."* (Px 6, line 153)

4.3.5.2 Subordinate theme: Usage persists despite knowledge and experience of health-related dangers

Most participants described being aware of the danger of heroin overdose and other health dangers:

> *"you understand like the danger and everything but still keep doing it"* (Px 1, line 90)

> *"you know it's like an issue and you know about all the dangers, but [you] don't really notice the real state of danger till you get the like overdose or other worse things can happen. Even like [seeing] people been losing body parts, yeah, doing like dirty [hits with dirty] needles, you know.*" (Px 1, line 96)

Direct experience of serious and debilitating adverse health consequences to heroin use were often reported matter-of-factly:

> *"Well, I've lost half of my veins, so I have like – I've got like vein problems. I've got circulation problems. I've got heart problems. I've nearly died several times through overdosing."* (Px 2, line 85)

> *"The only [health] problem that I had was hepatitis C, but I got rid of that with treatment"* (Px 4, line 66)

> *"I have had a couple of overdoses, like but that was like about ten years ago." (Px 5, line 50)*

> *"I've had hep C, like I got rid of that about three years ago" (Px 5, line 160)*

However, contracting Hepatitis C from injecting was described by one participant as particularly impactful:

> *"I contacted Hepatitis C from injecting, I've been through treatment and cleared it, but yeah that was a massive thing, and it's affected my mental health, you know? I suffer from depression a lot, and anxiety and stuff like that, which has probably got a lot to do with that"* (Px 3, line 40)

Despite the risk of injecting being well known throughout the sample, only one participant had opted to smoke rather than inject heroin for this reason, and only one participant cited health concerns as motivating him to take more care when injecting:

> *"I never inject it, 'cos I knows that it kill you, I'm not that stupid, you know what, even though I'm a smackhead – I'm not a smackhead, I'm in recovery. But I'm not a [daft neck 0:11:14], I know if you inject, you're dead."* (Px 6, line 287)

> *"… but the times I have injected, I have been careful, there's times though that's – but at the same time that's why I'm still checking, like obviously if I've got it again and I'm going to have to get treatment again, but my treatment went over, like I cleared it and all that."* (Px 5, line 169)

One participant described knowledge of said danger as being motivational in help seeking.

> *"…and yeah, and not only that, it's like the injuries like from injecting in dirty places, do you know what I mean, dirty drugs, man. Have you seen the shit they put in some of that – in some those fucking – what they mix with heroin, like rat poison and fucking all sorts of shit, innit."* (Px 2, line 478)

4.3.5.3 Subordinate theme: Shame and guilt associated with antisocial behaviours

Engagement in antisocial and reckless behaviours were described by most participants as part of the experience of addiction.

> *"It's the lifestyle, innit? It's the lifestyle, what you have to do, like your morality out the window and all that." (*Px 2, line 477)

These descriptions came in the form of highlighting how one might experience the need for funds to purchase heroin and commit crimes which harm others, as well as reckless borrowing:

> *"That's like the biggest issue money issues and how you deal with that, and how you manage this, yeah, abusing someone again or not. It's dangerous, yeah. You can get armed robbery. You can do shoplifting. You can, you know, just take loans and loans and loans, yeah, borrowing money and just keep spending and not paying back."* (Px 1, line 104)

This participant went on to highlight his preference for daily maintenance medication, as longer wait periods carry the risk that he will consume the substitution medication too quickly, leaving a prolonged length of time in which he can engage in unwanted behaviours:

> *"three weeks, I can still hurt someone, I can still do robberies, I can still need to fix myself, yeah, so you don't give a fuck about no one, yeah."* (Px 1, line 230)

Another patient recalled his experience of the relationship between committing illegal acts and the urge to use heroin when he stated:

> *"…people want to stop doing like what I was doing, like the lifestyle, all the thieving and all the badness that's associated with it, but they don't want to stop doing the gear"* (Px 2, line 465)

In this participant's experience, illegal behaviour resulted in incarceration and thus prolonged periods of abstinence. These periods of incarceration did not result in extinguishing of the cognitive component of addiction:

> *"I've done loads of cold turkeys like in prisons, and I've gone through sentences and not touched any [heroin], and out of all intentions, near enough every time I've been to jail, I've said, "Right, that is it, I ain't doing it again through my sentence." And I haven't even thought about it, yeah? But then like the night before I get out, I start thinking about it."* (Px 2, line 132)

The decision to seek help for OUD was summarised as being motivated by a want to stop engaging in illegal behaviours:

> *"[I sought help] 'Cos I just didn't want to keep committing the crime, basically."* (Px 2, line 216)

During his interview, he highlighted the discrepancy between his illegal behaviours and his concept of self, stating that:

> *"it's made me do things that I wouldn't necessarily have done, but nah, I think essentially I'm the same – same person [as before the addiction]"* (Px 2, line 120)

One participant described how he would steal from shops to pay for heroin but would not burgle houses or mug people for money. He made a moral distinction between robbery and theft by stating that:

> *"[I] don't think it's bad [shoplifting], it's obviously not a good thing to do, but at the same time I'm not harming anyone, fucking taking things from them." (Px 5, line 119)*

Another participant makes a similar moral distinction by stating that:

> *"I never become like a vile crook, and do burglaries, nothing like that, or muggings, no I stick to [shoplifting]"* (Px 6, line 133)

However, this participant also described the legal consequences of shoplifting to acquire funds for heroin, and how this did not deter him from engaging in this behaviour:

> *"I was threatened over being sent to prison, and – what it was, I was bound over for a year, I broke that within two weeks."* (Px 6, line 422)

4.3.5.4 Subordinate theme: Help seeking is a personal decision related to values

Another participant described his attitudes and behaviours towards socialising prior to developing a heroin addiction in positive terms.

> *"[I was] bubbly, bubbly like I was always gotta be out with me mates. I'm still like that now"* (Px 3, line 64)

In contrast, his description of his behaviour following addiction to heroin was insular and self-focussed:

> *"I was selfish, I'd become selfish, very self-centred obviously because everything was focused on heroin"* (Px 3, line 102)

He also described his primary motivator for help seeking as being born of introspection, and an awareness of the discrepancy between his values and his behaviour:

> *"I didn't like who I was, I didn't like who I was. I didn't feel like it was me like at all"* (Px 3, line 150)

This participant elaborated that his decision to seek help came when he rejected the lifestyle associated with heroin addiction:

> *"[I] wanted to sort myself out, I wanted to see what it was like to not wake up and feel like you needed to go and, you know, try and get money to live that lifestyle, yeah."* (Px 3, line 144)

For another participant, taking a literal look in the mirror and becoming aware of his lack of self-care was a decisive moment in his decision to seek help:

> *"People, when I was going out and I'd sit down and beg and that, and people were just looking at me and walking past and I thought there's got to be something wrong here, usually I can make money begging and I wasn't making any money and then I just, I went to the toilets at the University Hospital and I just looked and I thought, wow, you haven't changed your clothes for three weeks, and I'm like, I've got to do something about that [laughs], so I did."* (Px 4, line 317)

One participant reconciled his engagement in non-values-based behaviours such as theft by understanding his actions as carried out by his addiction, rather than himself freely engaging in them:

> *"if I need a fix I can get a right horrible – but that's you just have to ignore that and let that go 'cos that's not me, it's the addiction."* (Px 4, line 186)

Another participant described his motivation for seeking help as a rejection of the heroin addiction lifestyle, with an emphasis on the psychological fatigue of lying and the toll this takes on valued relationships:

> "*Well [motivation for seeking help] it is having enough of it, because like as long as you're doing this and this, like you're just going to have like nothing, like girlfriends and that, like 'cos it does make you like – I suppose like if you've got like £200 and then your missus knows you've got that but you've spent it all when you got back, what have you done, oh I've left it, lost it on the bus, I've left it in my friend's car, or I was riding a bike, and like so the lies just keep coming one after another and then at some point it fucking just like, it wears thin isn't it?"* (Px 5, line 233)

A particularly succinct statement summed up the egodystonic nature of the addiction in behavioural terms:

> *"…at the end of the day really, if I'm not doing – if I'm not doing them drugs, I'm not a bad person"* (Px 2, line 515)

4.3.6 Superordinate theme 4: Substance use disorder treatment service as a safe and supportive environment

The final superordinate theme apparent at analysis concerns the characteristics of the substance use disorder treatment service as experienced by the participants. These characteristics are those which are valued by the participants and can be summarised as a safety, stability, and supportiveness. These valued characteristics were apparent not only described by the participants in their answers to the questions posed to them, but also in the participant's years of attendance at the service.

4.3.6.1 Subordinate theme: Safe environment

The substance use disorder treatment service environment was described in positive terms by all participants. The substance use disorder treatment service was described as being a place of safety from different perspectives. Some described the service as a place where the participant felt physically safe from the elements, highlighting the problem of insecure housing in this population:

"Seeking help, yeah, and I feel safe in here." (Px 2, line 362)

"… you go there because it's just dry and warm, yeah, not maybe because of [seeking help for] drugs." (Px 1, line 293)

"[the service is] especially [important] through the winter months like if it's cold and that" (Px 4, line)

Whereas other participants described the substance use disorder treatment service as a place free from social dangers such as the danger of judgement:

"I don't feel as judged. Yeah just like, yeah, it's different, different kind of atmosphere like, you know? Yeah, I just think it's got a different sort of feel to it, I think." (Px 3, line 172)

"it's peaceful place to come to, don't get any hassle, you can come here, sit down, have a chat, and that's it." (Px 4, line 283)

4.3.6.2 Subordinate theme: Supportive environment

The role of the substance use disorder treatment service in providing both emotional or interpersonal support, and practical support was apparent in the data. Emotional support included talking about problems and more generally socialising with others. The support was described as informal and readily accessible:

"Yeah, they'll talk to you. Yeah, something might be going on in life, might be depressed or, I don't know, just – or angry about something" (Px 2, line 306)

"It's part seeking help, and like sometimes you just sort of like just feel you've got nothing to do for a bit, and it's like – especially through the winter months like if it's cold and that, sort of the staff know me, so I'll just pop in and have a coffee and a chat sort of thing, you know? But that helps in itself I spose, 'cos you're sort of offloading stuff" (Px 3, line 181)

One participant stated the importance of social interaction with support staff at the substance use disorder treatment service in relation to loneliness:

"you get to speak to someone. It's another human being, innit? I might not speak to anybody all day other than that fucking one person." (Px 2, line 297)

One participant described how the support offered by the service helped with the difficulty of changing behaviours in the context of an addiction:

"It's hard to change, even to do [less heroin than usual]. It's very, very like – it's good when places who help with this, you know, that support yeah." (Px 1, line 196)

More practical support was related to queries, which could range from health and social care to help with housing:

> *"[You] might have an injury from injecting, when there's a nurse here that'll deal with that, like clean dressings or whatever."* (Px 2, line 308)

> *"It's the volunteers, the staff, they're just so helpful, you've got a question for them nine times out of ten if the person you're talking to can't answer it someone else can."* (Px 4, line 276)

> *"It could be to do with housing or just like form filling and that, I've had hep C, like I got rid of that about three years ago, so that's what I was waiting for, now I've done tests like two weeks ago so I came in here, well to be honest that was what I came in here for, was the test results."* (Px 5, line 160)

One participant described how rapport was important in terms of accessing support:

> *"Yeah, like I've got a couple of staff who works, I get on better, that I'll pick out, so if I have got any problems there's a couple of staff that I'll go and see personally isn't it".* (Px 5, line 155)

Geography and travel were cited as an obstacle to attending the service:

> *"If I lived closer, I'd be here five times a week, man, you know, use the drop-in service, come round for a cup of tea, see what's on the board"* (Px 6, line 339)

TABLE 18: SUPERORDINATE AND SUBORDINATE THEMES

Superordinate themes	Subordinate themes	Px 1	Px 2	Px 3	Px 4	Px 5	Px 6
Addiction as a peer-facilitated and peer-maintained response to psychological vulnerabilities.		✓	✓	✓	✓	✓	✓
	Peer introduction to heroin	✓	✓	✓	✓	✓	✓
	Psychological vulnerability	X	✓	✓	✓	X	✓
	Peer use inhibits change	✓	✓	✓	X	✓	X
Psychological inflexibility		✓	✓	✓	✓	✓	✓
	Inflexible addiction beliefs	✓	X	✓	✓	X	✓
	Experiential avoidance	✓	✓	✓	✓	✓	✓
Rejection of addiction lifestyle as egodystonic		✓	✓	✓	✓	✓	✓
	Usage persists despite awareness of consequences for family and valued others	X	✓	✓	X	✓	✓
	Usage persists despite knowledge and experience of health-related dangers	✓	✓	✓	✓	✓	✓
	Shame and guilt associated with antisocial behaviours	✓	✓	X	X	✓	✓
	Help seeking is a personal decision related to values	X	✓	✓	✓	✓	X

Substance use disorder treatment service as a safe and supportive environment		✓	✓	✓	✓	✓	✓
	Safe environment Supportive environment	✓ ✓	✓ ✓	✓ ✓	✓ ✓	X ✓	X ✓

4.4 General discussion

This study explored the subjective experiences of help seeking for OUD in a sample of heroin using men. The study also examined the experience of OUD from the perspective of the help-seeking heroin user.

Participants often described various adverse life events, including traumatic events, predating development of OUD. These experiences are also in keeping with the picture painted by the wider evidence base (434,435). These events were often regarded by the participants as an important factor in the developments of their problems with heroin in that said adverse events were described as some way causative in experiencing negative affective states (e.g. anxiety due to environmental stressors or depression due to loss) which were ameliorated later through heroin use. The use of intoxicants as a means of experiential avoidance in the context of historical adverse experience has been identified in the literature (436,437).

Heroin use, or more precisely the lifestyle associated with heroin use, was described as functionally related to adverse experiences and to the negative emotions associated with said experiences such as loss, bereavement, trauma, and other drug withdrawal. However, the continued use of heroin gave rise to more adverse internal experiences, especially guilt and shame due to the egodystonic nature of the addiction lifestyle.

The addiction lifestyle could be described as representing an incongruence between the participant's values, and their behaviour. The behaviours associated with the heroin addicted lifestyle described by the participants were dangerous to their health, often antisocial and criminal, and caused harm to those closest to them. Additionally, participant's understanding of addiction was inflexible, and often included a fixed self-concept of one as an addict, with little thought given to the addictiveness of heroin as a substance.

The experience of OUD was found to be facilitated and maintained by exposure to and inclusion within a peer-using social group. Conversely however, social interaction in a safe and supportive environment appeared to facilitate and maintain substance use disorder treatment service attendance. These seemingly incongruent findings make sense when we consider other evidence highlighting the subjective need for belonging in the development of opioid addiction (and addiction

more generally) (438,439), alongside with what is known of the effects of chronic opioid use on the normal functioning of the endogenous opioid system. As prosocial behaviours including social laughter and eye contact, are reinforced by endogenous opioid release (440,441), so limited uptake of endogenous opioids correlate with feelings of loneliness (51). Further exogenous opioid administration is then likely to medicate said loneliness in the short-term, thus contributing to the maintenance of the disorder.

However, the belonging which is experienced as result of being in the safe, supportive environment of the substance use disorder treatment service, when combined with abstinence from exogenous opioids, may well lead to a longer lasting, more durable alleviation of loneliness, without the values incongruent behaviour necessary to maintain an opioid drug addiction. The author posits that this dual mechanism of abstinence from heroin allowing the exogenous opioid system to regain a greater degree of normal functioning, plus the satisfaction of a human yearning to belong by regularly visiting the substance use disorder treatment service, is vital in explaining the benefits that substance use disorder treatment service attenders experience.

For the most part, rejection of the egodystonic lifestyle proved to be the primary motivator for help seeking amongst the narratives provided by the participants. The idea that heroin users who seek help to overcome their addictions are aware of a discordance between their personal values and their addiction related behaviours has been found by other qualitative researchers (251,442). In our sample, the process of lifestyle rejection appeared to involve recognising the incongruence between the participant's values and their behavioural repertoire over a prolonged period. The data reported here suggests that a lack of introspection, likely made possible by frequent intoxication and processes considered to be hallmarks of psychological inflexibility such as reduced attentional focus and experiential avoidance (431,432,443), may play a part in delaying rejection of the addiction lifestyle as egodystonic.

The characteristics of the substance use disorder treatment service which were valued by participants were the safety and the supportiveness of the environment, made possible by the men and women who staff and volunteer at the service. The experiences of the participants, and the help and support offered by the substance use disorder treatment service workers appeared contrasted with the life events which laid the ground for their usage, and the lifestyle which maintained it.

4.4.1 Limitations

The sample were homogenous in that they were all treatment-seeking people with histories of illicit opioid use. In terms of conducting IPA research, this is a methodological strength (444). However, when we consider the positivist elements of the research design, and also accept that the findings

with of this study are most valuable when they are assumed to be generalisable to some degree, then the convenience sampling of participants was a limitation. The study used an entirely male sample, and as such the experiences of women suffering from OUD and seeking help for their problems may differ in important ways. Also, the sample were homogenous in terms of ethnic background, with only two nationalities represented, both of which represent western European culture. For these reasons, the qualitative data gleaned from carrying out this study has implications for a specific population group, and the possibility remains that the experiences of people outside of this group may differ in significant ways. As such further research is needed to gain a fuller picture of the experience of heroin addiction from a phenomenological perspective.

4.4.2 Conclusions

The decision to seek substance use disorder treatment service support for OUD amongst a sample of heroin addicted men is rooted in the rejection of a lifestyle which is egodystonic, and as such involves patterns of behaviour incongruent with the personal values held by the addicted person. This lifestyle is not a separate entity from the addiction, and it is characterised and maintained by psychological inflexibility. The experience of OUD itself is peer facilitated and maintained and is rooted in historical adverse life events.

Though a discordant relationship between personal value and SUDs are apparent in the literature, this study is the first example of an IPA investigation identifying the rejection of an egodystonic lifestyle as a motivator for help seeking amongst heroin using men.

In the next chapter I will satisfy my objective of describing the treatment landscape for OUD and identifying barriers to treatment adherence by describing factors associated with treatment non-adherence amongst by way of a literature review and survey study.

Chapter 5 – Obstacles to Treatment Adherence in Opioid Use Disorder: A scoping review of the literature

5.1 Background

The term ‘adherence’ refers to the extent to which a person’s medication-taking or treatment engagement behaviour follows the recommendations of the treatment provider (445). Terms such as ‘attrition’, ‘drop out’, ‘persistence’, and ‘continuation’ are all present in the literature and are sometimes used erroneously as synonyms for adherence (446). Attrition or ‘drop out’ refers to the proportion of patients who discontinue their engagement with treatment before optimal response (447). This can of course occur for different reasons, including death, hospitalisation, or other rapid changes of circumstance which do not necessary reflect how well (or not) the patient adhered to the

treatment whilst engaging. Similarly persistence and continuation refers to the longevity of engagement in treatment, and not to the level of adherence to the treatment regime itself (448).

Methods of defining and measuring adherence to treatment amongst OUD patients differ in their accuracy and practicability. For example, a direct measure of treatment adherence in OUD which offers high accuracy would be analysis of urine to measure illicit opioid drug metabolites, but this is invasive and resource intensive. Self-report measures of medication or treatment adherence are less invasive and less expensive but suffer from a risk of recall and reporting bias which does not apply to urine analysis (449).

There are other indirect methods available to researchers measuring treatment adherence, but these suffer various drawbacks of their own. For example, the use of routine pharmacy data can be used to measure medication compliance by calculating the 'medication possession ratio' (MPR). The MPR refers to the sum of a medication supply in days over a particular period, divided by the number of days in that period. However, MPR is limited in its value as a measure of medication compliance as if a patient reorders a prescription before they are due for a repeat, the ratio will exceed 100%. An alternative method which avoids this problem is to measure the proportion of days covered (PDC). This is similar to calculating the MPR, but instead of measuring the sum of a medication supply in days over a given period, the medication supply is considered as an 'array' of days. If the patient reorders prior to the time that they are due to run out medication, the overlapping arrays this would create are moved forward to compensate and thus avoiding a ratio of over 100%. Both methods are of limited use in measuring adherence as neither can measure whether a medication was taken as directed, but only if a prescription was dispensed as expected. These methods are also dependent on the accessibility and quality of the pharmacy monitoring data.

In cases where treatment is delivered within a single discrete timeframe, such as a clinician supervised dosage of a maintenance medication, or a session of behavioural treatment, researchers can capture and analyse routine appointment attendance data. In the former example, this would mean capturing data where in a supervising clinical staff member records a dosage of medication as fully and correctly administered. In the case of the latter this would mean review of clinical notes or transcripts, either by a person, which would be resource intensive, or using artificial intelligence (AI). Using AI for this method is not resource intensive but it is expensive and is most effectively applied to therapy transcript data as this provides the richest data set (450). Such prerequisites limits researchers to working with data from text therapy providers which limits the scope of research to a limited number of clinical populations.

In the context of OUD, treatment adherence is strongly associated with better treatment outcomes (451–453) and reduced risk of overdose (454). Despite the benefits of treatment adherence in the context of OUD, treatment adherence remains low (455,456). In addition, there is a paucity of literature concerning the nature of obstacles to treatment adherence affecting treatment seeking OUD patients.

Considering the available evidence concerning importance of treatment adherence in ensuring favourable outcomes to SUDs, and the paucity of research concentrating solely on obstacles to adherence to treatment for OUD, I sought to carry out a mixed methods investigation. Firstly, I carried out a scoping review of the available literature to identify predictors of poorer adherence in treatment for OUD. Secondly, I carried out a survey of substance use disorder (SUD) service workers to describe treatments delivered by substance use disorder workers for OUD; the methods by which SUD service workers measure adherence to treatments for OUD; identify obstacles to treatment adherence for OUD; and to identify any relationships between professional background and years of experience with reported obstacles to adherence.

5.2 Method

Inclusion and exclusion criteria for this review are summarised in Table 19.

TABLE 19: PECOTS TABLE 2

Population	Patients undergoing treatment for OUD.
Exposure	Any non-experimental treatment primarily for OUD.
Comparison	Within or between group comparisons.
Outcomes	Patient characteristics predictive of appointment attendance; medication compliance; illicit drug use on top of OUD treatment medication.
Timings	Single or repeated measures
Settings	Any OUD treatment settings.

In carrying out the scoping review I aimed to interrogate the literature by searching the appropriate databases using a search strategy which reflected the inclusion and exclusion criteria (Table 20). Care was taken to avoid terms which would refer to attrition or 'drop out', persistence or continuation in treatment as opposed to adherence to treatment. As the term 'compliance' is often used synonymously with adherence (457,458) (though it has been criticised as being too paternalistic in recent years (459)) this was included in the search strategy as was the term 'engagement', as adherence itself is defined as a process of engagement (445). MeSH terms or equivalents were used in the searches. Dates of publication were restricted to 20 years prior to the search date. Results were limited to English language only publications.

TABLE 20: SEARCH STRATEGY 2

#1	("opioid use disorder" OR "OUD" OR "opioid addiction" OR "opioid dependence")
#2	(modulat* OR predict* OR factor* OR variable* OR mediat* OR moderat* OR influenc*)
#3	(treatment* OR therap* OR management OR medication* OR service* OR support OR program* OR intervention*)
#4	(adherence OR engagement OR compliance)
#5	#1 AND #2 AND #3 AND #4

A medical literature database (Medline), a general scientific database (Scopus), and a psychiatry and psychology specialised database (Psych Info) were interrogated. Searches were carried out on 17.05.21, and the interrogated databases with number of records returned are listed in Table 21.

TABLE 21: INTERROGATED DATABASES

Medline	n=155
Scopus	n=336
Psych Info	n=97
Total articles returned	n=588
Total articles after duplicates removed	n=444

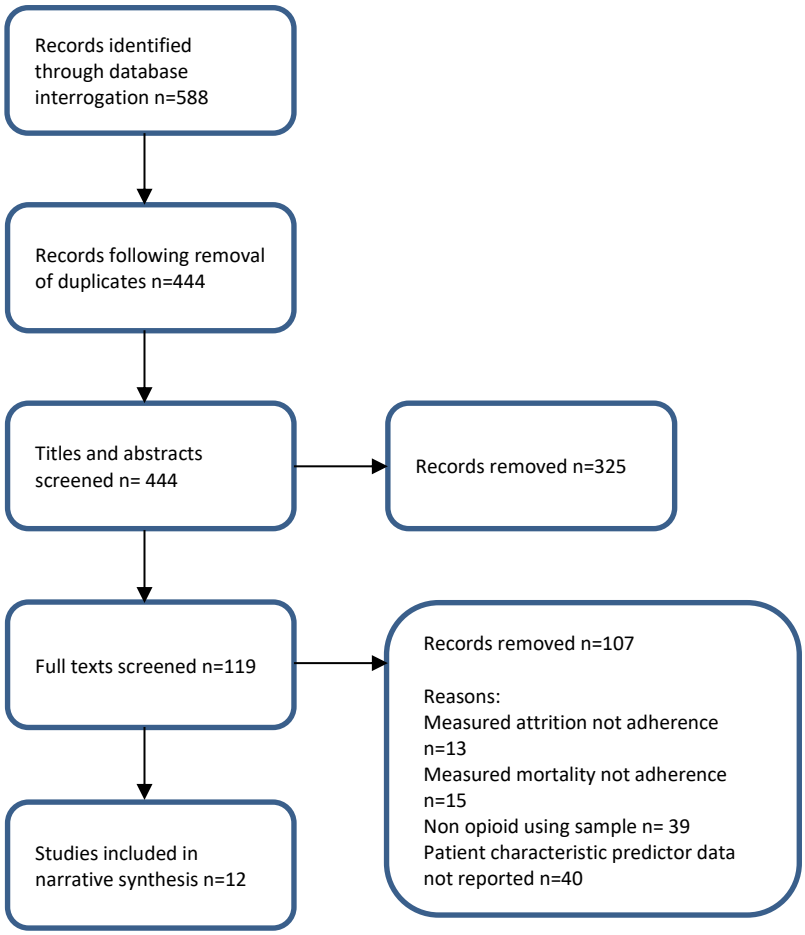


FIGURE 7: PRISMA FLOWCHART 3

The search returned a total of 588 articles, with 144 articles removed as duplicate. Article screening and removal at each stage of the review process are presented in Figure 7 which is the PRISMA flowchart (150). Finally, 12 articles were included at analysis, and the total number of case participants included in those studies was n= 28885.

5.2.1 Analysis plan

Once the review was completed, relevant data were extracted using a data extraction table in which was recorded the date of publication for each study; the study authors; the sample size for each; the type of treatment(s) the sample were exposed to; the methods for measuring of adherence used by the authors; and the strength of association between the patient characteristic data and measured outcomes. Following data extraction, a narrative synthesis was carried out.

5.2.2 Ethics

No ethical approval was necessary for carrying out this review.

5.3 Results

n=12 studies were included at analysis. Article name and year of publication; the type of treatments carried out; the number of participants; and the measures of adherence are reported in Table 22.

Study authors used several different methods to define and measure adherence, and thus to define what constitutes 'poorer' or 'greater' adherence (though study authors may have included synonyms for poorer and greater adherence e.g., suboptimal, or optimal).

The included articles were arranged into groups of studies which measured adherence in relation to 1) appointment attendance, 2) medication compliance, 3) 'on top' opioid use (illicit opioid use concurrent with maintenance medication), 4) and patient self-report.

I followed the advice of Arksey and O'Malley (460) in carrying out scoping reviews (as opposed to systematic reviews) in that I did not attempt to report on the robustness of the methods employed in the included studies or on the generalisability of the findings. I have made available the findings of the studies clearly presented in the data extraction table used to complete the review (Appendix G).

TABLE 22: STUDY CHARACTERISTICS

Baxley et al. 2019. The Influence of Anxiety Sensitivity on Opioid Use Disorder Treatment Outcomes.	Psychosocial treatment following Buprenorphine assisted detox	61	Proportion of days attended of days referred to attend.	*BMT = Buprenorphine Maintenance Therapy; MMT = Methadone Maintenance Therapy; UDS = Urine Drug Test; PDC = Proportion of Days Covered;*
Dunphy et al. 2021. Do out-of-pocket costs influence retention and adherence to medications for opioid use	BMT	6439	Percentage increase in days without treatment coverage by retentions period.	

Article	Roux et al. 2014. Predictors of non-adherence to methadone maintenance treatment in opioid-	Chao et al. 2020. Adherence among HIV-positive injection drug users undergoing methadone	Pizzicato et al. 2020. Adherence to buprenorphine: An analysis of prescription drug monitoring	Nguyen et al. 2017. Adherence to methadone maintenance treatment and associated factors	Luo et al. 2016. Concurrent Heroin Use and Correlates among Methadone Maintenance	Lo-Ciganic et al. 2019. Adherence trajectories of buprenorphine therapy among pregnant	Liu et al. 2017. Club drugs and alcohol abuse predicted dropout and poor adherence among	Kinsky et al. 2019. A comparison of adherence, outcomes, and costs among opioid use disorder Medicaid	Kim et al. 2015. Predictors of Outcome from Computer-Based Treatment for Substance	Guillou et al. 2014. Buprenorphine prescription compliance: an original observational and longitudinal
Treatment	MMT	MMT	BMT	MMT	MMT	BMT	MMT	MMT and BMT	MMT plus counselling	BMT
n=	145	961	10669	241	6848 (5110 of which concurrently used heroin with MMT)	1614	401	1184	160	162
Measure of adherence	Self-reported coverage, incidents of intentional overdosage of methadone, illicit usage, and instances	Frequency of daily attendance.	≥ 0.8% PDC over treatment period.	Number of non-attendances in three retention periods.	Frequency of illicit opioid use by UDS.	PDC	< than 50% attendance clinic appointments in treatment period.	Non-adherence to MMT defined as missed attendance for ≥ seven days in 6 months.	Opioid free days by UDS.	Stable or unstable medication adherence by coverage.

5.3.1. Adherence as measured by appointment attendance

Baxley et al. (461) carried out a retrospective chart review and survey study on a sample of n=61 patients diagnosed with OUD according to DSM-5 diagnostic criteria. Patients received an undefined

psychosocial treatment following buprenorphine assisted detoxification. They measured adherence using a treatment adherence rate, which they defined as the number of days attended over the number of days patients were referred to attend. They found the average adherence rate to be 41%. They carried out a hierarchical regression at 2 steps and found male gender to predict poorer adherence to a statistically significant degree. The overall model was statistically significant, $F(6, 83) = 3.03$, $p = .010$, though the authors reported wide confidence intervals suggestive of a lack of precision in their estimates, likely due to a limited sample size. Lack of precision is closely associated with reduced predictive power of regression models (473).

Kinsky et al. (465) made use of routine data to measure adherence to MMT and BMT for OUD. They observed a sample of n=1184 patients diagnosed according to ICD-10 diagnostic criteria and defined non-adherence to daily supervised methadone as 7 or more non-attendances over six months. The authors carried out a proportional hazards regression and found that male gender, being younger than 40 years of age and having been diagnosed with a serious mental illness to be significant predictors of poorer adherence. The authors reported precise estimates as exhibited by narrow confidence intervals suggesting adequate predictive power. The authors did not report model fit statistics.

Liu et al. (466) carried out a cohort study of n=401 daily methadone patients. No diagnostic criteria were referred to in relation to OUD. The authors defined non-adherence as attending less than 50% of scheduled clinic appointments. Multivariate log-binomial regression revealed that use of club drugs in the last six months, especially methamphetamine, plus a history of binge drinking (defined as 6 or more drinks on any one occasion) to be significant predictors of poorer adherence. Confidence intervals suggested less than optimal precision, which the authors conceded in their limitations whilst making reference to a limited sample size. They did not report model fit statistics.

Nguyen et al. (469) carried out a cross sectional survey of 241 daily methadone patients in a rural setting. No diagnostic criteria were referred to in relation to OUD. The authors measured adherence by asking three questions: 1) number of days that they missed doses in the last 4 days; 2) whether they missed doses in the last weekend and 3) when they missed the last dose within the last 3 months. Adherence was considered optimal if patients reported ‘no’ to three questions, and suboptimal if they answered ‘yes’ or “don’t remember” to any question. This methodology is that which is used by the Vietnamese Ministry of Health as a standardised measure of treatment adherence. The authors found that unemployment, being in the poorest or richest quartiles in terms of earnings, and less experience of SUD treatment predicted poorer adherence using a backwards step wise regression model. This approach of removing non-significant predictors from a fully

saturated model can improve predictive performance, however stepwise methods are sensitive to smaller sample sizes (474), which may explain the presence of wide confidence intervals in the reported study's outcome data. Having a family member helping to remind patients to attend treatment predicted improved adherence.

Chao et al. (471) conducted a retrospective chart review using routine data. The authors included n=961 HIV positive OUD patients in in their analysis, all of whom had received daily methadone treatment. No diagnostic criteria were referred to in relation to OUD. The authors measured adherence in terms of daily attendance, which was grouped in to 'low', 'medium' and 'high' over three retention periods of 90, 180, and 365 days. Using an ordinal logistic regression model, they found significant predictors of poorer adherence included younger age, being employed, less education, being unmarried (or separated), and being diagnosed with HIV prior to treatment. The authors did not report model fit statistics, but narrow confidence intervals suggest adequate power and high precision of reported estimates.

5.3.2 Adherence as measured by medication compliance

Dunphy et al. (462) carried out a retrospective review of payment records of n=6439 OUD patients who had undergone maintenance treatment with buprenorphine. Patients were diagnosed with OUD according to ICD-10 criteria. The authors carried out a multivariable Poisson regression to identify predictors of percentage increase in days without treatment coverage indicative of noncompliance over three retention periods. The authors did not report model fit statistics, but estimates were precise exhibiting narrow confidence intervals. The retention periods were 180, 360 and 540 days. Younger age (18-34 years) was a predictor of increased proportion of days without coverage over all retention periods. Being diagnosed with a SUD (alcohol, cannabis, sedative, cocaine, stimulant, or nicotine use disorder) was negatively associated with an increased proportion of coverage over 2 or more retention periods, as was having an active opioid prescription. The same was found of having a diagnosis of an anxiety disorder, bipolar disorder, major depressive disorder, attention-deficit hyperactivity disorder, PTSD and schizophrenia. In terms of physical health problems, presence of periarticular pain, osteoarthritis or general back pain all predicted poorer medication compliance over 2 or more of the retention periods to a statistically significant degree.

Guillou et al. (463) studied adherence in a cohort of n=162 OUD patients receiving treatment with buprenorphine. No diagnostic criteria were referred to in relation to OUD. They measured medication compliance by sorting participants in to two separate groups of 'stable' or 'unstable'. Those who complied with a clinician determined drug delivery date for their buprenorphine prescription were grouped as stable, and those who requested that their prescription be available

+/- 2 days prior to or after the clinician determined date (a maximum of 28 days post previous delivery date) were grouped as unstable. Using a mixed effects logistic regression, they found that addictive behaviours amongst friends or family, as well as unfavourable (e.g., unsupportive, characterised by interpersonal conflict) family situation, and to a lesser extent having a criminal record were significant predictors of being in the unstable group, and therefore exhibiting poorer adherence. The authors reported varying precision in their estimates suggesting mixed predictive power and did not report model fit statistics. Older age was predictive of transitioning from unstable to stable grouping.

Kinsky et al. (465) defined noncompliance to prescribed buprenorphine as a medication coverage gap longer than ten consecutive days in 6 months (182.5 days). As previously described under heading 5.3.1, the authors carried out a proportional hazards regression and found that male gender and being younger than 40 years of age to be significant predictors of poorer compliance. As previously observed, narrow confidence intervals suggested adequate predictive power, and no model fit statistics were reported.

Lo-Ciganic et al. (467) carried out a retrospectively studied a cohort of n=1614 OUD patients receiving treatment with prescribed buprenorphine. No diagnostic criteria were referred to in relation to OUD. The authors calculated medication compliance by the proportion of days covered in a given time frame. They found that average adherence in the sample was 59%, with a standard deviation of 31%. Participants were allocated to groupings of ‘early’ or ‘late initiators’ to treatment, and ‘declining’ or ‘moderate to high’ adherence using a series of group-based trajectory models to identify individual patterns of adherence by estimating likelihood of group membership and trajectories of change over time. The authors reported model fit statistics stating that they selected the final regression model after trialling several based the Bayesian information criterion (BIC) value and application of Nagin's criteria. Multinomial logistic regression was then used to identify factors associated with the different trajectory groupings revealing that, amongst both early and late initiators to treatment, prior hospitalisation and number of outpatient hospital attendances were predictors of poorer adherence. Prior maintenance treatment with either methadone or buprenorphine were strong predictors of compliance. Reported confidence intervals were narrow suggesting adequate precision.

Pizzicato et al. (470) included n=10669 OUD patients in a retrospective chart review. All the patients included were treated with prescribed buprenorphine. No diagnostic criteria were referred to in relation to OUD. The authors calculated the PDC and defined a PDC greater than or equal to 0.80 over 180 days as being highly compliant with their prescriptions. Multivariable logistic regression

revealed that younger age and male gender, as well as socioeconomic deprivation, were significant predictors of poorer compliance. Narrow confidence intervals suggest adequate precision, and model fit was assessed with Hosmer-Lemeshow test which did not suggest a poor fit.

5.3.3 Adherence as measured by 'on top' opioid use

Kim et al. (464) presented a secondary analysis of data from an RCT involving patients with OUD. No diagnostic criteria were referred to in relation to OUD. n=160 participants with OUD received standard treatment (daily methadone plus counselling), or an experimental approach of daily methadone and reduced counselling supplemented with use of a 'therapeutic education system' software program. Participants were asked to provide urine for toxicology analysis at weekly intervals throughout their treatment. The authors measured adherence as the percentage of drug free weeks in treatment period and generalised linear models (GLM) were used to estimate the effect of predictor variables on opioid abstinence, and Cox proportional hazards regressions analyses were conducted to determine the contribution of significant predictors on adherence within and between groups. For OUD patients undergoing standard treatment older age; male gender; being employed; being married; having a HIV diagnosis; reporting recent cocaine use; higher anxiety; and ambivalence as measured using the Stage of Change Readiness and Treatment Engagement Scale (SOCRATES) (475) were significant predictors of poorer adherence. The authors did not report confidence intervals nor model fit statistics.

Luo et al. (468) used routine data supplemented with survey data to carry out an investigation of treatment adherence in n=6848 OUD patients treated with daily methadone. No diagnostic criteria were referred to in relation to OUD. The authors looked at predictors of positive results to monthly urine toxicological analysis amongst the cohort, carrying out both univariate binary logistic regression and multivariate ordinal logistic regression. They found that being employed was a significant predictor of poorer adherence by way of positive toxicology (univariate only), as was inharmonious family relationships (univariate and multivariate), being HIV positive at intake to treatment (univariate and multivariate), having multiple sexual partners at intake (multivariate only), using opioid drugs for 5 years or less (univariate only), and favouring intravenous drug administration (univariate and multivariate). The authors did not report model fit statistics but confidence intervals were narrow suggesting adequate precision.

5.3.4. Adherence as measured by patient self-report

Roux et al. (472) recruited 145 OUD patients receiving treatment with methadone to take part in a survey study at three time points – 3, 6 and 12 months. Participating patients were asked to complete a 9-item survey containing questions about intentional overdose, missed dose, illicit drug

use, and medication diversion. Scores for each item ranged from 0-2, with higher scores suggesting non-adherence. Reponses were grouped into adherent, non-adherent, and highly non-adherent categories. Patients were diagnosed accruing to DSM-IV criteria. The authors carried out univariate and multivariate logistic regression and identified female gender, homelessness or unstable housing, and problematic alcohol or cocaine usage to be significant predictors of poorer adherence using both models. Having children, previous maintenance therapy, depression, and suicidality, were significant predictors of poorer at univariate analysis only. The authors did not report model fit statistics, but excessively wide confidence intervals render estimates imprecise.

5.4 Discussion

The studies included in the scoping review all used models of regression to identify predictors of adherence to OUD treatment.

Younger age was the most often identified predictor of poorer adherence, reported by Kinsky et al. (465), Chao et al. (471), Dunphy et al. (462), Guillou et al. (463), Pizzicato et al. (470), whilst only Kim et al (464). reported that conversely, older age predicted poorer adherence. These findings are in line with other findings apparent in the literature regarding high-risk opioid use, including those described in chapter 3 (98,476). Why younger OUD patients appear to adhere to treatment more successfully is not obvious, though it may simply be that older patients represent those with a longer history of treatment resistant disease. Indeed Lo-Ciganic et al. (467) and Roux et al. (472) found that previous OUD treatment predicted poorer adherence, though Nguyen et al. (469), found the opposite to be true.

Baxley et al. (461), Kinsky et al. (465), Pizzicato et al. (470), Kim et al. (464) all found that male gender predicted poorer adherence, but Roux et al. (472) found that female gender was a predictor of poorer adherence. These findings are also in line with other findings, including those described in chapter 3 (98). Without qualitative assessment, it is hard to pinpoint why gender would play a role in treatment adherence, though one might theorise that generally inferior inhibitory control amongst males may well play a role (477).

Concurrent mental health problems including serious mental illness were reported as predictive of poorer adherence by Kinsky et al. (465), Dunphy et al. (462), Kim et al. (464), and Roux et al. (472). These findings correlate with the increased incidence of schizophrenia amongst opioid overdose decedents as reported in chapter 3 (98). The stress-vulnerability model of psychopathology states not only that genetic predisposition to mental disorders exists, but that other extrinsic and intrinsic psychological and social factors can mediate pathology include risk of relapse (478). In accepting this model, it is understandable that concurrent mental illness would hinder one's ability to adhere to a

treatment regime for the treatment of OUD. By the same logic it is not surprising that Liu et al. (466), Dunphy et al. (462), Kim et al. (464), and Roux et al. (472) found that concurrent SUD/substance use to predict poorer adherence; and that Chao et al. (471), Dunphy et al. (462), Lo-Ciganic et al. (467), Kim et al. (464), and Luo et al. (468) found that concurrent chronic or long-term (e.g. involving multiple hospital stays or visits) health conditions predicted poorer adherence also.

Relationship status was also identified as predictive of poorer adherence. Nguyen et al. (469), Guillou et al. (463), and Luo et al. (468) reported findings to suggest that inharmonious or unsupportive family relationships predicted poorer adherence, whilst Chao et al. (471), found that being single or separated predicted poorer adherence. These findings are compatible with those to support the efficacy of couples therapy (187,188) and Community Reinforcement and Family Training for addiction (190,191), which rely on supportive interpersonal relationships to bring about change.

However, Kim et al. (464) found that being married was predictive of poorer adherence, and Roux et al., found that having children was predictive of poorer adherence. As both marriage and parenting are inevitably sources of stress as well as joy, the findings of Kim and Roux may be explained by reference to the stress-vulnerability model previously mentioned (478).

In terms of sociodemographic predictors, the picture is less clear. Nguyen et al. (469) and Pizzicato et al. (470) found that socioeconomic deprivation predicted poorer adherence, and Nguyen et al. (469) found that unemployment did so too. However, Chao et al. (471), Kim et al. (464), and Luo et al. (468) found the opposite by identifying employment as a predictor of poor adherence. Roux et al. (472) found that homelessness or unstable housing predicted poorer adherence, and Chao et al. (471) found that lower educational level predicted poorer adherence.

There was little evidence to support the hypothesis that low motivation, experiential avoidance, disorganisation, and unwillingness to defer to authority figures, however methodological constraints may have not allowed for the identification of these factors, as no authors reported using measures of any of these phenomena.

5.4.1 Limitations

Limitations of this review are as follows: not all the authors clearly defined the treatments being applied. For example, one study described ‘psychosocial treatment’ following detoxification with buprenorphine, whilst another described counselling alongside daily methadone, but neither author specified the model or approach used.

The findings of this review lack diagnostic consistency in that only three of the 12 included studies reported diagnostic criteria for OUD. Additionally, only four studies reported the types of opioid substances used by the participants, which were exclusively or almost exclusively heroin.

Lack of coherence in how adherence was measured or defined were expected amongst the literature, and so this was factored into the literature search. This did not negate the problem posed by differences in measurement amongst the included studies however, as some methods of measuring adherence will be more specific or sensitive than others.

The predictive power of regression models described by the study authors appear to differ based on precision of results and reported model fit. This review highlights the variation in methodology of regression analysis used by researchers seeking to identify predictors of adherence in OUD. In addition, the results of the included studies vary in precision when statistically significant results are reported, and authors rarely commented on model fit. For this reason, it is possible that there are demographic or clinical groups who are at increased risk of poorer adherence who are not reflected in these finding, and also that there are identified predictors which are actually less impactful than the data may suggest.

5.4.2 Conclusions

In terms of applicability to current practice, the findings of the scoping review suggest that when treating OUD consideration should be made to ensure that patients who are younger than 40 years of age, are male, have pre-existing mental health problems, SUDs or chronic or long-term health problems, are from socioeconomically deprived areas, or who report poor quality or unsupportive relationships with family members, are well supported and monitored closely for lapses in treatment adherence.

Additionally, further research on the relationship between stress tolerance and treatment adherence in OUD is called for.

5.5 Obstacles to Treatment Adherence in Opioid Use Disorder: A Survey Study of Substance Use Disorder Service Personnel

5.6 Method

A survey of substance use disorder treatment service staff involved in the treatment of OUD was carried out to identify the patient characteristics that service providers considered to be primary and secondary obstacles to adherence, and to describe the methods of measuring adherence which staff employed in their practice. The choices presented to respondents were informed primarily by the

findings of the scoping review, and by the findings of the other studies undertaken as part of this PhD.

5.6.1 Sample

The population of interest was any substance use disorder treatment service worker who delivered treatment – be it behavioural or pharmacological – for OUD. The sample was therefore likely to include a range of professionals, from medical, nursing and para-medical professionals to substance use disorder treatment service support workers who may not necessarily have a core profession.

The bulk of the survey items were designed to capture nominal data, and as such a sample size calculation was not warranted. However, I did seek to collect numerical data (e.g. age, years of experience) which is further specified under heading 7.2.2.2. With these data in mind, I conservatively calculated a desired sample size based on a 95% confidence level, a 0.5 standard deviation, and a margin of error of 5%. A 95% confidence level equates to a Z-score of 1.96 and so: $n = 1.96^2 \times 0.5 \times (1 - 0.5) / 0.05^2 = 384.16$ (479). Therefore, a sample of 385 would be needed with continuous data items in mind.

5.6.2 Design

In addition to the findings of the scoping review, the survey design was developed further by referring to findings from this PhD, and by discussion with academic supervisors AG, CB & AW between 1/9/21 and 1/11/22, with piloting and subsequent changes taking place between 1/11/22 and 30/12/22. The survey was live between 1/1/22 and 1/3/22 and was disseminated via Twitter, and by email using a snowball sampling method. A copy of the finalised survey can be found in Appendix H.

The survey was designed so that participants – who were intended to be SUD treatment service workers - would be able to respond quickly and intuitively. In this way the value of respondent's time was considered in the design of the survey. In line with research on effective survey study delivery, 'free text' boxes were kept to a minimum, whilst multiple choices in a tick box format were offered for answering most items (480). Additionally, it has been demonstrated that incentives such as shopping vouchers have been found to improve survey response rates amongst clinicians (481). Therefore, respondents were able to enter a raffle to win an electronic gift voucher for a major online retailer valued at the equivalent of £50. This was paid for by way of a Santander scholarship grant awarded in 2021.

The survey included items to capture data regarding respondents age, gender, job title, and years of experience. Respondents were then asked to state the kinds of treatments they delivered for OUD, and how they measure adherence on an individual patient basis.

Once respondents answered items related to their own characteristics, the treatments they delivered in their practice, and how they measured treatment adherence, they were presented with the first of two rounds of questions related to patient characteristics and treatment adherence to identify primary and then secondary obstacles. Respondents were asked “Based on your clinical experience, which one patient characteristic most often correlates with poorer adherence to treatment?”. Respondents were then able to choose from items including patient gender; patient age; other drug problems, comorbid mental health problem or disability; comorbid physical health problem or disability; poor family relationships; unstable housing or homelessness; low motivation to change; difficulty communicating; unmet medical or care needs; peripatetic/chaotic lifestyle; financial difficulties; living with peer user; or other (with free-text box). Each item led to further items which allowed the respondent to elaborate on their initial answer. For example, if a respondent chose ‘Age’ as their initial answer, they could then choose from a series of age ranges to elaborate. If a respondent chose ‘Comorbid mental health problem’ they would be presented with a list of mental health problem diagnostic categories. Respondents were not limited in the number of responses they could give to each item, so if they regarded two factors as having equal waiting, they would be able to select both.

Secondly respondents were asked “Thank you for your answer. In your experience, which patient characteristic is the next most often correlated with poorer adherence to treatment?”. Once respondents answered this question, they were once again able to elaborate on their response.

The survey ended by displaying a debriefing message, and by asking the respondent for their email address via a free-text box for entry into the raffle.

5.6.3 Piloting

Following the initial survey draft, multiple items were revised by piloting the survey with a small sample of experts in the field of OUD and survey studies. Experts were identified as colleagues with whom my supervisors or myself were familiar with as experts in survey research and/or OUD, and by reviewing current IOTOD (Improving Outcomes for the Treatment of Opioid Dependence) working group faculty members and contacting them via the IOTOD website.

Feedback was sought by sending a .PDF export of the survey items, and posing the following questions via email:

Is the survey clear in what it is asking? Are you left in any doubt as to what you are being asked?

Do any questions seem unnecessary? Would you remove any items?

Is there anything missing? Any questions you think should be asked but are not included?"

Revisions following piloting are summarised in Table 23.

TABLE 23: EXPERT PILOT FEEDBACK AND REVISIONS

Expert respondent	Feedback	Revision
Professor Fabrizio Schifano – addictions psychiatrist and chair in clinical pharmacology and therapeutics, University of Herefordshire	1) Q3: Add more examples to job title item including nurse, psychologist, addiction medical specialist or GP with special interests. 2) Q5: Removal treatment option of clonidine and addition of lofexidine.	Q3: Prompts added to job title item to read "Please state your current job title e.g. "Addictions Psychiatrist", "Nurse", "Psychologist", "Support worker", or "Substance Use Liaison Worker" Q5: Treatment item response 'clonidine' removed and replaced with 'lofexidine'.
Dr Julia Lewis – addictions psychiatrist, Aneurin Bevan university health board, IOTOD (Improving Outcomes for the Treatment of Opioid Dependence) faculty member	1) Q5: Removal treatment option of clonidine and addition of lofexidine. 2) Q5: Inclusion of SMART recovery (CBT based secular alternative to 12-step with relatively limited evidence base) 3) Q5: Inclusion of trauma focussed behavioural treatment e.g. EMDR 4) Q6: Add mouth swap as point of care testing of adherence. 5) Q10 & Q19: The removal of sedatives, hypnotics and anxiolytics as separate categories, and the inclusion of benzodiazepines as distinct category of drug of abuse. 6) Inclusion of sub-threshold PTSD as comorbid mental health problem	Q5: Treatment item response 'clonidine' removed and replaced with 'lofexidine'. Q5: SMART and trauma focussed treatments (e.g. EMDR or trauma focussed-CBT) included in behavioural treatments. Q6: Mouth swab item added as measure of adherence. Q10 & Q19: Sedatives, hypnotics and anxiolytic items removed, and benzodiazepines item added for comorbid drugs of abuse. Inclusion of 'other trauma presentation e.g. sub-clinical PTSD, adverse life events or acute stress disorder added to comorbid mental health problems.
Duncan Hill – specialist substance use pharmacist, NHS Lanarkshire & University of Strathclyde, IOTOD faculty member	1) Q10 & Q19: The removal of sedatives, hypnotics and anxiolytics as separate categories, and the inclusion of benzodiazepines as distinct category of drug of abuse.	Q10 & Q19: Sedatives, hypnotics and anxiolytic items removed, and benzodiazepines item added for comorbid drugs of abuse.
Rachel Ayres - Service manager Bristol drugs project (BDP)	1) Q3: Inclusion of 'substance use liaison worker' in job title prompt. 2) Specify subsequent opportunity to identify second characteristic.	Q3: Prompts added to job title item to read "Please state your current job title e.g. "Addictions Psychiatrist", "Nurse", "Psychologist", "Support worker", or "Substance Use Liaison Worker" Second comment not actioned to keep question text as parsimonious as possible.
Dr Alison Porter – Associate professor in health services research, Swansea University	1) Intro text: Change wording of incentive to clarify entry in to raffle as option and not requirement. 2) Intro text & consent form: Consistency in use of word 'participant'. 3) Q4: Change years of experience working in OUD to multiple choice for easier analysis.	Intro text: Wording changed to emphasise raffle entry as optional. Intro text & consent form: Use of participant used consistently with usage of 'respondent' or other synonyms replaced. Q4: Years of experience item changed to multiple choice tick boxes.
Professor Hayley Hutchings – Professor of health services research, Swansea University	No changes recommended	No revisions.

5.6.4 Analysis plan

Descriptive data including demographics, job role and time in post were to be reported including means and standard deviations. Data related to treatments provided and measures of adherence employed would also be captured and summarised in table format.

Chi-squared tests of independence would be used to identify associations between professional background and primary and secondary obstacle preferences. Kruskal-Wallis tests of independence would be used to identify associations between years of experience and primary and secondary obstacle preference.

5.6.5 Ethics

The study was submitted to the Swansea Medical School Ethics board (Ref no: 2021-0082) for consideration in September 2021 and approved the same year.

5.7 Results

5.7.1 Demographics

Of n=547 responses, n=507 responses were included at analysis, and n=40 responses were excluded due to incompleteness (less than 97% completeness).

Demographically, the gender ratio amongst substance use disorder treatment service workers involved in the treatment of OUD was close to equal at 50.3% (n=255) female and 47.93% (n=243) male, with 1.77% of respondents choosing not to report their gender (n=9). Median age of substance use disorder treatment service workers making up the sample was 35.54 [8.52] years. Most workers reported between 5-10 years of experience in the treatment of OUD, and age was positively correlated with experience (r= 0.43, p=<0.001).

Respondents were based in seven different countries: n=438 answered from the USA; n=59 from the UK; n=4 from Spain; n=3 from Netherlands; n=1 from Canada; n=1 from Italy; n=1 from Kenya.

A total of 45 different job titles were reported (Appendix I), and professional groups were ascertained where this was clear in the job title e.g. if a participant's job title was listed as 'addiction liaison nurse' then professional group would equal nurse. 'Support worker' represents a wider frame of job titles which included "support worker", "case worker", "use worker", "liaison worker", "links worker", "engagement worker", and acronyms thereof like 'HCSW' (Health Care Support Worker). Using this method, respondents fell in to five professional groups based on job titles. Most workers were nurses (n=179), followed by psychologists (n=131), and then medical doctors (n=108). A minority were support workers (n=68).

n=1 was a social worker, n=4 respondents did not report their job title and n=20 participants did not provide job titles from which it was possible to clearly establish professional background. These respondent's data were excluded from any analysis which sought to identify relationships between item response and professional grouping.

5.7.2 Treatments provided

Amongst the whole sample, buprenorphine was the most provided pharmacological treatment (when alone and combined with naltrexone buprenorphine represented over 30% of reported treatments provided by respondents), closely followed by methadone. Motivational Interviewing (MI) was the most often provided behavioural treatment (see Appendix J for all survey response results). The average number of treatments provided per respondent was 2.41.

However, responses varied by region, and as such results are reported by region in Table 24. The most common pharmacological therapies (buprenorphine with and without naloxone, methadone, naltrexone and lofexidine) were provided by similar proportions of respondents in both the USA and UK. Notably however, HAT was provided by over 4% of USA respondents, but a much lower proportion of UK respondents provided this treatment. The most often provided behavioural treatment in the USA was 12-step, making up close to 4% of all treatments (about the same as in the UK). Behavioural treatments made up 21.38% of treatments reported in the US. In the UK, behavioural treatments were more often reported (making up 37.63% of treatments provided), with MI the most often provided behavioural treatment (over 14% of respondents reported providing this treatment).

The number of respondents from the EU, Canada and Kenya were very low, and so there is little scope to make meaningful observations from these data. In the reminder of this text, data related to these locations will be presented in table form, but not commented upon in the narrative.

TABLE 24: TREATMENTS PROVIDED BY LOCATION

Location (respondents)	Treatment	No. of responses	% responses
USA (n=438)	Pharmacological - buprenorphine	189	20.50
	Pharmacological - methadone	180	19.50
	Pharmacological - naltrexone	124	13.42
	Pharmacological - buprenorphine with naloxone	111	12.00
	Pharmacological - lofexidine	47	5.08
	Pharmacological - diamorphine (HAT)	40	4.31
	Behavioural - 12 step	37	3.99
	Behavioural - CBT	35	3.77
	Behavioural - trauma-focussed therapy e.g. EMDR or TF-CBT	32	3.44
	Behavioural - Self-Management and Recovery Training (SMART)	32	3.44
	Pharmacological - dihydrocodeine	32	3.43
	Behavioural - motivational interviewing	31	3.32
	Behavioural - contingency management	27	2.89
	Behavioural - couples therapy	5	0.53
		Total=922	
UK (n=59)	Pharmacological - methadone	39	14.83
	Pharmacological - buprenorphine	38	14.45
	Behavioural - motivational interviewing	38	14.45
	Pharmacological - naltrexone	30	11.41
	Pharmacological - buprenorphine with naloxone	25	9.51
	Behavioural - CBT	17	6.46
	Behavioural - Self-Management and Recovery Training (SMART)	14	5.32
	Pharmacological - lofexidine	14	5.32
	Behavioural - trauma-focussed therapy e.g. EMDR or TF-CBT	12	4.56

	Pharmacological - dihydrocodeine	11	4.18
	Behavioural - 12 step	8	3.04
	Pharmacological - diamorphine (HAT)	5	1.90
	Behavioural - contingency management	5	1.90
	Behavioural - solution focused therapy	2	0.76
	Behavioural - couples therapy	2	0.76
	Behavioural - Core skills for relapse prevention	1	0.38
	Pharmacological - clonidine	1	0.38
		Total=263	
EU (n=8)	Pharmacological – buprenorphine with naloxone	5	16.67
	Pharmacological – buprenorphine	4	13.33
	Pharmacological - methadone	4	13.33
	Behavioural - CBT	3	10.00
	Pharmacological - naltrexone	3	10.00
	Behavioural - motivational interviewing	2	6.67
	Pharmacological - diamorphine (HAT)	2	6.67
	Behavioural - 12 step	2	6.67
	Pharmacological - morphine	1	3.33
	Behavioural - contingency management	1	3.33
	Behavioural - couples therapy	1	3.33
	Behavioural - Humanistic therapy	1	3.33
	Behavioural - trauma-focussed therapy e.g. EMDR or TF-CBT	1	3.33
		Total=30	
Kenya (n=1)	Behavioural - 12 step	1	33.33
	Behavioural - motivational interviewing	1	33.33
	Behavioural - trauma-focussed therapy e.g. EMDR or TF-CBT	1	33.33
		Total=3	
Canada (n=1)	Pharmacological - buprenorphine	1	33.33
	Pharmacological - buprenorphine with naloxone	1	33.33
	Behavioural - contingency management	1	33.33
		Total=3	

5.7.3 Measures of adherence

Urine toxicology and medication compliance were the most often employed measures of adherence among the whole sample (Appendix J). On average respondents reported utilising 1.96 methods of adherence each.

As presented in Table 25, in the USA, urine toxicology screening and medication compliance are the most frequently employed measures. In comparison, UK respondents reported monitoring attendance as the most often employed measure of adherence, though medication compliance is also the second most often employed. In contrast to the American response data, urine toxicology was rarely employed by the UK sample.

TABLE 25: MEASURES OF ADHERENCE BY LOCATION

Location (respondents)	Adherence	No. of responses	% responses
USA (n=438)	Urine toxicology screening	247	32.37
	Medication compliance	241	31.54
	Patient self-report	137	17.91
	Attendance	82	10.70
	Mouth swab	56	7.30
		Total=763	
UK (n=59)	Patient self-report	50	23.47
	Attendance	48	23.19
	Urine toxicology screening	43	20.09
	Medication compliance	40	19.23

	Mouth swab	21	10.05
	Feedback from keyworker and pharmacist	2	0.95
	History and presentation	1	0.47
	Psychometric outcome measures	1	0.47
	Observation of patient	1	0.47
		Total=207	
EU (n=8)	Attendance	6	30
	Urine toxicology screening	6	30
	Patient self-report	3	15
	Medication compliance	5	25
		Total=20	
Kenya (n=1)	Attendance	1	100
		Total=1	
Canada (n=1)	Attendance	1	50
	Medication compliance	1	50
		Total=2	

5.7.4 Primary and secondary obstacles to adherence

Numerous primary obstacles to adherence were identified by respondents. As it was possible for respondents to enter more than one option, on average respondents identified 1.64 primary obstacles to adherence each.

Amongst the whole sample, cluster C and B personality disorders were the two most often reported primary obstacles. Though other mental health, social and behavioural obstacles were reported, when grouped together, personality disorders made up 15.5% of all responses. Were 'personality disorder' to be a single selectable response in the survey, it would have been the most often reported primary obstacle to adherence. Mental health and social issues were more often reported than physical illnesses.

US participant responses were in keeping with the wider sample, with cluster B and C personality disorders the most often reported primary obstacles. Personality disorders when grouped together would have made up almost the same proportion of US responses as they would have in the whole sample (15.9% compared with 15.5%). In contrast, UK respondents deviated from the wider sample in that they placed peripatetic/chaotic lifestyle and low motivation and at the top of the list of responses. Personality disorders were still reported often, however, and when grouped, would have been the most often reported primary obstacle (16.79% of UK responses).

Amongst the whole sample, each respondent reported 1.68 secondary obstacles to adherence each. Cluster A, B and C personality disorders topped the list of responses, making up 20.9% of all reported secondary obstacles to adherence (Appendix J). As with primary obstacles to adherence, mental health and social issues were more often reported than physical illnesses.

Amongst US respondents' personality disorders were also the most often reported secondary obstacles to adherence. As with the whole sample, Cluster A, B and C personality disorders were the top three reported obstacles, which when grouped together represented over 20% of all responses.

UK respondents reported homelessness/unstable housing and peripatetic lifestyles most often as secondary obstacles to adherence. Personality disorders did not feature as prominently as with the US respondents. However, when grouped together they would still represent the most often reported secondary obstacle to adherence. All obstacles reported are summarised in Table 26.

TABLE 26: PRIMARY AND SECONDARY OBSTACLES

Primary obstacles to adherence	No. of responses	% of total responses	Secondary obstacles to adherence	No. of responses	% of total responses	Combined % of total responses
Cluster C personality disorder	51	6.10%	Cluster C personality disorder	65	7.60%	13.70%
Cluster B personality disorder	47	5.60%	Cluster B personality disorder	63	7.40%	13.00%
Cluster A personality disorder	32	3.80%	Cluster A personality disorder	50	5.90%	9.70%
Low motivation to change	38	4.60%	Low motivation to change	36	4.20%	8.80%
Bipolar disorder	33	4.00%	Bipolar disorder	40	4.70%	8.70%
Peripatetic/chaotic lifestyle	39	4.70%	Peripatetic/chaotic lifestyle	33	3.90%	8.60%
Anxiety disorders	35	4.20%	Anxiety disorders	36	4.20%	8.40%
Poor family relationships	26	3.10%	Poor family relationships	44	5.20%	8.30%
Unstable housing or homelessness	34	4.10%	Unstable housing or homelessness	35	4.10%	8.20%
Schizophrenia	27	3.20%	Schizophrenia	33	3.90%	7.10%
Depression	28	3.40%	Depressive disorder	28	3.30%	6.70%
Other Trauma presentation	15	1.80%	Other Trauma presentation	27	3.20%	5.00%
Male gender	14	1.70%	Male gender	26	3.00%	4.70%
PTSD	17	2.00%	PTSD	23	2.70%	4.70%
Comorbid Cannabis use	20	2.40%	Comorbid Cannabis use	18	2.10%	4.50%
Comorbid Solvents use	23	2.80%	Comorbid solvents use	12	1.40%	4.20%
Cardiovascular disease	18	2.20%	Cardiovascular disease	17	2.00%	4.20%
Attention deficit hyperactivity disorder	17	2.00%	Attention deficit hyperactivity disorder	17	2.00%	4.00%
Unmet social care needs	20	2.40%	Unmet social care needs	13	1.50%	3.90%
Neurological disease or injury	23	2.80%	Neurological disease	8	0.90%	3.70%
Comorbid Hallucinogens use	21	2.50%	Comorbid Hallucinogenic use	9	1.10%	3.60%
Respiratory disease	19	2.30%	Respiratory disease	10	1.20%	3.50%
Hepatitis	19	2.30%	Hepatitis	9	1.10%	3.40%
Unmet chronic health condition management needs	19	2.30%	Unmet chronic health condition management needs	9	1.10%	3.40%
Chronic pain	14	1.70%	Chronic pain	14	1.60%	3.30%
Brain injury related speech disorder	18	2.20%	Brain injury related speech disorder	8	0.90%	3.10%
Comorbid Alcohol use	12	1.40%	Comorbid Alcohol use	14	1.60%	3.00%
Female gender	3	0.40%	Female gender	22	2.60%	3.00%
HIV	13	1.60%	HIV	11	1.30%	2.90%
Autism spectrum disorder	8	1.00%	Autism spectrum disorder	15	1.80%	2.80%
Intellectual disability	10	1.20%	Intellectual disability	12	1.40%	2.60%
Age of 25-40 years	14	1.70%	age 25-40 years	7	0.80%	2.50%
Comorbid Benzodiazepines use	10	1.20%	Comorbid Benzodiazepines use	11	1.30%	2.50%
Comorbid Cocaine use	5	0.60%	Comorbid Cocaine use	16	1.90%	2.50%
Psychiatric speech problem (e.g. disorganised speech)	11	1.30%	Psychiatric speech problem	8	0.90%	2.20%
Comorbid Stimulants use	11	1.30%	Comorbid Stimulants use	7	0.80%	2.10%

Living with peer user	9	1.10%	Living with peer user	7	0.80%	1.90%
Foreign language speaker	8	1.00%	Foreign language speaker	7	0.80%	1.80%
Unmet pain control needs	5	0.60%	Unmet pain control needs	10	1.20%	1.80%
Age of 16-25 years	9	1.10%	age 16-25 years	1	0.10%	1.20%
Patient unable to afford treatment costs	10	1.20%	Patient unable to afford treatment costs	0	0%	1.20%
Patient unable to afford transport costs	9	1.10%	Patient unable to afford transport costs	0	0%	1.10%
Diabetes	7	0.80%	Diabetes	2	0.20%	1.00%
Comorbid NPS use	1	0.10%	Comorbid NPS use	5	0.60%	0.70%
Transgenderism/gender dysphoria	0	0%	Transgenderism/gender dysphoria	6	0.70%	0.70%
Comorbid Pregabalin use	0	0%	Comorbid Pregabalin use	5	0.60%	0.60%
Unmet psychological care needs	5	0.60%	Unmet psychological care needs	0	0%	0.60%
Cancer	1	0.10%	Cancer	2	0.20%	0.30%
Age of 40-60 years	1	0.10%	age 40-60 years	1	0.10%	0.20%
Service factors	2	0.20%	Service factors	0	0%	0.20%
Age of <16 years	1	0.10%	Age of <16 years	0	0%	0.10%
Difficulty understanding treatment	0	0%	Difficulty understanding treatment	1	0.10%	0.10%

5.7.5 Professional background and obstacle preference

Pearson's Chi-squared test were performed to assess the relationship between professional background, where these data were available (n=486 respondents were included at analysis), and obstacle preference. Professional background as derived from respondent job titles included Doctor, Nurse, Psychologist, and Support Worker (Social Worker was omitted due to low count of n=1). These professional backgrounds were grouped in to one 'professional group' string variable in SPSS, and two analyses were run to identify associations between professional group and primary obstacle preference and for professional group and secondary obstacle preference.

5.7.5.1 Chi-squared test 1

Regarding primary obstacle preference, no significant associations were identified between professional group and patient age, gender, comorbid physical health problem, financial difficulties, poor family relationships, service factors, unmet medical or care needs, or unstable housing and homelessness, or peripatetic/chaotic lifestyle.

Statistically significant relationships were found between professional group and comorbid mental health problem X^2 (3, n=486) =14.95, p=0.002. In descending order 30.89% of Support Workers identified comorbid mental health problems as a primary obstacle to adherence, along with 25.7% of Nurses, 21.38% of Psychologists and 9.26% of doctors.

Professional group was significantly associated with low motivation to change X^2 (3, n=486) =9.04, p=0.29. 13.89% of doctors identified low motivation to change as a primary obstacle to adherence, as did 6.87% of Psychologists, 5.03% of Nurses, and 4.41% of Support Workers.

Professional group was significantly associated with comorbid drug problems as a primary obstacle to adherence X^2 (3, n=486) =13.34, p=0.004. Proportions were 21.3% of doctors, 10.3% of Support Workers, 9.16% of Psychologists and 7.82% of Nurses.

Professional group was significantly associated with difficulty communicating or understanding treatment X^2 (3, n=486) =10.6, p=0.014. 9.16% of Psychologists identified difficulty communicating or understanding treatment as a primary obstacle to treatment adherence, along with 6.7% of Nurses, 1.47% of Support Workers and 0.93% of doctors.

Professional group was significantly associated with living with peer user X^2 (3, n=486) =8.4, p=0.04. 4.63% of doctors considered living with a peer user to be a primary obstacle to treatment adherence, as did 1.53% of Psychologists, 0.56% of Nurses, and 0% of Support Workers.

5.7.5.2 Chi-squared test 2

Regarding secondary obstacle preference, no significant associations were identified between professional group and patient age, gender, comorbid physical health problem, difficulty communicating or understanding treatment, financial difficulties, living with peer users, low motivation to change, poor family relationships, unmet physical or care needs, or unstable housing or homelessness.

Statistically significant association was found between professional group and comorbid mental health problem X^2 (3, n=486) =17.54, p=<0.001. 36.9% of Nurses, 30.9% of Support Workers, 29% of Psychologists and 13.9% of doctors identified comorbid mental health problems as a secondary obstacle to adherence.

Professional group was significantly associated with other comorbid drug problems X^2 (3, n=486) =14.98, p=0.002. 20.37% of doctors identified comorbid drug problems as a secondary obstacle to adherence to treatment, as did 13.26% of Support Workers, 10.69% of Psychologists, and 5.59% of Nurses.

Professional group was also associated to statistically significant degree with peripatetic/chaotic lifestyle X^2 (3, n=486) =11.59, p=0.009. 13% of doctors, 8.82% of Support Workers, 4.58% of Psychologists and 3.35% of Nurses identified peripatetic/chaotic lifestyle as a secondary obstacle to adherence.

5.7.5.3 Binary Logistic regression

Primary and secondary obstacle preferences were collapsed into a combined binary variable ascribed a numerical value of 1 for each selection of patient age, gender, comorbid mental health problem or disability, other drug problem, comorbid physical health problem or disability, unmet

medical or care need, financial difficulties, living with peer user, peripatetic or chaotic lifestyle, poor family relationships, unstable housing or homelessness, difficulty communicating, or service factors as either a primary of secondary obstacle per respondent. This combined variable served as the dependent variable in a series of binary regressions where in professional background were the independent predictors controlling for respondent age, sex, and experience. Support Worker background was omitted from some models due to low counts, and Hosmer-Lemeshow goodness of fit tests returned X^2 over 0.05 indicating adequate model fit for each model.

Models reporting statistically significant relationships are summarised in Tables 27 - 29, whilst the results of these analyses in their entirety are available in Appendix L.

TABLE 27: PROFESSIONAL BACKGROUND AS PREDICTORS OF COMORBID MENTAL HEALTH PROBLEM OR DISABILITY AS PRIMARY OR SECONDARY OBSTACLE

Predictor variables	OR	SE	p	95% Confidence Interval	
				Lower Bound	Upper Bound
Gender	.773	.208	.217	.514	1.163
Age	1.003	.016	.866	.972	1.034
Experience	.856	.126	.219	.669	1.097
Doctor	.110	.412	***<.001***	.049	.245
Nurse	.705	.333	.295	.367	1.356
Psychologist	.445	.341	***.018***	.228	.868
Support Worker	-	-	-	-	-
Constant	2.064	.62	.24	-	-

Variable(s) entered on step 1: Gender, Age, Experience, Doctor, Nurse, Psychologist. SE = standard error.

TABLE 28: PROFESSIONAL BACKGROUND AS PREDICTORS OF OTHER COMORBID DRUG PROBLEM AS PRIMARY OR SECONDARY OBSTACLE

Predictor variables	OR	SE	p	95% Confidence Interval	
				Lower Bound	Upper Bound

	Gender	1.627	.240	.042	1.017	2.605
	Age	.989	.018	.542	.955	1.024
	Experience	1.052	.140	.714	.800	1.384
	Doctor	2.119	.384	***.050***	.999	4.495
	Nurse	.427	.405	***.036***	.193	.945
	Psychologist	.760	.398	.490	.348	1.658
	Support Worker	-	-	-	-	-
	Constant	.339	.668	.105	-	-
Variable(s) entered on step 1: Gender, Age, Experience, Doctor, Nurse, Psychologist. SE = standard error.						

TABLE 29: PROFESSIONAL BACKGROUND AS PREDICTORS OF UNSTABLE HOUSING OR HOMELESSNESS AS PRIMARY OR SECONDARY OBSTACLE

Predictor variables		OR	SE	p	95% Confidence Interva Lower Bound	Upp
	Gender	.922	.310	.794	.502	1.69
	Age	1.019	.022	.382	.976	1.0(
	Experience	1.259	.182	.205	.882	1.79
	Doctor	.918	.462	.854	.371	2.2
	Nurse	.596	.473	.274	.236	1.5(
	Psychologist	.324	.526	***.032***	.116	.90
	Support Worker	-	-	-	-	-
	Constant	.58	.826	<.001	-	-
Variable(s) entered on step 1: Gender, Age, Experience, Doctor, Nurse, Psychologist. SE = standard error.						

5.7.6 Experience and obstacle preference

5.7.6.1 Kruskal-Wallis test 1

To measure the relationships between experience and age and primary obstacle preference I carried out Kruskal-Wallis test with respondents allocated to groups based on experience ranging from 0-5 years, 5-10 years, 10-20 years, 20-30 years, 30+ years. The use of the non-parametric Kruskal-Wallis test as opposed to Chi-squared was warranted due to the independent variable of experience being ordinal.

No statistically significant associations were found between experience and age, gender, comorbid mental health problems, comorbid physical health problems, comorbid substance use, difficulty communicating or understanding treatment, financial difficulties, living with peer user, poor family relationships, unmet health or social care needs, or unstable housing and homelessness.

Significant associations were found between experience and low motivation to change *H* (4, n=492) =9.47, p=0.05. Respondents reporting 20-30 years of experience were more likely to identify low motivation as a primary obstacle (mean rank = 268.1) than those with 0-5, 5-10, 10-20 years of experience (mean ranks of 239.3, 242.3, 250.3); and of those with 30+ years of experience (mean rank = 229.5).

Statistically significant associations were also found between experience and peripatetic/chaotic lifestyle as a response preference H (4, n=492) =14.6, p=0.006. Respondents reporting 30+ years of experience were more likely to identify lifestyle as a primary obstacle to adherence (mean rank = 290) than those reporting with 0-5, 5-10, 10-20, or 20-30 years of experience (mean ranks = 264.6, 238.94, 245.82, 242.97).

Finally, service factors were significantly associated with experience H (4, n=492) =40.0, p=<0.001. Respondents with 30+ years of experience were exclusively likely to report service factors (mean rank = 266.5) compared to all other experience groups (mean rank 246.00).

5.6.6.2 Kruskal-Wallis test 2

In regards to experience and respondent preference for secondary obstacle to treatment adherence, no statistically significant associations were found for age, gender, comorbid physical health problem, difficulty communicating or understanding treatment, financial difficulties, living with peer users, low motivation to change, other comorbid substance use disorder, poor family relationships, unmet medical or social care needs, or unstable housing and homelessness.

Statistically significant association did exist between years of experience and preference for comorbid mental health problem as secondary obstacle to adherence H (4, n=492) =15.08, p=0.005.

Respondents with 5-10 years of experience were most likely to return this preference (mean rank = 262.53) compared to those with 0-5 years of experience (mean rank = 244.38); or those with 10-20, 20-30, or 30+ years (mean ranks = 243.1, 209.3, 209.3).

Significant associations were also identified for years of experience and peripatetic/chaotic lifestyle H (4, n=492) =10.2, p=0.038 however. Respondents in the 30+ years of experience group were most likely to identify peripatetic/chaotic lifestyle as a secondary obstacle to adherence (mean rank = 291.5) compared to those with 0-5, 5-10, 10-20, and 20-30 years (mean ranks = 256.24, 243.92, 240.4, and 249.3).

A significant association was also found between experience and unstable housing/homelessness H (4, n=492) =9.3, p=0.05. Respondents in the 30+ years of experience grouping were more likely to identify this as an obstacle to adherence (mean rank = 293.5) than those with 0-5, 5-10, 10-20, or 20-30 years of experience (mean ranks = 245.12, 242.44, 249.32, and 246.5).

SPSS output including syntax for Chi-squared and Kruskall-Wallis tests are available in Appendix K.

5.8 Discussion

The findings of this study describe an OUD treating workforce, mostly in their thirties, with a close to equal number of men and women. There were less support worker staff amongst the sample than expected, and this may be due to there being less support workers employed by substance use disorder treatment services than other professional groups, or it is possible that members of the other professional groups were more likely to have a work email address by which to receive the survey link.

The number of job titles in the sample was considerably higher (9x) than the professional groupings identified. Commentators and researchers within the nursing profession posit that a high number of job titles within healthcare service settings have the potential to be confusing to service users, service providers, and other stakeholders such as commissioning services (482,483). Further research into this area is welcomed.

In terms of treatments provided, the prevalence of buprenorphine and methadone as the most often reported pharmacological agents used were in keeping with the results of the scoping review described earlier in this chapter, as well as with the wider literature concerning the application of medications in the treatment of OUD (13,165).

Mental health and social problems dominated both primary and secondary obstacles to treatment adherence, with personality disorders representing the most often reported primary and secondary obstacles to adherence by a significant margin. Studies have found comparatively high prevalence of

personality disorders (especially antisocial and borderline) amongst people experiencing OUD (341,484), though the proportion of respondents who consider these diagnoses to be obstacles to treatment adherence is disproportionate to reported prevalence. Anxiety disorders (not including PTSD) and schizophrenia were frequently reported as both primary and secondary obstacles, consistent with the literature concerning prevalence amongst people with OUD (116,393). Despite a robust body of literature supporting a high prevalence of PTSD amongst people with OUD (434,435,485), PTSD was not frequently reported as a primary or secondary obstacle to treatment adherence. It may be the case that substance use disorder treatment service workers by way of training and experience are well prepared for managing PTSD as it commonly accompanies OUD. However, this reasoning does not explain why personality, and to a lesser extent anxiety disorders, are so often reported as obstacles to adherence.

Social problems, specifically unemployment, homelessness and poor family relationships were also frequently reported as obstacles to treatment adherence. This is unsurprising given that the available literature demonstrates that these problems are often reported by people experiencing OUD (127,486,487). These findings also highlight the relationship between personality disorder and interpersonal difficulties apparent in this population (487,488).

The most often reported comorbid substance use as a primary obstacle to adherence was solvents, followed by hallucinogens. In relation to secondary obstacles, cannabis was most often reported. These findings are not in keeping with the literature on polydrug use and OUD where in alcohol, cannabis and sedatives are the most common comorbid problem substances OUD (378,435). The comparative infrequency of solvent and hallucinogen use may itself explain why managing these forms of polydrug use presents such an obstacle to treatment adherence.

Despite the well documented risk of hepatitis and HIV among people who use heroin (489), in combination these conditions accounted for less than 4% of primary obstacle responses, and less often reported as secondary obstacles to treatment adherence. Once again, it may be the case that substance use disorder treatment service workers are aided by training and experience and thus are confident in helping people with HIV and OUD.

Male gender was more often reported as a primary or secondary obstacle compared to female gender, and age of 25-40 years was most often reported as an obstacle in both lists compared to other age groups. This is consistent with the literature concerning differences in problem severity and outcomes between genders in OUD (118,430).

5.8.1 Incongruence between literature and survey data

There exists as clear lack of coherence between the results of the scoping review and the results of the substance use disorder treatment service worker survey.

Comorbid mental health problems, including serious mental health problems such as bipolar disorder and schizophrenia featured in the results on the scoping review. However, personality disorders did not feature specifically in the results of the scoping review but were by some margin the most oft reported obstacles to adherence by survey respondents. More generally, the position of mental health problems at the top of the lists of most reported primary and secondary obstacle to treatment adherence form the point of view of substance use disorder treatment service workers is not coherent with the findings of the scoping review.

The findings of the scoping review also suggested other drug use to be a significant obstacle to adherence, with alcohol and cocaine use specifically problematic. However, in the survey, the most often reported comorbid substances were solvents, hallucinogens, and cannabis.

It may be that the respondents to the survey are not so much reporting the patient characteristics that represent obstacles to adherence in an objective sense (e.g. those which are more closely associated with on-top opioid use, non-attendance or use of medication for example) but which they personally find to be the most challenging to manage.

However, it may also be the case that the studies which were reviewed simply did not reflect the most often encountered obstacles to adherence in the treatment of OUD due to the lack of consistency in diagnostic criteria, definition of adherence, and in describing the treatments provided.

5.8.2 Differences between US and UK based respondents

The most obvious differences between the US and UK based respondents related to treatments provided concern the application of behavioural methods. The US respondents reported similar use of pharmacological treatments, but rarely used behavioural methods. The most popular behavioural method was 12-step, and that was reported by less than 4% of the US sample (a similar proportion of UK respondents reported involvement with 12-step). MI was the most often employed behavioural approach used by UK respondents, and was used by over 14% of UK respondents, placing it above naltrexone, and buprenorphine with naloxone.

By contrast UK respondents used behavioural treatments significantly more than their US counterparts. It is unclear whether this difference is due to substance use disorder treatment service

worker preference, scope of practice limitations or some other unknown factor. Further research is necessary to shed light on these findings.

For measures of adherence, US respondents more often reported using objective methods of measuring adherence, with urine toxicology and medication compliance the most often reported methods. UK respondents more often reported subjective methods with patient self-report topping the list. UK respondents more often considered attendance as a measure of adherence to treatment also. As with treatments provided, the differences here could be down to which methods are covered by service-user insurance in the case of American respondents. Alternatively, time may be an issue. More objective measures not only cost more, but also take more time, whereas simply considering attendance as a measure of adherence and listening to patient feedback is low cost and very quick.

In terms of obstacles to adherence, the clearest differences between the US and UK respondents concern the inclusion of social issues alongside psychological and psychiatric problems as primary and secondary obstacles to adherence. Both US and UK respondents reported psychological and psychiatric problems as obstacle to adherence in similar proportions, but UK respondents more often reported social issues including lifestyle and housing. In addition, UK respondents more often reported low motivation to change as an obstacle.

The reasons behind such a discrepancy are hard to pinpoint, but it may be that the American approach to the treatment of OUD is more medicalised than the British approach. We see that UK respondents were more likely to provide behavioural treatments, which are inherently more holistic and less medical than pharmaceutical treatments, and so it may be that social issues (and general poor motivation irrespective of a mental health diagnosis) are more apparent to the substance use disorder treatment service worker speaking to the patient about their problems as part of a behavioural intervention, than it is to the substance use disorder treatment service worker providing medication for a problem.

5.8.3 Professional group and experience

5.8.3.1 Professional group and obstacle preference

Chi-squared tests of independence were performed to identify associations between professional grouping as derived from job titles, and primary and secondary obstacle preference. The results suggest that a significant proportion of all professional groups could benefit from training packages in a variety of areas.

Despite the commonality of dual diagnosis presentations (116,413,490), Chi-squared results suggest that dual diagnosis training could be of use to non-medical substance use disorder treatment service workers (especially support workers and nurses). Various e-learning courses in dual diagnosis are available in the NHS (491), and so it would be useful to evaluate the effectiveness of the available e-learning, the adherence to this e-learning in NHS addiction treatment services, and also availability and adherence in third sector organisations.

Similarly, Difficulty in communicating and/or understanding treatment was significantly related to professional group, with psychologists the most likely to identify this as the primary obstacle to treatment adherence, followed by nurses, but small minority of support workers and doctors. Therefore, we can conclude that a sizeable minority of psychologists could benefit from a training package in effective patient communication. Such training packages have been found to be effective in cancer and primary care settings (492), so the evaluation of such a package in substance use settings would be welcome.

Low motivation to change was significantly associated with professional group, with doctors the most likely to identify this as a primary obstacle to adherence. This group then could be targeted for training in motivating patients to adhere to treatment. This could include accessible training programs in empirical values based methods such as MI or ACT, examples of which are readily available (493). Further research specifically evaluating such packages in the context of doctors working in substance use disorder treatment is welcomed.

Despite the comparative commonality of comorbid SUDs (494), professional group and preference for this as both the primary and secondary obstacle to treatment adherence were found to be statistically significantly associated. As with low motivation to change, doctors were most likely to opt for this preference, followed by psychologists. A cursory search of the available literature confirms that despite the prevalence of comorbid SUDs and other addictive problems, and the negative impact this has on outcomes(494), an effective, evidence based approach to this problem is welcome (495). This appears to be an area of critical need in regard to further research.

Living with peer user(s) was also significantly associate with professional group, with doctors most likely to choose this preference. Though living with peer users could mean more than simply romantic relationships, it would be useful to establish whether or not improved access to training in evidence based couples' treatment for addictions (185) would be of benefit to substance use disorder treatment service workers (especially doctors). Similarly, the development of a more 'catch all' training program to help address the difficulties of people struggling with opioid addiction and

living with peer users such as housemates or family members aimed at substance use disorder treatment service workers could pose a fruitful research endeavour.

Peripatetic/chaotic lifestyle was associated with professional group as a secondary obstacle, but not as a preference for primary obstacle to adherence. Doctors were most likely to opt for this preference. Peripatetic/chaotic lifestyle is a difficult multifaceted problem as it is as much about voluntary behaviour as it is about housing, financial and interpersonal factors. Researchers I psychotherapy and psychology have posited the theory that daily routine is of importance in mental disorders including bipolar (496,497) and unipolar depression (498). Research into the role of daily routine and SUD outcomes may be of some value based on the findings presented here.

Binomial regression further elucidated the relationship between professional background and obstacle preferences, with doctors at significantly reduced odds of considering comorbid mental health problems an obstacle to adherence, but at increased odds of considering comorbid drug use an obstacle. Psychologists also demonstrated reduced odds of reporting mental health problems an obstacle, and the same went for housing problems and homelessness. Potentially reflecting differences in education or experience compared with doctors, nursing staff were at reduced odds of reporting comorbid drug problems as an obstacle to adherence.

5.8.3.2 Experience and obstacle preference

Regarding preference for primary obstacle to treatment adherence, statistically significant relationships between experience and low motivation to change and factors were identified. Peripatetic/chaotic lifestyle was associated with both primary and secondary preference, and unstable housing/homelessness was significantly associated with secondary obstacle preference.

Respondents with more experience (from 20-30, or most often 30+ years) were most likely to be associated with each of the associated preferences. We see that in the sample experience is positively correlated with respondent age, and so we may be observing an association between respondent age and obstacle preference, or more likely both. It may be the case that substance use disorder treatment service workers become more proficient in managing certain obstacles to treatment adherence over time, but that motivation to change, lifestyle and housing related obstacles remain challenging due to their independence from substance use disorder treatment service worker skill, or because substance use disorder treatment service worker s do not encounter sufficient opportunity to upskill in regard to managing these obstacles throughout their careers. Further research to establish why these issues remain as obstacles to adherence seemingly irrespective of substance use disorder treatment service worker experience is welcomed.

5.8.4 Limitations

The survey had an adequate response size, and an adequate number of responses were applicable to analysis. However, so few respondents were based in places other than the USA and the UK, commenting on these data was not feasible. We can therefore draw no conclusions about differences or similarities between US and UK based respondents and those situated in the rest of the world.

Question items omitted details which would have been useful in understanding the kinds of OUD related treatments provided by respondents. Respondents were able to say if they provided patients with maintenance medications including methadone and buprenorphine but were not able to say what kind of preparations they used (e.g. extended release depot buprenorphine injection versus the same drug in sublingual tablet form).

The survey design could be criticised for being over engineered to the point where the multiple layers of response possible, and the freedom for respondents to choose multiple response to certain items, made analysis difficult and time consuming. Additionally, asking respondents to prioritise and rank one primary and one secondary obstacles to adherence did not allow for us to capture data on multiple interacting factors. The decision to limit the responses to primary and secondary obstacles was made in the interests of limiting survey length and so encouraging complete responses, and also to capture data on which factors recipients considered to be the most impactful. I accept that this decision limited options for analysis as the preponderance of categorical variables and lack of clear dependency amongst the variables (e.g. participant characteristics did not necessarily precede preference) meant that multivariate regression was not feasible.

5.8.5 Conclusions

US based substance use disorder treatment service workers appear to provide behavioural treatment for OUD patients considerably less than UK based substance use disorder treatment service worker s. They more often use objective measures of treatment adherence and are less likely to consider social difficulties as obstacles to adherence. Most of both the US and UK based substance use disorder treatment service workers reported that personality disorders represented the most often experienced primary and secondary obstacles to treatment adherence amongst patients with OUD. The responses of the whole sample reflected how mental health and social problems were the most often experienced obstacles to adherence to treatment for OUD. These problems were considerably more often reported than comorbid drug problem or physical health problems.

Statistically significant relationships exist between professional group and obstacle preference. For example, support workers were significantly more likely to identify comorbid drug problems as an obstacle to treatment adherence than were doctors (30.9% versus 9.26%). Substance use disorder treatment service worker years of experience were also associated with obstacle preference. For example, low motivation to change was perceived as an obstacle to treatment adherence by workers with 20-30 years of experience more often than those with less experience, or those with 30 or more years' experience (mean ranks of 268.1 versus 229.5-250.3). These data may be used to identify additional training needs amongst SUD treatment service staff.

Based on the incongruence between the findings of the scoping review and the survey, it appears that further research is needed to obtain clarity on what factors present obstacles to treatment adherence in OUD. This could be done by carrying out further survey studies to identify substance use disorder treatment service worker obstacle preferences and linking these data with adherence related outcomes such as non-attendance or medication compliance. Alternatively, easily accessible training such as e-learning packages in addressing certain obstacles (e.g. patient communication or dual diagnosis) could be trialled with certain professional groups and adherence related outcomes compared with the same service retrospectively, or with comparable services for any detectable differences.

In the next chapter I will summarise the findings of the reported studies, and discuss potential for future research, and implications for current practices. I will close this thesis with concluding remarks at the end of the next chapter.

Chapter 6 – Final Discussion

6.2 Summary of findings

In carrying out this PhD, I drew upon a range of different methodologies in order to satisfy a number of related aims and objectives. I have reported the results of the described studies so as to highlight how the problem of OUD manifests:

1) On an individual level by focusing on personality and OUD.
2) On an aggregate level by focusing on the epidemiology of the most serious consequence of OUD; overdose death.
3) On a service delivery level from the point of view of service beneficiaries by focusing on what helps people access help for OUD.
4) On a service delivery level from the point of view of service providers by focusing on what can impede access help for OUD.

In order to provide an overview of OUD from these vantage points, it was necessary to adopt a mixed-methods approach. Ideally mixed methods research should help contextualise and thereby deepen understanding of the phenomena under scrutiny. In the case of this PhD thesis, understanding individual susceptibility to OUD necessarily involves quantitative investigations of personality. However, individuals are the component parts of society, and OUD is a public health concern. Therefore the consequences of any observable relationship between personality and OUD must also be understood on an aggregate level, which was achieved by describing routine data related to opioid overdose deaths and the health service use which preceded these deaths.

Similarly, understanding what motivates help seeking from a service user perspective is one side of a relationship between service users and providers. In order to fully understand the interplay between these two parties, it is necessary to understand what impedes help seeking from a provider perspective. By applying mixed methods in this way I hope to have generated data which can be used to improve access and successful provision of help and support in the context of OUD.A summary of the findings of the studies described In each chapter are as follows:

Chapter two: Systematic review

The research undertaken as part of this PhD has for the first time (as far as the author is aware), identified a personality trait configuration associated with OUD by reviewing, synthesising and collating data from multiple studies. This configuration is apparent when measuring personality traits using established tools (the MMPI and MMPI-2), and can be summarised as a propensity for anger, antisocial behaviour, impulsivity, introversion, and dissatisfaction. In addition, the OUD patient exhibits low self-confidence, disorganised behaviour, and propensity for somatic complaints. This personality trait configuration appears to be persistent irrespective of usage, and so may be predictive of risk of onset of OUD.

The findings of systematic review (reported in chapter 2) found evidence of processes reflective of maladaptive attempts to avoid negative affect indicative of psychological inflexibility (e.g. impulsivity, anger, irritability and antisociality) (499,500). Similarly, the results of the review highlighted a propensity for depressive rumination, resentfulness and introversion, which are also indicative of psychological inflexibility (501,502).

Finally, the results of the review suggested over reporting of mental and physical complaints, which can be considered to be a hallmark of the maladaptive and self-defeating attempts to ‘belong’ by drawing attention to one’s ‘specialness’ (e.g. that of being uniquely ill) associated with psychological inflexibility (431).

Chapter three: Linked data studies

I carried out a series of observational studies using routinely captured linked data to analyse various characteristics of opioid overdose decedents, and their service usage prior to death. The findings of these linked data studies included evidence to suggest that high-risk opioid users live peripatetic lifestyles congruent with disorganised behaviour. Decedents were also found to visit the GP and emergency services often, congruent with a propensity for somatic complaints. Thus, these findings cohere with those reported in chapter 2. In contrast, a minority of the sample visited specialist SUD treatment services.

The sample of opioid overdose decedents were statistically more likely to die intentionally than members of the general population. Of the decedents, those that made use of SUD treatment services appeared to be less likely to die intentionally than those with no record of visiting SUD treatment services. These findings are congruent with the findings reported in chapter 2, as the trait configuration suggests propensity for anger and impulsivity, antisocial personality, and depression, each independently associated with suicidality in the context of SUD (503–505).

In terms of clinical co-morbidity, the final study reported in chapter 3 found a high prevalence of schizophrenia amongst people with OUD, largely either undiagnosed or untreated. These findings are also congruent with the findings of the systematic review, as antisocial personality disorder has been identified as predictive of increased risk of SUDs in people with schizophrenia (506).

Furthermore, the low uptake of specialist SUD treatment services reported on in chapter 3 may be a consequence of psychological inflexibility, as reduced illness awareness in mental health problems ranging from schizophrenia to pathological gambling has been associated with reduced psychological flexibility (507) and with reduced help seeking (508–510).

In summary, my routine data investigations confirm the consensus amongst the literature in that OUD has been found to be a pervasive, chronic, and potentially deadly behavioural disorder which disproportionately affects men from poorer socioeconomic backgrounds. Furthermore the highest risk opioid users appear to be at an increased risk of developing schizophrenia and related disorders, of dying intentionally, and make frequent user of primary care and emergency health services. They are much less likely to make use of SUD treatment services, however.

Chapter four: Qualitative interview study

A qualitative study looking at facilitators and obstacles to help seeking amongst a small sample of n=6 substance use disorder treatment service attenders using an interpretive phenomenological

approach was described. Interviews took place at a single site at an inner-city SUD treatment service, with each interview taking between 30 and 60 minutes.

The findings of the study suggested that those who sought help with the substance use disorder treatment service did so primarily as a way of proactively rejecting a value discordant lifestyle. Experiential avoidance appeared to play a major role in the maintenance of the disorder, and thus the sustained willingness to engage in drug use and associated behaviours which result in long term distress and ill-health. This lifestyle, within the wider context of the OUD, resulted in prolonged periods of negative affect and appeared to be maintained by processes indicative of psychological inflexibility (432). OUD appears to be associated with psychological distress and maladaptive behaviour, and a behavioural repertoire which is not in keeping with one's personal values.

The aspects of the substance use disorder treatment service which encouraged participants to return, and which were linked to subjective benefit, were related to safe and supportive social inclusion separate to heroin use.

Considering that chapters 2 and 3 describe the identification of a personality trait configuration predisposed to various psychopathologies, suicidality, and low attendance of substance use disorder treatment services, these qualitative findings are potentially of great practical importance. For instance, they could be used to develop effective persuasive campaign materials to improve substance use disorder treatment service attendance).

Chapter five: Scoping review and survey study

Two studies are described which seek to identify and describe obstacles to treatment adherence in OUD. Considering the low substance use disorder treatment service attendance amongst high-risk opioid users, improving adherence to treatment amongst those that do attend is of critical importance.

The first study was a scoping review of the literature, the second reported on a survey of dug service workers. The propensity for low mood and anxiety, disorganised and antisocial behaviour identified in chapter 2, the propensity for peripatetic lifestyle identified in chapter 3, and the evidence of experiential avoidance as identified in chapter 4 the hypothesis that these factors would be identified as barriers to adherence in the literature. While all there was limited evidence to support this hypothesis in the findings of the scoping review of the literature, the results of the survey study indicated some support for this hypothesis.

Specifically, the results of the scoping review suggest that gender, age, employment status, physical health problems (especially those related to HIV) and comorbid SUDs present primary obstacles to

adherence to treatment for OUD. Secondary obstacles were comorbid mental health problems (other than SUDs) and poor relationships with family.

The results of the substance use disorder treatment service worker survey were not entirely consistent with those of the review. The survey captured data related to the modalities of treatment for OUD delivered by substance use disorder treatment service workers and related to obstacles to treatment adherence from the perception of substance use disorder treatment service workers. The survey found that primary obstacles to adherence were comorbid mental health problems (mostly personality disorders) and social problems including homelessness. Age, gender, physical health problems and comorbid SUDs were not identified as primary or secondary obstacles to adherence by most respondents. The survey also found differences and similarities between responses for US and UK based respondents and found statistically significant relationships between what respondents considered to be obstacles to adherence, and the respondent profession, irrespective of years of experience. As professional background were associated with specific engagement difficulties, these findings suggest that specific professional groups could benefit from targeted training in addressing barriers to adherence, such as managing comorbidities and effective communication.

6.3 Recommendations for further research

6.3.1 Targeted psychoeducation interventions at population level

The results from the three studies reported in chapter three suggest that clinical staff based in primary and emergency care settings are likely to come in to contact with people with OUD, and especially with OUD patients who are at risk of dying from opioid overdose. These findings support the body of existing evidence that moderate to severe OUD involving medications and heroin are relatively common amongst primary care patients (511). The results of chapter 3 suggest that primary care staff rarely diagnose and/or refer OUD patients for specialist help at SUD treatment services. Qualitative research suggests that this may be because GPs are often uncomfortable addressing the prospect of high-risk opioid use and this reluctance presents a barrier to managing OUD in primary care (512). Time in practice or age of clinician may be a factor, as trainee family clinicians in America report being more receptive to treating OUD than those more advanced in their practice (513).

Based on the findings reported in chapter three, psychoeducation around the risks of OUD, including recognising the signs of increasing risk of death by opioid overdose, and signposting to services could be made available through leaflets, posters, or other means in primary and emergency healthcare settings. The findings of the qualitative study reported in chapter 4 could be used to inform the design of these materials. Such an intervention could be evaluated at the population level to test

whether it resulted in an increase in self-referral to substance use disorder treatment services or disclosure of OUD to primary care clinical staff.

6.3.2 Targeted training for people who treat or who come in to contact with OUD patients

The results from study two of chapter 5 suggest that substance use disorder treatment service workers from different professional backgrounds are likely to struggle to manage different obstacles to treatment adherence in OUD. Additionally, more years of experience was associated with respondent preference, suggesting that the skills necessary to improve confidence in tackling certain obstacles were not acquired over time in practice.

These findings suggest a need for further research investigating the need for targeted training to help SUD treatment service staff deal with specific obstacles to treatment adherence. Web-based e-learning packages could be trialled with professional groups to gather qualitative data regarding confidence or lack of confidence in tackling specific obstacles, and to test existing knowledge.

6.3.3 Development of a risk score for primary care clinicians prescribing opioid analgesics

Applicable at the individual rather than the aggregate level, a risk of development of OUD checklist could be developed based on the personality data from the study as described in chapter two, and the sociodemographic, service usage data from the studies carried out in chapter three. Such a tool could be of use to clinicians who are working with people who may benefit from the prescribing of opioid painkillers.

Brief screening measures for addiction have been developed and used in medical settings, most notably in pain clinics (514). However, such tools are designed to establish historical drug or alcohol abuse and then infer that a pre-existing proclivity will place the recipient of pain relief at risk of harmful use of a prescribed analgesic rather than establish risk of harmful opioid use specifically using a more comprehensive set of risk factors than simply previous drug or alcohol use.

6.3.5 Experimental trialling of SBIRT utilising ACT components for OUD

The findings from the data linkage studies reported in this thesis confirm that traditional healthcare settings, especially primary care and emergency departments are theoretically ideal places to identify OUD and deliver interventions. The feasibility of such interventions remains contentious however, with time pressures limiting the ability of clinical staff to identify and intervene in cases of high-risk opioid use. A possible method of addressing this problem is by using Screening, Brief Intervention and Referral to Treatment (SBIRT) programs. SBIRT programs seek to rapidly assess the severity of problematic drug or alcohol use, and then provide either feedback and education regarding risk, a brief intervention or referral to formal treatment depending on the severity of the

problem. SBIRT programs have been found to be clinically and economically effective in relation to SUDs (515,516) but are rarely applied in emergency settings (other than for problem drinking) (517). The use of SBIRT programs to address problematic risky substance use is limited in primary care settings, and so increased use of the SBIRT model has been recommended in the literature (518).

Combining the sociodemographic profile of high-risk opioid users with knowledge of service usage could allow for the development of effective SBIRT programs for delivery in primary and emergency care settings, and in psychiatric settings where people with diagnosis of schizophrenia may seek help.

The findings from the qualitative study reported in this PhD, which identifies psychological inflexibility as a core maintaining process in OUD, highlight the feasibility of including an ACT component in a SBIRT program for use in people using opioid drugs. ACT has many component strategies which could feasibly be applied in the form of a brief intervention to help people using opioid drugs enhance their motivation to change and so seek help.

ACT can be understood as the application of RFT to recognise maladaptive networks of RFs, and to re-contextualise and so alter the relational responses which make up the frames and underlie symptoms of suffering e.g. anxiety. ACT achieves this by helping patients increase their psychological flexibility, and so think and behave outside of the limits of rigid, restrictive, and crucially maladaptive relational frames. Where in a person may exhibit psychological inflexibility by operating along a limited repertoire of relational frames dominated by fear or otherwise distress inducing stimulus-response relations, ACT seeks to weaken fear-related relational responses and encourage the development and strengthening of adaptive, acceptance orientated responses to aversive stimuli. This in turn allows for habituation to aversive stimuli by way of increased tolerance of negative affective states, and thus the extinction of avoidance behaviours. This then free's up the patient to develop a more personally meaningful, value orientated behavioural repertoire, and so allows them to function optimally.

ACT seeks to enact the changes necessary for functional improvement by way of six core processes:

1) Acceptance of negative affect as opposed to experiential avoidance.
2) Cognitive defusion, which is detaching from negative thoughts rather than responding to them.
3) Mindful attention, which is focussing attention on the present moment rather than engaging in worry or rumination.

4) Self-as-context, which is experiencing internal experiences such as thoughts and feelings non-judgementally as an observer rather than becoming 'fused' with said cognitions.
5) Clarification of values, which is knowing what we regard as meaningful and important.
6) Committed action, which is setting goals and engaging in behaviours that are in accordance with our values, rather than those which are essentially avoidant, such as drug use.

The application of ACT to the treatment of OUD would not be without precedence, as ACT is an evidence-based approach to cognitive behavioural therapy (CBT), which has been found to be as effective as traditional CBT in the treatment of various mental disorders, including SUDs (207,208).

ACT often focuses on values (519), and so drawing attention to the value incongruence of the lifestyle which accompanies high risk opioid use could be an effective method of motivating high risk opioid users to attend SUD treatment services. ACT also includes methods for managing negative affect, including craving, to help people reduce their usage (209). The development of OUD specific SBIRT programs using ACT principles should be further investigated. Such interventions could be either clinician delivered, or accessed via app or website in the form of an electronic or e-SBIRT (520), which could be ideal given clinician time pressures in primary and emergency care settings.

6.3.6 Implications for practice

The findings of the reported studies have several implications for clinical practice. The systematic review data tells us that SUD service practitioners – be they clinicians or support workers – should be aware of the personality traits that appear to be reliably associated with OUD as being associated with the maintenance of their presentation. As well as assessing the severity of the problematic substance use itself, questions should be asked regarding social anxiety and self-confidence and how these processes influence opioid use. Similarly, lifestyle including housing and any engagement in antisocial behaviours, and relationships with others should be examined in sufficient depth.

The linked data studies reported in this PhD suggest that the highest risk opioid users are likely to be depressed and at increased risk of suicidality. Therefore, risk planning should be a thorough and comprehensive process, with all the possible resources drawn on from supportive family members to signposting to additional services and short-term coping strategies such as harm replacement exercises.

The qualitative component of this PhD highlights the need for SUD treatment service workers to focus on the values of patients when working to reduce problematic opioid use. The threat of physical harm for example is a valid avenue to explore with people experiencing OUD, but the threat

that continued opioid use poses to their personal values, and thus their ability to live the lives they wish to live should not be side-lined in their recovery journey.

Finally, personal awareness on behalf of people supporting others with OUD as to what kind of obstacles to treatment adherence they are likely to find challenging would seem to be a sensible precaution. If, for example a psychologist recognises that a patient's comorbid chronic physical health problem is making it difficult for them to adhere to the treatment as it is prescribed or delivered, then they should take concrete steps to improve their own ability to help their patient with this obstacle, either through self-directed learning, formal training or liaising with colleagues and taking a multi-disciplinary approach where possible.

6.4 Conclusions

In carrying out the program of study presented in this thesis, I sought to satisfy four aims. Firstly, I aimed to describe the personality correlates of OUD; secondly, I set out to provide an overview of the prevalence of overdose in OUD along with the demographic and service use characteristics of opioid overdose decedents.; thirdly I aimed to describe the facilitators of help-seeking for OUD; finally, I sought to describe the commonly utilised treatments for OUD, and the barriers to adherence to these treatments.

To satisfy to the first aim, I carried out a systematic review of the literature measuring personality traits using an established, psychometrically sound measure. The review contained a meta-analytic component but focused mainly on a narrative synthesis of the available literature. The findings from this review suggest that an identifiable, measurable personality trait configuration is associated with OUD, and that this configuration is independent of usage at the time of observation. It therefore has implications for assessing risk as well as a potential clinical value depending on how these data are applied to clinical populations.

The second aim was satisfied by carrying out three routine linked data studies. To carry out these studies I captured and analysed healthcare records belonging to opioid overdose decedents and supplemented these with mortality data held by the ONS. I found that the demographic make-up of overdose decedents were mostly men around 50 years of age, consistent with the available literature. I also found the sociodemographic backgrounds of decedents and the proportion of decedents to contact substance use disorder treatment services to be in keeping with the established literature.

In terms of service use I found that decedents of opioid overdose make frequent use of primary care and emergency healthcare services prior to death when compared to general population data.

Despite this primary care clinicians appear to be either unaware of OUD experienced by their patients, or unlikely to record OUD related to consultations. I also found that decedents of opioid overdose were also found to be comparatively highly likely to be diagnosed with schizophrenia (or a related condition) and comparatively likely to die intentionally.

My third research aim was satisfied through an in-depth interview study with substance use disorder treatment service users. The interview data was analysed and used to identify motivators for help-seeking for OUD, which were a values-based process of recognising and rejecting an egodystonic lifestyle inseparable from heroin addiction. The findings were concordant with other qualitative work in the realm of experiential study of opioid addiction.

The final aim was satisfied by carrying out two studies, comprising a scoping review of the literature concerning treatment adherence (or non-adherence) in OUD, and a survey of substance use disorder treatment service workers supporting people with OUD.

The findings of the scoping review and of the survey study were incongruent in that each identified a separate array of obstacles to treatment adherence with little in the way of overlap of findings. However, this incongruence provides opportunity for further research to better understand the complex picture of treatment adherence in OUD, and perhaps regarding SUDs more generally.

The survey study also provided a picture of the treatments commonly provided for people with OUD in different countries and revealed that professional background and years of experience were associated with the kinds of factors that substance use disorder treatment service workers identified as obstacles to treatment. These findings present the opportunity for further research addressing training needs amongst substance use disorder treatment service workers and areas for improvement in terms of treatment choice in different locales.

In conclusion, I have used several different methods of observational research to fulfil my research aims. The methodologies included interrogation of routine data sets, systematic and scoping reviews of the literature, and interview and survey studies. The findings of these studies open avenues for further research, which it is hoped will have practical application and ultimately a positive impact on the lives of people struggling with OUD.

Glossary

Abuse/Use/Use – In the context of opioids or other drugs, these terms refer to either ‘Harmful use’ as a pattern of psychoactive substance use that is causing damage to health or has social

consequences; or to 'Hazardous use' which is a pattern of substance use that increases the risk of harmful consequences for the user.

Abstinence - A self-enforced restraint from indulging in problematic behaviours.

Addiction – An intrusive and often overwhelming desire or compulsion to use a drug because of the anticipated affect reward.

Analgesic - A class of medications designed specifically to relieve pain.

Boolean - A system of algebraic notation used to represent logical propositions

Craving – An overwhelmingly strong desire or need to use a drug.

Decedent – A deceased person.

Dependence – The development of tolerance and withdrawal symptoms upon cessation of use of a drug.

Diversion – The illicit channelling of regulated pharmaceuticals from medical and therefore legal sources to an illicit marketplace.

Dual-diagnosis - A term to describe those suffering from a mental health condition as well as having a substance use problem.

Harm reduction – Interventions aimed at reducing the negative effects of health behaviours without necessarily extinguishing the problematic health behaviours completely.

Heroin - A highly addictive analgesic drug derived from morphine, often used illicitly as a narcotic producing euphoria.

Hypnotics – Medications to aid sleep.

Incidence - The proportion or rate of persons who develop a condition during a particular period of time.

Intent – The motivation behind overdose death as determined by a coroner as being purposeful (and therefore suicidal) or accidental.

Morbidity - The condition of suffering from a disease or medical condition.

Mortality - Death, especially on a large scale.

Prevalence - Proportion of persons who have a particular condition at or during a particular period.

Psychometrics – Psychological tools of testing, measurement, and assessment.

Qualitative – Non-statistical and unstructured or semi-structured data relating to properties, attributes, labels, and other characteristics.

Quantitative – Statistical, structured data expressed as numbers and values.

Recovery - Maintenance of abstinence from [problem substance] by any means.

Sensitivity – A diagnostic test's ability to designate an individual with disease as positive.

Specificity – A diagnostic test's ability to designate an individual who does not have a disease as negative.

Opioid – An opioid drug comprised of compounds which have been synthesised in a laboratory, or an opiate drug which has been formulated from naturally occurring, organic compounds.

Withdrawal – Unpleasant symptoms which occur on cessation or reduction of use of a drug which has recently been taken repeatedly, over a prolonged period, and often in high doses.

Z-Drugs – A group of non-benzodiazepine GABA agonists used as hypnotics.

Appendices

Appendix A: Systematic review Q-SSP study quality checklists

Quality Assessment Checklist for Survey Studies in Psychology (Q-SSP) & Guide

Quality Assessment Checklist for Survey Studies in Psychology (Q-SSP) and Guide

Study: Sutker 1971. Personality differences and sociopathy in heroin addicts and nonaddict prisoners					
The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.					
Research domain	**Quality item**	**Yes**	**No**	**Not stated clearly**	**N/A**
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?			X	
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?	X			
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			
Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?			X	

Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?		X		
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?			X	
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?		X		
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?		X		
Ethics	19. Were participants debriefed at the end of data collection?		X		
Ethics	20. Were funding sources or conflicts of interest disclosed?		X		

SCORING (optional; see guide below)

Overall Quality Score (%): 38.9

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 3/4

(3 items) Participants (Sampling/Recruitment) score: 1/3

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 3/10

(3 items) Ethics score: 0/3

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Kojak and Canby. 1975. Personality and behaviour patterns of heroin-dependent American servicemen in Thailand

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?			X	
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?		X		
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?	X			
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)	X			
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)	X			
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?			X	
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?				
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?	X			
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?	X			
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?	X			
Ethics	19. Were participants debriefed at the end of data collection?			X	
Ethics	20. Were funding sources or conflicts of interest disclosed?		X		

SCORING (optional; see guide below)

Overall Quality Score (%): 65

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 2/4

(3 items) Participants (Sampling/Recruitment) score: 2/3

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 8/10

(3 items) Ethics score: 1/3

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Study: Gerra et al. 2008. Relationship of Personality Traits and Drug of Choice by Cocaine Addicts and Heroin Addicts

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?	X			
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?			X	
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)		X		
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)		X		
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?		X		
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?		X		
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?	X			
Ethics	19. Were participants debriefed at the end of data collection?			X	
Ethics	20. Were funding sources or conflicts of interest disclosed?			X	

SCORING (optional; see guide below)

Overall Quality Score (%): 50

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 4

(3 items) Participants (Sampling/Recruitment) score: 1

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 4

(3 items) Ethics score: 1

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Study: Penk et al. 1979. Personality characteristics of compulsive heroin, amphetamine, and barbiturate users

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?			X	
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?	X			
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?	X			
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?		X		
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?		X		
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?			X	
Ethics	19. Were participants debriefed at the end of data collection?			X	
Ethics	20. Were funding sources or conflicts of interest disclosed?	X			

SCORING (optional; see guide below)

Overall Quality Score (%): 55.6

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 3

(3 items) Participants (Sampling/Recruitment) score: 2

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 4

(3 items) Ethics score: 1

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Study: Penk et al. 1980. MMPI factor scale differences among heroin addicts differing in race and admission status					
The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.					
Research domain	**Quality item**	**Yes**	**No**	**Not stated clearly**	**N/A**
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?	X			
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			
Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?	X			
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?		X		
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?			X	
Ethics	19. Were participants debriefed at the end of data collection?			X	

Ethics	20. Were funding sources or conflicts of interest disclosed?	X			

SCORING (optional; see guide below)

Overall Quality Score (%): 66.7

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 4

(3 items) Participants (Sampling/Recruitment) score: 2

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 5

(3 items) Ethics score: 1

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Study: Glankin et al. 2018. Psychological features of abstinent heroin users before and after rehabilitation in Saint Petersburg, Russia

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?		X		

Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			
Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?	X			
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)	X			
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?	X			
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?	X			
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?	X			
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?	X			
Ethics	19. Were participants debriefed at the end of data collection?			X	
Ethics	20. Were funding sources or conflicts of interest disclosed?	X			

SCORING (optional; see guide below)

Overall Quality Score (%): 84.2

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 3

(3 items) Participants (Sampling/Recruitment) score: 2

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 9

(3 items) Ethics score: 2

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Study: Marsh et al. 1988. Psychopathology of Opiate Addiction: Comparative Data from the MMPI and MCMI

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?		X		
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?		X		
Participants (Sampling)	6. Was the participant recruitment strategy described?		X		
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?			X	
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?	X			
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?	X			
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?		X		
Ethics	19. Were participants debriefed at the end of data collection?		X		
Ethics	20. Were funding sources or conflicts of interest disclosed?		X		

SCORING (optional; see guide below)

Overall Quality Score (%): 50

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 3

(3 items) Participants (Sampling/Recruitment) score: 0

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 6

(3 items) Ethics score: 0

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Study: Dolan et al. 1983. Personality differences among black, white, and Hispanic-American male heroin addicts on MMPI content scales

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?	X			
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?		X		
Participants (Sampling)	6. Was the participant recruitment strategy described?			X	
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)	X			
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?	X			
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?		X		
Ethics	19. Were participants debriefed at the end of data collection?		X		
Ethics	20. Were funding sources or conflicts of interest disclosed?	X			

SCORING (optional; see guide below)

Overall Quality Score (%): 68.4

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 4

(3 items) Participants (Sampling/Recruitment) score: 2

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 6

(3 items) Ethics score: 1

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Study: McKernan et al. 2015. Further Evidence of Self-Medication: Personality Factors Influencing Drug Choice in Substance Use Disorders

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?	X			
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?	X			
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?	X			
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?		X		
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?		X		
Ethics	19. Were participants debriefed at the end of data collection?				X
Ethics	20. Were funding sources or conflicts of interest disclosed?		X		

SCORING (optional; see guide below)

Overall Quality Score (%): 66.7

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 4

(3 items) Participants (Sampling/Recruitment) score: 2

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 6

(3 items) Ethics score: 0

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Study: Gerra et al. 2004. Aggressive responding in abstinent heroin addicts: neuroendocrine and personality correlates

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?		X		
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?			X	
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?		X		
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?			X	
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?		X		
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?	X			
Ethics	19. Were participants debriefed at the end of data collection?		X		
Ethics	20. Were funding sources or conflicts of interest disclosed?		X		

SCORING (optional; see guide below)

Overall Quality Score (%): 44.4

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 3

(3 items) Participants (Sampling/Recruitment) score: 1

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 3

(3 items) Ethics score: 1

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Gerra et al. 2000. Neuroendocrine correlated of temperament traits in abstinent opiate addicts.

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?	X			
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?			X	
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?	X			
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?			X	
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?		X		
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?	X			
Ethics	19. Were participants debriefed at the end of data collection?		X		
Ethics	20. Were funding sources or conflicts of interest disclosed?		X		

SCORING (optional; see guide below)

Overall Quality Score (%): 61.1

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 4

(3 items) Participants (Sampling/Recruitment) score: 1

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 5

(3 items) Ethics score: 1

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Haertzen et al. 1969. Changes in personality and subjective experience associated with the chronic administration and withdrawal of opiates

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?			X	
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?		X		
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?		X		
Participants (Sampling)	6. Was the participant recruitment strategy described?		X		
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)		X		
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)		X		
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?		X		
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?		X		
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?		X		
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?		X		
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?			X	
Ethics	19. Were participants debriefed at the end of data collection?		X		
Ethics	20. Were funding sources or conflicts of interest disclosed?		X		

SCORING (optional; see guide below)

Overall Quality Score (%): 20

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 2

(3 items) Participants (Sampling/Recruitment) score: 0

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 2

(3 items) Ethics score: 0

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Zeng et al. 2016. The similarities and differences in impulsivity and cognitive ability among ketamine, methadone, and non-drug users

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?	X			
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?	X			
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?	X			
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?	X			
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?	X			
Ethics	19. Were participants debriefed at the end of data collection?			X	
Ethics	20. Were funding sources or conflicts of interest disclosed?	X			

SCORING (optional; see guide below)

Overall Quality Score (%): 83.3

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 4

(3 items) Participants (Sampling/Recruitment) score: 2

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 7

(3 items) Ethics score: 2

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Roszell et al. 1986. Personality and demographic characteristics associated with the prescribing of psychoactive medications for methadone maintenance patients

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?			X	
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?			X	
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?		X		
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?		X		
Participants (Sampling)	6. Was the participant recruitment strategy described?	X			
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?				
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?		X		
Ethics	19. Were participants debriefed at the end of data collection?		X		
Ethics	20. Were funding sources or conflicts of interest disclosed?		X		

SCORING (optional; see guide below)

Overall Quality Score (%): 38.9

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 1

(3 items) Participants (Sampling/Recruitment) score: 1

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 5

(3 items) Ethics score: 0

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Husband & Iguchi. 1995. Comparison of MMPI-2 and MMPI clinical scales and high-point scores among methadone maintenance clients

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?		X		
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?		X		
Participants (Sampling)	6. Was the participant recruitment strategy described?	X			
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?	X			
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?	X			
Ethics	19. Were participants debriefed at the end of data collection?	X			
Ethics	20. Were funding sources or conflicts of interest disclosed?	X			

SCORING (optional; see guide below)

Overall Quality Score (%): 72.2

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 3

(3 items) Participants (Sampling/Recruitment) score: 1

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 6

(3 items) Ethics score: 3

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Craig et al. 2004. Predicting Methadone Maintenance Treatment Outcomes Using the Addiction Severity Index and the MMPI-2 Content Scales

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?	X			
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?	X			
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?			X	
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?	X			
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?	X			
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?	X			
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?	X			
Ethics	18. Were participants asked to provide (informed) consent or assent?			X	
Ethics	19. Were participants debriefed at the end of data collection?		X		
Ethics	20. Were funding sources or conflicts of interest disclosed?		X		

SCORING (optional; see guide below)

Overall Quality Score (%): 66.7

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 4

(3 items) Participants (Sampling/Recruitment) score: 1

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 7

(3 items) Ethics score: 0

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Sutker 1973. Incarcerated and street heroin addicts: A personality comparison

The Q-SSP is meant to be scored with the use of its guide; please, refer to the guide below.

Research domain	Quality item	Yes	No	Not stated clearly	N/A
Introduction (Rationale)	1. Was the problem or phenomenon under investigation defined, described, and justified?			X	
Introduction (Rationale)	2. Was the population under investigation defined, described, and justified?	X			
Introduction (Rationale)	3. Were specific research questions or hypotheses stated?		X		
Introduction (Variables)	4. Were operational definitions of all study variables provided?	X			

Participants (Sampling)	5. Were participant inclusion criteria stated?	X			
Participants (Sampling)	6. Was the participant recruitment strategy described?			X	
Participants (Sampling)	7. Was a justification/ rationale for the sample size provided?		X		
Data (Collection)	8. Was the attrition rate provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies)				X
Data (Analyses)	10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)?	X			
Data (Measures)	11. Were the measures provided in the report (or in a supplement) in full?		X		
Data (Measures)	12. Was evidence provided for the validity of all the measures (or instrument) used?		X		
Data (Collection)	13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)?		X		
Data (Collection)	14. Was information provided about the context (e.g., place) of data collection?	X			
Data (Collection)	15. Was information provided about the duration (or start and end date) of data collection?			X	
Data (Results)	16. Was the study sample described in terms of key demographic characteristics?	X			
Data (Discussion)	17. Was discussion of findings confined to the population from which the sample was drawn?			X	
Ethics	18. Were participants asked to provide (informed) consent or assent?			X	
Ethics	19. Were participants debriefed at the end of data collection?		X		
Ethics	20. Were funding sources or conflicts of interest disclosed?		X		

SCORING (optional; see guide below)

Overall Quality Score (%): 33.3

Compute an overall study quality score expressed as a percentage by dividing YES (Y) scores by the Total (T) number of **APPLICABLE** items and multiplying by 100. If a report fails to attain a Y score for 5 of the items, then it may be classed as of questionable quality.

Specifically:
When (T) = 20, then a score of Y/T ≥ 75% may be considered acceptable quality.
When (T) = 18, then a score of Y/T ≥ 72% may be considered acceptable quality.
When (T) = 17, then a score of Y/T ≥ 70% may be considered acceptable quality.
When (T) = 16, then a score of Y/T ≥ 68% may be considered acceptable quality.
If Y/T <75% or < 72% or < 70%, or < 68 (depending on number of applicable items), then study is of questionable quality.

Domain Quality Scores
Express domain quality scores as a simple ratio of the (Y) items, divided by the (T) applicable items.

(4 items) Introduction (Rationale/Variables) score: 2

(3 items) Participants (Sampling/Recruitment) score: 1

(10 items) Data (Collection/Analyses/Measures/Results/Discussion) score: 3

(3 items) Ethics score: 0

IN A DATA FILE, ASSIGN **1** FOR YES SCORES; **0** FOR NO OR NOT STATED CLEARLY; AND **2** = FOR NOT APPLICABLE.

Quality Assessment Checklist for Survey Studies in Psychology (Q-SSP)

Guide and Definition of Terms used

General guidance on assessment:

- Shaded areas indicate response options that are not available for Q-SSP items. Studies are not expected to omit the required information for these items.

- Studies are to be assessed based on the information provided **in the report**[1]**. Additional information may be provided in (online) supplemental material, assuming this is mentioned in the report.** The "not stated clearly" option should only be chosen if relevant information is not stated clearly **in the report or in a supplement**. Consequently, raters are expected to be make objective and justifiable assessments based on the available information. Annotating is a useful strategy when it comes to resolving inter- and intra- rater inconsistencies.

- Scoring involves dividing the YES items by the number of **APPLICABLE** total items multiplied by 100. The number of items to assess will vary as a function of study design (cross-sectional or comparative). A score of **≥ (68% or 70% or 72% or 75%, depending on applicable items)** suggests that the study may be of acceptable quality and a score of **< (68% or 70% or 72% or 75%, depending on applicable items)** suggests that the study may be of questionable quality. These recommended cut-off points have been used in several existing critical appraisal, methodological quality, and risk-of-bias checklists (e.g., Catalano, 2013; Glynn, 2006; Oliveira, Gomez, & Toscano, 2011). However, raters may choose to modify the numerical cut-off points —making them more-or-less stringent— to suit their research aims.

- Assigning numerical scores and categorizing studies as having "acceptable or questionable quality" are **optional** endeavours, to be undertaken when those serve the aims of the rater. For example, in the context of a meta-analysis, categories of "acceptable" or "questionable" studies could be used in a moderator analysis. In another scenario, a practitioner may want to get an overall sense of the quality of a body of literature compared to another, with the aim to inform their practice. In such cases, assigning numerical quality scores may be useful. Examples of situations where assigning overall quality numerical scores may not be necessary include narrative or scoping reviews; descriptions of aspects of a body of literature; and educational/ training programmes; elucidating what constitutes a study of acceptable/ questionable quality.

[1]"Report" refers to the journal article, book chapter, thesis, and conference paper, i.e., any report that describes the study to be assessed.

- Calculating numerical scores per study domain is also **optional** and at the discretion of the rater. We have recommended a simple ratio system to organize the scoring. The Q-SSP indicates study domains to help raters identify the most salient research areas assessed per quality item, quickly (and hence the colour shading scheme).

- The Q-SSP rests on the assumption that reporting quality and study quality are interlinked. Even though "reporting well" doesn't necessarily equate to "having conducted well", study quality can only be appraised in the context of transparent reporting; the core message of a key position paper by Asendorpf et al. (2013). Behaviour health researchers across disciplines tend to agree that non-transparent reporting is strongly associated with biased findings, as well as with use of funding—and other—resources (Buccheri & Sharifi, 2017; Mullins, DeLuca, Crepaz, & Lyles, 2014).

Checklist items, definitions and options.

1. Was the problem or phenomenon under investigation defined, described, and justified? Introduction (Rationale)

Definitions[2]**.** The *problem* or *phenomenon under investigation* is the area of concern or interest of the study. If, for example, the problem under investigation, is sexual risk-taking, then sexual risk-taking should be given a definition, description, and justification (explanation) of why it is a problem.

- ✓ Check YES if the problem under investigation was defined, described, and justified.
- ✓ Check NO if the problem under investigation was not defined, described, and justified.
- ✓ Check NOT STATED CLEARLY if the report provided limited or unclear information about the problem under investigation (e.g., if the problem is described but not justified as being worthy of investigation).
- × Do not check NOT APPLICABLE for this item.

2. Was the population under investigation defined, described, and justified? Introduction

[2] Definitions of terms were extracted, or, adapted, from the encyclopedia of survey research methods (Lavrakas, 2008); the encyclopedia of research design (Salkind, 2010); research methods in psychology (Jhangiani, Chiang, & Price, 2015); and research design (Creswell, 2003).

(Rationale)

Definitions. The *population under investigation* is the **entire** set of people under consideration. The study sample is a subset of the population under investigation. If, for example, the population under investigation is university students, then university students should be defined and described. Also, a justification (explanation) should be provided as to why / how the population is affected by the problem or phenomenon under investigation.

- ✓ Check YES if the population under investigation was defined, described, and justified.
- ✓ Check NO if the population under investigation was not defined, described, and justified.
- ✓ Check NOT STATED CLEARLY if the report provided limited or unclear information about the population under investigation (e.g., if the problem is described but not justified as being worthy of investigation).
- × Do not check NOT APPLICABLE for this item.

3. Were specific research questions or hypotheses stated? Introduction (Questions)

Definitions. *Research question*: an interrogative question or statement the investigator aims to answer. *Hypothesis:* a tentative and testable explanation of the relationship between two or more variables, often stated as a prediction that a certain outcome will result from a certain condition. To check YES for this question, **the report needs to state a set of specific research questions and hypotheses to be addressed in the study**. A generalized statement of purpose or aim or goal of the study is insufficient. Explicit statements of research questions or hypotheses are necessary for them to be aligned with data analysis techniques (see question 10).

- ✓ Check YES if specific research questions or hypotheses were stated.
- ✓ Check NO if specific research questions or hypotheses were not stated.
- × Do not check NOT STATED CLEARLY for this item.
- × Do not check NOT APPLICABLE for this item.

4. Were operational definitions of all study variables provided? Introduction (Variables)

Definitions. *Operational definition:* a definition of the variable in terms of precisely how it is used and measured in the study. *Variable:* a quantity or quality that varies across people or situations. Operational definitions may also be reported in other sections of the report (e.g.,

method, measures); still, operational definitions should be regarded as important 'introductory', or, 'background', information.

- ✓ Check YES if the report offered operational definitions of all study variables.
- ✓ Check NO if the report did not offer operational definitions of some or all of study variables.
- × Do not check NOT STATED CLEARLY for this item.
- × Do not check NOT APPLICABLE for this item.

5. Were participant inclusion criteria stated? Participants (Sampling)

Definitions. *Inclusion criteria:* a set of predefined characteristics used to identify individuals to be included in a research study.

- ✓ Check YES if the report provided the participant inclusion criteria.
- ✓ Check NO if the report did not provide the participant inclusion criteria.
- × Do not check NOT STATED CLEARLY for this item.
- × Do not check NOT APPLICABLE for this item.

6. Was the participant recruitment strategy described? Participants (Sampling)

Definitions. *Recruitment strategy:* the process of enlisting people for participation in a research study. In psychological research, typical recruitment strategies include advertisements, flyers, information sheets, notices, postings on internet bulletin boards, web pages, and social media sites; direct contact with potential study participants (e.g., through a presentation); letters and emails (e.g., from an agency, hospital, school); pre-existing participant pools (e.g., past research participants who have given permission for future contact).

- ✓ Check YES if the report described the recruitment strategy.
- ✓ Check NO if the report provided no description of the recruitment strategy.
- ✓ Check NOT STATED CLEARLY if the report provided limited or unclear information about the recruitment strategy
- ✓ Do not check NOT APPLICABLE for this item.

7. Was a justification/ rationale for the sample size provided? Participants (Sampling)

Definition. *Sample size:* the number of participants in a study. A justification/rationale for the sample size might be (1) a narrative explanation on why it is sufficient to answer the hypotheses, aims and research question; or (2) a statistical/mathematical calculation (e.g., a power analysis estimating sample size; ≥10 participants per independent variable); or both.

- ✓ Check YES if the report or supplement provided the measures in full.
- ✓ Check NO if the report or supplement did not provide the measures in full.
- × Do not check NOT STATED CLEARLY for this item.
- × Do not check NOT applicable for this item.

8. Was the attrition rate provided? (applies to cross-sectional and prospective studies) Data (Collection)

Definitions. *Attrition*: the loss of participants, or, the loss of participant data, during the study. *Attrition rate* (also known as *drop-out rate*) is usually reported as a percentage of the number of participants (or data entries) lost at the end of the study, divided by the total number of participants (or data entries) at the beginning of the study. It could also be expressed as participants *retained* at the end of the study compared to those that entered the study at the beginning (c.f. *retention rate*). Attrition in cross-sectional studies might be due to incomplete or spoiled questionnaires, or questionnaires with large amounts of missing responses precluding imputation or replacement. **Attrition rate differs from response rate**, the latter being the percentage of people who respond to an initial survey call or invitation.

- ✓ Check YES if the attrition rate was provided.
- ✓ Check NO if the attrition rate was not provided.
- ✓ Check NOT STATED CLEARLY if the report provided vague or insufficient information on attrition rates.
- ✓ Check NOT APPLICABLE if attrition was zero or if completion rate was 100%.

9. Was a method of treating attrition provided? (applies to cross-sectional and prospective studies). Data (Analyses)

Definitions. Methods for *treating attrition* in the data analyses are excluding cases, imputing or replacing missing values, conducting intention-to-treat, as-treated, per-protocol, efficacy subset, complier average causal effect, and simulation analyses (Peugh et al., 2017), or conducting

representative checks (e.g., testing for differences on key variables between participants that remained in the study and those that were excluded or dropped out).

- ✓ Check YES if a method of treating attrition was provided.
- ✓ Check NO if a method of treating attrition was not provided.
- ✓ Check NOT STATED CLEARLY if the report provided vague or insufficient information to ascertain if attrition was treated.
- ✓ Check NOT APPLICABLE if attrition was zero or if completion rate was 100%.

10. Were the data analysis techniques justified (i.e., was the link between hypotheses/ aims / research questions and data analyses explained)? Data (Analyses)

Definitions. *Data analysis:* the process of inspecting, cleansing, transforming, and modelling data, aiming to obtain useful information to draw conclusions for research and practice. To be *justified,* data analyses techniques should match the study's research questions/ hypotheses. Authors should provide a clear *justification* for the selection of their analyses and indicate how they are aligned with the research questions/hypotheses of the study.

- ✓ Check YES if data analysis techniques were justified.
- ✓ Check NO if the data analysis techniques were not justified.
- ✓ Check NOT STATED CLEARLY if the report provided vague or insufficient information to justify the data analysis techniques (e.g., may justify some but not all techniques).
- × Do not check NOT APPLICABLE for this item.

11. Were the measures provided the report (or in a supplement) in full? Data (Measures)

Definitions. *Measures:* the questions or *items* used in survey research to elicit responses from participants.

- ✓ Check YES if the report or supplement provided the measures in full.
- ✓ Check NO if the report or supplement did not provide the measures in full.
- × Do not check NOT STATED CLEARLY for this item.
- × Do not check NOT applicable for this item.

12. Was evidence provided for the validity of all measures (or instrument) used?

Data (Measures)

Definitions. Evidence to support the validity of a measure (or an instrument) can be provided by reporting a process of validation. *Validation:* a procedure undertaken to ensure that measures are appropriate means to measure their intended variable, construct, or entity. Authors should provide evidence of measurement validation procedures conducted as part of the study, or clearly cite prior validation procedures (e.g., previous validation research) that support the validity of the measures used. Validation may refer to the psychometric properties of the measures or instrument used in the survey, and may be the result of **pilot testing with validity analyses** (e.g., exploratory or confirmatory factor analysis, principal components analysis).

- ✓ Check YES if there was evidence for the validity of the measures/instrument used.
- ✓ Check NO if there was no evidence for the validity of the measures/instrument used.
- × Do not check NOT STATED CLEARLY for this item.
- × Do not check NOT APPLICABLE for this item.

13. Was information provided about the person(s) who collected the data (e.g., training, expertise, other demographic characteristics)? (Collection)

Definitions. At minimum, the report should indicate who (e.g., study authors, research assistants, research students) collected the data. The characteristics of those who collect data can impact study findings (and thus quality) in several ways; in fact, it has been suggested that up to 56 types of biases may be introduced to the research, as a result of the characteristics of the people involved in the data collection and analysis (Sackett, 1979). For instance, knowledge of, or relationship to, the person or people collecting the data by participants may affect their participation (e.g., response rate) and responses (e.g., attrition rate). In addition, information about the people who collected the data should be provided to facilitate study replication (Schroter, Glasziou & Heneghan, 2012).

- ✓ Check YES if the report provided information about the person(s) who collected the data.
- ✓ Check NO if the report did not provide information about the person(s) who collected the data.
- × Do not check NOT STATED CLEARLY for this item.
- × Do not check NOT applicable for this item.

14. Was information provided about the context (e.g., place) of data collection? Data (Collection)

Definitions. At minimum, the report should indicate the physical place of data collection (e.g., hospital, classroom, home, neighborhood, the internet). Context characteristics at data collection have been found to influence findings, and thus study quality (Norris, Plonsky, Ross, & Schoonen, 2015). The context must be mentioned to facilitate study replication too (Schroter, Glasziou & Heneghan, 2012). Please, bear in mind that the context of phone-based or internet-based studies is **not** the 'internet' or the 'phone'. Reports should indicate the **place** where participants provided their data. This may not be possible for internet-based surveys, which may have to be checked as NO or NOT STATED CLEARLY on this item.

- ✓ Check YES if the report provided information about the context of data collection.
- ✓ Check NO if the report did not provide information about the context of data collection.
- ✓ Check NOT STATED CLEARLY if the report provided vague or insufficient information to ascertain the context of data collection (e.g., report could state that questionnaires were "mailed to participants", without specifying where questionnaires were mailed to).
- ✗ Do not check NOT applicable for this item.

15. Was information provided about the duration (or start and end date) of data collection? Data (Collection)

Definitions. Data collection duration should be reported to facilitate study replication (Schroter, Glasziou & Heneghan, 2012). Data collection duration also touches upon ethical considerations, as it is more ethical to demand less of participants' time, especially when participants cannot decide when data are collected. These ethical concerns are minimized for online surveys, whereby participants can control the length and speed of their reports.

- ✓ Check YES if the report provided information about the duration of the data collection.
- ✓ Check NO if the report did not provide information about the duration of the data collection.
- ✓ Check NOT STATED CLEARLY if the report provided vague or insufficient information to ascertain the duration of data collection (e.g., may only report the start of

data collection).

- ✗ Do not check NOT applicable for this item.

16. Was the study sample described in terms of key demographic characteristics?

Data (Results)

Definitions. *Demographic characteristics:* information about research participants that is necessary for the determination of whether they are a representative sample of the target population. The American Psychological Association recommends describing the participants in terms of "age; sex; ethnic and/or racial group; level of education; socioeconomic, generational, or immigrant status; disability status; sexual orientation; gender identity; and language preference as well as important topic-specific characteristics (e.g., achievement level in studies of educational interventions)" (APA, 2010, p. 29). While the sample should be described as precisely as possible, we argue, in line with Sifers, Puddy, Warren, and Roberts (2002) that psychological studies should, at minimum, report age, gender, ethnicity/race, and socio-economic status (SES).

- ✓ Check YES if the report provided key demographic characteristics (i.e., age, gender, ethnicity/race, and SES)
- ✓ Check NO if the report did not provide essential demographic characteristics (i.e., age, gender, ethnicity/race, and SES).
- ✗ Do not check NOT STATED CLEARLY for this item.
- ✗ Do not check NOT applicable for this item.

17. Was discussion of findings confined to the population from which the sample was drawn (target population)? Data (Discussion)

Definitions. Findings should apply/extend to the population from which the study sample was drawn (i.e., target population). For example, if the study sampled French psychology undergraduates, then findings should apply to that population only. If the discussion of findings extends beyond the target population then it should be clearly labelled as 'speculative'.

- ✓ Check YES if the discussion of findings was confined to the target population.
- ✓ Check NO if the discussion of findings extended beyond the target population and the discussion was not described as speculation.

- ✓ Check NOT STATED CLEARLY if it was unclear whether the findings were discussed with the target population, only, in mind.
- ✗ Do not check NOT APPLICABLE for this item.

18. Were participants asked to provide (informed) consent or assent? Ethics

Definitions. *Informed consent:* voluntary agreement by people to participate in a research study, subsequent to their being informed about study aims, procedures, potential risks and benefits of participation, including rights to withdraw. In research where participant deception is involved, participants provide consent, without being fully informed about the study. *Assent:* agreement to participate in research by people who are, by definition, too young to give (informed) consent (typically < 18 or 16 years of age, depending on country or state legislation), but are old enough to understand the aims of the research and their rights to withdraw without punishment or consequence. Assent may be requested from the ages of six or seven. In addition to assent, parental or guardian consent may also be required. Participant consent or assent may be waived under certain circumstances (e.g., neglected, abused, emancipated, self-sufficient minors; non-FDA-regulated research; research that could not be practically carried out without the waiver; the consent form poses a breach to anonymity/confidentiality; research that poses no known harm to participants).

- ✓ Check YES if participants were asked to provide informed consent / and / or assent.
- ✓ Check NO if participants were not asked to provide informed consent / and / or assent.
- ✓ Check NOT STATED CLEARLY if the report provided no or insufficient evidence to ascertain whether informed consent / and / or assent was provided.
- ✓ Check NOT applicable if consent/assent was justifiably waived.

19. Were participants debriefed at the end of data collection? Ethics

Definitions. *Debrief:* the process of giving participants further information about the study, subsequent to their participation. If participant deception was necessary to conduct the study, a debrief offers participants an explanation for the deception, and a chance to withdraw their consent and data, retrospectively. Examples of debrief content include providing participants the opportunity to ask questions about the study and voice thoughts or emotions in relation to the study, and thanking participants for their time. Sometimes, debriefing provides information

about ways participants can get help in dealing with issues addressed in the study (e.g., websites or referrals to health care centers, contact details of the research team, etc.). If participants are minors, then parents/guardians might also be debriefed. Sometimes, debrief can be justifiably waived (e.g., debriefing may pose more harm than good, the deception is harmless, debriefing is impractical, participants are experts on the study topic).

- ✓ Check YES if participants were debriefed.
- ✓ Check NO if participants were not debriefed.
- ✓ Check NOT STATED CLEARLY if the report provided no or insufficient evidence to ascertain whether debriefing occurred.
- ✓ Check NOT applicable if debrief was justifiably waived.

20. Were funding sources or potential conflicts of interest disclosed? Ethics

Definitions. *Funding source*: a source of money supporting the research study, typically a government, corporation, institution, or foundation. *Conflict of interest:* a situation where financial or personal issues may compromise (or seem to compromise) a researcher's professional judgment in conducting or reporting the research.

- ✓ Check YES if funding sources or potential conflicts of interest were disclosed.
- ✓ Check NO if funding sources or potential conflicts of interest were not disclosed.
- ✓ Check NOT STATED CLEARLY if the information provided about funding sources or conflicts of interest was insufficient (e.g., reported vaguely or for some but not all authors).
- ✗ Do not check NOT applicable for this item.

Appendix B: Systematic review included study results

Study authors and title	*Country*	*N (cases and controls /comparators)*	*Sample age*	*Sample gender*	*Administration and setting*	*Reported raw means and/or T-scores (SD) and any comparative statistics*	*Quality*
Sutker 1971. Personality differences and sociopathy in heroin addicts and nonaddict prisoners (314)	USA	40 heroin addicts, 40 incarcerated controls	Cases 27.07 [6.48], Controls 24.88 [7.26]	All male	Single administration, forensic	Hypochondriasis Addicts = 64.22, incarcerated controls= 50.92, t= 5.07 p=<0.001 Depression Addicts= 74.52, incarcerated controls= 60.3, t= 4.18 p=<0.001. Hysteria Addicts= 65.18, incarcerated controls= 55.02, t= 4.81 p=<0.001 Psychopathic Deviate	Questionable quality Overall Quality Score (%): 38.9 Domain Quality Scores: Introduction (Rationale/Variables) score: 3 /4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Me

						Addicts= 81.25, incarcerated controls= 68.6, t= 6.0 p=<0.001. Masculinity-Femininity Addicts= 57.78, incarcerated controls=58.65, t= 0.45 Paranoia= 62.0, 58.38, t= 1.45 Psychasthenia Addicts= 69.3, incarcerated controls= 56.6, t= 3.76 p=<0.001. Schizophrenia Addicts= 68.82, incarcerated controls= 62.5, t= 2 p=<0.05. Hypomania Addicts= 68.15, incarcerated controls= 66.18, t= 0.74 Social Introversion Addicts= 54.98, incarcerated controls= 50.9, t= 2.12 p=<0.05. Anxiety (supplementary scale) Addicts= 58.02, incarcerated controls= 52.42, t= 2.75 p=<0.01. Repression (supplementary scale) Addicts= 51.05, incarcerated controls= 47.75, t= 1.65 L scale Addicts= 47.42, incarcerated controls= 52.18, t= 2.99 p=<0.01. F scale Addicts= 62.2, incarcerated controls= 60.95, t= 0.63 K scale Addicts= 49.42, incarcerated controls= 51.8, t= 1.27	asures/Results/Discussio n) score: 3/10 Ethics score: 0/3
Kojak and Canby. 1975. Personality and behaviour patterns of heroin-dependent American servicemen in Thailand (315)	USA	25 heroin dependents, 50 controls	n/d	All male	Single, military inpatient rehabilitation	Raw score/K-corrected T-score): Hypochondriasis Dependents= 13.9/56.7 controls= 13.5/55.5 Depression Dependents= 21.3/60.9, controls= 18.6/54.8 Hysteria Dependents= 20.5/57, controls= 24.8/64.8 Psychopathic Deviate Dependents= 24.8/63.6, controls= 23.0/60 Masculinity-femininity Dependents= 24.1/57.2, controls= 24.6/58.2 Paranoia Dependents= 11.8/61.4, controls= 10.1/56.3 Psychasthenia Dependents= 28.2/60.4, controls= 28.0/60 Schizophrenia Dependents= 28.5/62,	Questionable quality Overall Quality Score (%): 65 Domain Quality Scores: Introduction (Rationale/Variables) score: 2/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 8/10 Ethics score: 1/3

						controls= 30.2/65.4 Hypomania Dependents= 21.9/62.7, controls= 23.1/65.3 Social introversion Dependents= 25.1/50.1, controls= 25.8/50.8 Can-not-say scale Dependents= 7.6/43.3, controls= 7.4/43.2 L scale Dependents= 3.8/48.8, controls= 3.4/47.6 F scale Dependents= 6.4/58.8, controls= 7.2/60.4 K scale Dependents= 12.4/49.8, controls= 13.5/52	
Gerra et al. 2008. Relationship of Personality Traits and Drug of Choice by Cocaine Addicts and Heroin Addicts (316)	Italy	85 heroin addicts, 60 cocaine addicts, 50 controls	Cases 30.9, [2.79]	All male	Single administration, MMT	hypochondriasis Addicts = 47.2, cocaine addicts= 61.0, controls= 48.8, F=15.45 p=<0.001 Depression 58.7, 57.8, 47.8 Hysteria 59.1, 51.9, 48.3, F=16.03 p=<0.001 Psychopathic Deviate 60.0, 70.0, 49.2, F=13.94 p=<0.001 Masculinity-femininity 68.2, 50.08, 48.0, F=47.58 p=<0.001 Paranoia 59.5, 64.7, 48.5, F=10.11 p=<0.001 Psychasthenia 61.2, 62.3, 48.0 Schizophrenia 64.5, 61.0, 49.7 Hypomania 58.8, 64.1, 50.0 Social introversion 62.2, 53.2, 49.2, F=14.87 p=<0.001	Questionable quality Overall Quality Score (%): 50 Domain Quality Scores: Introduction (Rationale/Variables) score: 4 /4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 4/10 Ethics score: 1/3
Penk et al. 1979. Personality characteristics of compulsive heroin, amphetamine, and barbiturate users (317)	USA	65 heroin dependents, 45 amphetamine users, 34 barbiturate users	Cases 23 [n/d]	All male	Single administration, military inpatient rehabilitation	p values are reported for statistically significant univariate F ratio: Heroin dependents Hypochondriasis mean= 49.42, amphetamine users= 54.57, barbiturate users= 57.38 Depression= 51.63, 65.27, 62.44 Hysteria= 48.41, 55.46, 55.32 Psychopathic deviate= 68.41, 76.71, 67.68 Masculinity-femininity= 55.38, 60.71, 60.15, p=<0.05 Paranoia= 59.38, 67.75, 62.5 p=<0.05 Psychasthenia= 63.77, 74.34, 67.91 p=<0.01 Schizophrenia= 64,28, 75.23, 74.65 p=<0.01 Hypomania= 69.94, 67.12, 68.35	Questionable quality Overall Quality Score (%): 55.6 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 4/10 Ethics score: 1/3

						Social introversion= 47.86, 57.21, 58.03 p=<0.01 L scale= 50.09, 48.16, 50.59 F scale= 69.06, 74.02, 70.79 p=<0.01 K scale=51.22, 45.96, 46.21 Total MMPI profiles differed between groups F= 2.08, p=<0.002	
Penk et al. 1980. MMPI factor scale differences among heroin addicts differing in race and admission status (318)	USA	260 treatment seeking heroin addicts, 67 addicts mandated treatment	Cases 27 [n/d]	All male	Single administration, inpatient rehabilitation	Treatment seeking Anxiety mean= 10.48 (3.75), mandated treatment mean= 8.49 (3.44), F= 20.87 p=<0.01 Repression= 8.39 (2.82), 8.76 (3.22) Somatization= 7.35 (4.0), 4.69 (3.13), F= 20.87 p=<0.01 Unconventionality= 8.04 (3.23), 7.72 (3.06)	Questionable quality Overall Quality Score (%): 66.7 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 5/10 Ethics score: 1/3
Glankin et al. 2018. Psychological features of abstinent heroin users before and after rehabilitation in Saint Petersburg, Russia (319)	Russia	164 heroin addicts	32.1 [8.5]	Male 120, female 44	Single administration, inpatient rehabilitation	Hypochondriasis mean prior to rehabilitation= 61.0 Depression= 62.0 Hysteria= 58.0 Psychopathic Deviate= 81.6 Masculinity-femininity= 69.0 Paranoia= 75.3 Psychasthenia= 69.0 Schizophrenia= 87.0 Hypomania= 76.4 Social Introversion= 60.0 L Scale= 49.0 F Scale= 97.9 K Scale= 46.0	Acceptable quality Overall Quality Score (%): 84.2 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 9/10 Ethics score: 2/3
Marsh et al. 1988. Psychopathology of Opiate Addiction: Comparative Data from the MMPI and MCMI (320)	USA	157 heroin addicts			Single administration, MMT	Hypochondriasis mean= 62.98 (11.98) Depression= 67.48 (12.73) Hysteria= 63.15 (9.72) Psychopathic deviate= 74.59 (10.66) Masculinity-femininity= 56.48 (10.85) Paranoia= 60.57 (9.32) Psychasthenia= 62.64 (12.28) Schizophrenia= 62.62 (12.88) Hypomania= 65.29 (10.69) Social introversion= 53.87 (10.18) L Scale= 48.96 (8.03)	Questionable quality Overall Quality Score (%): 50 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 0/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 6/10 Ethics score:0/3
Dolan et al. 1983. Personality differences among black, white, and Hispanic-American male heroin addicts on MMPI	USA	423 heroin addicts, 268 were black or hispanic and 154 white	White cases 27.61 [8.91], Black cases 30.98 [1.67], hispanic 31.64 [9.59]	All male	Single administration, military inpatient rehabilitation	Social Maladjustment mean ethnic minority participants= 53.29 (10.28), Caucasian participant mean= 57.81 (13.08), F= 16.91 p=<0.005 Depression= 61.97 (12.83), 66.26 (14.04), F= 12.47 p=<0.005 Feminine Interests= 55.54 (9.45), 49.78 (9.44), F=29.39 p=<0.005 Poor Morale= 55.82 (11.2),	Questionable quality Overall Quality Score (%): 68.4 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Me

content scales (321)						58.64 (11.31), F= 7.04 p=<0.01 Religious Fundamentalism= 48.97 (7.97), 46.03 (9.92), F= 5.4 p=<0.05 Authority Conflicts= 62.69 (8.25), 62.62 (9.04) Psychoticism= 62.56 (15.18), 62.08 (14.58) Organic Symptoms= 64.5 (17.93), 65.6 (16.79) Family Problems= 63.49 (12.35), 68.59 (13.18), F= 10.91 p=<0.001 Manifest Hostility= 57.19 (11.63), 57.29 (10.71) Phobias= 59.81 (11.44), 55.31 (11.05), F= 7.43 p=<0.01 Hypomania= 56.92 (9.92), 58.54 (10.17) Poor Health= 64.54 (13.2), 63.98 (12.9)	asures/Results/Discussion) score: 6/10 Ethics score: 1/3
McKernan et al. 2015. Further Evidence of Self-Medication: Personality Factors Influencing Drug Choice in Substance Use Disorders (322)	USA	96 opioid drug users, 236 other drug (depressants and stimulants) users	37.7 [12.34]	232 male, 100 female	Single administration, inpatient rehabilitation	Posttraumatic stress opioid user mean= 65.39 (14.79), other drug user mean= 60.18 (15.29), F=6.91 p=<0.009 Subjective Depression= 67.66 (14.58), 62.34 (14.71), F=7.68 p=<0.006 Cynicism= 54.16 (9.62), 49.51 (10.17), F=12.66 p=<0.001 Ego strength= 39.26 (13.5), 42.96 (13.5), F=4.38 p=<0.05 Insufficient Self-control= 26.95 (22.66), 23.42 (21.3) Aggression= 53.52 (14.99), 50.63 (12.55) Antisocial Tendencies= 63.74 (13.16), 56.44 (11.05), F=22.56 p=<0.001	Questionable quality Overall Quality Score (%): 66.7 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 6/10 Ethics score: 0/3
Gerra et al. 2004. Aggressive responding in abstinent heroin addicts: neuroendocrine and personality correlates (323)	Italy	20 abstinent heroin addicts, 20 controls	Cases 29.4 [5.1], Controls 26.4 [6.5]	All male	Single administration, post inpatient rehabilitation (discharged)	Depression Abstinent addicts= 64.9 (3.2), controls= 45.7 (2.2), t= 4.5 p=<0.001. Psychopathic Deviance Abstinent addicts= 70.2 (2.1), controls= 50.1 (2.4), t= 4.05 p=<0.001	Questionable quality Overall Quality Score (%): 44.4 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 3/10 Ethics score: 1/3
Gerra et al. 2000. Neuroendocrine correlated of temperament traits in abstinent opiate addicts (324)	Italy	22 abstinent heroin addicts, 22 controls	Cases 28.6 [6.3], Controls 27.1 [6.1]	All male	Single administration, post inpatient rehabilitation (discharged)	Depression Abstinent addicts= 62.18(2.27), controls= 49.65(1.85), F= 17.93 p=<0.001 Psychopathic Deviate Abstinent addicts= 71.58(2.83), controls= 51.5(1.71), F=39.27 p=< 0.001 Hypochondriasis Abstinent addicts=	Questionable quality Overall Quality Score (%): 61.1 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 1/3

						63.14(2.07), controls= 53.25(1.04), F= 17.09 p=<0.001	Data (Collection/Analyses/Measures/Results/Discussion) score: 5/10 Ethics score: 1/3
Haertzen et al. 1969. Changes in personality and subjective experience associated with the chronic administration and withdrawal of opiates (325)	USA	15 heroin addicts	n/d	All male	Repeated administration in experimental setting: During abstinence, during chronic administration of heroin, and during withdrawal	Hypochondriasis mean during abstinence= 52.7 (11.11), during usage= 60.4, during withdrawal= 75.8. F= 2.86 p=<0.05, SD of abstinence versus withdrawal= 5.4 p=<0.01 Depression= 61.4 (10.38), 63.5, 76.1F= 4.62 p=<0.01 Hysteria= 53.6 (7.23), 56.3 ,67.9, F= 4.28 p=<0.01 Psychopathic deviate= 73.8 (10.93), 76.8, 76.7 Masculinity-femininity= 58.4 (7.24), 61.0, 58.5 Paranoia= 57.4(7.63), 56.5, 58.7 Psychasthenia= 55.5 (10.72), 59.6, 66.7, F= 3.25 p=<0.05 Schizophrenia= 60.7 (10.32), 59.3, 71.4, SD of abstinence versus withdrawal =2.3 p=<0.01 Hypomania= 67.5 (10.57), 65.7, 68.3 Social introversion= 49.7 (9.87), 47.8, 51.9 L Scale= 31.8 (4.69), 31.3, 27.5, F=3.2 p=<0.01 F Scale= 59. (8.08), 61.3, 65.6 K Scale= 55.4 (9.68), 55.5, 55.4	Questionable quality Overall Quality Score (%): 20 Domain Quality Scores: Introduction (Rationale/Variables) score: 2 Participants (Sampling/Recruitment) score: 0 Data (Collection/Analyses/Measures/Results/Discussion) score: 2 Ethics score: 0
Zeng et al. 2016. The similarities and differences in impulsivity and cognitive ability among ketamine, methadone, and non-drug users (326)	China	59 MMT patients, 51 ketamine users, 60 drug naïve controls	Cases 42.48 [5.09], Comparison 25.72 [5.83], Controls 23.35 [3.47]	Cases 36 male 23 female, Comparison 29 male 22 female, controls 30 male 30 female	Single administration, MMT	Raw score/Non K-corrected T-score: Methadone patients =24.31 (5.64)/66.6, ketamine users= 24.47 (5.93)/66.9 Drug naïve= 20.75 (4.63)/, F= 6.11 p=<0.001.	Acceptable quality Overall Quality Score (%): 83.3 Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 2/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 7/10 Ethics score: 2/3
Roszell and Calsyn 1986. Personality and demographic characteristics associated with the prescribing of psychoactive medications	USA	67 MMT patients, 11 of which prescribed antidepressants, and 26 prescribed anxiolytics	Antidepressants 30.5 [3.1], Anxiolytics 33.7 [6.7], No prescription 36.2 [8.1],	All male	Single administration, MMT	MMT patients not prescribed medications Hypochondriasis mean= 61.9 (14.2), prescribed antidepressants= 64.0 (16.6), prescribed anxiolytics= 73.9 (14.9), F= 6.2 p=<0.01 Depression= 68.1 (17.1), 67.1 (16.7), 83.3 (15.3), F= 8 p=<0.001 Hysteria= 61.9 (10.3), 65.2 (12.5), 71.2 (8.3), F= 7.8 p=<0.001 Psychopathic Deviate= 72.1 (19.2), 72.8 (13.0), 86.0	Questionable quality Overall Quality Score (%): 38.9 Domain Quality Scores: Introduction (Rationale/Variables) score: 1/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 5/10 Ethics score: 0/3

for MMT patients (327)						(18.7), F= 5.3 p=<0.01 Masculinity-femininity= 63.9 (13.1), 63.2 (8.9), 64.3 (11.9), F= 0.03 Paranoia= 60.7 (20.5), 57.0 (10.5), 65.1 (14.1), F= 0.9 Psychasthenia= 62.9 (17.4), 67.3 (10.9), 77.1 (14.8), F= 7.0 p=<0.01 Schizophrenia= 62.7 (18.4), 64.9 (15.3), 76.5 (21.7), F= 4.9 p=<0.01 Hypomania= 60.9 (11.5), 57.3 (7.4), 68.1 (12.8), F= 4.7 p=<0.05 Social introversion= 52.4 (10.2), 51.0 (13.0), 57.0 (12.0), F= 1.9 Somatization= 4.5 (3.8), 6.7 (6.0), 10.4 (4.9), F=13.1 p=<0.01 Low Morale= 7.2 (3.9), 8.3 (2.7), 9.9 (3.6), F=3.5 p=<0.05 Depression= 5.9 (4.6), 6.9 (3.0), 11.2 (4.5), F=9.9 p=<0.001 Psychotic Distortion= 5.2 (3.8), 6.0 (1.9), 7.5 (4.4), F= 2.6 Acting Out= 8.7 (2.7), 9.6 (2.2), 10.1 (1.7), F= 2.5 L Scale= 50.7 (7.3), 50.8 (10.6), 44.9 (4.9), F= 6.3 p=<0.01 F Scale= 62.4 (14.3), 67.5 (12.2), 72.2 (19.6), F= 3.8 p=<0.05 K Scale= 52.1 (7.9), 52.1 (7.6), 47.1 (9.3), F= 3.5 p=<0.05	
Husband & Iguchi. 1995. Comparison of MMPI-2 and MMPI clinical scales and high-point scores among MMT clients (328)	USA	51 MMT patients	35 [n/d]	22 men 29 female	Single administration, MMT	Hypochondriasis MMPI-1 mean= 61.08 (13.36), MMPI-2 mean= 59.71 (12.55) Depression= 66.92 (12.12), 59.0 (11.71) Hysteria= 58.47 (10.71), 53.47 (12.95) Psychopathic Deviate= 72.72 (11.86), 64.61 (10.59) Paranoia= 65.92 (12.59), 59.76 (13.86) Psychasthenia= 62.74 (12.39), 59.55 (13.57) Schizophrenia= 69.98 (17.75), 62.72 (14.83) Hypomania= 71.16 (11.98), 64.14 (13.92) Social Introversion= 56.39 (9.46), 52.2 (8.53) L Scale= 45.5 (7.33), 51.27 (8.1) F Scale= 66.35 (12.46), 65.47 (15.41) K Scale= 47.08 (7.79), 42.0 (8.92)	Acceptable quality Overall Quality Score (%): 72.2 Domain Quality Scores: Introduction (Rationale/Variables) score: 3/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 6/10 Ethics score: 3/3
Craig et al. 2004. Predicting MMT	USA	108 MMT patients	48.8 [6.6]	All male	Single administration, MMT	Negative treatment mean= 61.85 (15.11) Cynicism mean= 61.57 (13.21)	Questionable quality Overall Quality Score (%): 66.7

Treatment Outcomes Using the Addiction Severity Index and the MMPI-2 Content Scales (329)							Domain Quality Scores: Introduction (Rationale/Variables) score: 4/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 7/10 Ethics score: 0/3
Sutker 1973. Incarcerated and street heroin addicts: A personality comparison (330)	USA	82 heroin addicts mandated MMT, 35 incarcerated addicts, 87 incarcerated controls	MMT mandated 27.76 [n/d], Addicts 27.11 [n/d], Controls 28.28 [n/d]	All male	Single administration, forensic	Hypochondriasis Treatment addicts= 67.19, incarcerated addicts= 53.06, incarcerated controls= 55.48, F= 22.26 p=<0.01 Depression Treatment addicts= 73.44, incarcerated addicts= 63.51, incarcerated controls= 61,76, F= 17.85 p=<0.01 Hysteria Treatment addicts= 65.00, incarcerated addicts= 55.00, incarcerated controls= 57.26, F= 18.28 p=<0.01 Psychopathic Deviate Treatment addicts= 78.89, incarcerated addicts= 76.49, incarcerated controls= 73.69, F= 4.9 p=<0.01 Masculinity-Femininity Treatment addicts= 57.67, incarcerated addicts= 58.31, 56.68, F= 0.49 Paranoia Treatment addicts= 61.32, incarcerated addicts= 59.11, 61.6 F= 0.63 Psychasthenia Treatment addicts= 68.85, incarcerated addicts= 59.23, 61.92, F= 9.84 p=<0.01. Schizophrenia Treatment addicts= 68.46, incarcerated addicts= 62.43, 67.02, F= 2.3 Hypomania Treatment addicts= 68.94, incarcerated addicts= 68.4, 66.27, F= 1.37 Social Introversion Treatment addicts= 55.15, incarcerated addicts= 50.26, 53.48, F= 2.99 Anxiety (supplementary) Treatment addicts= 56.82, incarcerated addicts= 52.4, 55.03, F= 2.37 L scale Treatment addicts= 47.88, incarcerated addicts= 48.63, 51.65, F=6.62 p=<0.01 F scale	Questionable quality Overall Quality Score (%): 33.3 Domain Quality Scores: Introduction (Rationale/Variables) score: 2/4 Participants (Sampling/Recruitment) score: 1/3 Data (Collection/Analyses/Measures/Results/Discussion) score: 3/10 Ethics score: 0/3

						Treatment addicts= 63.37, incarcerated addicts= 62.43, 63.57, F=0.19 K scale Treatment addicts= 50.27, incarcerated addicts= 50.26, 51.85, F=0.9	

Appendix C: SPSS syntax 1 Mann-Whitney

```
NPAR TESTS
  /M-W= Hypochondriasis Depression Hysteria
PsychopathicDeviate Masculinityfemininity Paranoia
    Psychasthenia Schizophrenia Hypomania SocialIntroversion
Lscale Fscale Kscale BY Using(1 0)
  /MISSING ANALYSIS.
```

NPar Tests

Notes

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	Weight	<none>
	Split File	<none>
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Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each test are based on all cases with valid data for the variable(s) used in that test.
Syntax		NPAR TESTS /M-W= Hypochondriasis Depression Hysteria

		PsychopathicDeviate Masculinityfemininity Paranoia Psychasthenia Schizophrenia Hypomania SocialIntroversion Lscale Fscale Kscale BY Using(1 0) /MISSING ANALYSIS.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01
	Number of Cases Allowed[a]	165564

a. Based on availability of workspace memory.

Mann-Whitney Test

Ranks

	Using	N	Mean Rank	Sum of Ranks
Hypochondriasis	0	8	8.25	66.00
	1	5	5.00	25.00
	Total	13		
Depression	0	9	9.00	81.00
	1	5	4.80	24.00
	Total	14		
Hysteria	0	7	6.86	48.00
	1	5	6.00	30.00
	Total	12		
PsychopathicDeviate	0	10	8.60	86.00
	1	5	6.80	34.00
	Total	15		
Masculinityfemininity	0	5	6.00	30.00
	1	5	5.00	25.00
	Total	10		
Paranoia	0	7	6.29	44.00
	1	5	6.80	34.00
	Total	12		

Psychasthenia	0	7	6.14	43.00
	1	5	7.00	35.00
	Total	12		
Schizophrenia	0	7	6.43	45.00
	1	5	6.60	33.00
	Total	12		
Hypomania	0	7	6.71	47.00
	1	5	6.20	31.00
	Total	12		
SocialIntroversion	0	7	6.29	44.00
	1	5	6.80	34.00
	Total	12		
Lscale	0	7	5.14	36.00
	1	4	7.50	30.00
	Total	11		
Fscale	0	7	5.00	35.00
	1	3	6.67	20.00
	Total	10		
Kscale	0	7	5.71	40.00
	1	3	5.00	15.00
	Total	10		

Test Statistics[a]

	Hypochondriasis	Depression	Hysteria	Psychopathic Deviate
Mann-Whitney U	10.000	9.000	15.000	19.000
Wilcoxon W	25.000	24.000	30.000	34.000
Z	-1.464	-1.800	-.406	-.735
Asymp. Sig. (2-tailed)	.143	.072	.685	.462
Exact Sig. [2*(1-tailed Sig.)]	.171[b]	.083[b]	.755[b]	.513[b]

Test Statistics[a]

	Masculinityfemininity	Paranoia	Psychasthenia	Schizophrenia
Mann-Whitney U	10.000	16.000	15.000	17.000
Wilcoxon W	25.000	44.000	43.000	45.000
Z	-.522	-.244	-.406	-.081

Asymp. Sig. (2-tailed)	.602	.808	.685	.935
Exact Sig. [2*(1-tailed Sig.)]	.690[b]	.876[b]	.755[b]	1.000[b]

Test Statistics[a]

	Hypomania	SocialIntroversion	Lscale	Fscale	Kscale
Mann-Whitney U	16.000	16.000	8.000	7.000	9.000
Wilcoxon W	31.000	44.000	36.000	35.000	15.000
Z	-.244	-.244	-1.134	-.798	-.342
Asymp. Sig. (2-tailed)	.808	.808	.257	.425	.732
Exact Sig. [2*(1-tailed Sig.)]	.876[b]	.876[b]	.315[b]	.517[b]	.833[b]

a. Grouping Variable: Using

b. Not corrected for ties.

```
NPAR TESTS
  /M-W= Hypochondriasis Depression Hysteria
PsychopathicDeviate Masculinityfemininity Paranoia
    Psychasthenia Schizophrenia Hypomania SocialIntroversion
Lscale Fscale Kscale BY Maintained(1 0)
  /MISSING ANALYSIS.
```

NPar Tests

Notes

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	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	15
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each test are based on all cases with valid data for the variable(s) used in that test.
Syntax		NPAR TESTS /M-W= Hypochondriasis Depression Hysteria PsychopathicDeviate Masculinityfemininity Paranoia Psychasthenia Schizophrenia Hypomania SocialIntroversion Lscale Fscale Kscale BY Maintained(1 0) /MISSING ANALYSIS.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00
	Number of Cases Allowed[a]	165564

a. Based on availability of workspace memory.

Mann-Whitney Test

Ranks

	Maintained	N	Mean Rank	Sum of Ranks
Hypochondriasis	0	9	6.11	55.00
	1	4	9.00	36.00
	Total	13		
Depression	0	10	6.70	67.00

	1	4	9.50	38.00
	Total	14		
Hysteria	0	8	6.13	49.00
	1	4	7.25	29.00
	Total	12		
PsychopathicDeviate	0	10	8.30	83.00
	1	5	7.40	37.00
	Total	15		
Masculinityfemininity	0	8	5.38	43.00
	1	2	6.00	12.00
	Total	10		
Paranoia	0	8	5.88	47.00
	1	4	7.75	31.00
	Total	12		
Psychasthenia	0	8	6.25	50.00
	1	4	7.00	28.00
	Total	12		
Schizophrenia	0	8	5.88	47.00
	1	4	7.75	31.00
	Total	12		
Hypomania	0	8	6.50	52.00
	1	4	6.50	26.00
	Total	12		
SocialIntroversion	0	8	6.00	48.00
	1	4	7.50	30.00
	Total	12		
Lscale	0	7	5.57	39.00
	1	4	6.75	27.00
	Total	11		
Fscale	0	6	5.00	30.00
	1	4	6.25	25.00
	Total	10		
Kscale	0	6	5.83	35.00
	1	4	5.00	20.00
	Total	10		

Test Statistics[a]

	Hypochondriasis	Depression	Hysteria	Psychopathic Deviate
Mann-Whitney U	10.000	12.000	13.000	22.000
Wilcoxon W	55.000	67.000	49.000	37.000
Z	-1.234	-1.131	-.510	-.367
Asymp. Sig. (2-tailed)	.217	.258	.610	.713
Exact Sig. [2*(1-tailed Sig.)]	.260[b]	.304[b]	.683[b]	.768[b]

Test Statistics[a]

	Masculinityfemininity	Paranoia	Psychasthenia	Schizophrenia
Mann-Whitney U	7.000	11.000	14.000	11.000
Wilcoxon W	43.000	47.000	50.000	47.000
Z	-.261	-.849	-.340	-.849
Asymp. Sig. (2-tailed)	.794	.396	.734	.396
Exact Sig. [2*(1-tailed Sig.)]	.889[b]	.461[b]	.808[b]	.461[b]

Test Statistics[a]

	Hypomania	SocialIntroversion	Lscale	Fscale	Kscale
Mann-Whitney U	16.000	12.000	11.000	9.000	10.000
Wilcoxon W	52.000	48.000	39.000	30.000	20.000
Z	.000	-.679	-.567	-.640	-.426
Asymp. Sig. (2-tailed)	1.000	.497	.571	.522	.670
Exact Sig. [2*(1-tailed Sig.)]	1.000[b]	.570[b]	.648[b]	.610[b]	.762[b]

a. Grouping Variable: Maintained

b. Not corrected for ties.

```
NPAR TESTS
  /M-W= Hypochondriasis Depression Hysteria
PsychopathicDeviate Masculinityfemininity Paranoia
    Psychasthenia Schizophrenia Hypomania SocialIntroversion
Lscale Fscale Kscale BY Abstinent(1 0)
```

```
/MISSING ANALYSIS.
```

NPar Tests

Notes

Output Created		17-NOV-2022 22:38:08
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Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each test are based on all cases with valid data for the variable(s) used in that test.
Syntax		NPAR TESTS /M-W= Hypochondriasis Depression Hysteria PsychopathicDeviate Masculinityfemininity Paranoia Psychasthenia Schizophrenia Hypomania SocialIntroversion Lscale Fscale Kscale BY Abstinent(1 0) /MISSING ANALYSIS.
Resources	Processor Time	00:00:00.00

	Elapsed Time	00:00:00.00
	Number of Cases Allowed[a]	165564

a. Based on availability of workspace memory.

Mann-Whitney Test

Ranks

	Abstinent	N	Mean Rank	Sum of Ranks
Hypochondriasis	0	9	6.78	61.00
	1	4	7.50	30.00
	Total	13		
Depression	0	9	6.89	62.00
	1	5	8.60	43.00
	Total	14		
Hysteria	0	9	6.56	59.00
	1	3	6.33	19.00
	Total	12		
PsychopathicDeviate	0	10	7.10	71.00
	1	5	9.80	49.00
	Total	15		
Masculinityfemininity	0	7	5.29	37.00
	1	3	6.00	18.00
	Total	10		
Paranoia	0	9	7.22	65.00
	1	3	4.33	13.00
	Total	12		
Psychasthenia	0	9	7.00	63.00
	1	3	5.00	15.00
	Total	12		
Schizophrenia	0	9	7.11	64.00
	1	3	4.67	14.00
	Total	12		
Hypomania	0	9	6.33	57.00
	1	3	7.00	21.00
	Total	12		
SocialIntroversion	0	9	7.11	64.00
	1	3	4.67	14.00

	Total	12		
Lscale	0	8	7.13	57.00
	1	3	3.00	9.00
	Total	11		
Fscale	0	7	6.43	45.00
	1	3	3.33	10.00
	Total	10		
Kscale	0	7	5.00	35.00
	1	3	6.67	20.00
	Total	10		

Test Statistics[a]

	Hypochondriasis	Depression	Hysteria	Psychopathic Deviate
Mann-Whitney U	16.000	17.000	13.000	16.000
Wilcoxon W	61.000	62.000	19.000	71.000
Z	-.309	-.733	-.092	-1.102
Asymp. Sig. (2-tailed)	.758	.463	.926	.270
Exact Sig. [2*(1-tailed Sig.)]	.825[b]	.518[b]	1.000[b]	.310[b]

Test Statistics[a]

	Masculinityfemininity	Paranoia	Psychasthenia	Schizophrenia
Mann-Whitney U	9.000	7.000	9.000	8.000
Wilcoxon W	37.000	13.000	15.000	14.000
Z	-.342	-1.202	-.832	-1.017
Asymp. Sig. (2-tailed)	.732	.229	.405	.309
Exact Sig. [2*(1-tailed Sig.)]	.833[b]	.282[b]	.482[b]	.373[b]

Test Statistics[a]

	Hypomania	SocialIntroversion	Lscale	Fscale	Kscale
Mann-Whitney U	12.000	8.000	3.000	4.000	7.000
Wilcoxon W	57.000	14.000	9.000	10.000	35.000
Z	-.277	-1.017	-1.837	-1.481	-.798
Asymp. Sig. (2-tailed)	.782	.309	.066	.138	.425

Exact Sig. [2*(1-tailed Sig.)]	.864[b]	.373[b]	.085[b]	.183[b]	.517[b]

a. Grouping Variable: Abstinent

b. Not corrected for ties.

```
NPAR TESTS
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PsychopathicDeviate Masculinityfemininity Paranoia
    Psychasthenia Schizophrenia Hypomania SocialIntroversion
Lscale Fscale Kscale BY MMPI(1 2)
  /MISSING ANALYSIS.
```

NPar Tests

Notes

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	Split File	<none>
	N of Rows in Working Data File	15
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each test are based on all cases with valid data for the variable(s) used in that test.

Syntax		NPAR TESTS /M-W= Hypochondriasis Depression Hysteria PsychopathicDeviate Masculinityfemininity Paranoia Psychasthenia Schizophrenia Hypomania SocialIntroversion Lscale Fscale Kscale BY MMPI(1 2) /MISSING ANALYSIS.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00
	Number of Cases Allowed[a]	165564

a. Based on availability of workspace memory.

Mann-Whitney Test

Ranks

	MMPI	N	Mean Rank	Sum of Ranks
Hypochondriasis	1	9	7.33	66.00
	2	4	6.25	25.00
	Total	13		
Depression	1	9	8.67	78.00
	2	5	5.40	27.00
	Total	14		
Hysteria	1	9	6.89	62.00
	2	3	5.33	16.00
	Total	12		
PsychopathicDeviate	1	9	9.33	84.00
	2	6	6.00	36.00
	Total	15		
Masculinityfemininity	1	8	4.50	36.00
	2	2	9.50	19.00
	Total	10		
Paranoia	1	9	6.33	57.00

	2	3	7.00	21.00
	Total	12		
Psychasthenia	1	9	6.56	59.00
	2	3	6.33	19.00
	Total	12		
Schizophrenia	1	9	5.78	52.00
	2	3	8.67	26.00
	Total	12		
Hypomania	1	9	6.78	61.00
	2	3	5.67	17.00
	Total	12		
SocialIntroversion	1	9	5.56	50.00
	2	3	9.33	28.00
	Total	12		
Lscale	1	9	5.22	47.00
	2	2	9.50	19.00
	Total	11		
Fscale	1	8	4.75	38.00
	2	2	8.50	17.00
	Total	10		
Kscale	1	8	6.50	52.00
	2	2	1.50	3.00
	Total	10		

Test Statistics[a]

	Hypochondriasis	Depression	Hysteria	Psychopathic Deviate
Mann-Whitney U	15.000	12.000	10.000	15.000
Wilcoxon W	25.000	27.000	16.000	36.000
Z	-.463	-1.400	-.647	-1.414
Asymp. Sig. (2-tailed)	.643	.162	.518	.157
Exact Sig. [2*(1-tailed Sig.)]	.710[b]	.190[b]	.600[b]	.181[b]

Test Statistics[a]

	Masculinityfemininity	Paranoia	Psychasthenia	Schizophrenia
Mann-Whitney U	.000	12.000	13.000	7.000

Wilcoxon W	36.000	57.000	19.000	52.000
Z	-2.089	-.277	-.092	-1.202
Asymp. Sig. (2-tailed)	.037	.782	.926	.229
Exact Sig. [2*(1-tailed Sig.)]	.044[b]	.864[b]	1.000[b]	.282[b]

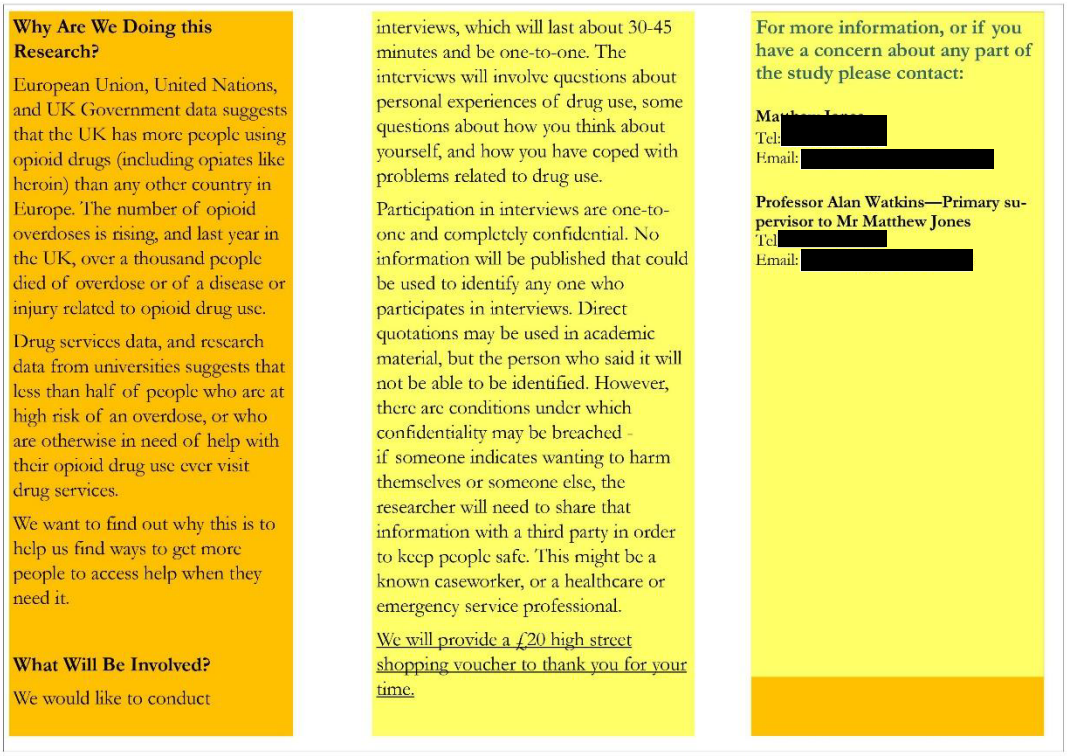
Test Statistics[a]

	Hypomania	SocialIntroversion	Lscale	Fscale	Kscale
Mann-Whitney U	11.000	5.000	2.000	2.000	.000
Wilcoxon W	17.000	50.000	47.000	38.000	3.000
Z	-.462	-1.572	-1.650	-1.567	-2.089
Asymp. Sig. (2-tailed)	.644	.116	.099	.117	.037
Exact Sig. [2*(1-tailed Sig.)]	.727[b]	.145[b]	.145[b]	.178[b]	.044[b]

a. Grouping Variable: MMPI

b. Not corrected for ties.

Appendix D: Interview study information sheet



Why Are We Doing this Research?

European Union, United Nations, and UK Government data suggests that the UK has more people using opioid drugs (including opiates like heroin) than any other country in Europe. The number of opioid overdoses is rising, and last year in the UK, over a thousand people died of overdose or of a disease or injury related to opioid drug use.

Drug services data, and research data from universities suggests that less than half of people who are at high risk of an overdose, or who are otherwise in need of help with their opioid drug use ever visit drug services.

We want to find out why this is to help us find ways to get more people to access help when they need it.

What Will Be Involved?

We would like to conduct interviews, which will last about 30-45 minutes and be one-to-one. The interviews will involve questions about personal experiences of drug use, some questions about how you think about yourself, and how you have coped with problems related to drug use.

Participation in interviews are one-to-one and completely confidential. No information will be published that could be used to identify any one who participates in interviews. Direct quotations may be used in academic material, but the person who said it will not be able to be identified. However, there are conditions under which confidentiality may be breached - if someone indicates wanting to harm themselves or someone else, the researcher will need to share that information with a third party in order to keep people safe. This might be a known caseworker, or a healthcare or emergency service professional.

We will provide a £20 high street shopping voucher to thank you for your time.

For more information, or if you have a concern about any part of the study please contact:

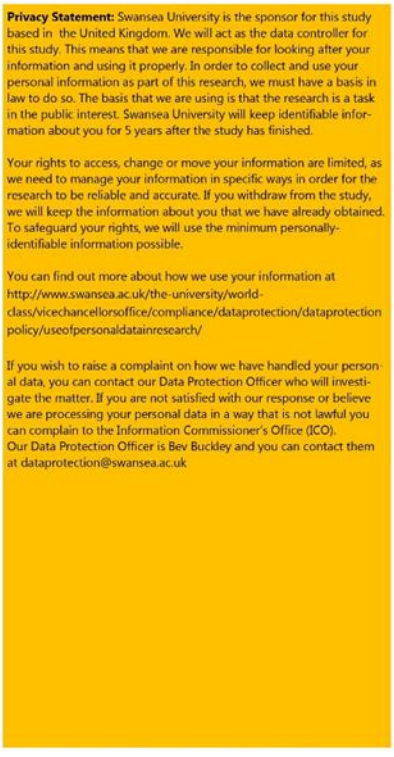
Ma[redacted]
Tel: [redacted]
Email: [redacted]

Professor Alan Watkins—Primary supervisor to Mr Matthew Jones
Tel[redacted]
Email: [redacted]

Swansea University Medical School Research Ethics Sub-Committee have reviewed and approved this study.

For general advice about taking part in research, please see:
http://www.nhs.uk/Conditions/Clinical-trials/Pages/Introduction.aspx

Version 0.2 16/12/2019



Privacy Statement: Swansea University is the sponsor for this study based in the United Kingdom. We will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. In order to collect and use your personal information as part of this research, we must have a basis in law to do so. The basis that we are using is that the research is a task in the public interest. Swansea University will keep identifiable information about you for 5 years after the study has finished.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information at http://www.swansea.ac.uk/the-university/world-class/vicechancellorsoffice/compliance/dataprotection/dataprotectionpolicy/useofpersonaldatainresearch/

If you wish to raise a complaint on how we have handled your personal data, you can contact our Data Protection Officer who will investigate the matter. If you are not satisfied with our response or believe we are processing your personal data in a way that is not lawful you can complain to the Information Commissioner's Office (ICO).
Our Data Protection Officer is Bev Buckley and you can contact them at dataprotection@swansea.ac.uk

Interview Study Information for patients

Please read this leaflet to find out about our study involving people who visit drug services for help related to opioid drug use.

Swansea University
Prifysgol Abertawe
Medical School
Ysgol Feddygaeth

Appendix E: Interview study consent form

Swansea University Medical School
Ysgol Feddygaeth Prifysgol Abertawe

Swansea University
Prifysgol Abertawe

Interview study – Why do people seek help from substance use disorder treatment services?

Consent Form for Interview Study

Thank you for reading the TIME study information sheet. If you are happy to participate in this interview study then please complete and sign the form below. Please initial the boxes below to confirm that you agree with each statement:

	Please tick box:
• I confirm that I have been informed about the study by the researcher, read the information sheet (v0.1 10.09.2019) and had ample opportunity to ask questions.	☐
• I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences. In addition, should I not wish to answer any particular question or questions, I am free to decline.	☐
• Interviews will take place one-to-one. I understand that my responses will be kept strictly confidential by the researcher. I understand that my name will not be linked with the research materials, and will not be identified or identifiable in the report or reports that result from the research.	☐
• I agree for this interview to be tape-recorded. I understand that the audio recording made of this interview will be transcribed and then destroyed. The transcription will be used for analysis and that extracts from the interview (from which I will not be personally identified) may be used in any conference presentation, report or journal article developed as a result of the research. I understand that no other use will be made of the recording without my written permission, and that no one other than the researcher will be allowed access to the original recording.	☐
• I understand that direct quotations may be used for academic purposes. I understand that these will be anonymised so that I cannot be identified, and that care will be taken to ensure that other information in the interview that could identify me will not be revealed.	☐
• I agree that my anonymised data will be kept for future research purposes such as publications related to this study after the completion of the study.	☐
• I agree to take part in this study.	☐

Participant Name	Date	Signature
_____	_____	_____
Researcher Name	Date	Signature
_____	_____	_____

Appendix F: Interview transcripts with emergent themes

Title: **BDPPHD1**

Interviewee/s:

Interview Date:

Interviewer:

Transcriber note: **Interviewee had tricky accent and was quiet and mumbling, leading to more inaudibles than usual**

Q: So, could you give me a kind of a brief history of when you started to use?

A: Seven years ago.

Q: Seven years ago. And how old are you now?

A: Thirty-nine.

Q: And what happened seven years ago? What – how did it start?

A: I just get like [inaudible 0:00:30] people [inaudible 0:00:32].

Q: So you were hanging round with people who already did it.

A: So, it was nothing special.

Q: Nothing special, just started.

A: Yeah.

Q: Okay. And has your using changed? Do you use the same amount as you always have?

A: Roughly, yeah, up and down. It depends [inaudible 0:00:59].

Q: What might make you take more, or less?

A: So it's all about money in a sense.

Q: Oh right, okay, yeah, so it's just having the money to get it. Okay. Have you – you know, in those seven years, have you noticed any health problems related to taking the heroin or…?

A: Yeah, maybe, maybe, but nothing sure yet.

Q: So maybe.

A: Yeah.

Q: So what kind of things?

A: I've not been checking really health so I'm not really – can't answer on this [inaudible 0:01:39].

Q: Are you about as healthy now as you were before seven years ago, like ten years ago?

A: I'm alright, I'm alright.

Q: Okay. And, you know, how you were or how you felt in yourself before you started using, how has that changed?

A: I don't know [Inaudible 0:02:10] I don't know. I've not been thinking about it.

Q: You've not been thinking about it.

A: Maybe it has been changed by the community where I'm – in which I live [for four years 0:02:23], the people with who I'm staying. There has been more change there.

Q: The people you stay with has changed.

A: Yes, [inaudible 0:02:36] and all that, who has become more my friends, who [inaudible 0:02:41].

Q: So, your friends, they've changed? You've got different friends now than you had before or..?

A: Yeah, [like I say 0:02:51] been involved in another kinds of groups of people, so obviously it's been changing everything. You know [Inaudible 0:03:01].

Q: Oh no, don't worry. From what you're telling me, I'll turn all that into text. And from using heroin, do you ever notice, in the short term, like after you've taken it, do you ever feel sick or panicky or just not feel very well?

A: Of course, yeah. You get addictive from it, you know. It makes you understand your troubles,

yeah. So [inaudible 0:03:37] sickness, yeah, more mental, more physical [inaudible 0:03:46] remind you about it every day, yeah. So it's not like you wake up a few days and you are alright. It's [inaudible 0:04:01].

Q: Every day, okay.

A: The longer using, the longer in this trouble, yeah. You cannot get out.

Q: So, does that mean that, you know, you're – does that mean you've tried to stop, you've tried to get out?

A: Yeah, yeah, I've even stopped on and off, things like that, but [inaudible 0:04:32] the taste of blood and that's crazy. You [inaudible 0:04:40]. You understand like the danger and everything but still keep doing it. Same you know smoking kills people, still smoking. Drink is no good, every Friday, every month, get drunk [laughs].

Q: It's true, it's true, yeah.

A: So, same about this. You know it's like an issue and you know about all the dangers, but [inaudible 0:05:09] don't really notice the real state of danger till you get the like overdose or other worse things can happen. Even like [inaudible infections 0:05:26] people been losing body parts, yeah, doing like dirty [hits 0:05:34] and needles, you know. All that is there, but you [inaudible 0:05:42] that danger is there, you know, maybe because you're using wrong. You get drunk, you drive, you kill someone, it's dangerous, you know. When you do drugs, you drive, you kill someone, it's dangerous. For you, maybe it's fine, you know. For you, maybe you're [inaudible 0:05:58] but as soon as you're in some public community, yeah, it's dangerous for [socials:06:10] you know what I mean, for people around, yeah. That's like the biggest issue [inaudible 0:06:19] money issues and how you deal with that, and how you manage this, yeah, abusing someone again or not. It's dangerous, yeah. You can get armed robbery. You can do shoplifting. You can, you know, just take loans and loans and loans, yeah, borrowing money and just keep spending and not paying back till you stand back again. I really [inaudible 0:06:56] like a time, like a month, yeah.

Q: And these are things that you've done, taken out loans and all the rest of it?

A: Yeah, many, all the time. So you get tired and [inaudible 0:07:12], that's when you have this break, then you go off, then you understand this really was for nothing, yeah. There's just [inaudible 0:07:21], not really for daily things and whatever, because for you it's just one issue, yeah, to sort yourself out and be alright, and that's it, nothing else. No one knows, just you and your problem, yeah. But then you get script, then you [inaudible 0:07:45] come down

and then you realise, yeah, wow, it's too much, too much of this. So then you come down [inaudible 0:07:55] but like I say, it's still hard when people don't understand that. It's [inaudible 0:08:04] timebomb. Like, one, two years and people die like that, you know, like constantly using [inaudible 0:08:19]. That's why it's a bit scary.

Q: So would you say you were scared?

A: No, I'm not scared of that because I understand the issue of dangerous, yeah, so I keep the level of – like limit, or say don't break this level, yeah, so be under tension all the time, yeah.

Q: Okay. Before you used any – you know, you used heroin before, seven years ago, how would you describe yourself as a person? Were you happy, sad, positive, negative?

A: Sad, yeah, definitely.

Q: Okay. And do you think that's changed?

A: Maybe, maybe. Like, right now it's maybe nothing more sad than this, yeah. Maybe that's why [I'm not saying that 0:09:24] upset, that's what's happened before or what, you know. It really depends on situations and all of that, you know. It's like [inaudible 0:09:42] and not happy, yeah [inaudible 0:09:46].

Q: And has anyone else sort of – when you started using heroin and through, you know, those seven years, have other people, like your friends or your family, ever commented on there being a change in you?

[0:10:04]

A: No. Maybe like about government and all that, like some probations and some detox, but like I say, it's more up to yourself, yeah. If you want it, you can do it. But if you don't want it, nobody can help you to change or nothing.

Q: So it doesn't matter about other people, it has to be –

A: You could be there and you could be listening and you could [inaudible 0:10:37] and saying, "Go, go, go, go," then you're not going to listen to even ten people, yeah. You're going to go and do your own things that you want to do, yeah. So mainly it's inside you, yeah. If you want to, you can do it [laughs]. [Inaudible 0:11:00] now you stop doing drugs and all that, you feel this massive empty gap, yeah, what do you do then? [inaudible 0:11:08] you're not doing no raising money, no nothing, yeah. So, for you it's completely a normal day, a week, like a

Sunday, yeah. Imagine it starts becoming like a week, a month, half year like that, you do nothing, you're going to go twisted in your head, yeah? And this is the hard part when [inaudible 0:11:08] out of like normal things, yeah. You've been doing just this one thing, regular thing, yeah, and then when you stop, it's hard to find, what can I fill my empty gap there. So I can swap my drugs for drink, driving motorbikes or cars or flying planes or diving whatever, you know, what I was doing before, yeah, but that's where you kind of – I think it's very – it makes you stronger, you know, to not fall back in. If you really don't, you stop and want to do this, yeah, and that, then when it fills the empty gaps there then it's alright. When there's nothing to fill it then it's very hard, yeah. It's very easy to get back in that. That's what's happening with me, yeah. I get off and on and off and on. Soon as I'm off, fill these empty gaps, yeah. Can't [inaudible 0:12:46] with the right people, yeah, and get back again in [inaudible 0:12:52].

Q: So you've got that emptiness to fill and you've got the same people around.

A: Yeah, yeah, yeah. See, I helped [inaudible 0:12:57] my friends and all of this, and we abstain [inaudibly 0:13:01], yeah, like six, seven months, yeah, and then I don't know why, we [inaudible 0:13:07] get involved again in this sort of stupid… So [inaudible 0:13:17] and blah, blah, blah.

Q: Is six or seven months about the longest you've been off?

A: Yeah, yeah.

Q: And earlier, I think I heard you use the term addict or addicted.

A: Yeah.

Q: Do you consider yourself an addict?

A: Maybe. People who use more than half a year is addictive

Q: Alright, so people who use more than half a year –

A: Is addictive. It goes in this kind of three, four month, then when you're using you don't feel the issue, yeah, or that you need it, yeah. Your body gets like kind of agree with that, you know, and starts like kind of asking you for this, yeah. Like drinking beer constantly, yeah, and one week you don't drink, you feel rough because you've not had the bottle of beer, yeah. So it's same, like the feelings, you know. Like I say, this empty gap, yeah, "What can I do now? What can I do now? All day I've been doing this and that, and what now?" It's hard to

change, even to do [inaudible 0:14:31]. It's very, very like – it's good when places who help with this, you know, that support, yeah.

Q: When you – with the help, why did you decide to come to seek out some help?

A: Because of script mainly, you know, because you don't need to be bothered about your health issues or [inaudible 0:15:02] sorted straight away, and your days become totally different, you know. There's [inaudible 0:15:11] looking for help, yeah.

Q: The script is the main –

A: Of course. You know if you wake up with a headache and some health issues, yeah, you definitely need something to fix the gap, yeah, to make you feel better, so you can work and do things like that.

Q: And the script allows you to do that, does it?

A: Yeah, [inaudible 0:15:33] clucking is very bad. I didn't realise that, but when I [inaudible 0:15:42] my friend was very bad in that before, yeah, like sixteen years ago, and [inaudible 0:15:52] was doing nothing, you know. He was asking me for money and all that. I said, "No, I'm not going to give you a single penny for drugs," yeah? [Inaudible 0:16:04] more money if you're going to go and have a drink with me or what. But when I had that same issue, yeah, I really understand better the influence, you know. It's like really – nothing compares to that. Even gambling is not that addictive, yeah? Because it makes you very, very deep in that, you know.

Q: So, you know, the kind of help – because of the script and, you know, the terrible symptoms from the clucking - why did you choose to come to here rather than go to a pharmacy?

A: Well, because pharmacy do a long term scripts, yeah, and [inaudible 0:16:59] get them like one day, same day, script, yeah. That is the difference. So it is waiting in [inaudible 0:17:07] for three weeks or waiting in a [inaudible 0:17:09] centre for three hours, it makes sense, yeah. Three weeks struggle or three hours wait, so you understand that you will have help. Three weeks, I can still hurt someone, I can still do robberies, I can still need to fix myself, yeah, so you don't give a fuck about no one, yeah. But people like them, yeah, they understand the level of danger, yeah, of issue, you know, so they give you a same day script, yeah, so then you manage on that amount that they prescribe, if it's good or not. You see the doctor in two weeks and then you can [inaudible 0:17:59]. So that's why, because not three weeks but three hours, yeah.

Q: Okay, so it's the time.

A: Time, big issue, yeah. The first I get from [inaudible 0:18:14], I was speaking about that, why in America it's like same day, in England it's two weeks. They pay more.

Q: Sure, yeah, money, yeah. And you used the term seeking help, or you used the term help. When you're seeking out help or when you come here, what are you – is it just for scripts? Is it just for needle exchange? Is it to talk to someone? What are the things you want?

A: All kind of – it could be all different things, you know. I've just not been really looking for this whole kind of services, but I know people who does and who [inaudible 0:18:56].

Q: What would you say you need most?

A: For my [basic 0:19:01] looking for like property and, you know, have a place [inaudible 0:19:10] and blah, blah, blah, so you can start job again and working. That's my issue there, nothing really down to medication and [inaudible 0:19:20]. Because like I say, it's all up to your head, yeah, how to figure out and how to put yourself in just the right place, yeah, in the right time and be alright. Maybe some really don't know this – the way of [push 0:19:44] it is the start. Because sometimes my friend has come, he's so desperate, yeah, and he's just [inaudible 0:19:50]. He's losing mind, he's losing his kind of [consciousness 0:19:50] and all that, yeah. He's very happy about that, you know. He's not spending money all over the night or over the one day. He can manage for a week or two, yeah. It makes a big, big difference, you know.

[0:20:16]

Q: So some stability.

A: Yeah, stability. That's what this place brings for people, you know, stability, yeah, because you come here and you're not being kicked off. Nobody's saying no, you know. It's really important, yeah, if someone comes to ask for help or what. If he's saying no, he'll never ever come back and ask again, yeah, you know what I mean. Because of that no, he'll maybe die two weeks later on the streets, you know. So it's very important how you deal with people here who come with different moods, like be angry, be happy. Someone just had his drugs and then just be treated for that. It's a very, very like [touchable 0:21:12] thing, yeah, how you speak and how you deal with people. I think this is very important.

Q: On a kind of day to day basis, how do you feel, you know, you cope? What helps you? I mean, as well as coming here.

A: From one to ten, I feel seven and nothing helps [inaudible 0:21:41]. I've not been really like pushing in that kind of direction yet, yeah? I know I'm waiting for my [post 0:21:49] so I can start job and all that. It's just a week or two, yeah, and get back to normal [inaudible 0:22:03]. Like I say, you do nothing, you get in this kind of spin again, you know. It's maybe, like I say, with all these empty gaps, you know, when they do these recovery groups, yeah, you have some like people can come, do some art groups or IT or something, yeah, they might be involved to doing something else, not just drugs. That's what I find out the hardest, yeah, when I was going in an addicts group. It was like every two weeks, yeah, we come, have a chat and blah, blah, blah, yeah, but then I felt like, when I go out through the door, yeah, I'm back in reality, you know, and by the evening, yeah, maybe four, five hours later, yeah, I've completely forgotten about what we was chatting there or what people were saying because again, you know, there's all this [inaudible 0:23:09] back in that. Then I was thinking, that is so sad, there is no centre to go, like proper centre or something, you can use computers or be there even all day long in, like even if the weather is not good, yeah. So mainly that is a very, very big issue, yeah. When you're on the streets, you're looking for something to stay in, yeah, and you don't really care what it's going to cost me, yeah. With drugs, you go there because it's just dry and warm, yeah, not maybe because of drugs. You understand?

Q: Yeah, yeah.

A: Because this is all happening, you just get [inaudible 0:23:49], tell me about your friends and tell me who you are, and this is the reality.

Q: Sure, okay. So, thank you very much for answering all those questions. Do you think since – I mean, when did you first come here, by the way? How long ago was that?

A: Fifteen years ago.

Q: Sorry, to this place, to BDP, it was about fifteen years ago?

A: Mm, mm.

Q: Do you think the way that you cope, you know, with your heroin use has changed in that time? Is it pretty much the same?

A: No, it's changed, much more slower whereas before it was like I enjoy that – now you enjoy this risk, like I say, yeah, so you can really see the level of danger. That's why I'm [inaudible 0:25:01].

Q: Okay, wonderful. Thank you very much. That's all my questions, so I'll turn this off.

[End of recording 0:25:01]

Emergent themes	Superordinate themes
Emergent theme 1 – Personal risk not an effective motivator of change • Little concern about health • Accepting of addiction related general poor health • Minimising risk of fatal overdose • Minimising harmfulness by comparing to other substances. • Witnessing dangers does not motivate change • Minimising social harms of heroin Emergent theme 2 - Peer usage facilitates usage and is obstacle to recovery • Introduced by peers • Peer usage increases risk of relapse Emergent theme 3 – Usage is associated with illegal, immoral and high-risk behaviour • Need for heroin linked to violent and illegal behaviours • Heroin linked to reckless borrowing • Duration of prescription is important. Emergent theme 9 - Illegal, immoral and high-risk behaviour are egodystonic • Prefers day to day script, longer scripts associated with relapse in to illegal and immoral behaviour. • Violent and criminal behaviours are described as dangerous and immoral. • Substance use disorder treatment service preferred over pharmacy due to long term prescriptions. Patient prefers daily script. Emergent theme 4 – Present orientated world-view • Substitution therapy linked to emptiness. Tasks are planned on day to day basis. • Substance use disorder treatment service preferred over pharmacy due to long term prescriptions. Patient prefers daily script. • Prefers day to day script, longer scripts associated with relapse in to illegal and immoral behaviour. Emergent theme 5 – Internal locus of control regarding recovery • Overcoming OUD is ultimately a personal choice, a matter of will • overcoming OUD is personal choice, down to will. Other people cannot change a person's will. • Recovery from OUD is personal choice, matter of will Emergent theme 10 – Heroin addiction potential no greater than other things, and it is a personal decision to overcome the addiction • Overcoming OUD is ultimately a personal choice, a matter of will • overcoming OUD is personal choice, down to will. Other people cannot change a person's will. • Recovery from OUD is personal choice, matter of will	**Change facilitated by occupation in safe, stable, peer-supportive environment** Substance use disorder treatment services offer safety, stability and alternative occupation. Personal risk not an effective motivator of change Peer usage facilitates usage and is obstacle to recovery **Addiction lifestyle if egodystonic** Usage is associated with illegal, immoral and high-risk behaviour Illegal, immoral and high-risk behaviour are egodystonic **Addiction attribution is seen as internal and globally applied (substance is irrelevant)** Heroin addiction potential no greater than other things it is a personal decision to overcome the addiction Internal locus of control regarding recovery **Addict reports psychological vulnerabilities** Patient describes self as always being prone to low mood Distress intolerance inhibits change **Psychological Inflexibility** Present orientated world-view Substance use disorder treatment services offer safety, stability and alternative occupation.

• Heroin is addictive, but so are other things, so they are equivalent • Addict is defined as using heroin for most of the year • multiple attempts at recovery. Up to 6 or 7 months sober Emergent theme 6 – Patient describes self as always being prone to low mood • self as a sad person • Usage has not changed self from sad person in to a less sad person Emergent theme 11 – Distress intolerance inhibits change • People with OUD find difficulty with emotional stability • Symptoms of relapse and emptiness are obstacle to recovery, makes relapse more likely • Without heroin and the daily routine devoted to obtaining heroin, a person becomes 'empty' • Emptiness is barrier to recovery, makes relapse more likely • Having activities other than pursuit of heroin important in recovery • Drug use orientated strategies unhelpful. Difficult to apply in practice. • Outlook on withdrawal changed with experience. Now likely to alleviate with heroin then to prioritise long term recovery. • Heroin withdrawal is particularly bad, emphasises awfulness of experience • Symptoms of relapse and emptiness are obstacle to recovery, makes relapse more likely Emergent theme 8 – Substance use disorder treatment services offer safety, stability and alternative occupation. • Substance use disorder treatment services seen as offering a lot of different options to users • Stable base (home and job) important for recovery. • Substance use disorder treatment services provide stability, and that that this can be of great importance (literally lifesaving) • Stability and routine important for recovery • Safe and stable environment important for recovery. Drug use associated with a place to stay where it is warm and safe. • Have been attending substance use disorder treatment service for 15 years • Control over use associated with significantly increased QOL	

Title: **BDPPHD2**

Interviewee/s:

Interview Date:

Interviewer:

Transcriber note:

Q: So, could you give me a kind of brief history of when you started using and why?

A: Okay. So… When I was thirteen years old, I – well, I'll give you a bit more – actually, I had a very rough childhood and my father was very violent, so I started running away from him when I was like nine years old, 'cos I was fearful to be in the house. And so I did this for a few years until I reached thirteen, and on that occasion I ran away, I went to Birmingham and I got abducted by a paedophile gang and I got really badly abused. And I had a lot of trauma in my head. And I actually started drinking first and knocking around with the wrong kind of people and that, and one of the guys that I was with was doing gear, like do you know what I mean, so he offered me a little bit of smoke, like, basically. Wasn't very pleasant the first time I did it. Made me really, really violently ill, sick, itchy, but it did something to me, do you know what I mean.

Q: Even though it made you sick, but it made you feel something else.

A: It made me violently sick, itchy, it weren't very pleasant at all. I was like retching, being sick. But it did something to my head, do you know what I mean. I can't really describe it, you know what I mean, just not make me feel anything, just did something to me, and I wanted it to do it again [laughs], do you know what I mean, even though it did that.

Q: Yeah, yeah.

A: So I did it like two or three times, and then I didn't do it for a bit, then I started doing it again. I had another like bash at it, and I thought actually like, after I'd done it for a little while, I didn't particularly want to do it anymore, and then I couldn't just stop doing it.

Q: But when you did take it, you know, you'd been through a really terrible time.

A: Yeah.

Q: So, you know, it numbed you.

A: Yeah.

Q: I mean, were you feeling just bad all the time, you know, during that period?

A: I just had really kind of like low self-esteem. And then 'cos after that, there was like a big trial and whatever, so I had to go and face that, and I got kind of disowned by my parents as well, which is – 'cos they was ashamed of what had happened, like, basically, 'cos they'd pushed me out the house. So they gave me up, basically, and I ended up being in the care system as well. I just – I just couldn't function, I wasn't functioning.

Q: Okay, yeah. So all of that's going on and you try heroin.

A: Yeah, and it like – yeah, and like I say, it just weren't [laughs] – it wasn't – not to – wasn't pleasant, but it did – like it did something, stopped me feeling something. I can't actually remember exactly what it was, but it just – yeah, it did something to me and made me want to do it again.

Q: How long did you – you know, how long did you then do it for? So how long did that last?

A: I'd say about two or three months. And I actually – I had a job at the time, so I – you know, and I could kind of afford it, kind of. But then as that time went by, I was doing more and more, and I couldn't afford it, and I actually lost my job, and that was when I first thought, I need to stop doing this [laughs], like, do you know what I mean.

Q: Sure.

A: And then I realised I hadn't actually – in that three months, I hadn't experienced the withdrawal because I had money to pay for it, do you know what I mean. And as time goes by, you build a tolerance up. It's deceptive, do you know what I mean. You do more and more and more to kind of like get the same kind of feeling, but like it's… It like sneaks up on you, like, do you know what I mean, gives you like a false sense of – do you know what I mean, "Oh, I'm handling this, I can afford it, I've got a job," and so on.

Q: Yeah, and then –

A: Do you know what I mean, but then it ain't – like it wasn't… And then, like I say, I lost my job and then I didn't have money to pay for it, and then I wanted to stop doing it, but I was actually physically addicted to it and I couldn't.

Q: The physical kind of addiction, do you think – you know, do you think that - from the time you

started using heroin, do you think you developed any health problems because of it?

A: Have I developed any health problems? I have, yeah.

Q: What kind of things have you noticed?

A: Well, I've lost half of my veins, so I have like – I've got like vein problems. I've got circulation problems. I've got heart problems. I've nearly died several times through overdosing.

Q: So a lot, it's been a lot to –

A: Yeah, lost all my friends, dignity or self-respect. Been to prison several times. I've committed some terrible crimes that I wouldn't have committed if I hadn't have been doing that. I mean, like, essentially, I mean, I'm a good person, I'm not a criminal, but like I've got a big criminal record, but it's all like 'cos of stuff to pay for that.

Q: So all of that is – you know, doing those things, it is to pay for the heroin. It's just –

A: Yeah, yeah, I wouldn't have done them otherwise, do you know what I mean? I lost my teeth.

Q: Sure, sure. And you talked then about, you know, things like the emotional or mental side of it, the low self-esteem and what have you. Before you started using, how would you have described yourself as a person? What were you like then? Were you positive, negative? Were you sort of – what kind of person were you?

A: Hmm, I'd say I was negative.

Q: Okay. Were you outgoing? Were you confident around people?

A: Nah, nah, I was very much a loner, spent most of my time on my own, or with other people like myself.

Q: Other people like yourself.

A: Yeah, who were like, you know, same kind of kid. There were like two or three of us that was running away together. You kind of like stayed together and like egged each other on and fed each other's habits.

Q: And then since, you know, you started using, do you think you've changed as a person at all, or do you think you've stayed pretty much the same?

A: Hmm, it's made me do things that I wouldn't necessarily have done, but nah, I think essentially I'm the same – same person.

Q: Okay, but done things you wouldn't have done.

A: Yeah, definitely, I've definitely done things I would never have done without like the substance. It makes you have a need, like, do you know what I mean, and makes you morals go out the window, do you know what I mean. The people that I've stolen off, I've stolen off people that love me, people that I've loved. They can't understand it.

Q: And how do you cope with that?

A: By doing more [laughs]. Yeah, it's a catch twenty-two thing, innit? I've done loads of cold turkeys like in prisons, and I've gone through sentences and not touched any, and out of all intentions, near enough every time I've been to jail, I've said, "Right, that is it, I ain't doing it again through my sentence." And I haven't even thought about it, yeah? But then like the night before I get out, I start thinking about it [laughs], do you know what I mean, yeah. "I'm out tomorrow," and then my head starts thinking, do you know what I mean, yeah. I start craving for it really bad. I almost feel as if I've done some without doing any, do you know what I mean. So, very rarely sleep on the last night before I get out, and then as soon as I start feeling like that, I just know what I'm going to be doing in the morning. It's just…

Q: Yeah. When you try and – you know, have you ever tried to imagine what it would be like if you – but in those days when you were using, have you tried to imagine, you know, never doing it again? What was that like? Was it a good feeling or a bad feeling?

A: A good feeling, and I've always thought or tried thinking to stop it, but never been successful. Or I've had very short periods of time where I've thought, yeah, I've cracked it, do you know what I mean, but it's always like crept back in.

Q: Sure, sure, okay. And so, you mentioned the kind of being sick as well, just to go back to that. How many years would you say all in all, you know, maybe on and off, but how many years were you using heroin, would you say?

[0:10:08]

A: Twenty-five years.

Q: Twenty-five years. And the sickness, did things like that happen all the time?

A: No, it doesn't. It just happens the initial few times, and as time's gone by and I've got clean and I've gone back to it, the sickness hasn't necessarily come back, do you know what I mean. You just kind of carry on from where you left off. And like, I've noticed as well, as time's gone by, like, the periods between – you know like when you first start doing it – when I very first did it, it took real effort to get addicted to it, to be fair. It didn't just happen. I didn't just smoke it and I was addicted to it. It took – I had to keep doing it, do you know what I mean. It took a few – like, you know, a few weeks, yeah. But as time's gone by and I've got older, that period of being like straight and then being addicted gets smaller and smaller, do you know what I mean. It goes from like weeks to like days, do you know what I mean. Last time I got out of – 2006 was the last time I done a prison sentence. When I got out, literally – I was injecting then, but I literally started injecting and through the week I was fucked, completely fucked.

Q: Right, so just from being inside, that changed how you kind of reacted to the drug.

A: Yeah, kind of. I think it's body wear and tear maybe, I don't know. Yeah, but definitely the period of, the initial starting it and not being addicted to being addicted gets smaller and smaller.

Q: I mean, that makes it – you know, stopping for a bit and then starting and stopping for a bit, it sounds harder. Does it get harder as it goes on?

A: It does, but like, you know, I always – I always reach a point where I just can't fucking deal with myself, what I'm doing, do you know what I mean. I just think, I can't fucking – I just can't keep doing it, and it's like – do you know what I mean. And then something changes in my head and makes it easy for me to like push through it, but it just never lasts, do you know what I mean. I can get – I can get the strength to do it, but it never sort of stays – kind of stops. That's why I'm on like long-term kind of substitutes. That takes that away from me. I don't have to worry about it, do you know what I mean.

Q: Yeah, yeah. And coming to here, you know, or – what was the first place you went for help, would you say, to do with your - was it here or was it somewhere else?

A: Prison.

Q: Prison was the first place.

A: Yeah.

Q: Who did you approach? What happened?

A: So, they used to have a thing called [CAROT 0:13:13].

Q: [CAROT]?

A: Yeah, it's like an acronym, I can't remember what it stands for now, but yeah, it was [CAROT], it was called, and they came to see me in the police station initially. They knew I was going to get remanded, so they said, "Right, we'll do like a little assessment with you and then my worker will catch you up in the prison." This is when there was actually rehabilitation in prisons [laughs]. And so they did catch me up, and then when I left, there was a thing called DIP, I remember what that stands for, Drug Intervention Programme, and they met me at the gate, and they linked me in with the local services that was available at the time. I think it was Turning Point.

Q: Oh, Turning Point, yeah. And why did you want help? What was the thing that…?

A: 'Cos I just didn't want to keep committing the crime, basically.

Q: So it was what you were doing.

A: Yeah, it didn't sit with me right.

Q: Ah okay. So, you wanted to stop, you know, acting in that way with help through the prison.

A: Yeah.

Q: When it comes to, you know, the substitution therapy, when did you start that? How long ago?

A: Hmm, I think I've been on this one for about a year, but I'm coming off it near enough – like, about two thirds of the way through coming off. I've just been doing it really slowly, like a little bit at a time, so I've not really noticed.

Q: That sounds good.

A: Yeah, yeah, and I – but I'm doing – you know, I'm doing things now. I'm not just doing it on its own. I've got a lot of things going on.

Q: Is that important?

A: Yeah. Like I do a bit of IT over here. I do a thing called Shooting Stars for them.

Q: I've seen the poster, yeah.

A: Yeah, it's kind of like a bit of fun but it's not, it's actually quite serious. It's harm minimisation and harm reduction information around safe injecting practices and bloodborne viruses. There's no such thing as safe injecting but there are safer ways, if that makes sense. So, we do like a little quiz, and they just have a little bit of a laugh, and they get a fiver at the end. But the fact is, they can do it three times, so they always come the three times 'cos they get a fiver every time they do it, but you can see, 'cos we keep records of the scores, over the three weeks, the information sticks.

Q: Right, yeah, good.

A: It does work, you know what I mean. So yeah, it's an important thing to have something to do, or feel like I'm doing something, otherwise I'm just drifting around and swimming in my own head, so that ain't no good to nobody. I know where that leads to [laughs].

Q: Sure, okay. So that leads to –

A: Back to square one, innit?

Q: And did you use needle exchanges before going on substitution?

A: Yeah.

Q: Did you use pharmacies and here?

A: Yeah.

Q: What are the kind of like pros and cons of going to the pharmacy or coming to here?

A: Okay, so a pharmacy has very limited supply of equipment, so they don't have any specialist equipment, so they just have two types of needles, and they won't give you anymore unless you've exchanged. They're quite strict on that. So you have to have something to give them to take something away, whereas here it doesn't matter whether – you can take a hundred away, come back the next day and take – they don't matter, they don't work it like that. They'd just rather you'd take stuff. And they have every different size needle and combination of different sized things you can think of. It's quite mindboggling, some of the stuff, do you

know what I mean. And they also have different acids to break down – you know you need acid to break down the heroin, right?

Q: Yeah, yeah.

A: So they have two different types, and they have vitamin C and citric, whereas if you go to a chemist, you just get citric, do you know what I mean. So you get a wider range of equipment and you can take more.

Q: Is that the kind of main reason why you come here over a pharmacy, or is there any other reason?

A: Yeah, and not only that, like pharmacies don't get to speak to you, do you know what I mean. They're just, "See you later," whereas here, like, you sit down and someone's across from you, and it's a point of contact.

Q: Yeah, right, so it's important speaking with someone.

A: Yeah, so you get to speak to someone. It's another human being, innit? I might not speak to anybody all day other than that fucking one person. That might be my only human contact that day, like, do you know what I mean? And they get to know you, so they know if something's up, you know what I mean, so they do get to know you over a period of time. You don't get that with the pharmacists, do you know what I mean?

Q: And when you say if something's up, does that mean, you know, if something's wrong, they'll talk to you?

A: Yeah, they'll talk to you. Yeah, something might be going on in life, might be depressed or, I don't know, just – or angry about something, or they might have an injury from injecting, when there's a nurse here that'll deal with that, like clean dressings or whatever. If you're using, if you – as well, see like, I ask for specific kit to inject in a specific area, right, so different sizes and gauges of needles for different areas of the body, so because it's all recorded, [inaudible 0:19:26] – because it's all recorded, they get to know what my patterns of – what equipment I use. So then if I go in and I say, "I want this, that and the other," and it's different, they'll say, "What you doing? What you doing different? Are you alright?" You know, say like I might have gone and I might not be able to use my arms or my legs anymore – I can, but like someone might ask for something long and it might be going in their groin, which is really fucking dangerous, do you know what I mean, yeah. So they'll say, "Are you sure that you want to take that? Do you know what the risks are?" Give you a bit of advice, like, on what to do, do you know what I mean? They won't actually show you what to do but they will, you

know, tell you – make it a bit…

[0:20:21]

Q: So you get all this here, you know. You've got all the kit and you've got the device being given to you, and people, you know, kind of talking to you. Why would people go to the pharmacy then? 'Cos some people seem to prefer a pharmacy and I'm just wondering why people would do that.

A: Well, here, you've got to go out of your way to come here, ain't you, do you know what I mean, yeah.

Q: Right, okay, yeah.

A: Like pharmacies tend to be a bit more in location, do you know what I mean.

Q: Yeah, yeah, they're everywhere.

A: So like as I'm walking to score or whatever, you're going to pass a pharmacy on the way. So they'll just grab their bits, go do whatever and then – do you know what I mean, whereas here it's not that simple, you know what I mean. You've got to like go out your way to come here and go off and do whatever. It's a bit more…

Q: Okay, so it's just kind of easier – even though you don't get all that stuff, you know, it is easier.

A: Yeah, and some people don't like dealing with people. They don't want to come in and talk to people. They don't want to be asked any questions. They just want to get their shit and go, do you know what I mean.

Q: Yeah, I see that, okay.

A: I mean, we've been talking a lot recently about like safe injection rooms, it's needed.

Q: It is needed, it is absolutely needed, yeah, I couldn't agree more. It is needed. Just to – yeah –

A: Sorry, I went off.

Q: Oh no, no, not at all. So, when you, you know, come here, do you feel like – yeah, what is it

that brings you back here? Would you say you're seeking help here or would you say it's something different?

A: Seeking help, yeah, and I feel safe in here.

Q: Safe?

A: Yeah, and I know – I've been coming here for a couple of years. I know all the staff here, all the staff know me. They offered me like to do the volunteering thing for them as like a peer, so obviously like I know that they think alright of me, do you know what I mean. So like I'm happy to come here and help them out 'cos they help me out, do you know what I mean. So yeah, they're just like nice people, ain't they?

Q: Do you think, since you've been coming here, the way – you know each day, how you cope with – I mean, sorry, I should go back to this. Would you describe yourself as an addict? Would you say you're an addict or would you not describe that?

A: Oh, definitely am, yeah [laughs].

Q: So, coping with addiction, has that changed since you've come here? Do you do it differently or do you do it the same?

A: Well, I'm a lot – see, like as – I wouldn't say it was anything to do here really, but they did plant a seed in my head [laughs], do you know what I mean, a couple of years ago. I've been like in a dry house or something for like two years on and off, and that seed was planted here.

Q: So the dry house system, do you think you've –

A: I got into that because of here.

Q: Oh right, okay. And how's that been?

A: Yeah, it's been good, yeah. And I got on my script because of here. I wasn't really interested in going on a script at that time. I was like flat out, doing what I was doing. I was quite happy doing it at that time, and then they started planting seeds in my head [laughs]. It was actually [Jim 0:23:54] started planting the seeds, started making me think about what I was doing.

Q: Okay. So coming here, what changed with that was you thought about what you were doing and things that you hadn't thought you'd want to do before, suddenly you do want to do.

A: Yeah, yeah. I mean, I'm very well aware of what it is I'm doing to myself. I'm very well aware of the damage that it does to me and everybody else that's around me, connected to me and, you know, I know what the dangers of it all are, and I know why I do it and whatever, but having that knowledge doesn't stop you doing it [laughs], like, do you know what I mean. You can have all the knowledge in the world but it doesn't – that don't actually make any difference, I don't think. It's still more powerful than the knowledge, the drug, do you know what I mean, you know. It doesn't care that I know about what it does to me [laughs], do you know what I mean.

Q: Well, like drinking and smoking, innit?

A: Yeah, or anything like that, yeah, yeah.

Q: Okay, great. And I missed one. Before, you know – so as you've kind of been on a journey from, you know, first trying heroin, to using heroin, to recovering and, you know, seeking help, have people around you sort of mentioned you've changed in any way, or do you think you've stayed sort of the same?

A: Hmm, so essentially like the core of myself's always been the same, do you know what I mean. Like I say, I only really do what I do 'cos there's a need, like a burning need, do you know what I mean. That's like more powerful than me, innit, do you know what I mean. But no, I think essentially I've stayed the same.

Q: Yeah.

A: Yeah. I mean, like, I've calmed down quite a lot. When I first came here, I was like all over the fucking place, like, do you know what I mean. I can sit still a bit, like. So I suppose I have changed a little bit, yeah, I supposed I have changed a bit, yeah.

Q: But not who you are, but –

A: But not who I am, no, but like… Yeah.

Q: Okay, cool, right.

A: I mean, who you are is who you are, innit? That's [what I think 0:26:22] [laughs].

Q: Yeah, yeah, well, yeah. I suppose that's the thing. It's kind of like, you know, does – you know, maybe some people change, some people don't. Some things happen to people to change them, some things don't. But yeah.

A: I mean, it definitely – it changes your brain chemistry. We know that for a fact.

Q: Yeah, yeah, yeah, sure. But who you are as a person, who you consider yourself to be, that's -

A: Yeah, the core person who you are inside, I don't think that ever changes, do you know what I mean. You are what you are, innit, like, do you know what I mean. Like, your ego, innit, and all that, do you know what I mean, like your personality, I don't think that changes.

Q: Yeah, I can get behind that. Thank you so much for answering these questions. I'm just seeing if I've missed any of my little prompts. It's not like a script I stick to, you know, kind of, but just making sure I got everything in there. Hmm… Okay.

A: Have you heard of like the heroin assisted treatment?

Q: Yes, I have, yeah.

A: That's a good idea as well.

Q: There's a lot of evidence saying it's helped people.

A: I've spoke about it to quite a few people, and not everybody wants a substitute, 'cos like the thing with a substitute is – I'm on like a Subutex script, yeah, but when I do my Subutex, I don't feel like I've done any opiates. I don't get high off it. It just stops me feeling ill, yeah? Methadone, you can feel a little bit of something off it but it's not anywhere like what doing gear itself is, yeah? But like, some people want to stop doing like what I was doing, like the lifestyle, all the thieving and all the badness that's associated with it, but they don't want to stop doing the gear, do you know what I mean, and for them people, that's where that comes in, do you know what I mean? Because if you can give it to them like on the NHS or however it's going to be given to them, it's going to stop all the crime, innit? So they ain't going to have to go out, doing all the madness and whatnot, but they can still have their fix, do you know what I mean.

Q: And what's important for you? Is it the not doing it or is it the getting away from the lifestyle or the things that went with it?

A: It's the lifestyle, innit? It's the lifestyle, what you have to do, like your morality out the window and all that. You lose all your family, all your friends. You lose everything. And yeah, and not only that, it's like the injuries like from injecting in dirty places, do you know what I mean,

dirty drugs, man. Have you seen the shit they put in some of that – in some those fucking – what they mix with heroin, like rat poison and fucking all sorts of shit, innit, do you know what I mean. But there ain't none of that in Diamorphine. It's made up of pure – do you know what I mean, it's just a lot safer, it's a lot, lot safer, and it's going to save the government a fortune.

Q: Sure, sure.

A: You think how much it must cost, you know. If I go out on a shoplifting spree, yeah, I could cause thousands and thousands of pounds' worth of damage to things, and not to mention like actual theft itself, and they've got to take me to court. I haven't got an address or anywhere to go, so they're going to send me to fucking prison, so they're going to send me to prison for like six to twelve months for like, you know, a few hundred quid's worth of – astronomical figures of money, like, do you know what I mean, when they could just give me – do you know what I mean. It makes sense to me anyway.

[0:30:30]

Q: But also – there's that cost to society, but also, you know, you mentioned the cost to you. You do those things, but who you are as a person hasn't changed. You don't want to be doing those things.

A: It doesn't sit right with you, like, do you know what I mean? It does chip away at you.

Q: How do you mean chip away?

A: Do you know what I mean, you know, so like the first couple of times, I'd do things and I'd feel bad about it, do you know what I mean. I'd feel like, ah, fucking hell, but then I'd do my [itch 0:30:56] and I'd think, well, [inaudible 0:30:59], do you know what I mean [laughs], do what I've got to do, ain't I, know what I mean. And then I just – do you know what I mean, it does chip away at you, like, do you know what I mean. And then you're flat out at it and you ain't even thinking about it, you're just doing it, 'cos, do you know what I mean, you kind of like don't care about it. All's you care about's your next – do you know what I mean?

Q: But even though it did chip away at you, it was still the reason why you wanted to seek help.

A: Yeah, yeah, 'cos I didn't really – like I said, my inside person who I am has never really changed, and that shit don't sit right with me. At the end of the day really, if I'm not doing – if I'm not doing them drugs, I'm not a bad person.

Q: Got you.

519

520 A: Do you know what I mean?

521

522 Q: Yeah. Okay, I'm going to just end it there.

523

524 [End of recording 0:31:43]

Emergent themes	Superordinate themes
Emergent theme 1 - Poor quality childhood Usage at young age - trauma Chaotic and unsafe childhood. Further trauma in later childhood. Poor parenting Did not adapt to institutionalised care	**Superordinate theme: Psychological consequences of trauma inhibits change** Emergent theme 1 - Poor quality childhood Emergent theme 9 – Patient describes self as having low self-esteem which is unchanging over time Emergent theme 17 – Change is inhibited by avoidance of negative internal experiences
Emergent theme 17 – Change is inhibited by avoidance of negative internal experiences First usage numbed negative affect. Heroin numbed negative affect Avoiding withdrawal is a motivating factor in maintaining use Substitution therapy is a medication for withdrawal, not a means of achieving a high. Avoidance of withdrawal motivation for illegal and immoral activities to secure funds	**Onset of OUD insidious and peer facilitated** Emergent theme 2 – Immediate onset of addiction Emergent theme 3 – Peer use facilitates usage Emergent theme 4 – Insidious onset of OUD
Emergent theme 2 – Immediate onset of addiction After first usage, immediately wanted another dose immediately addictive	**Rejection of addiction lifestyle motivates change** Emergent theme 5 – Illegal behaviour necessary to fund addiction Emergent theme 6- Illegal behaviour linked to guilt and shame Emergent theme 7 – Guilt and shame maintains usage Emergent theme 8 – Rejection of lifestyle not drug motivates change Emergent theme 18 – Prison first POE
Emergent theme 3 – Peer use facilitates usage Introduced by peers to heroin Peer group responsive to drug use peer group encouraged drug use	**Personal harms facilitate periods of abstinence but not lasting change** Emergent theme 11 – Multiple periods of abstinence does not facilitate long term change Emergent theme 10 – Acceptance of social and physical health costs of addiction
Emergent theme 4 – Insidious onset of OUD Did not like first usage - sickness Sporadic usage at first Tolerance builds insidiously loss of functioning is insidious also Addiction is perceived as being insidious and take repeated use over time Period from no craving to 'feeling' addicted gets shorter over time. Sickness in initial use, but clears up as use develops. Does not reoccur with periods of cessation.	**Substance use disorder treatment service offers multiple options for support, but is difficult to access on a regular basis due to location** Emergent theme 14 – Substance use disorder treatment service offers more options for support Emergent theme 15 – Substance use disorder treatment service supportive environment Emergent theme 16 - Substance use disorder treatment service attendance facilitates change Emergent theme 12 – Occupation important in recovery Emergent theme 13 – Pharmacy easier to access for needle exchange services (than substance use disorder treatment service)
Emergent theme 5 – Illegal behaviour necessary to fund addiction Funding heroin immediately difficult As use progressed need increases and legitimate income not sufficient	**Psychological inflexibility** Emergent theme 12 – Occupation important in recovery
Emergent theme 6- Illegal behaviour linked to guilt and shame Explains behaviour as consequence of OUD	

Believes behaviour incongruent with self as 'good'. Behaviour attributed to need to pay for heroin. Believes behaviour incongruent with self as 'good'. behaviour is clearly stated as being against values Behaviour attributed to need to pay for heroin. Drug use associated with behaviour which is not in keeping with idea of self. Non addicts do not understand why addict behaves in the way they do **Emergent theme 7 – Guilt and shame maintains usage** Shame, guilt and social consequences of behaviours maintain usage Craving supersedes morals Shame and guilt become easier to tolerate over time **Emergent theme 8 – Rejection of lifestyle motivates change** Patient describes addicts as wanting to be rid of lifestyle, but not rid of effects of drug. Rejection of egodystonic lifestyle primary motive for abstention. Shame and guilt motivates change and attempt to end usage Patient did not want to continue behaving in an illegal / immoral way lifestyle 'chips away' at you Patient considers self a better person when not using Social consequences motivator for abstention/reduced usage Unable to stop using despite desire to **Emergent theme 17 – Continued safe usage is preferred outcome for patient** Anger with drug producers/dealers re: contamination of heroin Prescription heroin seen as a safer choice and economically sensible Patient is advocate of safe injecting rooms Patient believes HAT to be a positive thing. The economic cost of addiction related crime is seen as a way of legitimising prescription heroin. Imprisoning addicts seen as economically unsound. Heroin on prescription seen as ideal solution Heroin on prescription seen as allowing addicts to get high, but avoid negative social consequences - this is preferable to substitution therapy. **Emergent theme 9 – Patient describes self as having low self esteem which is unchanging over time** Patient sees personality as unchanging over time. Patient sees self as unchanging. Describe self as having low self esteem describes self as negative	

describes self as asocial Self remains unchanged from patients perspective. Self seen as unchanging 'core' of self seen as unchanging. 'core' moral values unchanged over usage despite behaviour. **Emergent theme 10 – Acceptance of social and physical health costs of addiction** Addiction leads to loss of functioning - job loss Readily accepting health problems related to OUD Numerous health problems from OUD, near fatal overdose multiple times Great psychological and psychosocial costs to OUD Aesthetic and health consequences of use. Awareness of health risks does not modulate usage Social harm does not modulate use Consequences of use - health and social - do not modulate usage. Intellectual knowledge is not effective in modulating usage Drug described as more powerful than knowledge of dangers psychological consequences are insidious and prolong over time **Emergent theme 11 – Multiple periods of abstinence does not facilitate long term change** Periods of involuntary cessation does not diminish craving when heroin becomes available multiple attempts to stop usage Patient motivated to continue attempts to quit usage despite failures 25 year usage history Tolerance depletes when usage interrupted. **Emergent theme 18 – Prison first POE** Opioid detoxification program in prison service - actually called CARAT Support begins after arrest prior to incarceration Prison service facilitated ongoing support after release **Emergent theme 12 – Occupation important in recovery** replacement occupations important in addition to substitute therapy peer support in harm reduction as occupational activity activity is perceived as making a difference by increasing risk awareness in users that activity is useful to others important to patient occupation protects from relapse, which is associated with introspection lack of occupation leads to introspection which leads to relapse	

needle exchange use predates substitution therapy Inclusion in the substance use disorder treatment service important. validatory. Being helpful is important, also validatory. **Emergent theme 13 – Pharmacy easier to access for needle exchange services (than substance use disorder treatment service)** pharmacy use predates substitution therapy Substance use disorder treatment service is hard to get to pharmacies easier to access than substance use disorder treatment service Visits to pharmacy fits in with addicts daily routine Substance use disorder treatment service expects drug users to know how to use equipment available, pharmacy demonstrates Visiting a substance use disorder treatment service is inconvenient to the drug user Pharmacies appeal to people who do not want interpersonal support **Emergent theme 14 – Substance use disorder treatment service offers more options for support** limited choice of drug paraphernalia at pharmacy's Pharmacies operate a needle exchange, where as substance use disorder treatment service needle exchange doesn't actually involve any exchange. Users can take away as much equipment as they need. Choice of equipment is extensive at substance use disorder treatment services compared to pharmacy Equipment includes acids to prepare heroin for injection. Wider range of equipment and unlimited supply at substance use disorder treatment service versus pharmacy different size needles available for different injecting sites **Emergent theme 15 – Substance use disorder treatment service supportive environment** No interpersonal aspect to pharmacy, drug centre offers support Patient has limited social contact, substance use disorder treatment service provides this Emotional support offered at substance use disorder treatment service lack of emotional support at pharmacy (impersonal) in contrast with substance use disorder treatment service Emotional support is proactive at substance use disorder treatment service nursing support available at substance use disorder treatment service patterns of use - favoured injecting sites - known Substance use disorder treatment service staff proactively monitor risk based on injection habits Substance use disorder treatment service is a safe place. long term attendance. Familiarity with staff.	

Emergent theme 16 - Substance use disorder treatment service attendance facilitates change Did not aim for abstention when attending substance use disorder treatment service initially, but substance use disorder treatment service attendance inspired goal of abstinence Abstention long term process, idea of abstention came from substance use disorder treatment service attendance. 'Dry house' - entry facilitated by substance use disorder treatment service attendance Substitution therapy entered in to following substance use disorder treatment service attendance. Substance use disorder treatment service attendance facilitates questioning of habits and opens up option of abstention. Described self as emotionally labile when attending substance use disorder treatment service at first. patient regards self as being more emotionally stable following substance use disorder treatment service attendance. Patient's aims are to progress from substitutes to no usage gradual weaning off substitute	

Title: **BDPPHD3**

Interviewee/s:

Interview Date:

Interviewer:

Transcriber note:

Q: Okay, so could you – you know just give me a brief history then of when you started using heroin?

A: Yeah, I got into it in the early '90s, I was massively involved in the early like acid house rave scene, that just went throughout the whole '90s, and beyond as well. But, by about 1996 a lot of the people I was hanging around with, which were a lot older lads than me, they were smoking heroin. They started smoking heroin to come down off of the party drugs, I looked up to them, and started doing the same, and probably within about six weeks of trying it, I was injecting, yeah and it just – it just went on then for years and years like, just living as a full on heroin addict basically, that's all my life was functioning for.

Q: So, it was from going out taking, you know, uppers?

A: Yeah.

Q: And wanting to come down after that?

A: Yeah, yeah, and it worked, it worked for a period, but then I ended up with a habit. I got myself on the methadone scripts and that, I stayed alright for a little bit in periods, and then it would always end up slipping up and then slipping up again. And it would just sort of gradually progress back to where you were kind of just using on top of the methadone that I was on, yeah and it's, you know, it's over two decades of like sort of chaos really like.

Q: Right yes, so it's sort of been two decades that you've been – but you say off and on, so there have been some times?

A: Yeah.

Q: In that time, since you started using, would you say you've had any kind of long term health problems from it?

A: I contacted Hepatitis C from injecting, I've been through treatment and cleared it, but yeah that was a massive thing, and it's affected my mental health, you know? I suffer from depression a lot, and anxiety and stuff like that, which has probably got a lot to do with that, probably and other things as well, but it definitely affected my mental health as well, 'cos whatever it does to the chemicals in the brain. So yeah it has definitely you know, and then the Hepatitis C [inaudible 00:02:30] obviously, but I left that for years, but I got, you know, treated not long ago for it, and now I'm completely clear of it so.

Q: Okay, so what about kind of like short term stuff, like you know, does taking the drug make you feel sick or panicky?

A: It's almost like a release, like when I – if I use now, like it stems out of boredom and that boredom goes into thinking what would I usually do with a void, and the first thing I can think of, is to not feel uncomfortable, feeling like that, is to go and use, and it kind of you know, it numbs it. But I can't seem to control it, and now I feel in my head I can control it, but it creeps up, and I notice then sometimes like I've used everyday for like a week, you know? And that's when you're like you know – it obviously gets you down that like, 'cos I'm not scripted now, I came off [inaudible 00:03:36], I was on Subutex until November, so I've got to be really aware that you know – you can't get a habit back in that way sort of thing, but yeah I do struggle, I do struggle with it.

Q: Okay, so before you, you know, you tried any heroin, how would you describe yourself as a person? What were you like?

A: Bubbly, bubbly like I was always gotta be out with me mates. I'm still like that now, but like, you know, you sort of maybe with a bit with age as well, as you get a bit older like, you know, sort of you change, other people change and that. But I was a lot more outgoing, you know? A lot more sort of – yeah, I had lot more sort of confidence about myself, I think.

Q: So that's changed?

A: Yeah, yeah, like progressively over the years, as I've got older I've kind of got more aware, self aware like, you know, you don't want to be like that, you don't – you know, you don't want to be addicted to anything like really, but yeah.

Q: So, do you think that, you know, who you are as a person, do you think heroin has changed that? Or do you think you're pretty much the same person as you were?

A: I think I'm pretty much the same person, it's probably changed a lot of my thoughts or beliefs, self belief and stuff like that. Yeah, so I would say it's bound to have changed, it's bound to have done something, as well as other drugs that I've taken and that, but yeah, I'm sure of it, I'm sure. I'd be shocked if it hadn't [laughs].

Q: Okay, and those changes, are they for the better of the worse?

A: For the worse.

Q: Okay, okay.

A: Yeah definitely for the worse.

Q: Has anyone else, friends, family ever commented on a change in you after you started taking heroin? Do you think?

A: Yeah, yeah, I've had my mum and my dad, friends of mine over the years, yeah, I've had a lot of people that it's caused problems for them. Especially my dad, it really caused problems for him at one point. It's caused problems, I've got daughters as well, so yeah, it's had like a big big ripple effect.

Q: How did those people say that you'd changed?

A: That I was selfish, that I'd become selfish, very self centred obviously because everything was focused on heroin, so yeah, it was a horrible way, a horrible way to be.

Q: Yeah, okay. During that – you know when people have said those things, did you think you were selfish or did you think that you weren't selfish, but you were acting in a – you know, doing things that you didn't want to do? How would you describe it?

A: When – in the last ten years I've realised like it's been more about selfishness, and not thinking about other people first. But throughout like my twenties, and maybe like the early part of my thirties, I just thought that that's just who I was like, and kind of didn't think that – I didn't know how to change it, you know? So, I didn't sort of – yeah, I didn't have the right skills.

Q: But you don't think that's who you are now?

A: Like no, no.

Q: Okay, good, good. Ad would you describe yourself as an addict?

A: Yeah.

Q: Okay, and what does it mean to you, to be addicted to something, to be an addict? What does it mean?

A: It's not being able to be comfortable being yourself, you know? And it stems from deep rooted pain that could go back from anything, you know? But I think it's from my childhood sort of thing, things, you know, that I witnessed and that. Yeah so, I think I just self medicated, and it just became an addiction, you know, spiralled from there really so –

Q: But you know, you came here.

A: Yeah.

Q: What this the first place you came to for help with heroin use, or did you go somewhere else?

A: The first place I went to was my GP, first ever time, and I got prescribed methadone, but then they put me onto a shared care worker, which is from BDP, that I then saw every two weeks at my surgery, who did the prescribing part. And the doctor obviously who just signed the script sort of thing, but yeah, mainly it's been BDP that have helped, like.

Q: What made you go see the GP in the first place?

A: I wanted to sort myself out, I wanted to see what it was like to not wake up and feel like you needed to go and, you know, try and get money to live that lifestyle, yeah.

Q: Were there things in particular about that lifestyle that you wanted to get rid of the most, or things you wanted to change the most?

A: I didn't like who I was, I didn't like who I was. I didn't feel like it was me like at all. I was looking at other people, seeing them moving on like, you know, and like you're still sort of kind of stuck. Yeah that's had quite an effect I think, 'cos I still see it now like, you know?

Q: You've come here to use the needle exchange before?

A: Yeah.

Q: Why would you – I mean have you been to a pharmacy and used the needle exchange?

A: Yeah.

Q: Which do you prefer?

A: Here.

Q: And why is that? What is it about here that's better than a pharmacy?

A: I don't feel as judged.

Q: Right okay.

A: I don't feel as judged. Yeah just like, yeah, it's different, different kind of atmosphere like, you know? Yeah, I just think it's got a different sort of feel to it, I think.

[00:09:56]

Q: Okay, so less judgement, you don't get that then, okay. And when you – you know, when you come here, do you feel like you're seeking help, or is it different? What do you come here for?

A: It's part seeking help, and like sometimes you just sort of like just feel you've got nothing to do for a bit, and it's like – especially through the winter months like if it's cold and that, sort of the staff know me, so I'll just pop in and have a coffee and a chat sort of thing, you know? But that helps in itself I spose, 'cos you're sort of offloading stuff, so –

Q: So is it important that you come here and –

A: Yeah, yeah definitely yeah.

Q: And on like a kind of – you know said earlier, you know, being addicted. Each day, what kind of things help you cope with that? I mean you said coming here, that must be one of them.

A: Yeah.

Q: What kind of things would you say are things that help you?

A: Knowing – like as long - if I've got a purpose, like if it was something to do, then I can focus on that [coughs]. Yeah, it's on the days when I haven't got a lot on that I seem to struggle the

most sort of thing.

Q: Right.

A: Sort of more aware of like, you know, sort of surroundings and that, like. Yeah, it can be difficult, it can be difficult.

Q: So, having something to do, something to fill your time with?

A: Yeah.

Q: Okay, and now, you know sort of – do you – since coming here, how long have you been coming here by the way?

A: About nearly twenty years [laughs] like, yeah.

Q: And in that time, you know, do you feel like, you know, it's changed, you know – those things you were saying about how you feel about yourself, about you know, how you kind of cope each day, about things that change?

A: Yeah it has, yeah, sometimes I go through good periods and then, you know, I can go through sort of real dips as well so. But yeah, it's definitely sort of, yeah, that's had an effect on that, on, you know, changing and stuff.

Q: That's great, thank you so much, that's, you know, kind of – actually no, I want to ask one more thing. When you come here, and you've got the people to talk to you, what have you, and you're supported, do you feel like that carries on after you leave? Or does it get harder when you leave?

A: It can get harder I think for me, when I leave like, 'cos I'm left with my own thoughts.

Q: Right.

A: Yeah, so unless I know I've got somewhere to be, or something to do, I'll struggle, I do tend to struggle.

Q: Right, so keeping that going outside of here is hard?

A: Yeah, yeah.

Q: Okay, that's great, thank you so much.

A: No worries.

[END OF RECORDING – 00:13:02]

Emergent themes	Superordinate themes
Emergent theme 1: Heroin use as medication for acute withdrawal of CNS stimulants Introduced to heroin via rave scene Smoking heroin part of rave culture in 90s **Emergent theme 2: Peer pressure facilitates initial usage** Peer pressure, acceptance of older people led to smoking heroin to medicate comedowns Heroin effective at treating comedowns **Emergent theme 4: Substitution therapy facilitates periods of abstinence, but not long term change** Methadone scripts helped periods of abstinence from heroin Multiple attempts at abstinence using substitution therapy Relapse would leave to heroin plus methadone usage No longer on substitute Struggles with usage in absence of substitute **Emergent theme 5: Addiction progression is insidious** "two decades of chaos" increased usage is insidious Rapid transition from smoking to injecting heroin **Emergent theme 6: Physical health problems have psychological consequences** Contracted Hep C from injecting. Major impact on health. Hep C treated but associated with psychological problems - depression and anxiety Hep C has ben successfully treated **Emergent theme 7: Avoidance of internal experiences motivates usage** Boredom motivator for use 'Filling the void' occupation important in mental wellbeing lack of occupation associated with poorer mental health Lack of occupation associated with awareness of external problems and subsequent distress Occupation associated with better mood and functioning Lack of occupation associated with poorer mood **Emergent theme 8: Low distress tolerance** Using numbs uncomfortable emotional states Heroin usage seen as worsening mental health due to neurochemical effects Leaving substance use disorder treatment service associated with depressive rumination Being aware of surroundings associated with distress Addiction is being uncomfortable psychologically	**OUD onset peer facilitated and insidious in progression** Emergent theme 2: Peer pressure facilitates initial usage Emergent theme 5: Addiction progression is insidious **Heroin as means of avoiding internal experiences facilitates continued usage as distressing internal experiences increase** Emergent theme 16: Early trauma predisposes person to heroin use Emergent theme 1: Heroin use as medication for acute withdrawal of CNS stimulants Emergent theme 6: Physical health problems have psychological consequences Emergent theme 7: Avoidance of internal experiences motivates usage Emergent theme 8: Low distress tolerance Emergent theme 10: Longer term usage associated with worsening psychological health Emergent theme 11: Multiple negative Interpersonal consequences of addiction poor motivator of change **Rejection of addiction lifestyle motivates change** Emergent theme 12: Rejection of egodystonic lifestyle motivates change **Primary care facilitates periods of abstinence but not long term change** Emergent theme 4: Substitution therapy facilitates periods of abstinence, but not long term change Emergent theme 15: Primary care as first point of access **Addiction attribution as internal, stable, global** Emergent theme 17: Heroin not seen to have addiction potential different to other substances or activities Emergent theme 9: Self seen as unchanging Emergent theme 4: Substitution therapy facilitates periods of abstinence, but not long term change **Substance use disorder treatment service seen as safe, stable, supportive environment** Emergent theme 13: Substance use disorder treatment service safe, stable space which facilitates change Emergent theme 14: Fear of judgment inhibits using pharmacies (as opposed to substance use disorder treatment service)

Emergent theme 9: Self seen as unchanging Self described as upbeat and social, unchanging over time Changes in personality related to age not use of heroin More outgoing and confident when younger Self awareness increases with age **Emergent theme 10: Longer term usage associated with worsening psychological health** thoughts and beliefs changed due to heroin use - but 'self' unchanged Self-beliefs have changed due to heroin use seems obvious that heroin use has changed beliefs re: self Heroin has changed beliefs about self for the worst Heroin has changed beliefs about self for the worst Increased use associated with low mood **Emergent theme 11: Multiple negative Interpersonal consequences of addiction poor motivator of change** Relationship with parents damaged due to heroin use Relationship with dad has been especially damaged due to heroin use Heroin use has negatively impacted on daughters to some extent Heroin use associated with selfish behaviour **Emergent theme 12: Rejection of egodystonic lifestyle motivates change** Patient focussed on obtaining heroin being addicted 'horrible way to be' Has taken time to accept selfishness of addiction related behaviours Used to think selfishness was unchangeable aspect of self, now thinks differently Did not have skills to change when younger Does not define self as selfish addict anymore Rejection of lifestyle motivator for help seeking Behaviours incongruent with self image. Disparity caused distress. Addiction caused arrest in progress towards goals Seeing self as being 'held back' by addiction emotionally powerful **Emergent theme 17: Heroin not seen to have addiction potential different to other substances or activities** Does not want to be addicted to anything (as opposed to heroin specifically) Defines self as addict **Emergent theme 13: Substance use disorder treatment service safe, stable space which facilitates change** Substance use disorder treatment service accessible at all times	

Substance use disorder treatment service a safe space to shelter from cold - no appointment needed Staff accessible for a chat which is valued aspect of substance use disorder treatment service It helps to offload things by talking to staff informal chat with staff important aspect of substance use disorder treatment service Long term (20 year) attendance at substance use disorder treatment service Good and bad periods of mental health and wellbeing Substance use disorder treatment service facilitates change **Emergent theme 14: Fear of judgment inhibits using pharmacies** Has used needle exchange at substance use disorder treatment service Has used needle exchange at pharmacy Prefer substance use disorder treatment service for needle exchange services Feels judged when visiting pharmacy needle exchange, does not at substance use disorder treatment service Does not feel as judged at substance use disorder treatment service compared to pharmacy. Less judgemental atmosphere at substance use disorder treatment service compared to pharmacy Substance use disorder treatment service seen as main driver for help **Emergent theme 15: Primary care as first point of access in conjunctions with substance use disorder treatment service** Sought help for addiction Went to GP for help with heroin addiction, prescribed methadone GP worked in collaboration with 3rd sector substance use disorder treatment service **Emergent theme 16: Early trauma predisposes person to heroin use** Addiction rooted in past trauma Witnessed traumatic events when younger Heroin use initially as medication for historical trauma	

Title: **BDPPHD4**

Interviewee/s:

Interview Date:

Interviewer:

Transcriber note:

Q: Okay, so could you give me a brief history of you know, your use of heroin, or any other opioid drugs and, you know, how you started, what happened?

A: Okay, well I used to be, I used to use [mobile phone ringing] –

Q: Sorry about that, please go on.

A: My first ever drug I ever took was speed, amphetamine, and I was probably about twelve, thirteen when I first started using, my older sister used to be my drug dealer, and her boyfriend, who is now her husband [laughs], they used to be my – where I'd go get my drugs, yeah, I had my first hit when I was thirteen with heroin for a come down off of three days up of speed, but come back from a rave, and I used to use Valium and weed to come down, and my sister's boyfriend at the time he told me, "I've got something better," and yes he gave me my first hit of heroin, and yeah, I never looked back, and that was when I was thirteen, and that was like thirty years ago this year. I'm now forty-three now.

Q: Right, and that first hit was that injecting or smoking?

A: Yes, injecting, yeah, and ever since, and I haven't stopped using since [laughs]. I kept on using speed and coming down and then gradually as the years have gone on the speed got dropped out and I just carried on using heroin, so and that's been that –

Q: So it came along to deal with the come down?

A: Yeah.

Q: But it lasted longer than these in the –

A: Yes.

Q: That gave you the come down in the first place.

A: Definitely, definitely, yeah. And do I regret using it that first time, yeah, definitely, because I'm still using now thirty years later and it's like, wow! And I always said to myself I'd never do that, never do that, never do that, but yeah I did and I ended up doing it, because I was a pretty good sportsman when I was younger and I got picked for Torquay Academy, and I went and played and my dad told me not to go and play this match, he goes, we had a cup match and I used to play for Exmouth Town Reserves Rugby Team, and two weeks before I was meant to join up with Torquay Academy I went and played a rugby match and got my knee twisted, and they had to cut into my knee, take out the cartilage, and then they sewed it back up and basically that was the end of my football career, and basically that's how I just started going onto drugs was like for the pain.

Q: Okay, yeah.

A: And then it went onto the harder stuff, the speed 'cos it kept me moving and that, and then it went onto the heroin.

Q: So it started with pain meds?

A: Yeah, pain meds, yeah, and then it went on from there, so I used to get cortisone injections, but then they stopped doing cortisone injections, and then I started going out and my knee wasn't fixing properly, and then yeah, as the come down for the speed, started using heroin, used – that's a good painkiller, started using it during the day, got a habit, got addicted to it, and thirty years down the line here I am [laughs].

Q: Right, and do you think, you know, you've had any kind of long term health problems because of the heroin or not?

A: The only problem that I had was hepatitis C, but I got rid of that with treatment, so and health wise, yeah, you don't, personal hygiene, personal stuff, you don't look after yourself at all, really, really, really don't, I've only just started to look after myself again over the last couple of months, if you'd have seen me like three weeks ago you know, yeah, I would have been a complete mess.

Q: What spurred you to do that then, just started looking after yourself more?

A: People, when I was going out and I'd sit down and beg and that, and people were just looking at me and walking past and I thought there's got to be something wrong here, usually I can make money begging and I wasn't making any money and then I just, I went to the toilets at the University Hospital and I just looked and I thought, wow, you haven't changed your clothes for three weeks, and I'm like, I've got to do something about that [laughs], so I did.

Q: Good, good.

A: I had to, I had to, I had to, and I had a beard and it was down, yeah, if you'd have seen me like a week ago I had a full grown beard [laughs].

Q: Did you feel better for doing that?

A: Yeah, oh a lot better, 100 percent better, million pounds better, yeah.

Q: Oh good, and in the short term, kind of like how often you use now, do you find that you get things like immediately after a hit, like feeling sick, or anything bad in the anxiety or –

A: Not anymore.

Q: You used to?

A: Used to, yeah, yeah, yeah. Probably say about, I don't know, probably about twenty years ago when I had been in the game for about ten years and I was using, I'd get a bit anxious about it and I'd think, oh, do I really want to do this and like, you know, and then it'd be, well you've got no choice mate, you have to do this, come on, make yourself, you've got no choice, you have to do it, and then yeah, but once I've had the hit it's usually okay.

Q: Right, okay [laughs], so the hit relieves that.

A: Yeah, it does, because I like taking drugs, I admit that, I like that, the drugs isn't the main thing for me, I don't know whether you've heard this, but I'm going to say it, I have a needle fixation.

Q: Okay.

A: That is my prime thing, the drugs is a bonus to me, my thing is the getting the water, getting the dish, putting the citric in, putting in the gear, getting the needle out, drawing out the water, and I've got a needle fixation, that's my addiction.

Q: Why do you think that is, and what is it about that that –

A: It's just a sense of relief that like when I go out in the morning and I make twenty quid say and I go and get a couple of bags, and then I'll go to – come here to BDP to get my clean pins, and that, and then all the way along I'll be like, oh, they've got some more like that in my

pocket [mobile phone ringing] –

Q: I apologise sorry.

A: It'll be more to the point of me actually getting that needle, that's my thing, and as soon as I've got, as soon as I've got the drugs in the pin and I've got the needle in the pin and I've got it in my arm, that's my relief, that is me relieved.

Q: So before you feel the heroin, it's that moment of putting it in?

A: Yeah, that is my relief, and then when I do put the drugs in and like I say it's a bonus, [laughs].

Q: Right, yes.

A: That's the way I look at it anyway [laughs].

Q: Okay, do you think that has anything to do with the cortisone injections when you were a kid?

A: Might well have done, might well have done, I haven't looked into it that way, but yeah, that is another possibility, yes.

Q: It's very interesting, it is interesting. Can you, like before you started using any drugs, before the knee and what have you, how would you have described yourself as a person, what kind of –

A: I was a sportsman, I was an athlete, I was good at everything, you gave me a sport to do, even if I hadn't played it, give me like an hour and I'll be able to play it, I was that – that was me, like you know, the only game I could never play was basketball, that's the only game I couldn't play, so any other sport I was tiptop, rugby, football, hockey, squash, tennis, badminton.

Q: What was it about you do you think that made you really like sports, or just wanted to do them?

A: I was a hyper kid, I was a really hyper kid and then my mum just signed me up for loads of sports activities with my first school and then when I started playing football and rugby for them and then I went off to big school and then it was like, yay, now we're playing big time, and it was just, yeah, just continued. And my dad was an athlete, his dad was an athlete, my mum's dad was an athlete, his dad was an athlete, and then they – my dad's side of the

family they all played football, my mum's side of the family they were all rugby and they all played rugby and they all played football [laughs], so yeah, it was kind of cool, and the school that I went to, Exmouth Community College was a big, big sports athletics, sports school, and they encouraged it, so yeah, and we had one of the best, we had – no, when I was at school we had the best rugby team in England and Wales, we had the best really. Miss them days, but hey-ho [both laugh].

Q: Yeah, and so I mean I can see, you sound really passionate about it, just thinking about it.

A: Yeah.

Q: Do you think that, you know, using heroin has changed that kind of – has changed you in any way?

A: Oh yeah, absolutely, 100 percent completely changed me.

Q: In what way would you say your personality has changed?

A: Well over the years, I used to be a happy go lucky, and I'd say hello to people and I'd be friends with people and I wouldn't really mind, I wouldn't really bother looking into them or anything like that, just face value, alright, and yeah, but I forgot the question [laughs].

[00:10:01]

Q: That's alright, no, I was asking, you know, if you feel like you want to change it, yeah, yeah.

A: Oh change that, yeah, my – yeah, and now sort of from then to now I – yeah, I don't – I used to smile all the time, I don't anymore, I used to be happy, I don't anymore, if I need a fix I can get a right horrible – but that's you just have to ignore that and let that go 'cos that's not me, it's the addiction [laughs]. But yeah, yeah, personality has definitely gone downhill really, I used to be really, really happy and rise above things and stuff, now if something happens and it's wrong it puts me down and I don't rise above it anymore, I can't push myself up anymore 'cos I've done it for so long. But there is the odd time where I do and I have to, but like yeah, but most of the time, yeah, it's pretty stressful [laughs].

Q: Okay, yeah, so has anybody else kind of, you know, you've noticed this about yourself, do you find that other people, friends or family have noticed?

A: Yes, yeah, a couple of friends have noticed, saying that I'm not happy and that I look a bit depressed and stuff like that, and well yeah, it's just the situation that I'm in, that's all, as soon

as the situation changes then I'll be nice, which hopefully touch wood next week the situation will change, hopefully I'll be moving into my own place next week.

Q: Oh cool, great.

A: Yeah, so I'm rather chuffed about that.

Q: Yeah, yeah, great. Can I ask, what does the term addicted mean to you, and would you use it to describe yourself?

A: Addicted, addicted to me is me personally, is someone that has to get up in the morning and go out and get something that they need to use, it could be coffee, could be chocolate, could be shopping, could be meeting a friend, it could be riding a bike, it could be using drugs, but if you have to get up in the morning and you have to go and do that then that is an addiction to me.

Q: Right, sure, and you describe yourself as?

A: I'd describe myself as a user, not an addict.

Q: Okay, and why do you use that term rather –

A: Because I am actively using at the moments, so like I'm a user, if I was in recovery I'd be a recovering addict, I am a user at the moment.

Q: And so you know, you're currently using but, you know, you've come here, and how long have you come here for?

A: Ooh, I've been in Bristol ten years now.

Q: And all that time you've come to BDP?

A: Yes, yeah, I've used BDP.

Q: Was – would you say like, you know, was BDP the first service you went to for kind of like help or support or whatever with your heroin use or was there somewhere else?

A: It would be EDP.

Q: EDP?

A: Yeah, that would be Exeter Drugs Project.

Q: Right, okay.

A: Which is now called Rise.

Q: Oh I've heard of them, yeah, okay.

A: Yes, okay, and but yeah, back in the day when I've first gotten to it it was we had an EDP which is Exeter Drugs Project, I think it was the [inaudible 00:13:25] but like – but it's called Rise now, but yeah, yeah, I used the Exeter Drugs Project when it was EDP, yeah.

Q: And why did you go, what motivated you to do that?

A: It was just sort of like going to see checkout what they've got, and see what we see, and someone mentioned about groups and stuff like that, so I went down and checked out EDP and, yeah.

Q: What was it about groups that made you think I want to see what that's about then?

A: It was like trying something different, instead of the same old, same old.

Q: Right, okay.

A: So I thought I'd try something different.

Q: So did you want to break the routine?

A: Yes, yeah, yeah.

Q: Right, okay, okay. And you've obviously you keep – you've come back?

A: Yes.

Q: What keeps you coming back, what is it about this place that –

A: It's the volunteers, the staff, they're just so helpful, you've got a question for them nine times out of ten if the person you're talking to can't answer it someone else can, and there's always two or three volunteers, there's volunteers on hand to ask, so yeah, and that they're thirty-four

years old this year, thirty-four years old, that's pretty good.

Q: Yeah, it is good, yeah.

A: And yeah, yeah, I just get on, I just – most of the staff I get on with, so yeah, and I – and it's peaceful place to come to, don't get any hassle, you can come here, sit down, have a chat, and that's it.

Q: Right, yeah.

A: And it's good, it's good.

Q: Cool, great, and have you been to – for needle exchange?

A: Hmm-hmm.

Q: And I know there's a needle exchange here, and also at pharmacies, do you use both or have you been to both or –

A: Yes, I've been to both, yes.

Q: And what do you prefer?

A: I prefer coming here, because when you go to a pharmacy or another Boots, or something like that, they only give you a certain amount in a pack, whereas like say my pack, say I went to like Boots or something, and I wanted to get a pack there'd be like four spoons, one complete sachet of citric, have I said spoons?

Q: Yeah, yeah, you did yeah, four spoons.

A: Four spoons, citric, ten one mls, some alcohol swabs and some filters, if you come here you can actually ask for what you want, that's going to last you, so then you didn't have to keep coming back every day, you can just get what you need for the week.

Q: Right, okay, and was there ever a time that you'd have preferred going to a pharmacy?

A: No.

Q: Can you think of any other reasons why a pharmacy would be better than here or there, or no advantages?

A: Yeah, if you're like say, say like go to school and you had to go out, but say I had to cross the road or something, then yeah I'd go and use the Boots up there, if I wasn't anywhere near here, but nine times out of ten if I can I get it here, yeah.

Q: Sure, okay, and would you say that, you know, when you went to Exeter Drugs Project and when you come here, would you have said, you know, that you're seeking help or is it different, does it not help your seeking, is it something else? How would you kind of explain why you're going?

A: Advice and support, yeah, yeah.

Q: Advice and support, great. And yeah, on a – you mentioned you know, sort of how it's stressful, right, you know, kind of day to day basis, what kind of things do you find that help, what helps you cope, what do you do that kind of helps you?

A: Drinking tea [both laugh].

Q: Cool, yeah.

A: I'll put that into a bit of better perspective, if I'm ever stressed I will go to like Greggs or McDonald's or whatever, I'll have a cup of tea and I'll – say I'll go to Greggs, I'll grab a cup of tea and I'll grab a sausage roll and I'll sit down and I'll just sit there and I'll just think about why I'm stressed, and I just eat my food and then ten minutes later go, and you know, carry on with my day, but if I don't do that, and I just carry on with it, then I'll be stressed all day because I'll be continually thinking about it, so I have to stop for ten minutes, even if I haven't got a cup of tea or a sausage roll, I will stop for ten minutes and think well you can't do that, you've got to let that just go, and that's what I do now.

Q: Okay.

A: I just let it go, because if it doesn't affect my directly then it's not a problem.

Q: Sure, I get that, yeah, cool, yeah. And has, you know, since you, you know, you started using and started coming through, you know, the drugs project and seeking that support, have you found that the way you've coped has changed, or have you always been that way of having a sit down and –

A: Oh, for some really strange reason, I don't know why, but I have good coping mechanisms, so yeah, I've always been good at like coping with situations, which is quite cool, because not

everybody is.

Q: True, yeah, yeah.

A: But yeah, me personally I've always, yeah, I've been able to sort of – I've got out of some really sticky situations in my life [both laugh].

Q: Right, so good, glad to hear it, yeah, cool, okay, that's great. Thanks very much for answering all my questions, I've come to the end of everything I wanted to ask, I've certainly covered everything, so I'll stop that there.

[END OF RECORDING – 00:19:16]

Emergent themes	Super-ordinate themes
Does not identify as addict as currently using Describes self as a user - not an addict Patient is using heroin at the moment on a regular basis Term addict applies when in recovery, not when actively using **Addiction potential of heroin minimised by framing addiction as global concept** Addiction is the need on waking to obtain a certain substance Addiction seen as global concept, drugs are by chance the focus of an addiction Reiterates addiction is waking and experiencing a strong urge to obtain a certain substance or engage in a certain activity **Peaceful stability, familiarity, accessibility valued aspects of substance use disorder treatment service** Attended service for 10 years Attended the service for 10 years Has used other substance use disorder treatment services Have used other substance use disorder treatment services Exeter substance use disorder treatment service now called Rise First point of contact was Exeter drug project Exeter drug project now known as Rise Helpful and accessible staff valued Presence of volunteers valued Length of service valued Social contact with staff valued Peaceful and stable environment valued Advice and support is primary motivation for visiting substance use disorder treatment service **Substance use disorder treatment service needle exchange preferred to**	**Accessibility and peer usage facilitates initial use and development of OUD** Early life use facilitated by accessibility Use is insidious **Loss of aspirations in early years facilitates initial usage** Use motivated by sudden change in expectations for self **Chronic pain in early life motivates use** Usage motivated by analgesic properties of heroin Injection is fetishized **Self-perpetuating Ego dystonic addiction related behaviours dominate lifestyle** Heroin takes priority over existing drug usage Adverse health consequences of use minimised Addiction takes priority over self care Begging as a means of funding addiction Use of needle exchange part of daily routine Use of heroin incongruent with pre-existing values Use associated with negative change in psychology **Addition attribution as internal, stable, global** Does not identify as addict as currently using (identifies as 'user') Addiction potential of heroin minimised by framing addiction as global concept **Acceptance and awareness of problems motivates change** Introspection and awareness of coping capability motivates change

pharmacy, but used less Used both substance use disorder treatment service and pharmacy needle exchanges Restricted supply in pharmacy needle exchange Pharmacy supplies restricted equipment. Substance use disorder treatment service more generous Substance use disorder treatment service supply avoids need for daily visits which is seen as laborious Would use pharmacy only if it was significantly easier to in practical terms than to get to the substance use disorder treatment service **Curious desire for change motivator for change/help seeking** Heroin addiction lifestyle described as stressful. Living in temporary accommodation associated with low mood and low emotional resilience The thought of living in own home (as in not shared) lifts mood Patient visited substance use disorder treatment services to change routine Change of routine motivated visiting substance use disorder treatment services Enthusiastically agree to a change of routine being attractive prospect when visiting substance use disorder treatment service Curiosity motivated first visit to substance use disorder treatment services Curiosity and prospect of group therapy motivated visit to substance use disorder treatment service **Introspection and awareness of coping capability motivates change** Patient is currently introspective, reflective of problems Patient is able to identify negative cognitions and accept affect and/or successfully challenge cognitions thus reducing affect Patient practices and is good at acceptance	Curious desire for change motivator for change/help seeking **Substance use disorder treatment service as a safe and stable environment facilitates attendance** Peaceful stability, familiarity, accessibility valued aspects of substance use disorder treatment service **Pharmacy is easier to access geographically despite inferior service (in terms of needle exchange)** Substance use disorder treatment service needle exchange preferred to pharmacy, but used less

Patient performs a worry triage e.g. real life problem versus hypothetical worry. This works well for him. Patient recognises that he is good at coping with stressors Aware of coping skills as a strength Patient has been in some difficult situations in life and managed these Drinking tea helps manage stress Awareness of outward evidence of lack of self care motivates change **Early life use facilitated by accessibility** First drug usage preteen years Older sibling using drugs in childhood Easily accessibility to drugs in childhood Early use of heroin (13) to medicate comedown Introduced by extended family member First use was injection **Usage motivated by analgesic properties of heroin** drug use precipitated by pain (despite initial use being amphetamines associated with raving) Noticed that heroin was a good analgesic after medicating acute withdrawal from amphetamines Analgesic effects of heroin motivated further use **Use motivated by sudden change in expectations for self** Football career cut short by injury - client see's father as being to some degree responsible **Use is insidious** "I never looked back" 30 years usage Use is insidious. Time appears to pass quickly (lack of introspection?).	

Anticipatory anxiety to using heroin maintained for first decade of use (lack introspection) Framing usage as outside of control decreased anxiety Heroin effect reduced anxiety Enjoys using heroin **Injection is fetishized** Needle fixation is part of usage Preparing the heroin and administering is described as main source of satisfaction needle fixation as addiction Relief associated with assembling syringe for injection and administration of drug The administration is seen as being main source of relief, the effects are secondary Acknowledges experience of drug taking novel in drug using community Lack of introspection - did not link current needle fixation with medication injections as child **Use of heroin incongruent with pre-existing values** 'Always said to self I'd never do that' Athletic and interested in football when younger Early pre-drug self identity hinged on being a sportsman Enjoyed and confident in playing wide range of sports Describes self as hyperactive when younger Organised sports involvement from primary school age Remembers being excited about playing sports in comprehensive school Comes from a long line of sportsmen on both sides of family Proud of school's athletic credentials and being a part of that Fondly reminisces on school days	

Use associated with negative change in psychology Strongly believes that heroin has changed personality Described pre drug self as care free, low trait anxiety Describes pre drug self as social Loses concentration, forgets question quickly Mood is lower since using heroin Can be antisocial in behaviour, attributes this behaviour to symptoms of addiction Describes self as less emotionally resilient over usage time Self describes as lacking emotional resilience. Other notice depressed body language Short term memory difficulties apparent during interview **Heroin takes priority over existing drug usage** drug of choice focus changes from amphetamines to heroin Heroin displaced other drugs of use heroin followed amphetamine use **Adverse health consequences of use minimised** humorising pathology of addiction Hepatitis C as a result of use - treated successfully - humorised humorising pathology **Addiction takes priority over self care** Very little self care when using heroin reiterates how little self care one engages in when addicted to heroin only recently started to change behaviour re: self care. motivated to take care of self due to reactions from strangers	

Self care motivated by drop in income from begging. lack of self care, as with addiction in general, insidious in progression Surprised by how unkempt patient looked Humorising lack of self care Self care made a significant difference to mood **Begging as a means of funding addiction** Routinely makes £20 begging in city centre Begging prior to buying heroin part of daily routine **Use of needle exchange part of daily routine** Visiting substance use disorder treatment service for clean needle equipment part of daily routine May notice he has additional drug paraphernalia on his person during days events	

Title: **BDPPHD5**

Interviewee/s:

Interview Date:

Interviewer:

Transcriber note:

Q: Okay, so could you give me like a brief history of when you started to use heroin, is it heroin?

A: Yeah, basically I started at twenty-six, I'm forty-three now, and like I'm on a script and that, so basically like that's helping a bit, I have used the last month a couple of times, so but for some reason like I've been slipping a bit, but I'm trying to like sort myself out kind of.

Q: Sure, how long – so you started at twenty-six, have you been through periods where you've quit and then started, and quit or just –

A: I had a couple of like times I've stopped and obviously I've been in jail or something, I've been in a few like what do you call them, like hostels, like to stop using drugs, but I've lasted a couple of months and then like had a relapse and then got kicked out, so at the moment I'm just in a hostel where I ain't got no – like doing tests or anything so –

Q: Oh right, so you're just there and –

A: Yeah.

Q: Okay, and do you know like why you started using, what happened?

A: Yeah, I didn't think I would to be honest, but my friend was just doing it in his house and then I looked over and said, "Oh give me a bit," and then that was it, then like –

Q: Just wanted to know what it was –

A: Yeah, then I got back at his door the next day, like let's do that again, and then just carried on from there really, so –

Q: Right, okay, and do you think, you know, since you started using do you think you've had any kind of like health problems from it or not?

A: I've been kind of lucky really but I have had like kind of infections in my groin and that, I've had that three times, but that was like four years ago, so I've stopped going in my groin now

and it just goes in my arm or in my leg, like so like I've kind of missed like going down there.

Q: And that all treated and –

A: Yeah, I've still got like, I have a hole and like a little lump and that, but yeah, apart from that like it's not too bad, sometimes it throbs a bit, but doesn't – but yeah.

Q: Grand, and do you – you know when you have a hit now, or in the past, do you ever feel like – does it ever cause you any side effects, like being sick or feeling anxious or anything, or is it –

A: No, as I say I feel sick or anything, like now I don't really suffer from it, but I have had a couple of overdoses, like but that was like about ten years ago.

Q: Okay, so not for a long time then, yeah, okay.

A: But if I've been drinking, and like been like for days and took a couple of tablets and then obviously injected, like it's been like every time it's happened it's been like when I've been doing like that, but doing it by itself, haven't really been too bad.

Q: Okay, and would you kind of – before you started using, how would you have described yourself as a person, what kind of person were you?

A: I don't know as I started having kids at fifteen, I've got seven, so basically I was a drinker really more than, and like smoked cannabis and that, and then like, yeah, then I got to twenty-six and obviously started trying heroin and crack and that, and then I've just been like using, 'cos it's been like the last year I've been calming down a bit, I don't know if I've just had enough, 'cos like messing – like it's just like ruining my family, like my kids, seeing my kids and that, so I'm just tired of it now anyway, yeah.

Q: Right, okay, so the things that kind of, you know, I'll come back to what you just said about getting tired of it, but do you feel like since you've started using you've changed at all as a person, or like kind of like your, you know, the way you think has changed, or who you are, the way you act or anything as changed?

A: So since I stopped or –

Q: Since you started/

A: Oh, since I started. Hmm … I still took – I still think I'm the same person, but yeah, it's just because like if you're on like class As, like your life kind of just all revolves around that, so

you've got to like have money to like do that, so you can at least like, not off my family, but from shops or something like that, so like that I usually shoplift to fund my habit, that's what I've been doing, so like, that's what, yeah, that's how I have been doing it really.

Q: And you said now you kind of feel like you've had enough.

A: Yeah.

Q: What kind of things have you had enough of, what is it about the –

A: Like me not seeing my kids, like having nowhere to live, like just having no money, list goes on and on like, so like I'm forty-three now so it's about time I started thinking different really, like I don't want to be like this when I'm fifty, forty-five, fifty, so I've got to try and start making some changes, I'm on a DRR at the moment, so those groups and that. There's a leaflet upstairs to do courses and that, so I might try and do that as boredom as well, kind of I'm unemployed obviously, that's another thing is boredom, like and hanging around with the wrong people, that sort of, so I had my own place and I gave up my place so that's how bad I wanted to like start sorting myself out, but there's no point in me hanging about with the same people if I've given up my flat, like, so that's why I started all over again, like tried the rehab things, that didn't work out. So I've got arrested last year for supplying class As, I was just in my friend's – getting, scoring, in my friend's car and a person came to the passenger side and it was undercover so I handed the woman the thing not knowing that it was police, so I got housed five weeks, before this happened, and then I got arrested for it, remanded, lost my place, came out again, and now on the 28th December I've got a place given then, so like now I've got like somewhere to stay, but before that I was sofa surfing, and all that stuff like.

Q: So and those are the kind of things.

A: Yeah, you just lose everything, like you've gotten something nice, you sell it, like you know what I mean, just a vicious circle, but like I'm more doing it on payday now, like if I do do it, or like maybe if a friend got something I might do it then, but in the way of like going out like stealing for it, I've kind of knocked that on the head at the moment.

Q: Okay, the kind of like, that you mentioned the stealing, how did that make you feel, to do that?

A: I don't think I'm harming anyone, it's better than doing burglaries isn't it, or robbing someone.

Q: Yeah, it is [both laugh].

A: So I don't think it's bad, it's obviously not a good thing to do, but at the same time I'm not

harming anyone, fucking taking things from them, but I have, I have done every – mind saying that, like since I've been doing class As I've been mainly shoplifting, like when I was younger I had a little phase of just going doing everything, but like I think like shops ain't too bad like.

Q: Yeah.

A: I think a bit different burglaries now, like no, no, no.

Q: Yeah, sure.

A: Yeah.

Q: Okay, and when you, you know, coming here, how long have you come here for, when did you first –

A: I've been coming here for like maybe twenty years now, on and off, so I'm not – like 'cos I'm on a script now as well, I take Subutex to like obviously not get ill from not going down the heroin, but yeah, I've been coming here, I've been doing groups like on and off for twenty years, like I just pop in now and again too.

Q: Was this the first place you came to for kind of like any support or help or whatever?

A: Yeah.

Q: And why did you come here when you first came, what is it that made you come here?

A: I also, well I also did a couple of crimes and I was given a DRR, so that's a Drug Rehabilitation whatever it is, so I've had to do groups and that, so then obviously like I've done that about four times now, and like 'cos I know everyone there I just pops in anyway, like so that that's what I've done, just got my script and then came here to get a drink and then obviously I started with this and that.

Q: Yeah, and coming, do you – when you come here, do you see it as you're seeking help, or what is it that you're looking for when you come here, would you describe it that way or?

A: Yeah, like I've got a couple of staff who works, I get on better, that I'll pick out, so if I have got any problems there's a couple of staff that I'll go and see personally isn't it, but –

Q: What kind of problems would you come here with, would you say?

A: It could be to do with housing or just like form filling and that, I've had hep C, like I got rid of that about three years ago, so that's what I was waiting for, now I've done tests like two weeks ago so I came in here, well to be honest that was what I came in here for, was the test results.

[00:10:10]

Q: Yeah, yeah.

A: So but the times I have injected, I have been careful, there's times though that's – but at the same time that's why I'm still checking, like obviously if I've got it again and I'm going to have to get treatment again, but my treatment went over, like I cleared it and all that, so –

Q: Cool, good.

A: But yeah, it's just like, I don't know, looking after yourself.

Q: Yeah, and you know, have you used the needle exchange here?

A: Yeah, I've used it, because you could go to chemists, it ain't just there, so like because I've lived different areas, Bedminster, Fishponds, wherever, like sometimes it's easier just to go there, but instead of coming here, but if I – it's very rare I come here, because I'm usually like not close to wherever I'm using, so it's always been like I live St George isn't it, so if I was to get needles I'd most probably go up there. But –

Q: So it's just easier?

A: Yeah, like last Saturday I went there and they didn't have needles, only had one size, so obviously like that ain't appropriate size I needed, so but because I had no choice isn't it, so I suppose like they could do better, I reckon like they should like be more on top with things like that, because I got off the bus to go there as well, and to get back on the – like another bus, that went, when there was no like needles to exchange there.

Q: Yeah.

A: But I don't know whether, if that's to do with her, or to do with the chemist not on top of things, but so yeah.

Q: Yeah, and but so you know, the – are you – so the main reason you go to a chemist, just because it's easier because you're near there?

A: Yeah, unless I am down this way, like then I'll come here like.

Q: Okay, and kind of since you know, coming here, like you know, and you know, popping in here, do you feel like the way you cope every day is different, does it, you know, or is it –

A: Yes, I suffer from depression and anxiety and all that, so like that's what – with all my problems, because I've been using drugs flat out as obviously like, what's the right word, that was hard for me, like to cope, but now I'm just dabbling, like obviously everything's more like in my face, so like I find it, that's why I see my doctor a lot now, because I'm finding that hard to like cope with like everything what's going on, like family, kids, whatever it is, the general life, so yeah that's the situation I'm in at the moment.

Q: But are you getting help for that?

A: Yeah.

Q: Okay.

A: And then I just come out, again I've been in jail since fifteen to thirty-five, and then since thirty-five I might have been in once or twice, obviously I got nicked last year for that supply thing, which they'd done an operation, but like for the police to grab two – like users and try then nick you afterwards, so like they even got to the point anyway all they'd done is nicked the users and like the dealers were still out there, because obviously they've got runners isn't it, so if I was a dealer you could be my runner, so you ain't really got to the point anyway, like you know what I mean, so I thought it was an entrapment kind of thing in that sense. But yeah, I had that hanging over me, so like I'm on a two year suspended sentence, if I get in trouble in two years like I've got to go and do the time for that, so that's kind of like, that ain't what's stopping me from pinching, like what to do, I just do it, but like I don't – that's what I mean, so I've got that hanging over me now, so like I've got a –

Q: What do you think is stopping you from like going shoplifting and –

A: Well it is having enough of it, because like as long as you're doing this and this, like you're just going to have like nothing, like girlfriends and that, like 'cos it does make you like – I suppose like if you've got like £200 and then your missus knows you've got that but you've spent it all when you got back, what have you done, oh I've left it, lost it on the bus, I've left it in my friend's car, or I was riding a bike, and like so the lies just keep coming one after another and then at some point it fucking just like, it wears thin isn't it?

Q: If you find yourself lying, is that something you don't like do you not like it?

A: Yeah, I don't like it, but obviously like it could be like if my – if I use now and my mum asked I'd most probably have said I didn't, for the fact I don't want to hurt her, so it's not I don't want to do it intentionally, but I'm just doing it to like obviously make things a bit more, you know, so but I'm not intentionally a liar in that way, but like if I could make her situation better I think like I'd say that I suppose, because women are more, in my head a headache anyway, some are anyway.

Q: Yeah.

A: But yeah, so that's how it is right at the moment, but I have had, I don't know, it is tiring after a while like because more to life than this shit, like but it is like if you've got £300 now and you are – or have one smoke, and it ain't like that, it just – before you fucking never hit – like it's all gone like, and just tired of like being in that predicament now, like yeah.

Q: Sure, yeah.

A: You've got to kind of think what can I do, and what's the best way, so that's what I'm finding out now really, like yeah, but yeah, it's just like I'm just finding it, obviously 'cos I'm not using so much, it's just all the problems, like just seems like stacking up one after another like.

Q: Okay, thanks for answering all, you know, you've answered all my questions so thanks so much for that, I'm just going to stop this now.

[END OF RECORDING – 00:16:34]

Emergent themes	**Super-ordinate themes**
Substance use disorder treatment service helpful in managing health consequences of use Substance use disorder treatment service facilitates ongoing hepatitis testing Patient has recovered from Hepatitis C Patient careful about injecting since Hepatitis C infection Patient does not rule out having treatment for Hepatitis C - risk is not barrier to use Looking after yourself is part of substance use disorder treatment service ethos	**Substance use disorder treatment service valued for range of supportive, practical, and healthcare related services** Substance use disorder treatment service helpful in managing health consequences of use Values stability, safety, practical support and social contact as aspects of substance use disorder treatment service Overdose motivates safer use
More likely to use pharmacy needle exchange due to geographical ease despite comparatively limited service Needle exchange at pharmacies more convenient due to patient's peripatetic lifestyle Will use pharmacy even though equipment choice is limited Will sometimes go to effort to visit needle exchange at pharmacy to find the equipment he needs is not available Chemists do not prioritise heroin needle exchange services Proximity and ease of access more important that choice of equipment	**Lifestyle makes pharmacy more attractive than substance use disorder treatment service for needle exchange despite limited options** More likely to use pharmacy needle exchange due to geographical ease despite comparatively limited service **Poor distress tolerance obstacle to change** Psychological distress obstacle to change Occupation important in changing usage Evidence of trait impulsivity + risk taking **Rejection of lifestyle, not rejection of drug motivates change/help seeking** Immoral illegal actions are rationalised Despite prolonged use, will to change is present Legal consequences do not motivate change negative health consequences of usage do not motivate change
Values stability, safety, practical support and social contact as aspects of substance use disorder treatment service Sporadic substance use disorder treatment service attendance over 20 years Has had sporadic engagement in groups over 20 years Visits substance use disorder treatment service purely informal social interaction Values relationship with staff at substance use disorder treatment service Favour certain staff members for advice Staff help with practical 'life admin' tasks	**OUD onset insidious and treatment resistant** Onset of OUD is insidious Heroin takes priority over other needs Substitution therapy associated with abstinence but not longer term change

Psychological distress obstacle to change Depression and anxiety comorbid with OUD Increased drug use associated with worse depression and anxiety General stress associated with increased use General stress associated with increased use Stressful life events present obstacle to change **Occupation important in changing usage** Courses appealing in alleviating boredom Occupation associated with reduced usage **Onset of OUD is insidious** Immediately wanted more of the drug after initial usage Addiction lifestyle change from pre drug usage described as instantaneous Life revolves around the drug **Heroin takes priority over other needs** The addiction takes priority over enjoyment of ownership Heroin use means losing everything Has spent time sofa surfing as part of lifestyle A vicious circle of selling items to buy heroin **Legal consequences do not motivate change** Patient on court ordered drug rehabilitation Arrested for supply Caught by undercover police 5 week sentence Arrest cost patient his housing Council has supplied housing following arrest and sentencing	Periods of abstinence does not motivate change **Peer usage obstacle to change** Use facilitated and maintained by peer usage

Patient put on DRR as a result of criminal convictions DRR includes group work Has been on DRR on 4 occasions in jail in and out from age 15 to age 35 Patient thinks police efforts to arrest users is ineffective, dealers should be targeted Patient regards his recent arrest as entrapment by the police Threat of imprisonment is not an effective deterrent to stealing suspended sentence described as 'hanging over me' **Overdose motivates safer use** Couple of previous overdoses, most recent a decade ago, usage has become safer in this time Polydrug use increases risk of overdose Has reduced polydrug use in last 10 years **Use facilitated and maintained by peer usage** Peer usage facilitated initial usage Using for 17 years Peer usage obstacle to change **Evidence of trait impulsivity + risk taking** Became a father at a young age (15) – has 7 children Used alcohol and cannabis when younger Started using cracked cocaine in early - mid twenties Has engaged in other crimes when younger **Substitution therapy associated with abstinence but not longer term change** Substitution therapy facilitated more behavioural and social involvement in substance use disorder treatment service program	

Substitution therapy helps reduce usage but short of abstaining Patient not sure why usage persists despite substitution therapy Is using despite being on subutex **Periods of abstinence does not motivate change** Has had periods of abstinence, including due to incarceration Has attempted dry housing on multiple attempts Rehabilitation did not work for patient **negative health consequences of usage to not motivate change** Considers self-lucky only to have cellulitis (or the like) in groin from injecting Misses using groin as injection site, now uses arms and legs Some scarring from infections Some pain at past infection sites Does not feel sick or describe self as suffering as a result of usage **Rejection of lifestyle motivates change/help seeking** Rejection of lifestyle has motivated change in usage Money needed for daily heroin supply Shoplifts to fund heroin addiction Shoplifting is how addiction is maintained Agreed to having enough of lifestyle related to usage Patient rejects not seeing his children Patient rejects being homeless Patient rejects having no money Many aspects of lifestyle patient rejects Patient does not want to use heroin when older Age as identity is a motivator to change	

Patient has stopped stealing Patient prioritised changing over having own home Patient going to quite extreme lengths to change social group to facilitate change Now uses less, and does so with own money Will use if a friend has heroin Now in a hostel, not a dry house Has reduced usage in past year Rejection of lifestyle inhibits stealing and motivates change Lifestyle makes romantic relationships difficult Lying is a part of the lifestyle - and this takes an emotional toll on the addict Lies to spare others feelings. Does not want to lie. Does not see lying about addiction as within his control, a necessity Sees lying about use necessary to protect loved ones Rejection of lifestyle Patient wishes to be able to hold on to money, heroin use makes this impossible Rejection of precariousness of lifestyle **Immoral illegal actions are rationalised** Shoplifting seen as victimless crime Possibility of worse crimes used to legitimise shop lifting Shoplifting seen as morally neutral Shoplifting morally neutral Patient keen to moralise shoplifting as his main method of funding addiction Considers burglaries to be morally unacceptable **Despite prolonged use, will to change is present** Self as unchanged through use	

Patient thinking about how to change and overcome addiction, this is presented as a problem to solve	

Title: **BDPPHD6**

Interviewee/s:

Interview Date:

Interviewer:

Transcriber note:

Q: Okay, so could you – to start, could you give me like a brief history of when you first started using?

A: Right, then when – that was – I was sexually abused when I was a child, twice, and I kind of realised – I'm going to really make it quick, I don't want to drag it, drag my heels. I quickly realised when I was five years old, intelligently, my life is going to be very different from that day onwards, after the abuse, you know, the sexual abuse? The two times with both two different people, but I realised that the first time round, when it happened, my life had changed. When I got to school, I was okay, never bullied, nothing like that. Got into amateur boxing, but always knew when I was [inaudible 00:00:49] I'm an ex-amateur boxer, but always knew when I was chatting to people like – like yourself, I always knew I was different. This is where it all leads up to the drugs, then me brother – it's not – this has got nothing to do with me relapsing, but me and me brother – we're not twins, but we're both born on May the 2nd, but three years difference. My brother was murdered [a few years ago 0:01:10], in 1989, and that just completely sent me into meltdown, and yeah admittedly I did get on heroin, but I was a born an addict, not blaming anybody [bruv 0:01:21], it was in my DNA from day one, you know what I mean, yeah?

Q: So, you're saying you know, in your childhood, there were multiple traumas, then your brother passed away –

A: Yeah, whether I would have still become an addict, but all them traumas I think I possibly still would have.

Q: Right.

A: Yeah, you know, after forty-seven years of battling this, you must also know as well, I had eight years complete sobriety as well before.

Q: Okay.

A: Yeah, complete sobriety, and now I'm round about two years, I'm on a script

Q: Yeah

A: Just over two years of complete abstinence, so I've battled with addiction all me life.

Q: Yeah.

A: But I believe – I felt different as a child, not just the sexual abuse, I felt different, you know?

Q: In what way different, do you think?

A: I didn't relate to everyone, felt like, you know – didn't show it, you know, didn't act different, you know, just knew it, but the abuse kind of accelerated it, you know?

Q: Okay, and do you think – you know, how old were you when you first started using would you say?

A: I was – I got at about nineteen.

Q: Nineteen.

A: Yeah, stopped at twenty-three, the first time round, when I went to rehab.

Q: So, in the time that you have used, do you feel like it's caused you any health problems, that you wouldn't have had otherwise?

A: Oh, flipping hell yeah – cor yeah, my gosh yeah, you don't eat properly, you feel sick all the time, 'cos you're not eating. You feel – you don't feel fear, you feel terror, you feel terror throughout. Even when you've got smack, heroin, I'm not even joking, you could have a fucking gram there right, you're still worried about tomorrow –

Q: About where the heroin…

A: Yeah, it's terror yeah, if it runs out, constant feeling ill, yeah, yeah. It's a horrible life mate, that's why some of us get clean, you know what I mean?

Q: Yeah, yeah.

A: 'Cos in the two years, really quickly I've been clean, it's about two and a half year, but two years and three months, something like that, I've never had the desire to use.

Q: Great.

A: Just sick and tired of feeling sick and tired basically. Sorry carry on.

Q: Sure, and what about kind of you know, when you were using then, was there any short term stuff, like did you ever feel – was it only ever a good feeling from the hit, or was it ever kind of like panic or sickness or anything that went with it?

A: Sickness, just constant really, I sort of – yeah, no there's no really good times with heroin, it's only when you first start, and I should imagine you burnt out a lot of times and you have to believe it. It lasted about five days, if you use it when you first start, five days back to back, then it stops working and it never comes back, never comes back. Just constantly feeling ill basically, that's my experience.

Q: Okay.

A: 'Cos I've had – basically I've had two times on drugs, in the '90, cleaned up, and then cleaned up two and a half years ago, so I've only ever had the one relapse, which was, you know what I mean, a few years ago, yeah.

Q: And before you used, you know, before the age of nineteen, how would you describe yourself as a person? I mean you kind of already said that -

A: Bubbly, bubbly, you know, doing the bird thing, I was into boxing as well, bubbly, but so quickly and so at a young age, just the minute I was introduced to smack – boom, five days – hooked. That's how quick it was, yeah, yeah. You know, from a completely –, you know, even you forget about the abuse and all that stuff you know, and feeling different. No, the actual drug use come over night.

Q: Right.

A: Yeah, over night – I didn't see it coming, I wasn't using or nothing like that, I didn't see it coming, it was just bang smack, between four and five days, addicted, and then just battled my entire forty-seven years mate.

Q: And what was the situation when you did first try it, do you remember? When you remember – like you know, did someone offer it to you or?

A: Oh it was definitely peer pressure, basically a friend – I'm not going to mention – well he's

passed away now, God bless his soul. And he is – I don't care if he was an addict, he is a real true friend, right? It's up to me if I wanted to use, but there was this new thing on the street, called heroin, and everyone used to go upstairs into his room, only one at a time, and he'd introduce you, and that's exactly how it happened. We all went up, one at a time, over the course of about – probably about a month.

Q: Okay.

A: You know? And then we was all hooked, every one of us, yeah. So, it is peer pressure, a hundred percent it was for me yeah.

Q: And since you started using, do you feel like you've changed as a person, or are you still the same person?

A: Still the same, yeah, I didn't change no, I never become like a vile crook, and do burglaries, nothing like that, or muggings, no I stick to [inaudible 00:05:51]. I'm not going to go on about it, but I'm really religious, and I believe in karma. If I do you wrong, steal your phone or your wallet, I can expect something really bad to happen to me. I don't mean death or nothing like that, I mean loss, that something's coming back to get me – so and do, you know, what, that's true as well, karma, you have to really believe that.

Q: Sure.

A: Karma's very real mate, yeah.

Q: And do you feel that's protected you from doing things that maybe you wouldn't have wanted to do?

A: Yes, yeah absolutely yeah yeah. Karma's really real, yeah, I promise you it is [laughs].

Q: I can believe that, yeah. And, do you – so do you think, sorry when you first started using, did anyone like friends or family ever comment on – you know, a change in you, or notice anything about you that changed?

A: Yeah, after about two years, I'll never forget my mum stood at the bottom of the stairs, looking up at me, 'cos of the weight loss. I'll never forget the day she blurts out, she says, "You're on fucking heroin [inaudible 00:06:55]. You're on fucking heroin ain't you?" And I just looked round and said yeah, and that was when about – she got me straight onto methadone, like her and the doctor, and within about eighteen months after that, I went straight in rehab.

Q: So that time going into rehab, that was –

A: '95 that was.

Q: That was – do you think if it hadn't been for your mum you would have gone in anyway? Or do you think your mum [both talking at once].

A: Yeah, you know, one thing, I can't go into too much detail, 'cos I don't want to drag my heels on this whole thing. What it is, I'm a very crap drug addict, now what I mean by that is, I'm very – I'm not tight with money in general, right, you know, I'm generous with money in general with friends, I don't complain about spending a pound or nothing like that. I'm not tight, but when it comes to spending ten fucking pounds on a lump of fucking crack right? And a bag of smack, I've never been able to get me head round that.

Q: Right.

A: Never accepted it, I can – do, you know what I mean? And I used to spend eight, ninety pounds on nine, you know, nine of these rocks for a night. But even when I was doing it, I hated it, so that's your answer, yeah.

Q: That's right, yeah, so it was spending the money on that stuff [both talking at once]

A: I resent it, yeah.

Q: Earlier you described yourself as an addict, so you openly describe yourself as an addict.

A: Yeah.

Q: What does addicted mean to you?

A: Everything, whether it's PlayStation, whether it's clothes, whether it's – you know, whether it's clothes and everything's got to be fucking North Face or Berghaus, or everything, everything's got to be top notch.

Q: Right.

A: Yeah, so my addiction goes for everything.

Q: So, it's not just heroin it is [both talking at once].

A: Oh no, it's yeah in general, I were born with it like this. That's why numerous – addictions side of it, that's why – even though I knew I was different really quickly with the sexual abuse, I don't believe that was it. I was born with an addictive personality, yeah. I'm not blaming or blagging anyone, I know it's me, do, you know what I mean?

Q: Okay.

A: And that's what helps me stay clean, you know, that don't you?

Q: What, knowing that?

A: Yeah, yeah, that's what got me clean for eight years before, that's why I'm clean – you know, two and a half years now, because I'm able get me head round, it's me, it's me.

Q: So, accepting that –

A: Oh total – you've got to accept it man.

Q: Okay, and when you said 1995, was that the first time you came here?

A: Yes, that would have been probably the end of '94, beginning of '95, and then I was in treatment September '95, that's when I went in to get –

Q: Was this the first [both talking at once].

A: I met Maggie; Maggie was in the group.

Q: Oh right, okay.

A: You know the person, the lady.

Q: Yeah, yeah.

A: She was in the group that day, she was the one that was telling us, in this real stuffy hot room, about six of us there, it weren't this one it was a bit bigger.

Q: Yeah.

A: She was the one telling us what we're going into.

Q: Right.

A: Yeah, I'll never forget Maggie yeah.

Q: You know, was this the first place you came to for any sort of help [both talking at once].

A: Yes.

Q: What was it that brought you here?

A: GP mentioned it, the GP Dr. [inaudible 00:09:45].

Q: Right.

A: Yeah, he's still practising now, yeah. [inaudible 0:09:47] surgery, he's the head practitioner now at that surgery. Yeah, he sent me here.

Q: Why – you know, when he mentioned it, why do you think it was that you thought, well I will go there, rather than, you know?

[00:10:00]

A: I wanted to stop mate, oh come on, I was about to die. Yeah, I was nine stone then yeah, and I was still as tall, you know, with what I am now, I was fucking nine stone, and as small as I am now, I'm about twelve stone, I was nine. It's quite clear if I didn't go into rehab then, I would not be here now, that's really clear, you know, when I explain nine stone frame [inaudible 00:10:21], just as I ever stopped mate.

Q: Okay, and have you been to kind of – did you ever use a – you know, a needle exchange?

A: Do you know, I never injected heroin either.

Q: Never?

A: No, I done one overdose, it was a deliberate one when I split up with my wife five years ago, it was a deliberate overdose, in my right arm shooting up, I've no track marks or nothing. It was a deliberate one, 'cos I knew I'd die. I'd die 'cos I was depressed, I'd just split up with my wife, and lost my house. Destroying you, destroying innit, just to prove – you see I've never banged up, look. [shows interviewer]

Q: Oh yeah.

A: Yeah, it was one in that arm, in that vein there, it was about four years ago, three and a half, four years ago. 'Cos, I knew it would kill me, I'd go to sleep and it wouldn't hurt, 'cos it would be an opiate overdose. And my heart stopped three times.

Q: Wow.

A: So, but [inaudible 00:11:09] I never inject it, 'cos I knows that it kill you, I'm not that stupid, you know what, even though I'm a smackhead – I'm not a smackhead, I'm in recovery. But I'm not a [daft neck 0:11:14], I know if you inject, you're dead. So, I never done it the first time round, never done it the second time round, only that once.

Q: Right, yeah.

A: Also, I've got a fear of needles, which helps.

Q: Yes.

A: Yeah – no really it does, no I don't like seeing blood, oh fuck me – you know operations on telly? I have to turn off, turn over, I can't even watch pregnancies or nothing like that, oh I'm very squeamish, yes, so – sorry.

Q: No no no, thank you. And when you have come here – [checking audio equipment] – when you have come here, ad would you say that you're seeking help, or are you seeking something else? What are you looking for when you come here?

A: Seeking help.

Q: It is seeking help?

A: Yeah, you do know what – you get it here as well, yeah. The services were not as much as what it is now in the '90s man, I will be honest. But they was – they still had me in rehab pretty quick in the '90s, yeah.

Q: Right.

A: Yeah, yeah, oh no if you want to get help – here.

Q: You know, when you do come here, are there different things that you look for help for? Is

there things, you know, you feel safe discussing here?

A: I feel comfortable discussing anything. No, I kind of come here, you know, when it's required. Do you know what I mean?

Q: Right okay.

A: You know? Yeah, I don't use the services too much, 'cos I'm too far out.

Q: Of course, you [inaudible 00:12:37].

A: Yeah, I had to make a big effort to get here today, that's why I thought [I'd sit in on this course 0:12:40] and take fifteen quid or whatever it is [laughs].

Q: Yeah.

A: It's a bugger, yeah. So yeah, can I be honest with you? If I was closer –

Q: Please do, yeah yeah.

A: If I lived closer, I'd be here five times a week, man, you know, use the drop in service, come round for a cup of tea, see what's on the board, but I live too far, that's all.

Q: Right.

A: That's why, yeah.

Q: But if you were closer, you'd be here?

A: Ah, flipping hell yeah, I would be yeah. Yeah definitely yeah, here regular yeah. Well every working day I'd be here.

Q: Yeah, 'cos I know you were saying earlier, you know, having the reason to get up and go somewhere.

A: Yeah, yeah.

Q: That's important? Is that –

A: Yes, it is, but again I live too far away, you know what I mean?

Q: Yeah.

A: Beautiful where I live, but yeah.

Q: You know, now you're on the – on Subutex? Is that what –

A: Yeah.

Q: Obviously that must be helpful?

A: Yeah, yeah desire had gone.

Q: Yeah, great. Are there things that, you know, since you've kind of, you know, since you first started, and, you know, you've been coming to BDP for health and support. Would you say the way you cope has changed, kind of in your head?

A: Yeah.

Q: The way you think about it?

A: Yeah, absolutely yeah, going on Subutex has give me a complete straight mind.

Q: Okay.

A: Yeah, I've not been arrested for two and a half years.

Q: Right.

A: Yeah, I've not shoplifted or nothing man, tell you what happened – it was BDP that got me on the script about two years three months, maybe two and a half years ago. The minute I got the script, that was it, everything stopped, there and then. Sorry I didn't mean that. Everything stopped, you know what I mean?

Q: Yeah.

A: It put me on instant even keel.

Q: You mentioned –

A: I'm kind of terrified of coming off it to be honest, and fucking everything up, you know what I mean?

Q: Yeah.

A: 'Cos it's kept me so straight.

Q: I can completely understand that yeah.

A: Brilliant, yeah it really has worked wonders, yeah.

Q: You mentioned the shoplifting, what kind of effect does that have on you?

A: Shame. Shame, shame, shame, more shame, anger, shame. You know, for the act of getting caught, you know what I mean?

Q: Does that make you – does that make you do anything? Did that –

A: It made me worse I suppose, yeah.

Q: Made you worse.

A: But I don't know, I spose the last time I was threatened when I was court, I was threatened over being sent to prison, and – what it was, I was bound over for a year, I broke that within two weeks. Then they bound me over three years, I broke that, and then the last time he didn't even bound me over again, right? He allowed me to go, he didn't give me another fine or nothing, but he looked at me in the eyes, and he said – this is Bristol Magistrates, the new one, he looked at me and he said, "You come back in here again Mr Porter," he said, "You will be going to prison," he said, "But I'm not going to give you any more fines on top of what you've got," kind of – he didn't say it in these words, but kind of break it down, he said, "Think about it," and I walked away and stopped.

Q: Right okay.

A: [Haven't done it 00:15:36] since man.

Q: Yeah, so that event was pretty important?

A: Oh, 1000 percent yeah, absolutely.

Q: Okay, great. Right, so thank you very much by the way, you've answered all the questions that I've got, you know.

A: Can I be honest with you, like I said when I come in, you know, I didn't just walk three odd miles, and it's got nothing to do with the money again. I like the fact that people like you – not just you, I done a survey a couple of years ago –

[END OF RECORDING – 00:16:06]

Emergent themes	Super-ordinate themes
Occupation important in maintaining abstinence agrees having purpose in the day is important Important to be occupied **Evidence of anxiety and low self esteem** Apologises to interviewer for no apparent reason Patient asks if can be honest with interviewer Px asked if he can be honest with interviewer Very high trait anxiety **Legal consequences poor motivator for change** Judge played a great role in changing px behaviour Last time patient was arrested he was bound over for 1 year - broke this within 2 weeks. Px was bound over again, but broke this too. Judge took leniency on patient, but promised him he would go to jail if he did not change his ways Judge promising patient that he would go to jail for his next offence facilitated change **Geography inhibits substance use disorder treatment service attendance** Geography prevents more service utilisation If I was closer to the substance use disorder treatment service - I'd visit more Px would visit every day of the week if he could px would use the drop in service, would have an informal catch up with staff, would engage in occupations, but lives too far to make full use of service Geography inhibits substance use disorder treatment service attendance Reiterates geography inhibiting attendance Patient very enthusiastic about visiting service more often were it possible Would visit service every working day if possible Patient walked 3 miles to attend substance use disorder treatment service lives too far to be occupied at substance use disorder treatment service **Substitution therapy useful in maintaining abstinence from PS to point patient reliant** Subutex useful Desire to use is ameliorated by subutex Subutex leads to cognitive change 'thinking straight' Subutex helped stop use immediately Usage stopped with subutex very quickly	**Emergent theme 29: Substance use disorder treatment service as safe, stable environment offering array of medical, psychosocial, and occupational services** Occupation important in maintaining abstinence Substance use disorder treatment service readily accessible, safe environment, offering array of services Geography inhibits substance use disorder treatment service attendance **Emergent theme 30: OUD characterised by mental and physiological trauma and pathology** Evidence of anxiety and low self esteem CSA motivates use Addiction as struggle or battle Traumatic bereavement motivates use Self critical self image Perception of self as different Rushed narrative Heroin use associated with chronic poor health Fear of and avoidance of withdrawal motivates use **Emergent theme 31: Facilitators of help seeking are revered** GP facilitated substance use disorder treatment service POA Clear and vivid recollection of people who facilitated help seeking Role of family important in facilitating change Substitution therapy useful in maintaining abstinence from PS to point patient reliant **Emergent theme 32: Addiction attribution internal, stable and global** Addict as someone who currently uses Past and current abstinence Addiction seen as both free choice and unavoidable Addictive personality belief facilitates abstinence Substance irrelevance belief in addiction No moral component to addiction **Emergent theme 33: Needle phobia inhibits injecting** Smokes rather than injects due to needle aversion Injection of heroin as suicide attempt **Emergent theme 34: OUD facilitated by peer usage and insidious onset**

Subutex put patient on an 'even keel'	Single influential peer facilitated initial usage
Patient very anxious about ceasing substitution therapy	Heroin usage enjoyable in early days
Patient very anxious about prospect of 'fucking things up' without subutex	Rapid and unexpected onset of addiction
Subutex has worked so well patient is afraid of being without it	**Emergent theme 35: Rejection of lifestyle motivator for change**
Subutex brilliant, has worked wonders	Rejection of addiction lifestyle motivates change
	Attitudes re: money at odds with lifestyle of addiction
Substance use disorder treatment service readily accessible, safe environment, offering array of services Substance use disorder treatment service seen as readily offering help to addicts	Legal consequences poor motivator for change
Substance use disorder treatment service seen as safe place to discuss problems	
Substance use disorder treatment service utilised when required, not scheduled access	
Substance use disorder treatment service facilitated substitution therapy	
Patient came to substance use disorder treatment service to seek help	
Help seeking takes place at substance use disorder treatment service	
Positive memories of childhood pre addiction When young happy and interested in boxing	
Describes self as bubbly. Do not know what 'doing the bird thing' means.	
enjoyed boxing as a youngster	
uneventful school days - no bullying	
Clear and vivid recollection of people who facilitated help seeking	
Remembers dates of treatment ceased after the fact	
Remembers useful group facilitator from initial rehabilitation	
Assume interviewer is familiar with otherwise unmentioned person	
Remembers impactful group facilitator	
Remembers group carried out in hot, stuffy room	
Prepared patient for rehabilitation	
Will never forget group facilitator	
GP who referred patient still practicing, is head of surgery	
GP facilitated substance use disorder treatment service POA Substance use disorder treatment service first point of access for support	
Referred by GP to substance use disorder treatment service	
Self critical self image	
See's being an addict (described as smackhead) as synonymous with being stupid	

Addict as someone who currently uses corrects self - not smackhead because in recovery **Attitudes re: money at odds with lifestyle of addiction** Being a 'good addict' means being disciplined with money Being generous with money at odds with being addicted to heroin Patient has lenient attitude to spending money Finds cost of addiction to be nonsensical. Motivator of change? Never been able to accept the price of heroin Patient has spent large amounts of money on heroin which doesn't last long Patient hated spending large amounts of money when using Patient resented spending money on drugs **Heroin use associated with chronic poor health** very certain about heroin causing health problems lack of appetite associated with heroin use resulting in nausea addiction described as constant illness Risk of death motivated change Patient very underweight, emphasises being underweight as consequence of usage Patient believes rehab saved his life Weight reflects poor health due to addiction **Smokes rather than injects due to needle aversion** Patient did not inject heroin when using reiterates not injecting for use Patient aimed to die Proves no track marks Sees injecting heroin as very dangerous Patient has a fear of needles squeamish about blood and medical procedures. Apologises for this trait. Injection as deadly Patient very adverse to the sight of blood **Injection of heroin as suicide attempt** Patient attempted suicide by overdose after divorce 5 years ago suicide attempt by injection Suicidal due to depression consequential to divorce and loss of home Overdose by injection attempt over 4 years ago	

Chose opioid overdose as painless Patient was severely ill Only ever injected to attempt suicide **Single influential peer facilitated initial usage** Peer pressure motivated initial use Friend who introduced patient to heroin has died One person introduced several people to heroin. Introduction one at a time. Remembers introduction to heroin very clearly Group of people addicted very quickly by one facilitator peer pressure important in first usage over a month large group of people introduced to heroin by one facilitator first use at age 19 **Rushed narrative** Keen to tell story quickly in a hurry to tell story and cover different points of salience Does not want to 'drag heels' when talking about mothers role in entry to rehab (emotionally salient topic) **Heroin usage enjoyable in early days** Good experiences with heroin early on in use only. As use progresses user 'burns out' Good experiences with heroin in first 5 days good experiences never return after initial 5 day 'honeymoon' period Heroin seen as new exciting substance **Perception of self as different** Perception of self as different considers self different to other people Perceived self as different to other people, aside from trauma Difference not behavioural, personal, affective Different because did not relate to all other people abuse exaggerated feeling of being different recalls making profound decision at very early age – re difference recalls coming to profound insight at 5 years of age – re difference **No moral component to addiction** See's addiction as unavoidable without any moral component usage seen as personal, free choice No moral dimension to addiction	

Addiction seen as both free choice and unavoidable px believes he was born an addict Does not think traumas were causal in addiction Patient believes he was destined to be an addict Patient alludes to numerous addictions **Addictive personality belief facilitates abstinence** Accepting being prone to addiction facilitates abstinence Acceptance of addiction as lifelong predilection maintains abstinence Patient believes he was born with addictive personality Patient accepts he is at risk of addiction for life, so does not use Acceptance that no use can be safe use is key to abstinence **CSA motivates use** Sexual abuse in childhood abuse by two different perpetrators life changed following abuse abuse as causative in drug use heroin use allowed patient to forget about past abuse Sexual abuse part of being different **Role of family important in facilitating change** Vivid memory of altercation with mother re: heroin use Vivid memory of altercation with memory re: heroin use. Mother noticed weight loss of px, and reacted emotionally. Px freely admitted to mother he was using heroin, and mother quickly facilitated methadone treatment access Avoids spending time thinking about mothers role in entry in to rehab **Past and current abstinence** Currently 2 years abstinent, using substitute therapy 2 prolonged episodes of abstinence. has been abstinent for 2.5 years 8 years abstinence abstinence seen as especially important for understanding story first stint of usage 4 years followed by rehabilitation has had prolonged period of abstinence in past Describes one relapse in usage history 1.5 years of methadone followed by rehabilitation	

Addiction as struggle or battle Addiction as a lifelong battle. Addiction as a battle lasting 47 years addiction as a 'battle' for 47 years addiction is 'constantly feeling ill' no good times with heroin Constant sickness **Substance irrelevance belief in addiction** Addiction is seen as a strong want to have good quality things, irrespective of drug type **Fear of and avoidance of withdrawal motivates use** constant worrying about supply of heroin fear of running out strong motivator to continue use **Rejection of addiction lifestyle motivates change** "Sick and tired" Addiction described as a 'horrible life', which motivates change to abstinence Karma inhibits immoral behaviour Convinced of karma as a reality Convinced of karma as a reality burglaries seen as especially immoral Patient has never mugged anyone, or burgled, but accepts this is associated with addiction patient is religious. states that he will not talk about beliefs at length without prompting. Patient believes in karma. demonstrates karma as loss in response to theft. Px very convinced of reality of trauma Addict seen as in some way going against being a true friend, requires qualification Shoplifting describes as being associated with shame (x6 reiterated). Anger x1 The act of getting caught shoplifting described as bringing shame and anger (x6, x1) Shoplifting made addiction worse Addiction seen as affecting every part of life Patient sees not shoplifting as sign of recovery No arrests by police in last 2.5 years **Rapid and unexpected onset of addiction** addiction described as setting in 'over night' Onset of addiction 'over night' and very surprising Onset of addiction described as completely unexpected and very rapid	

Describes becoming addicted to heroin very quickly after 5 days use **Traumatic bereavement motivates use** brothers born on same date different years brother murdered in 1989 - very traumatic loss brothers murder causative factor in taking heroin	

Appendix G: Scoping review included study results

<table>
<tr><th>Article</th><th>Treatment</th><th>n=</th><th>Measure of adherence</th><th>Patient characteristic data</th></tr>
<tr><td>The Influence of Anxiety Sensitivity on Opioid Use Disorder Treatment Outcomes. Baxley et al. 2019</td><td>Psychosocial treatment following Buprenrphine assisted detox</td><td>61</td><td>Proportion of days attended of days referred to attend.</td><td>Data presented from “Table 3: Hierarchical Logistic Regression Analyses for Detoxification and Follow-Up Outcomes”
<table>
<tr><th>Step 1</th><th>β (Standard error)</th><th>p=</th><th>OR</th><th>[95% CI]</th></tr>
<tr><td>CESD-R</td><td>0.2 (0.2)</td><td>.303</td><td>1.02</td><td>[.99, 1.05]</td></tr>
<tr><td>No. of inpatient-outpatient treatments</td><td>.29 (.86)</td><td>.732</td><td>1.34</td><td>[.25, 7.23]</td></tr>
<tr><td>Age</td><td>.01 (.03)</td><td>.784</td><td>1.01</td><td>[.96, 1.06]</td></tr>
<tr><td>Sex (male – female)</td><td>1.15 (.60)</td><td>.056</td><td>3.15</td><td>[.97, 10.20]</td></tr>
<tr><td>Step 2</td><td></td><td></td><td></td><td></td></tr>
<tr><td>CESD-R</td><td>.02 (.02)</td><td>.216</td><td>1.02</td><td>[.99, 1.05]</td></tr>
<tr><td>No. of inpatient-outpatient treatments</td><td>.26 (.86)</td><td>.764</td><td>1.30</td><td>[.24, 6.96]</td></tr>
<tr><td>Age</td><td>.01 (.03)</td><td>.629</td><td>1.01</td><td>[.96, 1.07]</td></tr>
<tr><td>Sex (male – female)</td><td>1.28 (.62)</td><td>.039*</td><td>3.59</td><td>[1.07, 12.07]</td></tr>
<tr><td>ASI-3</td><td>-.02 (.02)</td><td>.275</td><td>.98</td><td>[.94, 1.02]</td></tr>
</table>
Note. For variables labeled as “(yesno),” the reference category is “no.” For sex, the reference category is “female.” For type of treatment supposed to attend, the reference category is outpatient. p values in bold are significant. OR odds ratio; CI confidence interval; ASI-3 Anxiety Sensitivity Index3; STAI–Trait State–Trait Anxiety Inventory, Trait Anxiety Subscale; CESDR Center for Epidemiologic Studies Depression Scale—Revised; VAS Visual Analogue Scale; BBGS Brief Biosocial Gambling Screen. a Due to data transformation, the odds ratio should be interpreted as indicating greater days in an uncontrolled environment.</td></tr>
</table>

<table>
<tr>
<td>Do out-of-pocket costs influence retention and adherence to medications for opioid use disorder? Dunphy et al. 2021</td>
<td>BMT</td>
<td>6439</td>
<td>Percentage increase in days without treatment coverage by retention period.</td>
<td>Data presented from “Supplemental Table 3. Impact of out-of-pocket cost for buprenorphine on treatment retention and gaps in treatment coverage – Expanded”
<table>
<tr><td></td><td colspan="3">Percentage increase in number of days without treatment coverage by retention period
IRR (95% CI)[c]</td></tr>
<tr><td>Measure</td><td>180 days</td><td>360 days</td><td>540 days</td></tr>
<tr><td>Sex</td><td></td><td></td><td></td></tr>
<tr><td>Male</td><td>-0.05* (-0.08, -0.02)</td><td>-0.01 (-0.03, 0.01)</td><td>-0.01 (-0.02, 0.01)</td></tr>
<tr><td>Female (referent)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Age</td><td></td><td></td><td></td></tr>
<tr><td>Age: 18-34</td><td>0.20* (0.15, 0.24)</td><td>0.13* (0.10, 0.17)</td><td>0.07* (0.05, 0.10)</td></tr>
<tr><td>Age: 35-44</td><td>0.00 (-0.05, 0.05)</td><td>0.01 (-0.03, 0.04)</td><td>-0.10* (-0.12, -0.07)</td></tr>
<tr><td>Age: 45-54</td><td>0.04 (-0.01, 0.09)</td><td>0.09* (0.06, 0.13)</td><td>0.02 (-0.01, 0.05)</td></tr>
<tr><td>Age: 55-64 (referent)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Substance Use Disorders</td><td></td><td></td><td></td></tr>
<tr><td>Opioid Use Disorder</td><td>-0.11* (-0.14, -0.08)</td><td>-0.06* (-0.08, -0.04)</td><td>-0.02* (-0.04, -0.01)</td></tr>
<tr><td>Alcohol Use Disorder</td><td>-0.06* (-0.12, -0.01)</td><td>-0.26* (-0.30, -0.21)</td><td>-0.10* (-0.13, -0.06)</td></tr>
<tr><td>Cannabis Use Disorder</td><td>-0.15* (-0.23, -0.08)</td><td>0.14* (0.09, 0.19)</td><td>0.16* (0.11, 0.20)</td></tr>
<tr><td>Sedative Use Disorder</td><td>0.19* (0.12, 0.26)</td><td>0.14* (0.09, 0.19)</td><td>0.10* (0.05, 0.14)</td></tr>
<tr><td>Cocaine Use Disorder</td><td>0.31* (0.22, 0.40)</td><td>0.39* (0.32, 0.45)</td><td>0.17* (0.11, 0.23)</td></tr>
<tr><td>Stimulant Use Disorder</td><td>-0.20* (-0.32, -0.08)</td><td>0.30* (0.23, 0.37)</td><td>-0.21* (-0.29, -0.13)</td></tr>
<tr><td>Nicotine Use Disorder</td><td>0.06* (0.02, 0.10)</td><td>0.09* (0.05, 0.12)</td><td>-0.10* (-0.13, -0.08)</td></tr>
<tr><td>Psychiatric Diagnosis</td><td></td><td></td><td></td></tr>
<tr><td>Anxiety</td><td>0.01 (-0.02, 0.05)</td><td>-0.03* (-0.06, -0.01)</td><td>-0.04* (-0.07, -0.02)</td></tr>
<tr><td>Bipolar Disorder</td><td>0.08* (0.02, 0.15)</td><td>0.23* (0.19, 0.28)</td><td>0.09* (0.05, 0.13)</td></tr>
<tr><td>Major Depression</td><td>-0.06* (-0.10, -0.02)</td><td>0.02 (-0.01, 0.05)</td><td>-0.04* (-0.06, -0.01)</td></tr>
<tr><td>ADHD</td><td>0.12* (0.05, 0.18)</td><td>0.28* (0.23, 0.33)</td><td>0.06* (0.01, 0.10)</td></tr>
<tr><td>PTSD</td><td>-0.22* (-0.34, -0.10)</td><td>0.19* (0.12, 0.26)</td><td>0.15* (0.08, 0.21)</td></tr>
<tr><td>Schizophrenia</td><td>-0.28*</td><td>-0.15*</td><td>0.09</td></tr>
</table>
</td>
</tr>
</table>

				(-0.48, -0.08)	(-0.27, -0.03)	(-0.02, 0.19)
Pain Diagnosis			
Back Pain	0.10* (0.07, 0.14)	0.06* (0.03, 0.08)	0.08* (0.06, 0.11)
Neck Pain	0.04 (-0.01, 0.08)	0.04* (0.01, 0.08)	0.01 (-0.01, 0.04)
Migraine	-0.06 (-0.13, 0.01)	-0.02 (-0.07, 0.04)	0.16* (0.12, 0.20)
Fibromyalgia	-0.04 (-0.13, 0.05)	0.05 (-0.02, 0.11)	-0.08* (-0.14, -0.02)
Osteoarthritis	0.14* (0.09, 0.19)	0.08* (0.04, 0.12)	0.01 (-0.03, 0.04)
Inflammatory Joint Disorder	0.01 (-0.03, 0.05)	-0.02 (-0.05, 0.01)	0.05* (0.03, 0.08)
Periarticular	0.16* (0.10, 0.23)	0.38* (0.33, 0.43)	0.33* (0.29, 0.37)
Other Prescriptions			
Opioids	-0.03* (-0.07, -0.01)	-0.04* (-0.06, -0.01)	-0.08* (-0.10, -0.06)
Antidepressants	0.06* (0.03, 0.09)	0.02 (-0.00, 0.04)	0.05* (0.04, 0.07)
Benzodiazepines	0.02 (-0.01, 0.06)	0.04* (0.01, 0.07)	0.09* (0.07, 0.11)
Stimulants	0.12* (0.07, 0.18)	-0.08* (-0.13, -0.04)	0.03 (-0.01, 0.06)

Notes: Data Source: IBM® MarketScan® commercial claims and encounters database.
[a] Retained = Patient's buprenorphine prescriptions (days supplied) cover at least 80% of the days within the retention window, which refers to the number of days since treatment inception during the analysis period.
[b] Multivariable logistic regression models with binary dependent variable (retained=1, not retained=0).
[c] Multivariable Poisson regression models with count dependent variable representing the number of days a patient was without daily supply during the retention window. Models includes only individuals defined as retained during the stated retention window.
* p<0.05

Buprenorphine prescription compliance: an original observational and longitudinal study. Guillou et al. 2014	BMT	162	Stable or unstable medication adherence by coverage.	Date presented from "Table 3. Results of multivariate analysis of covariates associated with compliance and associated transitions"					
					Transition stable/unstable				
					Estimate	OR	IC 95%	RR	p-value
				Prior criminal record, yes	0.63	1.88	[1.20-4.03]	1.80	0.012
				Family situation, unfavorable	1.06	2.89	[1.58-4.53]	2.65	<0.001

<table>
<tr><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>Addictive behavior in environment, yes</td><td>1.12</td><td>3.08</td><td>[1.59-6.19]</td><td>2.47</td><td>0.001</td></tr>
<tr><td>Variables</td><td colspan="5">Transition unstable/stable</td></tr>
<tr><td></td><td>Estimate</td><td>OR</td><td>IC 95%</td><td>RR</td><td>p-value</td></tr>
<tr><td>Age at inclusion (years)</td><td>0.03</td><td>1.03</td><td>[1.001-1.685]</td><td>/*</td><td>0.005</td></tr>
<tr><td colspan="6">* We measured RR only for categorical variables.</td></tr>
</table>
</td></tr>
<tr><td>Predictors of Outcome from Computer-Based Treatment for Substance Use Disorders: Results from a Randomized Clinical Trial. Kim et al. 2015</td><td>MMT plus counselling</td><td>160</td><td>Opioid free days by UDS.</td><td>
Data presented from “Table 1 Within-Group Generalized Linear Model Analyses and Interaction Tests”
<table>
<tr><td colspan="2"></td><td colspan="2">Percentage of total study weeks with opioid abstinence</td><td colspan="2">Dropout during total study weeks</td></tr>
<tr><td colspan="2">Predictor Variables</td><td>TES B</td><td>Standard B</td><td>TES HR</td><td>Standard HR</td></tr>
<tr><td>1</td><td>Age</td><td>0.00[a](0.00)</td><td>−0.01[b](0.00)</td><td>0.97[a]</td><td>0.98[a]</td></tr>
<tr><td>2</td><td>Gender (male)</td><td>−0.15[a](0.09)</td><td>−0.51[b](0.09)</td><td>1.18[a]</td><td>1.25[a]</td></tr>
<tr><td>3</td><td>Ethnicity (Hispanic)</td><td>0.57[a](0.09)</td><td>0.15[b](0.09)</td><td>1.50[a]</td><td>1.01[a]</td></tr>
<tr><td>4</td><td>Race (White)</td><td>0.59[a](0.08)</td><td>−0.04[b](0.08)</td><td>1.17[a]</td><td>1.40[a]</td></tr>
<tr><td>5</td><td>Marital status (married)</td><td>−0.10[a](0.13)</td><td>−0.80[b](0.16)</td><td>0.87[a]</td><td>0.53[a]</td></tr>
<tr><td>6</td><td>Years education</td><td>−0.08[a](0.02)</td><td>−0.03[a](0.02)</td><td>0.89[a]</td><td>1.07[a]</td></tr>
<tr><td>7</td><td>Employment status (employed)</td><td>−0.16[a](0.08)</td><td>−0.48[b](0.08)</td><td>1.22[a]</td><td>1.08[a]</td></tr>
<tr><td>8</td><td>HIV+ (positive)</td><td>−0.23[a](0.12)</td><td>−0.45[b](0.20)</td><td>1.33[a]</td><td>2.39[a]</td></tr>
<tr><td>9</td><td>HCV+ (positive)</td><td>0.58[a](0.08)</td><td>0.02[b](0.09)</td><td>1.00[a]</td><td>1.25[a]</td></tr>
<tr><td>10</td><td>Past 30 days sedative use</td><td>0.41[a](0.08)</td><td>−0.09[b](0.09)</td><td>1.26[a]</td><td>1.01[a]</td></tr>
</table>
</td></tr>
</table>

				11	Past 30 days cocaine/crack use	−0.43[a](0.08)	−0.24[a](0.08)	1.76[a]	0.68[b]
				12	Past 30 days alcohol use to intoxication	0.55[a](0.09)	−0.17[b](0.11)	0.83[a]	1.48[a]
				13	Currently on probation or parole	0.24[a](0.11)	−0.04[a](0.16)	0.93[a]	1.41[a]
				14	Past 30 days sexual behavior	−0.29[a](0.08)	−0.05[b](0.08)	1.56[a]	1.27[a]
				15	Past 30 days injection drug use	−0.28[a](0.09)	−0.07[a](0.08)	1.88[a]	1.98[a]
				16	Beck Depression Inventory	0.00[a](0.00)	0.00[a](0.00)	1.01[a]	1.02[a]
				17	Beck Anxiety Inventory	0.03[a](0.00)	−0.03[b](0.00)	1.00[a]	1.01[a]
				18	HIV and Hepatitis Knowledge	0.00[a](0.02)	−0.02[a](0.02)	1.01[a]	1.04[a]
				19	Recognition	0.00[a](0.00)	0.00[a](0.00)	1.01[a]	1.00[a]
				20	Ambivalence	0.00[a](0.00)	−0.02[b](0.00)	1.00[a]	0.99[a]
				21	Taking Steps	0.00[a](0.00)	0.01[b](0.00)	1.00[a]	1.00[a]

Note: Gender Female=0, Male =1; Ethnicity Not Hispanic = 0, Hispanic =1; Race Non-White=0, White = 1; Marital Status Non-married =0, Married = 1; Employment Unemployed = 0, Employed = 1; HIV+ HIV negative = 0, HIV positive = 1; Past 30 days sedative use No = 0, Yes = 1; Past 30 days cocaine/crack use No = 0, Yes = 1; Past 30 days alcohol use to intoxication No = 0, Yes = 1; Probation or parole No=0, Yes =1; Last week sexual behavior No=0, Yes=1; Last week injection drug use No=0, Yes=1

Values in bold indicate $p < .05$, and values in bold and underlined indicate $p < .01$. The first section presents results from generalized linear modeling analyses that examined each predictor's unique contribution to the percentage of total study weeks with opioid abstinence within each study condition. Higher positive coefficients indicate a greater contribution to the percentage of study weeks with opioid abstinence. The numbers in parentheses are standard errors of unstandardized regression coefficients, B. Labels in the parentheses

<table>
<tr><td></td><td></td><td></td><td></td><td>refer to categories with a value of "1" for dichotomized variables. Superscripts a and b denoted across conditions indicate significant interaction effects of the predictor. The second section represents hazard ratios from Cox-regression analyses.</td></tr>
<tr><td>A comparison of adherence, outcomes, and costs among opioid use disorder Medicaid patients treated with buprenorphine and methadone: A view from the payer perspective. Kinsky et al. 2019</td><td>MMT and BMT</td><td>1184</td><td>Non-adherence to MMT defined as missed attendance for ≥ seven days in 6 months.

Non-adherence to Buprenorphine defined as a medication coverage gap ≥ ten consecutive days in 6 months.</td><td>Data presented from “Table 2 Proportional hazards model results for predictors of time to non-adherence.”
<table>
<tr><th>Variable</th><th>Adjusted HR (95% CI)</th><th>p</th></tr>
<tr><td>Age 40+</td><td>0.822 (0.691, 0.978)</td><td>0.027</td></tr>
<tr><td>Female</td><td>0.865 (0.735, 0.998)</td><td>0.047</td></tr>
<tr><td>White</td><td>0.822 (0.633, 1.068)</td><td>0.143</td></tr>
<tr><td>Area deprivation index = 110+</td><td>1.093 (0.938, 1.273)</td><td>0.254</td></tr>
<tr><td>Serious mental illness</td><td>1.165 (0.998, 1.360)</td><td>0.053</td></tr>
<tr><td>10+ current prescriptions</td><td>0.968 (0.824, 1.137)</td><td>0.689</td></tr>
<tr><td>Methadone Treatment Group</td><td>0.890 (0.722, 1.098)</td><td>0.276</td></tr>
</table>
Bold text indicates statistical significance at the threshold of p < .05 or lower.</td></tr>
<tr><td>Club drugs and alcohol abuse predicted dropout and poor adherence among methadone maintenance treatment patients in Guangzhou, China. Liu et al. 2017</td><td>MMT</td><td>401</td><td>< than 50% attendance clinic appointments in treatment period.</td><td>Data presented from “Table 2. Using club drugs and alcohol abuse to predict drop-out (Cox regression analyses, n=401)”
<table>
<tr><td></td><td colspan="2"></td><td colspan="2">Univariate</td><td>Adjusted for significant background variables[a]</td></tr>
<tr><td></td><td>Row %</td><td>HR(95%CI)</td><td>P-value</td><td>HR(95%CI)</td><td>P-value</td></tr>
<tr><td>Club drug abuse</td><td colspan="5"></td></tr>
<tr><td>Use of any of the club drugs in the last six months</td><td colspan="5"></td></tr>
<tr><td>No</td><td>19.8</td><td>1.00</td><td></td><td>1.00</td><td></td></tr>
</table></td></tr>
</table>

				Yes	32.4	1.86 (1.01, 3.42)	0.047	1.90 (1.01, 3.56)	0.047
				Use of methamphetamine in the last six months					
				No	19.7	1.00		1.00	
				Yes	35.5	2.13 (1.13, 4.02)	0.019	2.26 (1.15, 4.43)	0.017
				Use of Ma Gu in the last six months					
				No	20.6	1.00		1.00	
				Yes	37.5	2.11 (0.67, 6.68)	0.204	1.79 (0.55, 5.80)	0.334
				Use of Triazolam Tablets in the last six months					
				No	20.9	1.00		1.00	
				Yes	25.0	1.26 (0.18, 9.06)	0.817	1.51 (0.21, 10.97)	0.684
				Use of ketamine in the last six months					
				No	21.0	1.00		1.00	
				Yes	20.0	0.97 (0.14, 6.98)	0.977	0.91 (0.12, 6.78)	0.926
				Use of ecstasy in the last six months					

				No	20.9	1.00		1.00	
				Yes	25.0	1.26 (0.18, 9.06)	0.817	1.63 (0.22, 12.23)	0.635
				Alcohol abuse					
				Overdrinking					
				No	19.8	1.00		1.00	
				Yes	25.0	1.30 (0.80, 2.12)	0.290	1.17 (0.72, 1.92)	0.519
				Drinking frequency					
				Never	21.9	1.00		1.00	
				At least once	19.9	0.89 (0.58, 1.37)	0.603	0.84 (0.54, 1.29)	0.421
				Drinks on a typical day when drinking					
				1–2 drinks	17.3	1.00		1.00	
				≥3 drinks	24.2	1.50 (0.78, 2.88)	0.229	1.38 (0.71, 2.69)	0.335
				Frequency of having 6 or more drinks on 1 occasion when drinking					
				Never	16.2	1.00		1.00	
				At least once	27.8	1.85 (0.96, 3.56)	0.067	1.94 (1.00, 3.78)	0.051

<table>
<tr><td></td><td></td><td></td><td></td><td>aCox regression models adjusting for potential confounders (current marital status and number of times of compulsory drug detoxification), which predicted drop-out significantly at end of the study in a multivariate model (stepwise). HR: hazards ratio; CI: confidence interval.</td></tr>
<tr><td>Adherence trajectories of buprenorphine therapy among pregnant women in a large state Medicaid program in the United States. Lo-Ciganic et al. 2019</td><td>BMT</td><td>1614</td><td>PDC</td><td>Data presented from “Table S4. Factors Associated with Specific Buprenorphine Trajectories: Multivariate Multinomial Logistic Regression”
<table>
<tr><td colspan="3">Early initiators</td><td colspan="2">Late initiators</td></tr>
<tr><td>Trajectory Group

(Reference: Early initiator with persistent high adherence)</td><td>Moderate-to- high adherence (n=357)</td><td>Declining adhernce (n=248)</td><td>Moderate-to- high adherence (n=318)</td><td>Low-to-moderate adherence

(n=298)</td></tr>
<tr><td></td><td>OR (95% CI)</td><td>OR (95% CI)</td><td>OR (95% CI)</td><td>OR (95% CI)</td></tr>
<tr><td>Sociodemographics</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Age, year</td><td>0.98 (0.95, 1.01)</td><td>0.98 (0.95, 1.01)</td><td>0.98 (0.95, 1.02)</td><td>0.96 (0.92, 0.99)*</td></tr>
<tr><td>Non-white race (ref=white)</td><td>0.97 (0.48, 1.95)</td><td>1.78 (0.92, 3.41)</td><td>0.48 (0.20, 1.16)</td><td>1.06 (0.51, 2.19)</td></tr>
<tr><td>Eligible through pregnancy (ref=TANF/others)</td><td>2.13 (1.35, 3.37)***</td><td>0.69 (0.36, 1.34)</td><td>2.31 (1.43, 3.72)***</td><td>1.63 (0.98, 2.72)</td></tr>
<tr><td>Resided in non-metropolitan counties (ref= metropolitan counties)</td><td>1.49 (1.08, 2.05)*</td><td>1.40 (0.98, 2.02)</td><td>1.59 (1.12, 2.25)**</td><td>1.50 (1.04, 2.15)*</td></tr>
<tr><td>Health-Status</td><td></td><td></td><td></td><td></td></tr>
<tr><td>OUD</td><td>1.14 (0.76, 1.72)</td><td>0.67 (0.45, 0.99)*</td><td>0.88 (0.58, 1.34)</td><td>1.00 (0.65, 1.54)</td></tr>
<tr><td>Other non-opioid drug use disorders</td><td>0.98 (0.70, 1.39)</td><td>0.75 (0.52, 1.06)</td><td>0.95 (0.66, 1.37)</td><td>1.13 (0.77, 1.64)</td></tr>
<tr><td>Alcohol use disorders</td><td>0.59 (0.29, 1.20)</td><td>0.79 (0.38, 1.67)</td><td>1.37 (0.73, 2.58)</td><td>0.80 (0.40, 1.61)</td></tr>
<tr><td>Prior buprenorphine use (ref=no MAT therapy)</td><td>0.09 (0.06, 0.13)***</td><td>0.41 (0.21, 0.64)***</td><td>0.04 (0.03, 0.06)***</td><td>0.05 (0.03, 0.07)***</td></tr>
</table>
</td></tr>
</table>

Prior methadone use (ref= no MAT therapy)	0.66 (0.23, 1.86)	1.12 (0.29, 4.30)	0.85 (0.31, 2.35)	0.67 (0.22, 2.00)
Prior buprenorphine/methadone use	0.09 (0.05, 0.16)***	0.45 (0.24, 0.84)*	0.06 (0.03, 0.11)***	0.04 (0.02, 0.09)***
Tobacco use	1.12 (0.83, 1.53)	0.83 (0.60, 1.14)	1.19 (0.85, 1.67)	0.96 (0.69, 1.34)

Table S4 continued.

Early initiators			Late initiators	
Trajectory Group (Reference: Early initiator with persistent high adherence)	Moderate-to- high adherence (n=357)	Declining adherence (n=248)	Moderate-to- high adherence (n=318)	Low-to-moderate adherence (n=298)
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Patterns of Health Services Use & Care during Pregnancy				
Prior hospitalization	1.22 (0.73, 2.05)	2.13 (1.27, 3.58)**	1.39 (0.81, 2.41)	2.49 (1.50, 4.15)
No. ED visits	1.04 (1.00, 1.08)	1.04 (1.00, 1.09)	1.04 (1.00, 1.09)	1.09 (1.05, 1.14)
No. Outpatient visits	0.99 (0.97, 1.00)	0.97 (0.84, 0.99)**	0.98 (0.97, 1.00)	0.95 (0.93, 0.97)
No. monthly other prescriptions	1.02 (0.99, 1.06)	0.99 (0.95, 1.03)	1.00 (0.96, 1.04)	0.97 (0.93, 1.01)
Mean buprenorphine daily dose	0.94 (0.92, 0.97)***	0.95 (0.92, 0.98)***	0.94 (0.91, 0.97)***	0.92 (0.90, 0.95)***
No. buprenorphine prescribers	1.14 (1.00, 1.30)*	1.08 (0.93, 1.25)	0.82 (0.69, 0.97)*	0.60 (0.48, 0.74)***
Having behavioral counseling	1.20 (0.90, 1.61)	1.06 (0.76, 1.47)	1.32 (0.96, 1.81)	1.27 (0.91, 1.76)

Data presented from "Table S5. Factors Associated with Specific Buprenorphine Trajectories: Multivariate Multinomial Logistic Regression (Sensitivity Analysis Excluding Health Services Use Factors)"

Early initiators	Late initiators

Trajectory Group (Reference: Early initiator with persistent high adherence)	Moderate-to- high adherence (n=357)	Declining adherence (n=248)	Moderate-to- high adherence (n=318)	Low-to-moderate adherence (n=298)
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Sociodemographics				
Age, year	0.98 (0.95, 1.01)	0.98 (0.94, 1.01)	0.98 (0.95, 1.01)	0.96 (0.92, 0.99)*
Non-white race (ref=white)	1.05 (0.52, 2.11)	1.91 (1.01, 3.65)*	0.51 (0.22, 1.23)	1.19 (0.58, 2.43)
Eligible through pregnancy (ref=TANF/others)	1.96 (1.24, 3.08)***	0.65 (0.34, 1.26)	2.22 (1.39, 3.55)***	1.58 (0.96, 2.60)
Resided in non-metropolitan counties (ref= metropolitan counties)	1.39 (1.02, 1.90)*	1.26 (0.89, 1.80)	1.50 (1.07, 2.11)**	1.34 (0.95, 1.90)
Health-Status				
OUD	1.13 (0.75, 1.70)	0.65 (0.44, 0.96)*	0.87 (0.57, 1.32)	0.96 (0.63, 1.46)
Other non-opioid drug use disorders	1.00 (0.71, 1.40)	0.74 (0.52, 1.05)	0.97 (0.67, 1.39)	1.12 (0.77, 1.61)
Alcohol use disorders	0.68 (0.34, 1.36)	0.93 (0.45, 1.93)	1.55 (0.83, 2.88)	1.01 (0.51, 2.01)
Prior buprenorphine use (ref=no MAT therapy)	0.09 (0.06, 0.13)***	0.42 (0.27, 0.66)***	0.04 (0.03, 0.06)***	0.05 (0.03, 0.07)***
Prior methadone use (ref= no MAT therapy)	0.66 (0.23, 1.88)	1.10 (0.29, 4.18)	0.84 (0.31, 2.29)	0.70 (0.24, 2.06)
Prior buprenorphine/methadone use	0.10 (0.06, 0.17)***	0.50 (0.27, 0.91)*	0.06 (0.03, 0.11)***	0.05 (0.02, 0.10)***
Tobacco use	1.18 (0.87, 1.60)	0.86 (0.63, 1.17)	1.25 (0.89, 1.74)	0.98 (0.71, 1.36)

Table S5. Continued.

Early initiators			Late initiators	
Trajectory Group (Reference: Early initiator with persistent high adherence)	Moderate-to- high adherence (n=357)	Declining adherence (n=248)	Moderate-to- high adherence (n=318)	Low-to-moderate adherence (n=298)
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Patterns of Care during Pregnancy				
Mean buprenorphine daily dose	0.95 (0.92, 0.97)***	0.95 (0.93, 0.98)***	0.94 (0.92, 0.97)***	0.93 (0.90, 0.95)***
No. buprenorphine prescribers	1.13 (0.99, 1.29)	1.05 (0.91, 1.22)	0.81 (0.69, 0.96)*	0.57 (0.46, 0.71)***
Having behavioral counseling	1.23 (0.93, 1.65)	1.04 (0.75, 1.43)	1.33 (0.97, 1.82)	1.19 (0.86, 1.65)

P value = ≤ 0.5*, ≤ 0.01**, ≤ 0.001***

Concurrent Heroin Use and Correlates among Methadone Maintenance Treatment Clients: A 12-Month Follow-up Study in Guangdong Province, China. Luo et al. 2016	MMT	6848 (5110 of which concurrently used heroin with MMT)	Frequency of Illicit opioid use by UDS.	Data presented from "Table 3 Correlates of concurrent heroin use among the participants during study period (*n* = 6848)."

Variables	Univariate		Multivariate	
	OR (95% CI) [a]	*p*	OR (95% CI)	*p*
Age (years)				
18–	1.03 (0.84–1.26)	0.789	0.93 (0.75–1.16)	0.534
35–	1.03 (0.83–1.31)	0.809	0.98 (0.79–1.21)	0.843
≥45	1.00		1.00	
Gender				
Male	1.19 (0.98–1.44)	0.082	1.14 (0.93–1.39)	0.199
Female	1.00		1.00	
Marital Status				
Married Currently	1.10 (0.98–1.22)	0.097	1.10 (0.98–1.24)	0.093
Others	1.00		1.00	
Education Level				
Illiterate or primary school	1.01 (0.84–1.21)	0.914	0.98 (0.82–1.19)	0.867
Junior high school	0.96 (0.83–0.12)	0.633	0.95 (0.82–1.11)	0.513
Senior high school	1.00		1.00	
Employment Status				

				Employed	1.17 (1.05–1.31)	0.005	0.92 (0.82–1.03)	0.146
				Unemployed	1.00		1.00	
				Family Relationship				
				Harmonious	1.00		1.00	
				Inharmonious	1.75 (1.52–2.00)	<0.001	1.49 (1.24–1.78)	<0.001
				HIV-Infected at Baseline				
				Yes	1.30 (1.05–1.61)	0.015	1.25 (1.01–1.55)	0.047
				No	1.00		1.00	
				HCV-Infected at Baseline				
				Yes	0.90 (0.79–1.03)	0.126	1.08 (0.93–1.24)	0.324
				No	1.00		1.00	
				Multiple Sex Partners at Baseline				
				Yes	1.21 (0.96–1.52)	0.102	1.34 (1.07–1.69)	0.012
				No	1.00		1.00	
				Duration of Drug Use (years)				
				<5	1.56 (1.36–1.78)	<0.001	1.10 (0.91–1.33)	0.347
				5–10	1.01 (0.88–1.18)	0.850	1.04 (0.89–1.21)	0.658

				≥10	1.00		1.00	
				Intravenous Drug Use at Baseline				
				Yes	0.66 (0.58–0.74)	<0.001	0.81 (0.69–0.95)	0.009
				No	1.00		1.00	
				Average Maintenance Doses (mL)				
				<60	1.00		1.00	
				≥60	1.12 (0.99–1.26)	0.066	1.13 (1.01–1.28)	0.047
				Percentage of MMT Attendance (%)				
				<20	1.32 (1.14–1.53)	<0.001	1.32 (1.13–1.53)	<0.001
				20–	1.33 (1.15–1.53)	<0.001	1.33 (1.14–1.54)	<0.001
				50–	1.72 (1.46–2.02)	<0.001	1.69 (1.44–2.00)	<0.001
				≥80%	1.00		1.00	
				[a] OR: Odds Ratio; CI: Confidence Interval, obtained from binary logistic regression analysis.				

Adherence to methadone maintenance treatment and associated factors among patients in Vietnamese mountainside areas. Nguyen et al. 2017	MMT	241	Number of non-attendances in three retention periods.	Characteristics	Missing dose in the last 4 days		Missing dose at last weekend		Adherence (VAS)		Optimal adherence (MoH standard)	
					OR	95 % CI	OR	95 % CI	Coef.	95% CI	OR	95 % CI
				Age					0.44**	0.08; 0.79	1.03	0.99; 1.09
				Education (vs < High school)								
				• High school	3.81**	1.04; 13.94						
				• >High school					10.79	−3.26; 24.85		
				Employment (vs. Unemployment)								
				• Self-employed	0.28**	0.08; 0.97						
				• Worker/Farmer							0.11**	0.02; 0.67
				• Other							0.24*	0.05; 1.24
				HIV status (vs. Negative)								

				• Positive	0.20*	0.04; 1.09	0.04	0.00; 2.47	8.26	−4.35; 20.86		
				Income quintile (vs. poorest)								
				• Poor	5.56**	1.09; 28.35	2.70	0.65; 11.25			0.40*	0.15; 1.04
				• Middle							0.33**	0.13; 0.88
				• Rich	2.99	0.61; 14.76						
				• Richest	4.14*	0.82; 20.91					0.51	0.19; 1.38
				Location (Son Duong vs. Tuyen Quang)							0.51	0.21; 1.22
				Number of drug rehabilitation (vs. None)								
				• 1 time	0.10***	0.02; 0.52					3.97**	1.23; 12.83
				• 2 times							3.03*	0.86; 10.61
				• > 2 times	0.33*	0.10; 1.15	0.14*	0.01; 1.38			2.84*	0.89; 9.12

				Having problem in self-care (Yes vs No)	0.03**	0.00; 0.94	2.12	0.25; 18.28				
				Having problem in usual activities (Yes vs. No)					7.41	−0.02; 14.84	3.74**	1.16; 12.07
				Pain/Discomfort (Yes vs No)	0.11*	0.01; 1.53	6.48**	1.43; 29.42			0.26	0.05; 1.41
				Anxiety/Depression							0.27	0.05; 1.35
				EQ index	0.01**	0.00; 0.60					0.02**	0.00; 0.88
				EQ VAS					0.22**	0.03; 0.42		
				MMT duration (months)	1.00	0.94; 1.07	0.95	0.87; 1.04	−0.32**	−0.62; −0.01	0.97	0.93; 1.01
				Adherence supporting measures								
				• Mobile phone (Yes vs No)	0.09**	0.01; 0.96					0.37*	0.14; 1.02
				• Reminded by family member (Yes vs. No)					13.02***	6.65; 19.39	2.75**	1.24; 6.08

<table>
<tr><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>ARV treatment (Yes vs. No)</td><td></td><td></td><td>0.08</td><td>0.00; 3.06</td><td>9.31</td><td>−3.55; 22.16</td><td></td><td></td></tr>
<tr><td>Current smoking (Yes vs No)</td><td>0.38</td><td>0.12; 1.27</td><td>0.16 **</td><td>0.03; 0.79</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Current drug use (Yes vs. No)</td><td></td><td></td><td></td><td></td><td>−5.77</td><td>−13.13; 1.58</td><td></td><td></td></tr>
</table>
*** p < 0.01, ** p < 0.05, * p < 0.1
</td></tr>
<tr><td>Adherence to buprenorphine: An analysis of prescription drug monitoring program data. Pizzicato et al. 2020</td><td>BMT</td><td>10669</td><td>≥ 0.8% PDC over treatment period.</td><td>
Data presented from “Table 2. Multivariable associations between demographic and prescription characteristics and adherence to buprenorphine over 180 days.”
<table>
<tr><td>Effect</td><td>aOR</td><td colspan="2">95 % Confidence Interval</td></tr>
<tr><td>Age</td><td></td><td></td><td></td></tr>
<tr><td>15−24</td><td>1.00</td><td></td><td></td></tr>
<tr><td>25−34</td><td>1.64</td><td>1.33</td><td>2.01</td></tr>
<tr><td>35−44</td><td>1.97</td><td>1.60</td><td>2.43</td></tr>
<tr><td>45−54</td><td>2.11</td><td>1.70</td><td>2.62</td></tr>
<tr><td>55−64</td><td>2.59</td><td>2.04</td><td>3.29</td></tr>
<tr><td>65+</td><td>2.78</td><td>1.91</td><td>4.04</td></tr>
<tr><td>Sex</td><td></td><td></td><td></td></tr>
<tr><td>Male</td><td>1.00</td><td></td><td></td></tr>
<tr><td>Female</td><td>1.37</td><td>1.25</td><td>1.50</td></tr>
<tr><td>ZIP Code Poverty Level</td><td></td><td></td><td></td></tr>
<tr><td>Very High (≥40 %)</td><td>1.00</td><td></td><td></td></tr>
<tr><td>High (30 to <40 %)</td><td>1.08</td><td>0.96</td><td>1.22</td></tr>
</table>
</td></tr>
</table>

Medium (20 to <30 %)	1.52	1.34	1.73
Low (0 to <20 %)	1.55	1.37	1.74
Opioid Prescription	0.62	0.50	0.77
Benzodiazepine Prescription	0.77	0.56	1.06
Formulation of Last Buprenorphine Prescription			
Tablet	1.00		
Film	1.37	1.25	1.50
Daily Dose of Last Buprenorphine Prescription			
Low (<16 mg)	1.00		
Medium (16 to <24 mg)	1.76	1.55	2.00
High (≥24 mg)	5.11	4.30	6.17

aOR: adjusted odds ratio.

Adherence among HIV-positive injection drug users undergoing methadone treatment in Taiwan. Chao et al. 2020 | MMT | *961* | Frequency of daily attendance.

90 days [b]				180 days [c]			365 days [d]		
Characteristics	*OR*	*95% CI*		*OR*	*95% CI*		*OR*	*95% CI*	
Age	1.02**	1.01	1.04	1.02**	1.01	1.04	1.02**	1.01	1.04
Gender									
Female (RC)	1.00			1.00			1.00		
Male	1.41	0.97	2.06	1.20	0.82	1.74	1.11	0.75	1.64
Education level									

				< 9 years (RC)	1.00			1.00			1.00		
				> =9 years	1.51**	1.15	1.97	1.65***	1.26	2.16	1.44*	1.09	1.92
				Marital status									
				Married (RC)	1.00			1.00			1.00		
				Married but separated	0.73	0.40	1.31	0.48*	0.26	0.89	0.38**	0.20	0.74
				Single	0.93	0.62	1.40	0.77	0.51	1.17	0.55**	0.36	0.84
				Divorced	1.27	0.84	1.93	1.10	0.71	1.68	0.76	0.49	1.18
				Employment status									
				Not employed (RC)	1.00			1.00			1.00		
				Employed	1.36*	1.06	1.75	1.24	0.96	1.60	1.28	0.98	1.68
				Case management area									
				Taipei metro area (RC)	1.00			1.00			1.00		
				Kaohsiung metro area	0.76	0.56	1.02	0.61**	0.45	0.83	0.55***	0.40	0.75
				Taiwan County	0.59**	0.44	0.80	0.56***	0.41	0.77	0.57**	0.41	0.79
				MMT mean dosage									

				< 60 mg (RC) 1.00 1.00 1.00 > =60 mg 2.58*** (1.89, 3.52) 2.18*** (1.62, 2.95) 1.80*** (1.33, 2.43) HIV+ diagnosed & in MMT date HIV+ before MMT > = 180 days (RC) 1.00 1.00 1.00 HIV+ before MMT < 180 days 0.82 (0.59, 1.14) 0.70* (0.50, 0.98) 0.55** (0.38, 0.79) HIV+ after MMT 0.65** (0.50, 0.86) 0.61** (0.46, 0.81) 0.58*** (0.43, 0.78) Notes: *OR* odds ratio, *CI* confidence interval, *RC* reference category [a]Adherence of 90 days, 180 days, and 365 days for MMT ordered by > = 90%, 50–90, < 50% [b,c,d] Brant Tests of Parallel Regression Assumption were non-significant ($p > .05$) and approximate likelihood-ratio test of odds across response categories were non-significant ($p > .05$) *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
Predictors of non-adherence to methadone maintenance treatment in opioid-dependent individuals: implications for clinicians. Roux et al. 2014	MMT	*145*	Self-reported coverage, incidents of intentional overdosage of methadone, illicit usage, and medication diversion	Data presented from "Table 3. Pre-treatment and In-treatment Predictors of Long-term Non-adherence to Methadone: Multivariate Analyses." Pre-treatment predictors (n=138) — Pre- and in-treatment predictors (n=131) OR [95%CI] p-value — OR [95%CI] p-value Gender Male 1 — 1 Female 4.76 [1.23-18.35] 0.02 — 5.24 [1.31-20.94] 0.02 Owning or renting her/his house [a] Yes 1 — 1 No 2.28 [0.99-5.24] 0.05 — 2.18 [0.92-5.16] 0.08

				Alcohol consumption at M0 [b]				
				No consumption	1		1	
				Harmful consumption	4.29 [1.31-14.03]	0.02	3.84 [1.13-13.00]	0.03
				Alcohol dependence	6.01 [0.99-29.53]	0.03	7.33 [1.46-36.83]	0.02
				Cocaine use at M0 [b]				
				No	1		1	
				Yes	2.75 [0.99-7.62]	0.05	3.10 [1.09-8.85]	0.03

p-value of significant predictor of non-adherence to methadone at M12 are in bold
[a] at M0 visit
[b] during the previous month
M0= baseline; M6= month 6; M12= month 12.

Appendix H: Substance use disorder treatment service worker survey

Clinician survey - adherence to Opioid Use Disorder treatment v0.4 30.12.21

Survey Flow

Standard: Block 1 (18 Questions)
Standard: Px characteristic 2 (9 Questions)
Standard: Block 3 (debrief) (2 Questions)

Page Break

Start of Block: Block 1

Intro Dear respondent

Thank you for agreeing to participate in our survey. When completing the survey you will be asked to provide some information about yourself, and then to answer questions about your experiences treating patients with Opioid Use Disorder (OUD).

You will also be given the opportunity to provide an email address so you can be entered in to a raffle to win an Amazon gift card for the value of £50/€59 as a thank you for your participation.

You will now be asked to provide your consent to do so. Please make sure you have read the participant information sheet (PIS) before continuing.

Page Break

Consent form Consent form

I have read and understood the participant information sheet (PIS) version 2.0 dated 18.10.21. The PIS included the researcher's contact details so that I have had the opportunity to ask questions should I wish to.

I agree to take part in the project by completing the survey.

I understand that my taking part is voluntary and that I can withdraw from the study at any time; I do not have to give any reasons for why I no longer want to take part and there will be no adverse consequences if I choose to withdraw.

I understand my personal data, will not be revealed to anyone but the researcher.

I agree to the researchers processing my personal data in accordance with the aims of the study described in the Participant Information Sheet.

I understand that the data I provide will be anonymized and that my participation in the research will remain confidential.

I understand that the data I provide by responding to the survey items will be used (anonymously) in academic papers and other formal research output.

- ○ I agree and consent to complete the survey (4)
- ○ I do not agree and do not consent to complete the survey (5)

Skip To: Gender If Consent form I have read and understood the participant information sheet (PIS) version 2.0 dated... = I agree and consent to complete the survey

Skip To: Leave survey If Consent form I have read and understood the participant information sheet (PIS) version 2.0 dated... = I do not agree and do not consent to complete the survey

Leave survey Thank you for your time and interest in our survey study. As you have selected that you do not agree with the items of the consent form, and therefore do not consent to

participate in the survey, please close the browser window.

If you have any questions about the research, please contact:
Matthew Jones Swansea University Medical School 934644@swansea.ac.uk
or Professor Alan Watkins Swansea University Medical School a.watkins@swansea.ac.uk

Page Break

Gender Please select your gender

- ○ Male (1)
- ○ Female (2)
- ○ Prefer not to say (3)

Age Please state your age

_____

Job Title Please state your current job title e.g. "Addictions Psychiatrist", "Nurse", "Psychologist", "Support worker", or "Substance Use Liaison Worker"

_____

_____

_____

_____

_____

Experience years Approximately how long have you worked in the treatment of OUD?

- ○ 0-3 years (4)
- ○ 3-5 years (5)
- ○ 5-10 years (6)
- ○ 10-20 years (7)
- ○ 20-30 years (8)
- ○ 30+ years (9)

Treatments What kind of treatment(s) do you deliver for OUD? (choose all that apply)

- [ ] Pharmacological - methadone (1)
- [ ] Pharmacological - buprenorphine (2)
- [ ] Pharmacological - buprenorphine with naloxone (3)
- [ ] Pharmacological - naltrexone (4)
- [ ] Pharmacological - lofexidine (5)
- [ ] Pharmacological - dihydrocodeine (6)
- [ ] Pharmacological - diamorphine (HAT) (8)
- [ ] Behavioural - 12 step (9)
- [ ] Behavioural - motivational interviewing (10)
- [ ] Behavioural - CBT (including 3rd wave derivatives e.g. MBCBT, CFT, DBT, ACT) (11)
- [ ] Behavioural - Self-Management And Recovery Training (SMART) (13)
- [ ] Behavioural - trauma-focussed therapy e.g. EMDR or TF-CBT (14)
- [ ] Behavioural - contingency management (16)
- [ ] Behavioural - couples therapy (17)
- [ ] Other (18) _____

Page Break

Assessing adherence How do you assess adherence to treatment that you provide? (choose all that apply)

- [ ] Attendance (1)
- [ ] Medication compliance (2)
- [ ] Urine toxicology screening (3)
- [ ] Patient self-report (4)
- [ ] Mouth swab (5)
- [ ] Other (6) _____

Characteristic 1 Based on your clinical experience, which one patient characteristic most often correlates with poorer adherence to treatment?

(For most responses, you will be able to elaborate on your choice e.g. by choosing male or female gender, or by specifying an age group or particular comorbid health problem)

- ○ Gender (1)
- ○ Age (2)
- ○ Other drug problems (3)
- ○ Comorbid mental health problem or disability (4)
- ○ Comorbid physical health problem or disability (5)
- ○ Poor family relationships (6)
- ○ Unstable housing or homelessness (7)
- ○ Low motivation to change (8)
- ○ Difficulty communicating (9)
- ○ Unmet medical or care needs (10)
- ○ Peripatetic/chaotic lifestyle (12)
- ○ Financial difficulties (13)
- ○ Living with peer user e.g. friend or romantic partner (14)
- ○ Other (15) _____

Skip To: Px age If Based on your clinical experience, which one patient characteristic most often correlates with po... = Age

Skip To: Px Comorbid drug use If Based on your clinical experience, which one patient characteristic most often correlates with po... = Other drug problems

Skip To: Px mental illness If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

Skip To: Px physical illness If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid physical health problem or disability

Skip To: End of Block If Based on your clinical experience, which one patient characteristic most often correlates with po... = Poor family relationships

Skip To: End of Block If Based on your clinical experience, which one patient characteristic most often correlates with po... = Unstable housing or homelessness

Skip To: End of Block If Based on your clinical experience, which one patient characteristic most often correlates with po... = Low motivation to change

Skip To: Px comm difficulty If Based on your clinical experience, which one patient characteristic most often correlates with po... = Difficulty communicating

Skip To: Px unmet need If Based on your clinical experience, which one patient characteristic most often correlates with po... = Unmet medical or care needs

Skip To: Px financial diff. If Based on your clinical experience, which one patient characteristic most often correlates with po... = Financial difficulties

Skip To: End of Block If Based on your clinical experience, which one patient characteristic most often correlates with po... = Peripatetic/chaotic lifestyle

Skip To: End of Block If Based on your clinical experience, which one patient characteristic most often correlates with po... = Living with peer user e.g. friend or romantic partner

Skip To: End of Block If Based on your clinical experience, which one patient characteristic most often correlates with po... = Other

Skip To: End of Block If Condition: Other Is Not Empty. Skip To: End of Block.

Page Break

Px gender Please specify your response using the choices below:

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Gender

○ Male gender (1)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Gender

○ Female gender (2)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Gender

○ Transgenderism/dysphoria (3)

Skip To: End of Block If Please specify your response using the choices below: = Male gender

Skip To: End of Block If Please specify your response using the choices below: = Female gender

Skip To: End of Block If Please specify your response using the choices below: = Transgenderism/dysphoria

Page Break

Px age Please specify your response using the choices below:

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Age

- age of <16 years (1)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Age

- age of 16-25 years (2)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Age

- age of 25-40 years (3)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Age

- age of 40-60 years (4)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Age

- age of 60> years (5)

Skip To: End of Block If Please specify your response using the choices below: = age of <16 years

Skip To: End of Block If Please specify your response using the choices below: = age of 16-25 years

Skip To: End of Block If Please specify your response using the choices below: = age of 25-40 years

Skip To: End of Block If Please specify your response using the choices below: = age of 40-60 years

Skip To: End of Block If Please specify your response using the choices below: = age of 60> years

Page Break

Px Comorbid drug use Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Other drug problems

☐ Alcohol (1)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Other drug problems

☐ Cannabis (2)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Other drug problems

☐ Hallucinogens (3)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Other drug problems

☐ Solvents (4)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Other drug problems

☐ Benzodiazepines (5)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Other drug problems

☐ Stimulants (8)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Other drug problems

☐ Cocaine (9)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Other drug problems

☐ Other drug or class of drug (10) _____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Alcohol

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cannabis

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Hallucinogens

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Solvents

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Benzodiazepines

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Stimulants

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cocaine

Skip To: End of Block If Condition: Other drug or class of drug Is Not Empty. Skip To: End of Block.

Page Break

Px mental illness Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Cluster A personality disorder (e.g. Paranoid, Schizoid, or Schizotypal) (1)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Cluster B personality disorder (e.g. Antisocial, Borderline, or Histrionic) (2)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Cluster C personality disorder (e.g. Avoidant, Dependent, or Obsessive-Compulsive) (3)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Bipolar disorder (4)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Anxiety disorders (5)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Depression (6)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Schizophrenia (7)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ PTSD (8)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Other Trauma presentation (e.g. sub-clinical PTSD/adverse life events, Acute Stress Disorder) (9)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Attention deficit hyperactivity disorder (10)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Autism spectrum disorder (11)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid mental health problem or disability

☐ Intellectual disability (12)

☐ Other mental health problem or disability (13)

_____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cluster A personality disorder (e.g. Paranoid, Schizoid, or Schizotypal)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cluster B personality disorder (e.g. Antisocial, Borderline, or Histrionic)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cluster C personality disorder (e.g. Avoidant, Dependent, or Obsessive-Compulsive)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Bipolar disorder

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Anxiety disorders

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Depression

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Schizophrenia

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = PTSD

Skip To: End of Block If Condition: Intellectual disability Is Not Empty. Skip To: End of Block.

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Attention deficit hyperactivity disorder

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Autism spectrum disorder

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Intellectual disability

Skip To: End of Block If Condition: Intellectual disability Is Not Empty. Skip To: End of Block.

Page Break

Px physical illness Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid physical health problem or disability

☐ HIV (1)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid physical health problem or disability

☐ Chronic pain (2)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid physical health problem or disability

☐ Hepatitis (3)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid physical health problem or disability

☐ Cardiovascular disease (4)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid physical health problem or disability

☐ Respiratory disease (5)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid physical health problem or disability

☐ Neurological disease or injury (6)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid physical health problem or disability

☐ Diabetes (7)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid physical health problem or disability

☐ Cancer (8)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Comorbid physical health problem or disability

☐ Other physical health problem or disability (9)

_____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = HIV

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Chronic pain

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Hepatitis

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cardiovascular disease

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Respiratory disease

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Neurological disease or injury

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Diabetes

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cancer

Skip To: End of Block If Condition: Other physical health probl... Is Not Empty. Skip To: End of Block.

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Other physical health problem or disability

Px comm difficulty Please specify your response using the choices below:

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Difficulty communicating

☐ Foreign language speaker (1)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Difficulty communicating

☐ Brain injury related speech disorder (2)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Difficulty communicating

☐ Psychiatric speech problem (e.g. disorganised speech) (3)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Difficulty communicating

☐ Other (6) _____

Skip To: End of Block If Please specify your response using the choices below: = Foreign language speaker

Skip To: End of Block If Please specify your response using the choices below: = Brain injury related speech disorder

Skip To: End of Block If Please specify your response using the choices below: = Psychiatric speech problem (e.g. disorganised speech)

Skip To: End of Block If Please specify your response using the choices below: = Other

Skip To: End of Block If Condition: Other Is Not Empty. Skip To: End of Block.

Px unmet need Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Unmet medical or care needs

☐ Unmet pain control needs (1)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Unmet medical or care needs

☐ Unmet chronic health condition management needs (2)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Unmet medical or care needs

☐ Unmet social care needs (4)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Unmet medical or care needs

☐ Unmet psychological care needs (5)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Unmet medical or care needs

☐ Other (8) _____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Unmet pain control needs

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Unmet chronic health condition management needs

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Unmet social care needs

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Unmet psychological care needs

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Other

Skip To: End of Block If Condition: Other Is Not Empty. Skip To: End of Block.

Px financial diff. Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Financial difficulties

☐ Patient unable to afford transport costs (1)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Financial difficulties

☐ Patient unable to afford treatment costs (if applicable) (2)

Display This Choice:

If Based on your clinical experience, which one patient characteristic most often correlates with po... = Financial difficulties

☐ Other (3) _____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Patient unable to afford transport costs

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Patient unable to afford treatment costs (if applicable)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Other

Skip To: End of Block If Condition: Other Is Not Empty. Skip To: End of Block.

End of Block: Block 1

Start of Block: Px characteristic 2

Px characteristic 2 Thank you for your answer. In your experience, which patient characteristic is the next most often correlated with poorer adherence to treatment? (again, you will be able to elaborate on and specify your choice after selection)

- ○ Gender (1)
- ○ Age (2)
- ○ Other drug problem (3)
- ○ Comorbid mental health problem or disability (4)
- ○ Comorbid physical health problem or disability (5)
- ○ Poor family relationships (6)
- ○ Unstable housing or homelessness (7)
- ○ Low motivation to change (8)
- ○ Difficulty communicating (9)
- ○ Unmet medical or care needs (10)
- ○ Peripatetic/chaotic lifestyle (11)
- ○ Financial difficulties (12)
- ○ Living with peer user e.g. friend or romantic partner (13)
- ○ Other (14) _____

Skip To: Px gender If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Gender

Skip To: Px age If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Age

Skip To: Px comorbid drug If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Other drug problem

Skip To: Px mental illness If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

Skip To: Px physical illness If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid physical health problem or disability

Skip To: End of Block If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Poor family relationships

Skip To: End of Block If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Unstable housing or homelessness

Skip To: End of Block If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Low motivation to change

Skip To: Px unmet need If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Unmet medical or care needs

Skip To: Px comm. difficulty If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Difficulty communicating

Skip To: End of Block If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Peripatetic/chaotic lifestyle

Skip To: Px financial diff. If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Financial difficulties

Skip To: End of Block If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Living with peer user e.g. friend or romantic partner

Skip To: End of Block If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Other

Skip To: End of Block If Condition: Other Is Not Empty. Skip To: End of Block.

Page Break

Px gender Please specify your response using the choices below:

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Gender

○ Male gender (1)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Gender

○ Female gender (2)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Gender

○ Trensgenderism/dysphoria (3)

Skip To: End of Block If Please specify your response using the choices below: = Male gender

Skip To: End of Block If Please specify your response using the choices below: = Female gender

Skip To: End of Block If Please specify your response using the choices below: = Trensgenderism/dysphoria

Page Break

Px age Please elaborate on your response using the choices below:

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Age

○ age <16 years (1)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Age

○ age 16-25 years (2)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Age

○ age 25-40 years (3)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Age

○ age 40-60 years (4)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Age

○ age 60> years (5)

Skip To: End of Block If Please elaborate on your response using the choices below: = age <16 years

Skip To: End of Block If Please elaborate on your response using the choices below: = age 16-25 years

Skip To: End of Block If Please elaborate on your response using the choices below: = age 25-40 years

Skip To: End of Block If Please elaborate on your response using the choices below: = age 40-60 years

Skip To: End of Block If Please elaborate on your response using the choices below: = age 60> years

Page Break

Px comorbid drug Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Other drug problem

☐ Alcohol (1)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Other drug problem

☐ Cannabis (2)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Other drug problem

☐ Hallucinogenics (3)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Other drug problem

☐ Inhalants (solvents) (4)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Other drug problem

☐ Benzodiazepines (5)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Other drug problem

☐ Stimulants (8)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Other drug problem

☐ Cocaine (9)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Other drug problem

☐ Other drug or class of drug (10)

_____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Alcohol

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cannabis

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Hallucinogenics

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Inhalants (solvents)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Benzodiazepines

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Stimulants

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cocaine

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Other drug or class of drug

Page Break

Px mental illness Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Cluster A personality disorder (e.g. Paranoid, Schizoid, or Schizotypal) (1)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Cluster B personality disorder (e.g. Antisocial, Borderline, or Histrionic) (2)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Cluster C personality disorder (e.g. Avoidant, Dependent, or Obsessive-Compulsive) (3)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Bipolar disorder (4)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Anxiety disorders (5)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Depressive disorder (6)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Schizophrenia (7)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ PTSD (8)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Other Trauma presentation (e.g. sub-clinical PTSD/adverse life events, Acute Stress Disorder) (9)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Attention deficit hyperactivity disorder (10)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Austism spectrum disorder (11)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid mental health problem or disability

☐ Intellectual disability (12)

☐ Other mental health problem or disability (13)

_____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cluster A personality disorder (e.g. Paranoid, Schizoid, or Schizotypal)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cluster B personality disorder (e.g. Antisocial, Borderline, or Histrionic)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cluster C personality disorder (e.g. Avoidant, Dependent, or Obsessive-Compulsive)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Bipolar disorder

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Anxiety disorders

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Depressive disorder

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Schizophrenia

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = PTSD

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Other Trauma presentation (e.g. sub-clinical PTSD/adverse life events, Acute Stress Disorder)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Attention deficit hyperactivity disorder

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Austism spectrum disorder

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Intellectual disability

Page Break

Px physical illness Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid physical health problem or disability

☐ HIV (1)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid physical health problem or disability

☐ Chronic pain (2)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid physical health problem or disability

☐ Hepatitis (3)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid physical health problem or disability

☐ Cardiovascular disease (4)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid physical health problem or disability

☐ Respiratory disease (5)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid physical health problem or disability

☐ Neurological disease (6)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid physical health problem or disability

☐ Diabetes (7)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid physical health problem or disability

☐ Cancer (8)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Comorbid physical health problem or disability

☐ Other physical health problem or disability (9) _____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = HIV

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Chronic pain

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Hepatitis

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cardiovascular disease

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Respiratory disease

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Neurological disease

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Diabetes

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Cancer

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Other physical health problem or disability

Px comm. difficulty Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Difficulty communicating

☐ Foreign language speaker (1)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Difficulty communicating

☐ Brain injury related speech disorder (2)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Difficulty communicating

☐ Psychiatric speech problem (e.g. disorganised speech) (3)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Difficulty communicating

☐ Other (6) _____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Foreign language speaker

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Brain injury related speech disorder

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Psychiatric speech problem (e.g. disorganised speech)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Other

Skip To: End of Block If Condition: Other Is Not Empty. Skip To: End of Block.

Display This Question:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Unmet medical or care needs

Px unmet need Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Unmet medical or care needs

☐ Unmet pain control needs (1)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Unmet medical or care needs

☐ Unmet chronic health condition management needs (2)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Unmet medical or care needs

☐ Unmet social care needs (4)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Unmet medical or care needs

☐ Unmet psychological care needs (8)

☐ Other (9) _____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Unmet pain control needs

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Unmet chronic health condition management needs

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Unmet social care needs

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Unmet psychological care needs

Skip To: End of Block If Condition: Unmet psychological care needs Is Not Empty. Skip To: End of Block.

Px financial diff. Please specify your response using the choices below: (choose all that apply)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Financial difficulties

☐ Patient unable to afford transport costs (1)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Financial difficulties

☐ Patient unable to afford treatment costs (if applicable) (2)

Display This Choice:

If Thank you for your answer. In your experience, which patient characteristic is the next most ofte... = Financial difficulties

☐ Other (3) _____

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Patient unable to afford transport costs

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Patient unable to afford treatment costs (if applicable)

Skip To: End of Block If Please specify your response using the choices below: (choose all that apply) = Other

Skip To: End of Block If Condition: Other Is Not Empty. Skip To: End of Block.

End of Block: Px characteristic 2

Start of Block: Block 3 (debrief)

D1 And that's the end of our survey! Thank you for taking the time to complete it.

Before you go, please enter your email to be entered in to the raffle to win the Amazon gift card worth £50/€59:

_____

D2
Debrief:

As detailed in the PIS dated 18.10.21 (v2.0) your data will be processed in accordance with the Data Protection Act 2018 and the General Data Protection Regulation 2016 (GDPR). Your participation is strictly confidential and response data is viewed only by the researcher. Please note that the data we will collect for our study will be made anonymous following the closing date of the survey on 1/3/22. After this date it will not be possible to identify and remove your data, should you decide to withdraw from the study. Therefore, if you decide to have your data withdrawn, please let us know before 1/3/22.

You have a right to access your personal information, to object to the processing of your personal information, to rectify, to erase, to restrict and to port your personal information. Please visit the University Data Protection webpages for further information in relation to your rights. Any requests or objections should be made in writing to the University Data Protection Officer:- University Compliance Officer (FOI/DP)
Vice-Chancellor's Office
Swansea University Singleton Park
Swansea
SA2 8PP Email: dataprotection@swansea.ac.uk

How to make a complaint
If you are unhappy with the way in which your personal data has been processed, you may in the first instance contact the University Data Protection Officer using the contact details above. If you remain dissatisfied, then you have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner can be contacted at: -
Information Commissioner's Office
Wycliffe House, Water Lane
Wilmslow, Cheshire
SK9 5AF
www.ico.org.uk

If you have any questions about the research, please contact: Matthew Jones Swansea University Medical School [redacted] or Professor Alan Watkins Swansea University Medical School [redacted]

End of Block: Block 3 (debrief)

Appendix I: Survey job titles

45 job titles reported:

AASD n=1

Addiction Liaison Nurse n=1
Addiction Nurse n=2
Addiction Psychiatrist n=43
Addictions n=4
Addictions Hospital Liaison n=1
Addictions Psychiatrist n=44
Clinical Lead n=1
Clinical researcher n=1
Clinical Team Manager/Lead Therapist n=1
Clinical Psychologist n=1
Community Detox Links Worker n=1
Consultant Addictions Psychiatrist n=1
Consultant Psychiatrist with special interest in n=1
Doctor n=14
Drugs/alcohol Support worker n=1
Dual diagnosis practitioner n=1
Engagement worker n=1
HCSW n=1
Lead Clinician n=1
Medical Officer in Addictions n=1
Mental health & Substance use Nurse Practitioner n=1
Non-medical prescriber n=2
Nurse n=175
Oral and maxillofacial surgeon n=1
Outreach worker n=1
Psychiatrist n=2
Psychological Doctor n=25
Psychologist n=102
Recovery Worker n=2
Shared Care n=1
Shared Care worker n=1
Social Worker n=1
Specialist Addictions Nurse n=1
Specialty Doctor Addictions n=1
Specialty Doctor in Addictions psychiatry n=1
Substance application liaison officer n=2
Substance use caseworker n=1
Substance Use GP Liaison Nurse n=1
Substance Use Liaison Worker n=3
Substance Use Worker n=1
Substance Use Liaison officer n=6
Substance use liaison worker n=9
Support worker n=40
Team Leader for adult treatment services n=1
no data n=4

Appendix J: Survey results

Total treatments provided

391

Treatments provided	No. of responses	% of total responses
Pharmacological - buprenorphine	232	19.0%
Pharmacological - methadone	223	18.3%
Pharmacological - naltrexone	157	12.9%
Pharmacological - buprenorphine with naloxone	142	11.6%
Behavioural - motivational interviewing	72	5.9%
Pharmacological - lofexidine	61	5.0%
Behavioural - CBT	55	4.5%
Pharmacological - diamorphine (HAT)	47	3.8%
Behavioural - 12 step	47	3.8%
Behavioural - Self-Management And Recovery Training (SMART)	46	3.8%
Behavioural - trauma-focussed therapy e.g. EMDR or TF-CBT	46	3.8%
Pharmacological - dihydrocodeine	43	3.5%
Behavioural - contingency management	34	2.8%
Behavioural - couples therapy	8	0.7%
Behavioural - solution focused therapy	2	0.2%
Pharmacological - Buvidal	1	0.1%
Pharmacological other - morphine	1	0.1%
Behavioural - Humanistic therapy	1	0.1%
Pharmacological - clonidine	1	0.1%
Behavioural - Core skills for relapse prevention	1	0.1%
Other	1	0.1%

Total treatments = 1221

Total sample measures of adherence

Measures of adherence employed	No. of responses	% of total responses
Urine toxicology screening	296	29.8%
Medication compliance	287	28.9%
Patient self-report	190	19.1%
Appointment attendance	138	13.9%
Mouth swab	77	7.7%
Feedback from keyworker and pharmacist	2	0.2%
Observation of patient presentation	2	0.2%
Psychometric outcome measures	1	0.1%

Total =993

Total Primary obstacles

Primary obstacles to adherence	No. of responses	% of total responses	Secondary obstacles to adherence	No. of responses	% of total responses
Cluster C personality disorder	51	6.1%	Cluster C personality disorder	65	7.6%

Cluster B personality disorder	47	5.6%	Cluster B personality disorder	63	7.4%
Peripatetic/chaotic lifestyle	39	4.7%	Cluster A personality disorder	50	5.9%
Low motivation to change	38	4.6%	Poor family relationships	44	5.2%
Anxiety disorders	35	4.2%	Bipolar disorder	40	4.7%
Unstable housing or homelessness	34	4.1%	Low motivation to change	36	4.2%
Bipolar disorder	33	4.0%	Anxiety disorders	36	4.2%
Cluster A personality disorder	32	3.8%	Unstable housing or homelessness	35	4.1%
Depression	28	3.4%	Peripatetic/chaotic lifestyle	33	3.9%
Schizophrenia	27	3.2%	Schizophrenia	33	3.9%
Poor family relationships	26	3.1%	Depressive disorder	28	3.3%
Comorbid Solvents use	23	2.8%	Other Trauma presentation	27	3.2%
Neurological disease or injury	23	2.8%	Male gender	26	3.0%
Comorbid Hallucinogens use	21	2.5%	PTSD	23	2.7%
Unmet social care needs	20	2.4%	Female gender	22	2.6%
Comorbid Cannabis use	20	2.4%	Comorbid Cannabis use	18	2.1%
Unmet chronic health condition management needs	19	2.3%	Attention deficit hyperactivity disorder	17	2.0%
Respiratory disease	19	2.3%	Cardiovascular disease	17	2.0%
Hepatitis	19	2.3%	Comorbid Cocaine use	16	1.9%
Cardiovascular disease	18	2.2%	Autism spectrum disorder	15	1.8%
Brain injury related speech disorder	18	2.2%	Chronic pain	14	1.6%
PTSD	17	2.0%	Comorbid Alcohol use	14	1.6%
Attention deficit hyperactivity disorder	17	2.0%	Unmet social care needs	13	1.5%
Other Trauma presentation	15	1.8%	Intellectual disability	12	1.4%
Chronic pain	14	1.7%	Comorbid solvents use	12	1.4%
Age of 25-40 years	14	1.7%	HIV	11	1.3%
Male gender	14	1.7%	Comorbid Benzodiazepines use	11	1.3%
HIV	13	1.6%	Unmet pain control needs	10	1.2%
Comorbid Alcohol use	12	1.4%	Respiratory disease	10	1.2%
Comorbid Stimulants use	11	1.3%	Unmet chronic health condition management needs	9	1.1%
Psychiatric speech problem (e.g. disorganised speech)	11	1.3%	Hallucinogenic	9	1.1%
Intellectual disability	10	1.2%	Hepatitis	9	1.1%
Patient unable to afford treatment costs	10	1.2%	Neurological disease	8	0.9%
Comorbid Benzodiazepines use	10	1.2%	Psychiatric speech problem	8	0.9%

Age of 16-25 years	9	1.1%	Brain injury related speech disorder	8	0.9%
Patient unable to afford transport costs	9	1.1%	Foreign language speaker	7	0.8%
Living with peer user	9	1.1%	Living with peer user	7	0.8%
Foreign language speaker	8	1.0%	Comorbid Stimulants use	7	0.8%
Autism spectrum disorder	8	1.0%	age 25-40 years	7	0.8%
Diabetes	7	0.8%	Transgenderism/gender dysphoria	6	0.7%
Unmet psychological care needs	5	0.6%	Comorbid NPS use	5	0.6%
Unmet pain control needs	5	0.6%	Pregabalin	5	0.6%
Comorbid Cocaine use	5	0.6%	Diabetes	2	0.2%
Female gender	3	0.4%	Cancer	2	0.2%
Service factors	2	0.2%	age 40-60 years	1	0.1%
Comorbid NPS use	1	0.1%	Difficulty understanding treatment	1	0.1%
Age of 40-60 years	1	0.1%	age 16-25 years	1	0.1%
Cancer	1	0.1%	Total = 853		
Age of <16 years	1	0.1%			
Total = 832					

Primary obstacle by location

Location (respondents)	Primary obstacles	No. of responses	%
USA (n=438)	Cluster C personality disorder	44	6.57
	Cluster B personality disorder	37	5.52
	Bipolar disorder	28	4.18
	Anxiety disorders	28	4.18
	Peripatetic/chaotic lifestyle	28	4.18
	Low motivation to change	26	3.88
	Cluster A personality disorder	26	3.88
	Poor family relationships	25	3.73
	Unstable housing or homelessness	25	3.73
	Neurological disease or injury	22	3.28
	Depression	22	3.28
	Schizophrenia	20	2.99
	Hallucinogens	20	2.99
	Solvents	19	2.84
	Hepatitis	19	2.84
	Unmet social care needs	18	2.69
	Cannabis	18	2.69
	Unmet chronic health condition management needs	17	2.54
	Respiratory disease	17	2.54
	Cardiovascular disease	17	2.54
	Brain injury related speech disorder	16	2.39
	age of 25-40 years	14	2.09
	PTSD	12	1.79
	HIV	12	1.79
	Attention deficit hyperactivity disorder	12	1.79

	Chronic pain	11	1.64
	Alcohol	9	1.34
	age of 16-25 years	9	1.34
	Patient unable to afford treatment costs	9	1.34
	Intellectual disability	8	1.19
	Psychiatric speech problem	8	1.19
	Other Trauma presentation	8	1.19
	Patient unable to afford transport costs	8	1.19
	Foreign language speaker	7	1.04
	Diabetes	7	1.04
	Male gender	7	1.04
	Autism spectrum disorder	7	1.04
	Stimulants	5	0.75
	Living with peer user	5	0.75
	Other physical health problem or disability	5	0.75
	Benzodiazepines	4	0.60
	Unmet psychological care needs	3	0.45
	Unmet pain control needs	3	0.45
	age of <16 years	1	0.15
	age of 40-60 years	1	0.15
	Cancer	1	0.15
	Cocaine	1	0.15
	Female gender	1	0.15
		Total=670	
UK (respondents n=59)	Peripatetic/chaotic lifestyle	11	8.40
	Low motivation to change	10	7.63
	Cluster B personality disorder	9	6.87
	Other Trauma presentation	7	5.34
	Unstable housing or homelessness	7	5.34
	Anxiety disorders	7	5.34
	Cluster C personality disorder	7	5.34
	Depression	6	4.58
	Cluster A personality disorder	6	4.58
	Schizophrenia	6	4.58
	PTSD	5	3.82
	Benzodiazepines	5	3.82
	Bipolar disorder	4	3.05
	Living with peer user	4	3.05
	Attention deficit hyperactivity disorder	4	3.05
	Cocaine	4	3.05
	Alcohol	3	2.29
	Unmet social care needs	2	1.53
	Unmet pain control needs	2	1.53
	Unmet chronic health condition management needs	2	1.53
	Cannabis	2	1.53
	Unmet psychological care needs	2	1.53
	Service factors	2	1.53
	Stimulants	2	1.53
	Intellectual disability	2	1.53

	HIV	1	0.76
	Patient unable to afford transport costs	2	1.53
	Cardiovascular disease	1	0.76
	Respiratory disease	1	0.76
	Chronic pain	1	0.76
	Poor family relationships	1	0.76
	Other mental health problem or disability	1	0.76
	Autism spectrum disorder	1	0.76
	NPS	1	0.76
		Total=131	
EU (n=8)	Chronic pain	2	14.29
	Low motivation to change	2	14.29
	Unstable housing or homelessness	2	14.29
	Brain injury related speech disorder	1	7.14
	Psychiatric speech problem	1	7.14
	Neurological disease or injury	1	7.14
	Schizophrenia	1	7.14
	Bipolar disorder	1	7.14
	Attention deficit hyperactivity disorder	1	7.14
	Cluster B personality disorder	1	7.14
	Foreign language speaker	1	7.14
		Total=14	
Kenya (n=1)	Male gender	1	100
		Total=1	
Canada (n=1)	Psychiatric speech problem	1	100
		Total=1	

Secondary obstacles by location

Location (respondents)	**Secondary obstacles**	**No. of responses**	**%**
USA (n=438)	Cluster C personality disorder	58	8.06
	Cluster B personality disorder	46	6.39
	Cluster A personality disorder	41	5.69
	Poor family relationships	40	5.56
	Depressive disorder	33	4.58
	Anxiety disorders	29	4.03
	Bipolar disorder	29	4.03
	Schizophrenia	27	3.75
	Low motivation to change	27	3.75
	Cardiovascular disease	24	3.33
	Peripatetic/chaotic lifestyle	22	3.06
	Unstable housing or homelessness	19	2.64
	Respiratory disease	18	2.50
	Chronic pain	18	2.50
	Inhalants (solvents)	16	2.22
	Other Trauma presentation	16	2.22
	Cannabis	15	2.08
	Neurological disease	15	2.08
	Hepatitis	15	2.08

	Hallucinogenics	14	1.94
	Brain injury related speech disorder	12	1.67
	Autism spectrum disorder	12	1.67
	Alcohol	12	1.67
	Cocaine	11	1.53
	HIV	11	1.53
	Unmet social care needs	11	1.53
	Foreign language speaker	11	1.53
	age 25-40 years	10	1.39
	Stimulants	9	1.25
	PTSD	9	1.25
	Psychiatric speech problem	9	1.25
	age 16-25 years	8	1.11
	Intellectual disability	8	1.11
	Attention deficit hyperactivity disorder	8	1.11
	Benzodiazepines	7	0.97
	Female gender	7	0.97
	Unmet pain control needs	6	0.83
	Unmet chronic health condition management needs	6	0.83
	Living with peer user	6	0.83
	Diabetes	5	0.69
	Patient unable to afford treatment costs	4	0.56
	Patient unable to afford transport costs	4	0.56
	age 40-60 years	3	0.42
	Male gender	3	0.42
	Unmet psychological care needs	3	0.42
	Cancer	2	0.28
	Transgenderism/dysphoria	1	0.14
		Total=720	
UK (n=59)	Unstable housing or homelessness	15	11.81
	Peripatetic/chaotic lifestyle	11	8.66
	PTSD	8	6.30
	Other Trauma presentation	8	6.30
	Low motivation to change	7	5.51
	Depressive disorder	7	5.51
	Benzodiazepines	6	4.72
	Bipolar disorder	6	4.72
	Schizophrenia	6	4.72
	Cluster A personality disorder	6	4.72
	Anxiety disorders	6	4.72
	Cluster B personality disorder	6	4.72
	Cluster C personality disorder	5	3.94
	Alcohol	5	3.94
	Cocaine	4	3.15
	Attention deficit hyperactivity disorder	3	2.36
	Poor family relationships	3	2.36
	Cannabis	3	2.36
	Cardiovascular disease	2	1.57
	Autism spectrum disorder	2	1.57
	Chronic pain	1	0.79
	Living with peer user	1	0.79

	Respiratory disease	1	0.79
	Stimulants	1	0.79
	Hallucinogenics	1	0.79
	NPS	1	0.79
	HIV	1	0.79
	Inhalants (solvents)	1	0.79
		Total=127	
EU (n=8)	Low motivation to change	2	25
	Cluster B personality disorder	1	12.5
	Neurological disease	1	12.5
	Chronic pain	1	12.5
	Unmet social care needs	1	12.5
	Difficulty understanding treatment	1	12.5
	Bipolar disorder	1	12.5
		Total=8	
Kenya (n=1)	Unstable housing or homelessness	1	100
		Total=1	
Canada (n=1)	Autism spectrum disorder	1	100
		Total=1	

Appendix K: SPSS syntax 2 Chi-Squared & Kruskall-Wallis

```
EXECUTE.
EXECUTE.
CROSSTABS
  /TABLES=GROUP BY AgePO
ComorbidmentalhealthproblemordisabilityPO
    ComorbidphysicalhealthproblemordisabilityPO
DifficultycommunicatingorunderstandingtreatmentPO
    FinancialdifficultiesPO GenderPO
LivingwithpeeruseregfriendorromanticpartnerPO
    LowmotivationtochangePO OtherdrugproblemPO
PeripateticchaoticlifestylePO PoorfamilyrelationshipsPO
    ServicefactorsPO UnmetmedicalorcareneedsPO
UnstablehousingorhomelessnessPO
  /FORMAT=AVALUE TABLES
  /STATISTICS=CHISQ
  /CELLS=COUNT
  /COUNT ROUND CELL.
```

Crosstabs

Notes

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	Weight	<none>
	Split File	<none>
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	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
Syntax		CROSSTABS /TABLES=GROUP BY AgePO ComorbidmentalhealthproblemordisabilityPO ComorbidphysicalhealthproblemordisabilityPO DifficultycommunicatingorunderstandingtreatmentPO FinancialdifficultiesPO GenderPO LivingwithpeeruseregfriendorromanticpartnerPO Lowmotivationtochange

		PO OtherdrugproblemPO PeripateticchaoticlifestylePO PoorfamilyrelationshipsPO ServicefactorsPO UnmetmedicalorcareneedsPO UnstablehousingorhomelessnessPO /FORMAT=AVALUE TABLES /STATISTICS=CHISQ /CELLS=COUNT /COUNT ROUND CELL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01
	Dimensions Requested	2
	Cells Available	524245

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
GROUP * AgePO	486	100.0%	0	0.0%	486	100.0%
GROUP * ComorbidmentalhealthproblemordisabilityPO	486	100.0%	0	0.0%	486	100.0%
GROUP * ComorbidphysicalhealthproblemordisabilityPO	486	100.0%	0	0.0%	486	100.0%
GROUP * DifficultycommunicatingorunderstandingtreatmentPO	486	100.0%	0	0.0%	486	100.0%
GROUP * FinancialdifficultiesPO	486	100.0%	0	0.0%	486	100.0%
GROUP * GenderPO	486	100.0%	0	0.0%	486	100.0%

GROUP * LivingwithpeeruseregfriendorromanticpartnerPO	486	100.0%	0	0.0%	486	100.0%
GROUP * LowmotivationtochangePO	486	100.0%	0	0.0%	486	100.0%
GROUP * OtherdrugproblemPO	486	100.0%	0	0.0%	486	100.0%
GROUP * PeripateticchaoticlifestylePO	486	100.0%	0	0.0%	486	100.0%
GROUP * PoorfamilyrelationshipsPO	486	100.0%	0	0.0%	486	100.0%
GROUP * ServicefactorsPO	486	100.0%	0	0.0%	486	100.0%
GROUP * UnmetmedicalorcareneedsPO	486	100.0%	0	0.0%	486	100.0%
GROUP * UnstablehousingorhomelessnessPO	486	100.0%	0	0.0%	486	100.0%

GROUP * AgePO

Crosstab

Count

		AgePO		
		0	1	Total
GROUP	Doctor	106	2	108
	Nurse	167	12	179
	Psycholo	123	8	131
	Support	65	3	68
Total		461	25	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)

Pearson Chi-Square	3.615[a]	3	.306
Likelihood Ratio	4.279	3	.233
N of Valid Cases	486		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 3.50.

GROUP * ComorbidmentalhealthproblemordisabilityPO

Crosstab

Count

		ComorbidmentalhealthproblemordisabilityPO		
		0	1	Total
GROUP	Doctor	98	10	108
	Nurse	133	46	179
	Psycholo	103	28	131
	Support	47	21	68
Total		381	105	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.949[a]	3	.002
Likelihood Ratio	16.585	3	.001
N of Valid Cases	486		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.69.

GROUP * ComorbidphysicalhealthproblemordisabilityPO

Crosstab

Count

		Comorbidphysicalhealthproblemordisability PO		
		0	1	Total
GROUP	Doctor	90	18	108
	Nurse	146	33	179
	Psycholo	117	14	131
	Support	62	6	68
Total		415	71	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.908[a]	3	.116
Likelihood Ratio	6.154	3	.104
N of Valid Cases	486		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.93.

GROUP * DifficultycommunicatingorunderstandingtreatmentPO

Crosstab

Count

		Difficultycommunicatingorunderstandingtreatment PO		
		0	1	Total
GROUP	Doctor	107	1	108
	Nurse	167	12	179
	Psycholo	119	12	131
	Support	67	1	68
Total		460	26	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)

Pearson Chi-Square	10.600[a]	3	.014
Likelihood Ratio	12.797	3	.005
N of Valid Cases	486		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 3.64.

GROUP * FinancialdifficultiesPO

Crosstab

Count

		FinancialdifficultiesPO		
		0	1	Total
GROUP	Doctor	105	3	108
	Nurse	175	4	179
	Psycholo	125	6	131
	Support	67	1	68
Total		472	14	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.107[a]	3	.551
Likelihood Ratio	2.031	3	.566
N of Valid Cases	486		

a. 3 cells (37.5%) have expected count less than 5. The minimum expected count is 1.96.

GROUP * GenderPO

Crosstab

Count

		GenderPO		
		0	1	Total
GROUP	Doctor	108	0	108
	Nurse	172	7	179
	Psycholo	126	5	131
	Support	64	4	68
Total		470	16	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.438[a]	3	.142
Likelihood Ratio	8.710	3	.033
N of Valid Cases	486		

a. 3 cells (37.5%) have expected count less than 5. The minimum expected count is 2.24.

GROUP * LivingwithpeeruseregfriendorromanticpartnerPO

Crosstab

Count

		LivingwithpeeruseregfriendorromanticpartnerPO		
		0	1	Total
GROUP	Doctor	103	5	108
	Nurse	178	1	179
	Psycholo	129	2	131
	Support	68	0	68
Total		478	8	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)

Pearson Chi-Square	8.395[a]	3	.039
Likelihood Ratio	8.017	3	.046
N of Valid Cases	486		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 1.12.

GROUP * LowmotivationtochangePO

Crosstab

Count

		LowmotivationtochangePO		
		0	1	Total
GROUP	Doctor	93	15	108
	Nurse	170	9	179
	Psycholo	122	9	131
	Support	65	3	68
Total		450	36	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	9.037[a]	3	.029
Likelihood Ratio	8.099	3	.044
N of Valid Cases	486		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.04.

GROUP * OtherdrugproblemPO

Crosstab

Count

		OtherdrugproblemPO		
		0	1	Total
GROUP	Doctor	85	23	108
	Nurse	165	14	179
	Psycholo	119	12	131
	Support	61	7	68
Total		430	56	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.343[a]	3	.004
Likelihood Ratio	11.898	3	.008
N of Valid Cases	486		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.84.

GROUP * PeripateticchaoticlifestylePO

Crosstab

Count

		PeripateticchaoticlifestylePO		
		0	1	Total
GROUP	Doctor	95	13	108
	Nurse	169	10	179
	Psycholo	125	6	131
	Support	60	8	68
Total		449	37	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.430[a]	3	.059
Likelihood Ratio	7.156	3	.067
N of Valid Cases	486		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.18.

GROUP * PoorfamilyrelationshipsPO

Crosstab

Count

		PoorfamilyrelationshipsPO		
		0	1	Total
GROUP	Doctor	105	3	108
	Nurse	168	11	179
	Psycholo	122	9	131
	Support	65	3	68
Total		460	26	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.351[a]	3	.503
Likelihood Ratio	2.588	3	.460
N of Valid Cases	486		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 3.64.

GROUP * ServicefactorsPO

Crosstab

Count

		ServicefactorsPO		
		0	1	Total
GROUP	Doctor	107	1	108
	Nurse	179	0	179
	Psycholo	131	0	131
	Support	67	1	68
Total		484	2	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.839[a]	3	.279
Likelihood Ratio	4.185	3	.242
N of Valid Cases	486		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .28.

GROUP * UnmetmedicalorcareneedsPO

Crosstab

Count

		UnmetmedicalorcareneedsPO		
		0	1	Total
GROUP	Doctor	104	4	108
	Nurse	169	10	179
	Psycholo	116	15	131
	Support	64	4	68
Total		453	33	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.619[a]	3	.085
Likelihood Ratio	6.231	3	.101
N of Valid Cases	486		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.62.

GROUP * UnstablehousingorhomelessnessPO

Crosstab

Count

		UnstablehousingorhomelessnessPO		
		0	1	Total
GROUP	Doctor	98	10	108
	Nurse	169	10	179
	Psycholo	126	5	131
	Support	62	6	68
Total		455	31	486

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.809[a]	3	.283
Likelihood Ratio	3.804	3	.283
N of Valid Cases	486		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.34.

```
NPAR TESTS
  /K-W=AgePO ComorbidmentalhealthproblemordisabilityPO
ComorbidphysicalhealthproblemordisabilityPO
```

```
    DifficultycommunicatingorunderstandingtreatmentPO
FinancialdifficultiesPO GenderPO
    LivingwithpeerusereG.friendorromanticpartnerPO
LowmotivationtochangePO OtherdrugproblemPO
    PeripateticchaoticlifestylePO PoorfamilyrelationshipsPO
ServicefactorsPO UnmetmedicalorcareneedsPO
    UnstablehousingorhomelessnessPO BY Experience(1 5)
  /MISSING ANALYSIS.
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NPar Tests

Notes

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Syntax		NPAR TESTS /K-W=AgePO ComorbidmentalhealthproblemordisabilityPO ComorbidphysicalhealthproblemordisabilityPO DifficultycommunicatingorunderstandingtreatmentPO

		FinancialdifficultiesPO GenderPO Livingwithpeerusere.g.friendorromanticpartnerPO Lowmotivationtochange PO OtherdrugproblemPO Peripateticchaoticlifestyle PO Poorfamilyrelationships PO ServicefactorsPO Unmetmedicalorcareneeds PO Unstablehousingorhomelessness PO BY Experience(1 5) /MISSING ANALYSIS.
Resources	Processor Time	00:00:00.00
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a. Based on availability of workspace memory.

Kruskal-Wallis Test

Ranks

	Experience	N	Mean Rank
AgePO	1	75	247.12
	2	212	250.25
	3	142	242.66
	4	51	238.82
	5	12	254.50
	Total	492	
ComorbidmentalhealthproblemordisabilityPO	1	75	224.80
	2	212	255.82
	3	142	245.70
	4	51	240.24

	5	12	253.50
	Total	492	
ComorbidphysicalhealthproblemordisabilityPO	1	75	242.30
	2	212	252.43
	3	142	245.88
	4	51	233.62
	5	12	230.00
	Total	492	
DifficultycommunicatingorunderstandingtreatmentPO	1	75	252.68
	2	212	245.76
	3	142	241.66
	4	51	252.29
	5	12	253.50
	Total	492	
FinancialdifficultiesPO	1	75	255.90
	2	212	244.14
	3	142	246.43
	4	51	244.32
	5	12	239.50
	Total	492	
GenderPO	1	75	254.40
	2	212	247.28
	3	142	241.46
	4	51	247.65
	5	12	238.00
	Total	492	
Livingwithpeerusere.g.friendorromanticpartnerPO	1	75	248.56
	2	212	245.48
	3	142	245.46
	4	51	251.65
	5	12	242.00
	Total	492	
LowmotivationtochangePO	1	75	239.34
	2	212	242.26
	3	142	250.29
	4	51	268.09
	5	12	229.50

	Total	492	
OtherdrugproblemPO	1	75	247.02
	2	212	244.19
	3	142	252.15
	4	51	241.62
	5	12	238.00
	Total	492	
PeripateticchaoticlifestylePO	1	75	264.58
	2	212	238.94
	3	142	245.82
	4	51	242.97
	5	12	290.00
	Total	492	
PoorfamilyrelationshipsPO	1	75	249.90
	2	212	247.42
	3	142	245.63
	4	51	243.15
	5	12	233.50
	Total	492	
ServicefactorsPO	1	75	246.00
	2	212	246.00
	3	142	246.00
	4	51	246.00
	5	12	266.50
	Total	492	
UnmetmedicalorcareneedsPO	1	75	236.56
	2	212	245.08
	3	142	252.52
	4	51	249.29
	5	12	250.50
	Total	492	
UnstablehousingorhomelessnessPO	1	75	241.84
	2	212	245.92
	3	142	249.32
	4	51	251.29
	5	12	232.00

	Total	492

Test Statistics[a,b]

	AgePO	Comorbidmentalhealthproblemordisability PO	ComorbidphysicalhealthproblemordisabilityPO	Difficultycommunicatingorunderstandingtreatment PO	FinancialdifficultiesPO
Kruskal-Wallis H	3.032	5.394	2.655	2.735	5.152
df	4	4	4	4	4
Asymp. Sig.	.552	.249	.617	.603	.272

Test Statistics[a,b]

	GenderPO	Livingwithpeerusere.g.friendorromanticpartnerPO	LowmotivationtochangePO	OtherdrugproblemPO	PeripateticchaoticlifestylePO
Kruskal-Wallis H	4.620	2.098	9.465	1.231	14.597
df	4	4	4	4	4
Asymp. Sig.	.329	.718	.050	.873	.006

Test Statistics[a,b]

	PoorfamilyrelationshipsPO	ServicefactorsPO	Unmetmedicalorcareneeds PO	UnstablehousingorhomelessnessPO
Kruskal-Wallis H	1.238	40.000	3.577	1.940
df	4	4	4	4
Asymp. Sig.	.872	.000	.466	.747

a. Kruskal Wallis Test

b. Grouping Variable: Experience

```
NPAR TESTS
  /K-W=AgeSO ComorbidmentalhealthproblemordisabilitysO
ComorbidphysicalhealthproblemordisabilitysO
    Difficultycommunicatingorunderstandingtreatmentso
```

```
FinancialdifficultiesSO GenderSO
    LivingwithpeerusereG.friendorromanticpartnerSO
LowmotivationtochangeSO OtherdrugproblemSO
    PeripateticchaoticlifestyleSO PoorfamilyrelationshipsSO
UnmetmedicalorcareneedsSO
    UnstablehousingorhomelessnessSO BY Experience(1 5)
  /MISSING ANALYSIS.
```

NPar Tests

Notes

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	N of Rows in Working Data File	495
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each test are based on all cases with valid data for the variable(s) used in that test.
Syntax		NPAR TESTS /K-W=AgeSO ComorbidmentalhealthproblemordisabilitySO ComorbidphysicalhealthproblemordisabilitySO DifficultycommunicatingorunderstandingtreatmentSO

		FinancialdifficultiesSO GenderSO Livingwithpeerusere.g.friendorromanticpartnerSO Lowmotivationtochange SO OtherdrugproblemSO Peripateticchaoticlifestyle SO Poorfamilyrelationships SO Unmetmedicalorcareneedds SO Unstablehousingorhomelessness SO BY Experience(1 5) /MISSING ANALYSIS.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01
	Number of Cases Allowed[a]	165564

a. Based on availability of workspace memory.

Kruskal-Wallis Test

Ranks

	Experience	N	Mean Rank
AgeSO	1	75	242.56
	2	212	251.08
	3	142	242.93
	4	51	245.65
	5	12	236.00
	Total	492	
ComorbidmentalhealthproblemordisabilitySO	1	75	244.38
	2	212	262.53
	3	142	243.06
	4	51	209.26
	5	12	175.50

	Total	492	
ComorbidphysicalhealthproblemordisabilitySO	1	75	233.96
	2	212	249.29
	3	142	250.85
	4	51	249.59
	5	12	211.00
	Total	492	
DifficultycommunicatingorunderstandingtreatmentSO	1	75	246.84
	2	212	241.64
	3	142	249.13
	4	51	256.29
	5	12	257.50
	Total	492	
FinancialdifficultiesSO	1	75	251.84
	2	212	243.16
	3	142	247.20
	4	51	251.65
	5	12	242.00
	Total	492	
GenderSO	1	75	247.56
	2	212	249.12
	3	142	244.46
	4	51	241.00
	5	12	241.00
	Total	492	
LivingwithpeerusereferorromanticpartnerSO	1	75	246.78
	2	212	244.66
	3	142	246.96
	4	51	248.32
	5	12	264.00
	Total	492	
LowmotivationtochangeSO	1	75	246.90
	2	212	244.42
	3	142	251.29
	4	51	244.97
	5	12	230.50

	Total	492	
OtherdrugproblemSO	1	75	256.36
	2	212	237.89
	3	142	251.65
	4	51	255.59
	5	12	237.50
	Total	492	
PeripateticchaoticlifestyleSO	1	75	256.24
	2	212	243.92
	3	142	240.39
	4	51	249.29
	5	12	291.50
	Total	492	
PoorfamilyrelationshipsSO	1	75	240.90
	2	212	245.39
	3	142	245.29
	4	51	258.26
	5	12	265.50
	Total	492	
UnmetmedicalorcareneedsSO	1	75	245.06
	2	212	248.94
	3	142	241.96
	4	51	248.15
	5	12	259.00
	Total	492	
UnstablehousingorhomelessnessSO	1	75	245.12
	2	212	242.44
	3	142	249.32
	4	51	246.47
	5	12	293.50
	Total	492	

Test Statistics[a,b]

AgeSO	Comorbidmentalhealthprobl	Comorbidphysicalhealthpro	Difficultycommunicatingoru	Financialdifficultiesso

	emordisabilitySO	blemordisabilitySO	nderstandingtreatmentSO		
Kruskal-Wallis H	3.548	15.074	4.238	5.480	5.662
df	4	4	4	4	4
Asymp. Sig.	.471	.005	.375	.242	.226

Test Statistics[a,b]

	GenderSO	Livingwithpeerusere.g.friendorromanticpartnerSO	Lowmotivationtochange SO	Otherdrugproblem SO	Peripateticchaoticlifestyle SO
Kruskal-Wallis H	3.045	6.295	1.999	4.995	10.150
df	4	4	4	4	4
Asymp. Sig.	.550	.178	.736	.288	.038

Test Statistics[a,b]

	PoorfamilyrelationshipsSO	Unmetmedicallorcareneeds SO	Unstablehousingorhomelessness SO
Kruskal-Wallis H	2.878	3.331	9.297
df	4	4	4
Asymp. Sig.	.578	.504	.054

a. Kruskal Wallis Test

b. Grouping Variable: Experience

Appendix L: SPSS Syntax 3 Binary Logistic Regression

Logistic Regression

Notes

Output Created	08-MAY-2024 10:29:23

Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyAge /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			AnyAge		Percentage Correct
	Observed		0	1	
Step 0	AnyAge	0	406	0	100.0
		1	39	0	.0
	Overall Percentage				91.2

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-2.343	.168	195.298	1	<.001	.096

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	3.033	1	.082
		Age	.373	1	.541
		Experience	2.375	1	.123
		Doctor(1)	5.112	1	.024
		Nurse(1)	4.162	1	.041
		Psychologist(1)	.007	1	.934
		SW(1)	.085	1	.771

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	14.340	6	.026
	Block	14.340	6	.026
	Model	14.340	6	.026

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	250.030	.032	.071

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	12.802	8	.119

Contingency Table for Hosmer and Lemeshow Test

		AnyAge = 0		AnyAge = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	43	44.180	2	.820	45
	2	45	43.455	0	1.545	45
	3	43	43.023	2	1.977	45
	4	42	42.276	3	2.724	45
	5	39	41.578	6	3.422	45
	6	46	41.773	0	4.227	46
	7	39	40.251	6	4.749	45
	8	41	39.446	4	5.554	45
	9	36	39.088	10	6.912	46
	10	32	30.932	6	7.068	38

Classification Table

			Predicted		
			AnyAge		
	Observed		0	1	Percentage Correct
Step 1	AnyAge	0	406	0	100.0
		1	39	0	.0
	Overall Percentage				91.2

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	-.720	.360	3.996	1	.046	.487	.24
	Age	.025	.026	.886	1	.347	1.025	.97
	Experience	-.384	.226	2.902	1	.088	.681	.43

	Doctor(1)	-.978	.790	1.536	1	.215	.376	.08
	Nurse(1)	.642	.600	1.145	1	.285	1.900	.58
	Psychologist(1)	.165	.618	.071	1	.789	1.180	.35
	Constant	-2.221	1.065	4.351	1	.037	.109	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:29:57
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyMH /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(

		1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000

	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			AnyMH		Percentage Correct
	Observed		0	1	
Step 0	AnyMH	0	270	0	100.0
		1	175	0	.0
	Overall Percentage				60.7

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.434	.097	19.966	1	<.001	.648

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.641	1	.423
		Age	2.586	1	.108
		Experience	2.778	1	.096
		Doctor(1)	35.772	1	<.001
		Nurse(1)	11.969	1	<.001
		Psychologist(1)	.088	1	.766

	SW(1)	8.324	1	.004

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	50.022	6	<.001
	Block	50.022	6	<.001
	Model	50.022	6	<.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	546.441	.106	.144

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	8.305	8	.404

Contingency Table for Hosmer and Lemeshow Test

		AnyMH = 0		AnyMH = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	42	41.724	5	5.276	47
	2	37	38.325	8	6.675	45
	3	31	31.098	14	13.902	45
	4	26	27.826	19	17.174	45
	5	30	25.861	15	19.139	45
	6	28	24.411	17	20.589	45
	7	19	23.199	26	21.801	45
	8	24	21.710	21	23.290	45
	9	16	21.148	30	24.852	46
	10	17	14.696	20	22.304	37

Classification Table

			Predicted		
			AnyMH		Percentage Correct
	Observed		0	1	
Step 1	AnyMH	0	213	57	78.9
		1	97	78	44.6
	Overall Percentage				65.4

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	-.257	.208	1.527	1	.217	.773	.51
	Age	.003	.016	.029	1	.866	1.003	.97
	Experience	-.155	.126	1.512	1	.219	.856	.66
	Doctor(1)	-2.212	.412	28.890	1	<.001	.110	.04
	Nurse(1)	-.349	.333	1.095	1	.295	.705	.36
	Psychologist(1)	-.810	.341	5.641	1	.018	.445	.22
	Constant	.725	.620	1.366	1	.242	2.064	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:33:22
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488

Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyPH /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0

Total	488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			AnyPH		
	Observed		0	1	Percentage Correct
Step 0	AnyPH	0	326	0	100.0
		1	119	0	.0
	Overall Percentage				73.3

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.008	.107	88.538	1	<.001	.365

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.272	1	.602
		Age	5.340	1	.021
		Experience	.579	1	.447
		Doctor(1)	.961	1	.327
		Nurse(1)	1.744	1	.187
		Psychologist(1)	1.373	1	.241
		SW(1)	2.675	1	.102

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	15.751	6	.015
	Block	15.751	6	.015
	Model	15.751	6	.015

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	501.047	.035	.051

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7.807	8	.453

Contingency Table for Hosmer and Lemeshow Test

		AnyPH = 0		AnyPH = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	39	39.521	6	5.479	45
	2	37	36.626	8	8.374	45
	3	36	36.116	10	9.884	46
	4	39	34.210	6	10.790	45
	5	30	33.275	15	11.725	45
	6	32	32.424	13	12.576	45
	7	33	31.533	12	13.467	45
	8	27	29.857	17	14.143	44
	9	33	29.121	12	15.879	45
	10	20	23.318	20	16.682	40

Classification Table

			Predicted		
			AnyPH		Percentage
	Observed		0	1	Correct
Step 1	AnyPH	0	323	3	99.1
		1	119	0	.0
	Overall Percentage				72.6

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	.096	.220	.190	1	.663	1.101	.71
	Age	-.054	.019	8.453	1	.004	.947	.91
	Experience	.325	.136	5.655	1	.017	1.383	1.05
	Doctor(1)	.776	.433	3.206	1	.073	2.172	.92
	Nurse(1)	.513	.415	1.528	1	.216	1.670	.74
	Psychologist(1)	.253	.433	.341	1	.559	1.288	.55
	Constant	-.416	.693	.360	1	.548	.660	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:33:32
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyCommunication /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

Observed			Predicted		
			AnyCommunication		Percentage Correct
			0	1	
Step 0	AnyCommunication	0	408	0	100.0
		1	37	0	.0
	Overall Percentage				91.7

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-2.400	.172	195.457	1	<.001	.091

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.576	1	.448
		Age	.390	1	.532
		Experience	.500	1	.479
		Doctor(1)	6.489	1	.011
		Nurse(1)	.061	1	.805
		Psychologist(1)	11.344	1	<.001
		SW(1)	3.155	1	.076

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	19.093	6	.004

	Block	19.093	6	.004
	Model	19.093	6	.004

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	235.791	.042	.096

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	12.277	8	.139

Contingency Table for Hosmer and Lemeshow Test

		AnyCommunication = 0		AnyCommunication = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	45	44.301	0	.699	45
	2	45	44.157	0	.843	45
	3	42	44.012	3	.988	45
	4	40	42.432	5	2.568	45
	5	42	43.259	5	3.741	47
	6	43	41.878	3	4.122	46
	7	44	40.524	1	4.476	45
	8	40	39.261	5	5.739	45
	9	38	38.190	7	6.810	45
	10	29	29.986	8	7.014	37

Classification Table

			Predicted		
			AnyCommunication		Percentage Correct
	Observed		0	1	
Step 1	AnyCommunicatio n	0	408	0	100.0
		1	37	0	.0
	Overall Percentage				91.7

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	-.160	.358	.199	1	.655	.852	.42
	Age	.023	.025	.827	1	.363	1.023	.97
	Experience	.025	.208	.014	1	.905	1.025	.68
	Doctor(1)	.064	1.238	.003	1	.959	1.066	.09
	Nurse(1)	1.760	1.061	2.752	1	.097	5.811	.72
	Psychologist(1)	2.253	1.044	4.657	1	.031	9.517	1.23
	Constant	-4.811	1.363	12.455	1	<.001	.008	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:33:40
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyFinancial /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW

		/CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			AnyFinancial		Percentage Correct
	Observed		0	1	
Step 0	AnyFinancial	0	423	0	100.0
		1	22	0	.0
	Overall Percentage				95.1

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-2.956	.219	182.772	1	<.001	.052

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.006	1	.940
		Age	.033	1	.856

	Experience	.289	1	.591
	Doctor(1)	.199	1	.656
	Nurse(1)	.456	1	.500
	Psychologist(1)	3.672	1	.055
	SW(1)	1.143	1	.285

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	4.691	6	.584
	Block	4.691	6	.584
	Model	4.691	6	.584

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	170.513	.010	.032

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	9.355	8	.313

Contingency Table for Hosmer and Lemeshow Test

		AnyFinancial = 0		AnyFinancial = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	44	44.178	1	.822	45
	2	45	43.673	0	1.327	45
	3	44	44.334	2	1.666	46
	4	44	44.234	2	1.766	46
	5	45	43.165	0	1.835	45
	6	43	42.996	2	2.004	45
	7	40	42.711	5	2.289	45
	8	40	42.083	5	2.917	45

	9	43	42.230	3	3.770	46
	10	35	33.396	2	3.604	37

Classification Table

			Predicted		
			AnyFinancial		Percentage Correct
	Observed		0	1	
Step 1	AnyFinancial	0	423	0	100.0
		1	22	0	.0
	Overall Percentage				95.1

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	.149	.447	.111	1	.739	1.161	.48
	Age	.001	.033	.000	1	.986	1.001	.93
	Experience	-.181	.266	.464	1	.496	.834	.49
	Doctor(1)	.780	1.132	.475	1	.491	2.181	.23
	Nurse(1)	.725	1.097	.436	1	.509	2.064	.24
	Psychologist(1)	1.552	1.066	2.119	1	.145	4.723	.58
	Constant	-3.605	1.523	5.604	1	.018	.027	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:33:48
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1

	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyGender /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases	N	Percent

Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

		Predicted	
Observed		AnyGender	

			0	1	Percentage Correct
Step 0	AnyGender	0	421	0	100.0
		1	24	0	.0
	Overall Percentage				94.6

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-2.865	.210	186.318	1	<.001	.057

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.006	1	.937
		Age	.001	1	.981
		Experience	4.904	1	.027
		Doctor(1)	7.164	1	.007
		Nurse(1)	4.144	1	.042
		Psychologist(1)	.088	1	.766
		SW(1)	.610	1	.435

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	21.778	6	.001
	Block	21.778	6	.001
	Model	21.778	6	.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	165.065	.048	.139

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7.125	8	.523

Contingency Table for Hosmer and Lemeshow Test

		AnyGender = 0		AnyGender = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	46	46.000	0	.000	46
	2	46	46.000	0	.000	46
	3	44	44.322	1	.678	45
	4	43	43.640	2	1.360	45
	5	44	43.114	1	1.886	45
	6	39	37.888	1	2.112	40
	7	37	39.328	5	2.672	42
	8	42	39.392	1	3.608	43
	9	39	41.278	7	4.722	46
	10	41	40.037	6	6.963	47

Classification Table

			Predicted		
			AnyGender		Percentage Correct
	Observed		0	1	
Step 1	AnyGender	0	421	0	100.0
		1	24	0	.0
	Overall Percentage				94.6

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	-.187	.444	.177	1	.674	.830	.34
	Age	.055	.029	3.556	1	.059	1.057	.99
	Experience	-.767	.298	6.612	1	.010	.464	.25
	Doctor(1)	-18.655	3965.768	.000	1	.996	.000	.00
	Nurse(1)	.293	.636	.212	1	.646	1.340	.38
	Psychologist(1)	-.362	.681	.283	1	.595	.696	.18

Constant	-2.825	1.242	5.175	1	.023	.059	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:33:58
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES Anylivingwithpeer /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST

		(Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000

Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			Anylivingwithpeer		Percentage Correct
	Observed		0	1	
Step 0	Anylivingwithpeer	0	430	0	100.0
		1	15	0	.0
	Overall Percentage				96.6

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-3.356	.263	163.221	1	<.001	.035

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.527	1	.468
		Age	3.965	1	.046
		Experience	2.984	1	.084
		Doctor(1)	2.922	1	.087
		Nurse(1)	2.277	1	.131
		Psychologist(1)	.252	1	.616
		SW(1)	.379	1	.538

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	6.968	6	.324
	Block	6.968	6	.324
	Model	6.968	6	.324

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	124.221	.016	.061

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	10.277	8	.246

Contingency Table for Hosmer and Lemeshow Test

		Anylivingwithpeer = 0		Anylivingwithpeer = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	44	44.531	1	.469	45
	2	44	43.397	0	.603	44
	3	44	44.234	1	.766	45
	4	52	52.900	2	1.100	54
	5	46	44.874	0	1.126	46
	6	44	43.621	1	1.379	45
	7	43	43.326	2	1.674	45
	8	40	42.858	5	2.142	45
	9	46	43.271	0	2.729	46
	10	27	26.989	3	3.011	30

Classification Table

Observed	Predicted

			Anylivingwithpeer		Percentage Correct
			0	1	
Step 1	Anylivingwithpeer	0	430	0	100.0
		1	15	0	.0
	Overall Percentage				96.6

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	-.363	.547	.439	1	.508	.696	.23
	Age	.027	.036	.553	1	.457	1.027	.95
	Experience	.209	.307	.464	1	.496	1.233	.67
	Doctor(1)	1.189	1.099	1.169	1	.280	3.282	.38
	Nurse(1)	.174	1.193	.021	1	.884	1.190	.11
	Psychologist(1)	.743	1.118	.442	1	.506	2.103	.23
	Constant	-5.366	1.540	12.141	1	<.001	.005	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:34:05
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488

Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyLowmotivation /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0

Unselected Cases	0	.0
Total	488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			AnyLowmotivation		
	Observed		0	1	Percentage Correct
Step 0	AnyLowmotivation	0	392	0	100.0
		1	53	0	.0
	Overall Percentage				88.1

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-2.001	.146	186.932	1	<.001	.135

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.101	1	.751
		Age	3.938	1	.047
		Experience	3.863	1	.049
		Doctor(1)	8.651	1	.003
		Nurse(1)	3.799	1	.051
		Psychologist(1)	.045	1	.832
		SW(1)	.296	1	.587

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	11.606	6	.071
	Block	11.606	6	.071
	Model	11.606	6	.071

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	313.360	.026	.050

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7.643	8	.469

Contingency Table for Hosmer and Lemeshow Test

		AnyLowmotivation = 0		AnyLowmotivation = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	45	44.009	2	2.991	47
	2	41	41.630	4	3.370	45
	3	47	45.909	3	4.091	50
	4	42	42.758	5	4.242	47
	5	42	40.633	3	4.367	45
	6	37	40.268	8	4.732	45
	7	41	39.490	4	5.510	45
	8	36	37.978	9	7.022	45
	9	40	36.344	5	8.656	45
	10	21	22.981	10	8.019	31

Classification Table

			Predicted		
			AnyLowmotivation		
	Observed		0	1	Percentage Correct
Step 1	AnyLowmotivation	0	392	0	100.0
		1	53	0	.0
	Overall Percentage				88.1

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	-.082	.301	.074	1	.785	.921	.51
	Age	.010	.022	.207	1	.649	1.010	.96
	Experience	.200	.175	1.298	1	.255	1.221	.86
	Doctor(1)	.877	.535	2.685	1	.101	2.403	.84
	Nurse(1)	-.057	.563	.010	1	.920	.945	.31
	Psychologist(1)	.166	.555	.090	1	.764	1.181	.39
	Constant	-3.085	.856	12.991	1	<.001	.046	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:34:12
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyOtherdrugs /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95)

		/CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
	0	322	.000

Psychologist	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			AnyOtherdrugs		Percentage Correct
	Observed		0	1	
Step 0	AnyOtherdrugs	0	345	0	100.0
		1	100	0	.0
	Overall Percentage				77.5

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.238	.114	118.895	1	<.001	.290

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	3.129	1	.077
		Age	1.123	1	.289
		Experience	.354	1	.552
		Doctor(1)	24.275	1	<.001
		Nurse(1)	13.326	1	<.001
		Psychologist(1)	.855	1	.355
		SW(1)	.216	1	.642

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	30.909	6	<.001
	Block	30.909	6	<.001
	Model	30.909	6	<.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	443.297	.067	.102

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	5.340	8	.721

Contingency Table for Hosmer and Lemeshow Test

		AnyOtherdrugs = 0		AnyOtherdrugs = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	39	38.719	4	4.281	43
	2	37	39.686	8	5.314	45
	3	42	38.892	4	7.108	46
	4	38	37.797	7	7.203	45
	5	38	38.398	8	7.602	46
	6	40	37.417	6	8.583	46
	7	34	34.193	11	10.807	45
	8	30	31.196	15	13.804	45
	9	25	28.008	20	16.992	45
	10	22	20.693	17	18.307	39

Classification Table

			Predicted		
			AnyOtherdrugs		Percentage Correct
	Observed		0	1	
Step 1	AnyOtherdrugs	0	343	2	99.4
		1	100	0	.0

	Overall Percentage			77.1

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	.487	.240	4.116	1	.042	1.627	1.01
	Age	-.011	.018	.371	1	.542	.989	.95
	Experience	.051	.140	.134	1	.714	1.052	.80
	Doctor(1)	.751	.384	3.835	1	.050	2.119	.99
	Nurse(1)	-.850	.405	4.412	1	.036	.427	.19
	Psychologist(1)	-.275	.398	.476	1	.490	.760	.34
	Constant	-1.083	.668	2.632	1	.105	.339	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:34:19
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyLifestyle

		/METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			AnyLifestyle		Percentage Correct
	Observed		0	1	
Step 0	AnyLifestyle	0	385	0	100.0
		1	60	0	.0
	Overall Percentage				86.5

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.859	.139	179.376	1	<.001	.156

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.017	1	.896
		Age	14.654	1	<.001
		Experience	.067	1	.796
		Doctor(1)	10.744	1	.001
		Nurse(1)	6.863	1	.009
		Psychologist(1)	2.024	1	.155
		SW(1)	2.970	1	.085

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	28.713	6	<.001
	Block	28.713	6	<.001
	Model	28.713	6	<.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	323.254	.062	.114

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	5.126	8	.744

Contingency Table for Hosmer and Lemeshow Test

		AnyLifestyle = 0		AnyLifestyle = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	45	44.005	1	1.995	46
	2	42	43.238	4	2.762	46
	3	40	41.715	5	3.285	45
	4	46	43.046	1	3.954	47

	5	39	38.931	4	4.069	43
	6	41	40.307	4	4.693	45
	7	38	38.660	7	6.340	45
	8	36	36.369	9	8.631	45
	9	35	34.064	10	10.936	45
	10	23	24.665	15	13.335	38

Classification Table

			Predicted		
			AnyLifestyle		Percentage Correct
	Observed		0	1	
Step 1	AnyLifestyle	0	382	3	99.2
		1	59	1	1.7
	Overall Percentage				86.1

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	-.016	.292	.003	1	.957	.984	.55
	Age	.071	.020	12.641	1	<.001	1.074	1.03
	Experience	-.389	.169	5.277	1	.022	.678	.48
	Doctor(1)	.198	.428	.214	1	.643	1.219	.52
	Nurse(1)	-.737	.467	2.483	1	.115	.479	.19
	Psychologist(1)	-.791	.470	2.832	1	.092	.453	.18
	Constant	-3.158	.769	16.881	1	<.001	.043	

Logistic Regression

Notes

Output Created	08-MAY-2024 10:34:27
Comments	

Input	Data	C:\Users\m.b.jones\OneDrive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyFamilyrelationships /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

	Observed		Predicted AnyFamilyrelationships 0	Predicted AnyFamilyrelationships 1	Percentage Correct
Step 0	AnyFamilyrelationships	0	391	0	100.0
		1	54	0	.0
	Overall Percentage				87.9

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.980	.145	185.960	1	<.001	.138

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	6.201	1	.013
		Age	1.041	1	.308
		Experience	.052	1	.819
		Doctor(1)	5.830	1	.016
		Nurse(1)	.001	1	.970
		Psychologist(1)	5.273	1	.022
		SW(1)	.020	1	.889

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	15.429	6	.017
	Block	15.429	6	.017
	Model	15.429	6	.017

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	313.517	.034	.065

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7.065	8	.530

Contingency Table for Hosmer and Lemeshow Test

		AnyFamilyrelationships = 0		AnyFamilyrelationships = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	43	43.557	2	1.443	45
	2	43	42.169	2	2.831	45
	3	39	41.456	6	3.544	45
	4	41	41.992	5	4.008	46
	5	43	41.587	3	4.413	46
	6	42	39.562	3	5.438	45
	7	38	36.477	5	6.523	43
	8	39	37.469	6	7.531	45
	9	36	36.020	9	8.980	45
	10	27	30.710	13	9.290	40

Classification Table

			Predicted AnyFamilyrelationships		
	Observed		0	1	Percentage Correct
Step 1	AnyFamilyrelationships	0	391	0	100.0
		1	54	0	.0
	Overall Percentage				87.9

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	-.715	.312	5.247	1	.022	.489	.26
	Age	-.020	.024	.686	1	.408	.981	.93

	Experience	.007	.186	.001	1	.970	1.007	.70
	Doctor(1)	-.935	.636	2.161	1	.142	.393	.11
	Nurse(1)	-.023	.512	.002	1	.964	.977	.35
	Psychologist(1)	.392	.502	.612	1	.434	1.481	.55
	Constant	-.990	.908	1.189	1	.276	.372	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:34:33
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES Anyservice /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST

		(Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

	Frequency	Parameter coding (1)

SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			Anyservice		Percentage Correct
	Observed		0	1	
Step 0	Anyservice	0	444	0	100.0
		1	1	0	.0
	Overall Percentage				99.8

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-6.096	1.001	37.076	1	<.001	.002

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	1.034	1	.309
		Age	5.494	1	.019
		Experience	7.490	1	.006
		Doctor(1)	3.549	1	.060
		Nurse(1)	.631	1	.427
		Psychologist(1)	.383	1	.536

	SW(1)	.133	1	.716

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	7.897	6	.246
	Block	7.897	6	.246
	Model	7.897	6	.246

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	6.297	.018	.560

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	.002	8	1.000

Contingency Table for Hosmer and Lemeshow Test

		Anyservice = 0		Anyservice = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	45	45.000	0	.000	45
	2	43	43.000	0	.000	43
	3	46	46.000	0	.000	46
	4	45	45.000	0	.000	45
	5	45	45.000	0	.000	45
	6	47	47.000	0	.000	47
	7	45	45.000	0	.000	45
	8	45	45.000	0	.000	45
	9	45	44.998	0	.002	45
	10	38	38.002	1	.998	39

Classification Table

			Predicted		
			Anyservice		Percentage Correct
	Observed		0	1	
Step 1	Anyservice	0	444	0	100.0
		1	1	0	.0
	Overall Percentage				99.8

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% Lov
Step 1	Gender(1)	14.946	2050.326	.000	1	.994	3098126.044	
	Age	-.023	.227	.010	1	.920	.977	
	Experience	1.749	2.167	.652	1	.419	5.751	
	Doctor(1)	15.200	4724.371	.000	1	.997	3991694.184	
	Nurse(1)	.360	5401.185	.000	1	1.000	1.433	
	Psychologist(1)	-.026	5574.155	.000	1	1.000	.974	
	Constant	-39.688	5150.101	.000	1	.994	.000	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:34:41
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>

	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyUnmetmedicalcareneeds /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases	N	Percent

Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

Observed		Predicted AnyUnmetmedicalcareneeds	Percentage Correct

			0	1	
Step 0	AnyUnmetmedicalcareneeds	0	404	0	100.0
		1	41	0	.0
	Overall Percentage				90.8

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-2.288	.164	194.831	1	<.001	.101

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	3.644	1	.056
		Age	.795	1	.373
		Experience	1.209	1	.272
		Doctor(1)	3.957	1	.047
		Nurse(1)	.387	1	.534
		Psychologist(1)	5.971	1	.015
		SW(1)	.011	1	.915

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	16.357	6	.012
	Block	16.357	6	.012
	Model	16.357	6	.012

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	257.273	.036	.079

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	10.789	8	.214

Contingency Table for Hosmer and Lemeshow Test

		AnyUnmetmedicalcareneeds = 0		AnyUnmetmedicalcareneeds = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	44	42.898	0	1.102	44
	2	43	44.155	3	1.845	46
	3	44	41.852	0	2.148	44
	4	42	42.399	3	2.601	45
	5	43	41.697	2	3.303	45
	6	36	39.985	8	4.015	44
	7	41	40.431	4	4.569	45
	8	39	38.004	4	4.996	43
	9	37	39.337	9	6.663	46
	10	35	33.241	8	9.759	43

Classification Table

			Predicted AnyUnmetmedicalcareneeds		
	Observed		0	1	Percentage Correct
Step 1	AnyUnmetmedicalcareneeds	0	404	0	100.0
		1	41	0	.0
	Overall Percentage				90.8

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	.767	.350	4.793	1	.029	2.153	1.08
	Age	-.042	.027	2.446	1	.118	.959	.91
	Experience	.306	.200	2.343	1	.126	1.359	.91
	Doctor(1)	-.873	.701	1.551	1	.213	.418	.10
	Nurse(1)	-.353	.566	.389	1	.533	.702	.23

	Psychologist(1)	.519	.548	.899	1	.343	1.681	.57
	Constant	-1.926	1.014	3.611	1	.057	.146	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:34:47
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES Anyhousing /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1)

		/CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000

	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			Anyhousing		Percentage Correct
	Observed		0	1	
Step 0	Anyhousing	0	396	0	100.0
		1	49	0	.0
	Overall Percentage				89.0

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-2.090	.151	190.395	1	<.001	.124

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.001	1	.972
		Age	5.270	1	.022
		Experience	4.476	1	.034
		Doctor(1)	3.624	1	.057
		Nurse(1)	.836	1	.361
		Psychologist(1)	3.524	1	.060
		SW(1)	2.382	1	.123

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	12.869	6	.045
	Block	12.869	6	.045
	Model	12.869	6	.045

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	295.738	.029	.057

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	5.231	8	.733

Contingency Table for Hosmer and Lemeshow Test

		Anyhousing = 0		Anyhousing = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	42	40.990	1	2.010	43
	2	44	43.328	2	2.672	46
	3	41	41.821	4	3.179	45
	4	40	40.395	4	3.605	44
	5	35	33.578	2	3.422	37
	6	40	40.511	5	4.489	45
	7	37	40.798	9	5.202	46
	8	39	39.007	6	5.993	45
	9	38	36.923	6	7.077	44
	10	40	38.649	10	11.351	50

Classification Table

		Predicted	
Observed		Anyhousing	

			0	1	Percentage Correct
Step 1	Anyhousing	0	396	0	100.0
		1	49	0	.0
	Overall Percentage				89.0

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C. Lower
Step 1	Gender(1)	-.081	.310	.068	1	.794	.922	.50
	Age	.019	.022	.765	1	.382	1.019	.97
	Experience	.230	.182	1.607	1	.205	1.259	.88
	Doctor(1)	-.085	.462	.034	1	.854	.918	.37
	Nurse(1)	-.518	.473	1.197	1	.274	.596	.23
	Psychologist(1)	-1.127	.526	4.601	1	.032	.324	.11
	Constant	-2.853	.826	11.941	1	<.001	.058	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:34:56
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488

Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES AnyUnderstanding /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0

Unselected Cases	0	.0
Total	488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000
Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			AnyUnderstanding		
	Observed		0	1	Percentage Correct
Step 0	AnyUnderstanding	0	444	0	100.0
		1	1	0	.0
	Overall Percentage				99.8

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-6.096	1.001	37.076	1	<.001	.002

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	1.034	1	.309
		Age	12.899	1	<.001
		Experience	14.298	1	<.001
		Doctor(1)	3.549	1	.060
		Nurse(1)	.631	1	.427
		Psychologist(1)	.383	1	.536
		SW(1)	.133	1	.716

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	14.194	6	.028
	Block	14.194	6	.028
	Model	14.194	6	.028

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	.000	.031	1.000

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	.000	8	1.000

Contingency Table for Hosmer and Lemeshow Test

		AnyUnderstanding = 0		AnyUnderstanding = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	46	46.000	0	.000	46
	2	46	46.000	0	.000	46
	3	45	45.000	0	.000	45
	4	51	51.000	0	.000	51
	5	46	46.000	0	.000	46
	6	45	45.000	0	.000	45
	7	45	45.000	0	.000	45
	8	45	45.000	0	.000	45
	9	45	45.000	0	.000	45
	10	30	30.000	1	1.000	31

Classification Table

			Predicted		
			AnyUnderstanding		Percentage Correct
	Observed		0	1	
Step 1	AnyUnderstanding	0	444	0	100.0
		1	0	1	100.0
	Overall Percentage				100.0

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95 L
Step 1	Gender(1)	33.473	6208.404	.000	1	.996	34443016292 7261.500	
	Age	.448	496.307	.000	1	.999	1.566	
	Experience	22.777	4850.339	.000	1	.996	7798264566.0 97	
	Doctor(1)	-23.572	3915.365	.000	1	.995	.000	
	Nurse(1)	3.699	5709.533	.000	1	.999	40.393	
	Psychologist(1)	-26.597	4191.145	.000	1	.995	.000	
	Constant	-161.963	11901.776	.000	1	.989	.000	

Logistic Regression

Notes

Output Created		08-MAY-2024 10:35:03
Comments		
Input	Data	C:\Users\m.b.jones\One Drive - Swansea University\Survey Stats.csv
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	488
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES Anyother /METHOD=ENTER Gender Age Experience Doctor Nurse Psychologist SW /CONTRAST (Doctor)=Indicator(1) /CONTRAST (Nurse)=Indicator(1) /CONTRAST (Psychologist)=Indicator(1) /CONTRAST (SW)=Indicator(1) /CONTRAST (Gender)=Indicator(1) /PRINT=GOODFIT CI(95) /CRITERIA=PIN(0.05)

		POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Warnings

Due to redundancies, degrees of freedom have been reduced for one or more variables.

Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	445	91.2
	Missing Cases	43	8.8
	Total	488	100.0
Unselected Cases		0	.0
Total		488	100.0

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
SW	0	393	.000
	1	52	1.000
Doctor	0	347	.000
	1	98	1.000
Nurse	0	273	.000
	1	172	1.000
Psychologist	0	322	.000
	1	123	1.000

Gender	0	226	.000
	1	219	1.000

Block 0: Beginning Block

Classification Table

			Predicted		
			Anyother		Percentage Correct
	Observed		0	1	
Step 0	Anyother	0	444	0	100.0
		1	1	0	.0
	Overall Percentage				99.8

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-6.096	1.001	37.076	1	<.001	.002

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.971	1	.324
		Age	.023	1	.880
		Experience	.157	1	.692
		Doctor(1)	3.549	1	.060
		Nurse(1)	.631	1	.427
		Psychologist(1)	.383	1	.536
		SW(1)	.133	1	.716

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	4.542	6	.604
	Block	4.542	6	.604
	Model	4.542	6	.604

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	9.652	.010	.323

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	.051	8	1.000

Contingency Table for Hosmer and Lemeshow Test

		Anyother = 0		Anyother = 1		
		Observed	Expected	Observed	Expected	Total
Step 1	1	45	45.000	0	.000	45
	2	45	45.000	0	.000	45
	3	43	43.000	0	.000	43
	4	45	45.000	0	.000	45
	5	45	45.000	0	.000	45
	6	45	45.000	0	.000	45
	7	43	43.000	0	.000	43
	8	45	45.000	0	.000	45
	9	45	44.952	0	.048	45
	10	43	43.048	1	.952	44

Classification Table

			Predicted		
			Anyother		
	Observed		0	1	Percentage Correct
Step 1	Anyother	0	444	0	100.0
		1	1	0	.0

	Overall Percentage			99.8

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% Lo
Step 1	Gender(1)	-15.342	2298.172	.000	1	.995	.000	
	Age	-.022	.184	.014	1	.905	.978	
	Experience	-.392	1.507	.068	1	.795	.676	
	Doctor(1)	16.326	5031.727	.000	1	.997	12313682.949	
	Nurse(1)	-.007	5743.135	.000	1	1.000	.993	
	Psychologist(1)	-.283	6056.119	.000	1	1.000	.754	
	Constant	-18.612	5031.730	.000	1	.997	.000	

Appendix M: Achievements

Publications

Peer-reviewed articles

- **Jones M**, Guirguis A, Watkins A, Bradshaw C, Mohamed L, Schifano F. Obstacles to treatment retention in opioid use disorder: An international substance use disorder treatment worker survey. Hum Psychopharmacol. 2023 Sep;38(5):e2882. doi: 10.1002/hup.2882. Epub 2023 Sep 29. PMID: 37776029.
- Fuller G, W., **Jones M.**, Bradshaw C, A., Jones J., John A., Snooks H., Watkins A. (2022). The Socio-Demographics and Health Service Use of Opioid Overdose Decedents in Wales: A Cross-Sectional Data Linkage Study. European Addiction Research. doi: 10.1159/000521614
- **Jones, M.,** Bradshaw, C., Jones, J., John, A., Snooks, H., & Watkins, A. (2020). Primary Care Service Utilization Among People at High Risk of Fatal Opioid Overdose: A Short Communication on an Autopsy Study. Journal of Primary Care & Community Health. https://doi.org/10.1177/2150132720925957
- Watkins, A., John, A., Bradshaw, C., Jones, J., & **Jones, M.** (2019). Schizophrenia in high-risk opioid users: A short communication on an autopsy study. Psychiatry research, 276, 112–114. https://doi.org/10.1016/j.psychres.2019.04.026

Conference abstracts

- **Jones, M.,** Snooks, H., Evans, B., Watkins, A., Fuller, G. PP19 Opioid poisoning deaths: a national picture. Presented at 999EMS Research Forum, Birmingham. Awarded Most Innovative Use of Routine Data sponsored by Health Data Research UK. Published in Emergency Medicine Journal. 36. e8.1-e8. 10.1136/emermed-2019-999.19.
- Snooks, H., **Jones, M**., Khanom, A., Lyons, R., & Watkins, A. PP28 Pros and cons of using anonymised linked routine data to improve efficiency of randomised controlled trials in healthcare: experience in primary and emergency care. Presented at International

Conference for Administrative Data Research, Cardiff. Published in Emergency Medicine Journal. 37. e13.1-e13. 10.1136/emermed-2020-999abs.28.

- Jones, M., Snooks, H., Watkins, A. et al. PP77 Opioid overdose death in Wales from 2012 to 2015: a linked data autopsy study. In: BMJ Open. Second European Emergency Medical Services Congress (EMS2018), 16-18 Apr 2018, Copenhagen, Denmark. BMJ Publishing Group, A29-A29.

Conference presentations

- Oral presentation "Opioid overdose death in Wales 2012-2018: A linked data autopsy study" delivered at 2nd International Webinar on Addiction, Psychiatry and Mental Health (Coalesce Research Group) on 16/9/21.
- Oral Presentation "Opioid overdose death in Wales 2012-2015: A linked data autopsy study" delivered at South West Academic Primary Care Annual Research Meeting (Southampton) 2019 on 13/3/2019

Awards

- Most Innovative Use of Routine Data for *Opioid overdose death in Wales from 2012-2015: A linked data autopsy study*. Awarded at 999EMS Research Forum 2019, sponsored by Health Data Research UK

Impact

Schizophrenia in high-risk opioid users: A short communication on an autopsy study was covered in a commentary article in Psychiatry Advisor which is an online magazine for psychiatry healthcare professionals. The link to the article is:
https://www.psychiatryadvisor.com/home/schizophrenia-advisor/high-risk-opioid-use-may-be-linked-to-self-medication-in-schizophrenia/

References

1. Atcheson R. Opioid Therapy in the 21st Century. BJA Br J Anaesth. 2013 Dec 1;111(6):1036.

2. Pérez-Mañá C, Papaseit E, Fonseca F, Farré A, Torrens M, Farré M. Drug Interactions With New Synthetic Opioids. Front Pharmacol [Internet]. 2018 [cited 2022 Jul 25];9. Available from: https://www.frontiersin.org/articles/10.3389/fphar.2018.01145

3. Eriksen J, Sjøgren P, Bruera E, Ekholm O, Rasmussen NK. Critical issues on opioids in chronic non-cancer pain: an epidemiological study. Pain. 2006 Nov;125(1–2):172–9.

4. Ballantyne JC, Shin NS. Efficacy of opioids for chronic pain: a review of the evidence. Clin J Pain. 2008 Aug;24(6):469–78.

5. Häske D, W. Böttiger B, Bouillon B, Fischer M, Gaier G, Gliwitzky B, et al. Analgesia in Patients with Trauma in Emergency Medicine. Dtsch Ärztebl Int. 2017 Nov;114(46):785–92.

6. Olmsted K, Diercks DB. Cardiac chest pain. In: Thomas SH, editor. Emergency Department Analgesia: An Evidence-Based Guide [Internet]. Cambridge: Cambridge University Press; 2008 [cited 2024 Mar 22]. p. 162–7. (Cambridge Pocket Clinicians). Available from: https://www.cambridge.org/core/books/emergency-department-analgesia/cardiac-chest-pain/C0EB4CF0789ECEF217BF223C8EC55D54

7. United Nations : Office on Drugs and Crime (UNODC). United Nations : Office on Drugs and Crime. 2021 [cited 2022 Apr 29]. World Drug Report 2021. Available from: //www.unodc.org/unodc/en/data-and-analysis/wdr2021.html

8. Smolka M, Schmidt LG. The influence of heroin dose and route of administration on the severity of the opiate withdrawal syndrome. Addict Abingdon Engl. 1999 Aug;94(8):1191–8.

9. Kerrigan S, Goldberger BA. Opioids. In: Levine BS, KERRIGAN S, editors. Principles of Forensic Toxicology [Internet]. Cham: Springer International Publishing; 2020 [cited 2022 Jul 1]. p. 347–69. Available from: https://doi.org/10.1007/978-3-030-42917-1_22

10. Brenner G, MD JPR, editors. The Massachusetts General Hospital Handbook of Pain Management. 4th edition. LWW; 2020. 664 p.

11. Salahudeen MS, Nishtala PS. An overview of pharmacodynamic modelling, ligand-binding approach and its application in clinical practice. Saudi Pharm J SPJ. 2017 Feb;25(2):165–75.

12. Pathan H, Williams J. Basic opioid pharmacology: an update. Br J Pain. 2012 Feb;6(1):11–6.

13. Whelan PJ, Remski K. Buprenorphine vs methadone treatment: A review of evidence in both developed and developing worlds. J Neurosci Rural Pract. 2012;3(1):45–50.

14. Martin C, De Baerdemaeker A, Poelaert J, Madder A, Hoogenboom R, Ballet S. Controlled-release of opioids for improved pain management. Mater Today. 2016 Nov 1;19(9):491–502.

15. Mars SG, Bourgois P, Karandinos G, Montero F, Ciccarone D. The Textures of Heroin: User Perspectives on “Black Tar” and Powder Heroin in Two US Cities. J Psychoactive Drugs. 2016;48(4):270–8.

16. Nelson PK, Mathers BM, Cowie B, Hagan H, Des Jarlais D, Horyniak D, et al. Global epidemiology of hepatitis B and hepatitis C in people who inject drugs: results of systematic reviews. Lancet Lond Engl. 2011 Aug 13;378(9791):571–83.

17. Wong CY, Zhu W, Aurigemma GP, Furukawa N, Teshale EH, Huang Y lin A, et al. Infective Endocarditis Among Persons Aged 18–64 Years Living with Human Immunodeficiency Virus, Hepatitis C Infection, or Opioid Use Disorder, United States, 2007−2017. Clin Infect Dis. 2021 May 15;72(10):1767–81.

18. Ledgerwood DM, Lister JJ, LaLiberte B, Lundahl LH, Greenwald MK. Injection opioid use as a predictor of treatment outcomes among methadone-maintained opioid-dependent patients. Addict Behav. 2019 Mar;90:191–5.

19. Yalamanoglu A, Schuurmans MM. [Foil Smoking/Heroin Inhalation]. Praxis. 2018;107(25):1393–8.

20. Qureshi IA, Qureshi MA, Rauf Afzal M, Maud A, Rodriguez GJ, Cruz-Flores S, et al. Black Tar Heroin Skin Popping as a Cause of Wound Botulism. Neurocrit Care. 2017 Dec 1;27(3):415–9.

21. Tirpack AR, Duker JS, Baumal CR. An Outbreak of Endogenous Fungal Endophthalmitis Among Intravenous Drug Abusers in New England. JAMA Ophthalmol. 2017 Jun;135(6):534–40.

22. Ciccarone D, Harris M. Fire in the vein: Heroin acidity and its proximal effect on users' health. Int J Drug Policy. 2015 Nov 1;26(11):1103–10.

23. Darke S, Hall W, Weatherburn D, Lind B. Fluctuations in heroin purity and the incidence of fatal heroin overdose. Drug Alcohol Depend. 1999 Apr 1;54(2):155–61.

24. Jones CM. Heroin use and heroin use risk behaviors among nonmedical users of prescription opioid pain relievers – United States, 2002–2004 and 2008–2010. Drug Alcohol Depend. 2013 Sep 1;132(1):95–100.

25. European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Heroin drug profile. [cited 2022 Apr 29]. Heroin drug profile | www.emcdda.europa.eu. Available from: https://www.emcdda.europa.eu/publications/drug-profiles/heroin_en

26. Vardanyan RS, Hruby VJ. 3 - Analgesics. In: Vardanyan RS, Hruby VJ, editors. Synthesis of Essential Drugs [Internet]. Amsterdam: Elsevier; 2006 [cited 2022 Jul 27]. p. 19–55. Available from: https://www.sciencedirect.com/science/article/pii/B9780444521668500030

27. Murphy PB, Bechmann S, Barrett MJ. Morphine. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 [cited 2022 Jul 27]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK526115/

4. Abuse NI on D. What are the long-term effects of heroin use? [Internet]. National Institute on Drug Abuse. [cited 2022 Apr 29]. Available from: https://nida.nih.gov/publications/research-reports/heroin/what-are-long-term-effects-heroin-use

29. Ciccarone D. Heroin in brown, black and white: Structural factors and medical consequences in the US heroin market. Int J Drug Policy. 2009 May;20(3):277–82.

30. O'Donnell JK, Halpin J, Mattson CL, Goldberger BA, Gladden RM. Deaths Involving Fentanyl, Fentanyl Analogs, and U-47700 - 10 States, July-December 2016. MMWR Morb Mortal Wkly Rep. 2017 Nov 3;66(43):1197–202.

31. Zerell U, Ahrens B, Gerz P. Documentation of a heroin manufacturing process in Afghanistan. Bull Narc. 2005;57(1–2):11–31.

32. Unick G, Rosenblum D, Mars S, Ciccarone D. The relationship between US heroin market dynamics and heroin-related overdose, 1992–2008. Addiction. 2014;109(11):1889–98.

33. American Psychiatric Association (APA). Diagnostic and statistical manual of mental disorders: DSM-5™, 5th ed. Arlington, VA, US: American Psychiatric Publishing, Inc.; 2013. xliv, 947 p. (Diagnostic and statistical manual of mental disorders: DSM-5™, 5th ed).

34. Miele GM, Tilly SM, First M, Frances A. The definition of dependence and behavioural addictions. Br J Addict. 1990;85(11):1421–3.

35. Goldberg AE. The (in)Significance of the Addiction Debate. Neuroethics. 2020 Oct 1;13(3):311–24.

36. Adinoff B. Neurobiologic Processes in Drug Reward and Addiction. Harv Rev Psychiatry. 2004;12(6):305–20.

37. Berridge KC, Robinson TE. Liking, wanting, and the incentive-sensitization theory of addiction. Am Psychol. 2016 Nov;71(8):670–9.

38. Wollman SC, Alhassoon OM, Hall MG, Stern MJ, Connors EJ, Kimmel CL, et al. Gray matter abnormalities in opioid-dependent patients: A neuroimaging meta-analysis. Am J Drug Alcohol Abuse. 2017 Sep;43(5):505–17.

39. Schmidt A, Vogel M, Baumgartner S, Wiesbeck GA, Lang U, Borgwardt S, et al. Brain volume changes after long-term injectable opioid treatment: A longitudinal voxel-based morphometry study. Addict Biol. 2021;26(4):e12970.

40. Lyoo IK, Pollack MH, Silveri MM, Ahn KH, Diaz CI, Hwang J, et al. Prefrontal and temporal gray matter density decreases in opiate dependence. Psychopharmacology (Berl). 2006 Jan;184(2):139–44.

41. Tolomeo S, Gray S, Matthews K, Steele JD, Baldacchino A. Multifaceted impairments in impulsivity and brain structural abnormalities in opioid dependence and abstinence. Psychol Med. 2016 Oct;46(13):2841–53.

42. Bach P, Frischknecht U, Reinhard I, Bekier N, Demirakca T, Ende G, et al. Impaired working memory performance in opioid-dependent patients is related to reduced insula gray matter volume: a voxel-based morphometric study. Eur Arch Psychiatry Clin Neurosci. 2021 Aug 1;271(5):813–22.

43. Johnson SW, North RA. Opioids excite dopamine neurons by hyperpolarization of local interneurons. J Neurosci Off J Soc Neurosci. 1992 Feb;12(2):483–8.

44. Wise RA. Neurobiology of addiction. Curr Opin Neurobiol. 1996 Apr 1;6(2):243–51.

45. Vaughan CW, Ingram SL, Connor MA, Christie MJ. How opioids inhibit GABA-mediated neurotransmission. Nature. 1997 Dec 11;390(6660):611–4.

46. Koob GF, Volkow ND. Neurocircuitry of addiction. Neuropsychopharmacol Off Publ Am Coll Neuropsychopharmacol. 2010 Jan;35(1):217–38.

47. Koob GF. Addiction is a Reward Deficit and Stress Surfeit Disorder. Front Psychiatry. 2013;4:72.

48. Feil J, Sheppard D, Fitzgerald PB, Yücel M, Lubman DI, Bradshaw JL. Addiction, compulsive drug seeking, and the role of frontostriatal mechanisms in regulating inhibitory control. Neurosci Biobehav Rev. 2010 Nov;35(2):248–75.

49. Peciña M, Karp JF, Mathew S, Todtenkopf MS, Ehrich EW, Zubieta JK. Endogenous opioid system dysregulation in depression: implications for new therapeutic approaches. Mol Psychiatry. 2019 Apr;24(4):576–87.

50. Toubia T, Khalife T. The Endogenous Opioid System: Role and Dysfunction Caused by Opioid Therapy. Clin Obstet Gynecol. 2019 Mar;62(1):3–10.

51. Prossin AR, Love TM, Koeppe RA, Zubieta JK, Silk KR. Dysregulation of Regional Endogenous Opioid Function in Borderline Personality Disorder. Am J Psychiatry. 2010 Aug;167(8):925–33.

52. Bandelow B, Wedekind D. Possible role of a dysregulation of the endogenous opioid system in antisocial personality disorder. Hum Psychopharmacol. 2015 Nov;30(6):393–415.

53. Binswanger IA, Blatchford PJ, Mueller SR, Stern MF. Mortality after prison release: opioid overdose and other causes of death, risk factors, and time trends from 1999 to 2009. Ann Intern Med. 2013 Nov 5;159(9):592–600.

54. White JM, Irvine RJ. Mechanisms of fatal opioid overdose. Addiction. 1999;94(7):961–72.

55. Raj H, Ray R, Prakash B. Relapse precipitants in opiate addiction : assessment in community treatment setting. Indian J Psychiatry. 2000 Jul;42(3):253–7.

56. Maehira Y, Chowdhury EI, Reza M, Drahozal R, Gayen TK, Masud I, et al. Factors associated with relapse into drug use among male and female attendees of a three-month drug detoxification-rehabilitation programme in Dhaka, Bangladesh: a prospective cohort study. Harm Reduct J. 2013 Sep 1;10:14.

57. Deroche-Gamonet V, Belin D, Piazza PV. Evidence for Addiction-like Behavior in the Rat. Science. 2004 Aug 13;305(5686):1014–7.

58. Ferrario CR, Gorny G, Crombag HS, Li Y, Kolb B, Robinson TE. Neural and Behavioral Plasticity Associated with the Transition from Controlled to Escalated Cocaine Use. Biol Psychiatry. 2005 Nov 1;58(9):751–9.

59. Bracken MB. Why animal studies are often poor predictors of human reactions to exposure. J R Soc Med. 2009 Mar 3;102(3):120.

60. West R, Brown J. Theory of Addiction. 2nd edition. Chichester, West Sussex, UK: Wiley-Blackwell; 2013. 274 p.

61. Glautier S. Measures and models of nicotine dependence: positive reinforcement. Addict Abingdon Engl. 2004 Jun;99 Suppl 1:30–50.

62. Skinner BF. Contingencies of Reinforcement: A Theoretical Analysis. Englewood Cliffs, NJ: Prentice Hall; 1972. 283 p.

63. Solomon RL. The opponent-process theory of acquired motivation: The costs of pleasure and the benefits of pain. Am Psychol. 1980;35(8):691–712.

64. Koob GF, Markou A, Weiss F, Schulteis G. Opponent process and drug dependence: Neurobiological mechanisms. Semin Neurosci. 1993 Oct 1;5(5):351–8.

65. Robinson JH, Pritchard WS, Davis RA. Psychopharmacological effects of smoking a cigarette with typical “tar” and carbon monoxide yields but minimal nicotine. Psychopharmacology (Berl). 1992 Sep 1;108(4):466–72.

66. Kuntsche E, Knibbe R, Gmel G, Engels R. Why do young people drink? A review of drinking motives. Clin Psychol Rev. 2005 Nov 1;25(7):841–61.

67. Hogarth L, Balleine BW, Corbit LH, Killcross S. Associative learning mechanisms underpinning the transition from recreational drug use to addiction. Ann N Y Acad Sci. 2013;1282(1):12–24.

68. Anderson KG, Briggs KEL, White HR. Motives to Drink or Not to Drink: Longitudinal Relations Among Personality, Motives, and Alcohol Use Across Adolescence and Early Adulthood. Alcohol Clin Exp Res. 2013;37(5):860–7.

69. Newton TF, De La Garza II R, Kalechstein AD, Tziortzis D, Jacobsen CA. Theories of Addiction: Methamphetamine Users' Explanations for Continuing Drug Use and Relapse. Am J Addict. 2009 Jan 1;18(4):294–300.

70. Martinez S, Brandt L, Comer SD, Levin FR, Jones JD. The subjective experience of heroin effects among individuals with chronic opioid use: Revisiting reinforcement in an exploratory study. Addict Neurosci. 2022 Dec 1;4:100034.

71. Everitt BJ, Dickinson A, Robbins TW. The neuropsychological basis of addictive behaviour. Brain Res Brain Res Rev. 2001 Oct;36(2–3):129–38.

72. Troisi JR. Perhaps More Consideration of Pavlovian–Operant Interaction May Improve the Clinical Efficacy of Behaviorally Based Drug Treatment Programs. Psychol Rec. 2013;63(4):863–94.

73. Carter BL, Tiffany ST. Meta-analysis of cue-reactivity in addiction research. Addiction. 1999;94(3):327–40.

74. Tuvblad C, Wang P, Patrick CJ, Berntsen L, Raine A, Baker LA. Genetic and environmental influences on disinhibition, boldness, and meanness as assessed by the triarchic psychopathy measure in 19–20-year-old twins. Psychol Med. 2019;49(9):1500–9.

75. Diamond A. Executive Functions. Annu Rev Psychol. 2013;64:135–68.

76. Williams PG, Suchy Y, Kraybill ML. Five-factor model personality traits and executive functioning among older adults. J Res Personal. 2010;44(4):485–91.

77. Nordvall O, Neely AS, Jonsson B. Self-reported impulsivity and its relation to executive functions in interned youth. Psychiatry Psychol Law. 2017;24(6):910–22.

78. Romer D, Betancourt LM, Brodsky NL, Giannetta JM, Yang W, Hurt H. Does adolescent risk taking imply weak executive function? A prospective study of relations between working memory performance, impulsivity, and risk taking in early adolescence. Dev Sci. 2011;14(5):1119–33.

79. Roye S, Calamia M, Castagna PJ, Aita SL, Hill BD. Normative and Maladaptive Personality Traits and Self-Reported Executive Functioning. Assessment. 2022 Apr 1;29(3):499–507.

80. Evenden JL. Varieties of impulsivity. Psychopharmacology (Berl). 1999 Oct 1;146(4):348–61.

81. Fontenelle LF, Oostermeijer S, Harrison BJ, Pantelis C, Yücel M. Obsessive-Compulsive Disorder, Impulse Control Disorders and Drug Addiction. Drugs. 2011 May 1;71(7):827–40.

82. Leary MR, Hoyle RH, editors. Handbook of Individual Differences in Social Behavior. 1st edition. New York: Guilford Press; 2009. 624 p.

83. Zuckerman M. Sensation seeking, impulsivity and the balance between behavioral approach and inhibition. Personal Individ Differ. 2014 Apr 1;60:S4.

84. Sher KJ, Bartholow BD, Wood MD. Personality and substance use disorders: a prospective study. J Consult Clin Psychol. 2000 Oct;68(5):818–29.

85. Tarter RE, Kirisci L, Mezzich A, Cornelius JR, Pajer K, Vanyukov M, et al. Neurobehavioral Disinhibition in Childhood Predicts Early Age at Onset of Substance Use Disorder. Am J Psychiatry. 2003 Jun;160(6):1078–85.

86. Moeller SJ, Bederson L, Alia-Klein N, Goldstein RZ. Neuroscience of inhibition for addiction medicine: From prediction of initiation to prediction of relapse. Prog Brain Res. 2016;223:165–88.

87. Garavan H, Brennan K, Hester R, Whelan R. The neurobiology of successful abstinence. Curr Opin Neurobiol. 2013 Aug 1;23(4):668–74.

88. Smith JL, Mattick RP, Jamadar SD, Iredale JM. Deficits in behavioural inhibition in substance abuse and addiction: A meta-analysis. Drug Alcohol Depend. 2014 Dec 1;145:1–33.

89. Ciccarone D. The triple wave epidemic: Supply and demand drivers of the US opioid overdose crisis. Int J Drug Policy. 2019 Sep 1;71:183–8.

90. Schieber LZ, Guy GP Jr, Seth P, Young R, Mattson CL, Mikosz CA, et al. Trends and Patterns of Geographic Variation in Opioid Prescribing Practices by State, United States, 2006-2017. JAMA Netw Open. 2019 Mar 15;2(3):e190665.

91. Jani M, Yimer BB, Sheppard T, Lunt M, Dixon WG. Time trends and prescribing patterns of opioid drugs in UK primary care patients with non-cancer pain: A retrospective cohort study. PLOS Med. 2020 Oct 15;17(10):e1003270.

92. Gaffney A, Lexchin J, Us, Group CPPRW. Healing an ailing pharmaceutical system: prescription for reform for United States and Canada. BMJ. 2018 May 17;361:k1039.

93. Dunlop AJ, Lokuge B, Lintzeris N. Opioid prescribing in Australia: too much and not enough. Med J Aust [Internet]. 2021 Aug 2 [cited 2022 Apr 29];215(3). Available from: https://www.mja.com.au/journal/2021/215/3/opioid-prescribing-australia-too-much-and-not-enough

94. Cicero TJ, Ellis MS, Harney J. Shifting Patterns of Prescription Opioid and Heroin Abuse in the United States. N Engl J Med. 2015 Oct 29;373(18):1789–90.

95. Rudd RA. Increases in Drug and Opioid-Involved Overdose Deaths — United States, 2010–2015. MMWR Morb Mortal Wkly Rep [Internet]. 2016 [cited 2022 Apr 29];65. Available from: https://www.cdc.gov/mmwr/volumes/65/wr/mm655051e1.htm

96. Cicero TJ, Kasper ZA, Ellis MS. Increased use of heroin as an initiating opioid of abuse: Further considerations and policy implications. Addict Behav. 2018 Dec 1;87:267–71.

97. Public Health England UG. GOV.UK. [cited 2022 May 5]. Adult substance misuse treatment statistics 2019 to 2020: report. Available from: https://www.gov.uk/government/statistics/substance-misuse-treatment-for-adults-statistics-2019-to-2020/adult-substance-misuse-treatment-statistics-2019-to-2020-report

98. Fuller GW, Jones M, Bradshaw CA, Jones J, John A, Snooks H, et al. The Socio-Demographics and Health Service Use of Opioid Overdose Decedents in Wales: A Cross-Sectional Data Linkage Study. Eur Addict Res. 2022;28(3):226–30.

99. Pierce M, van Amsterdam J, Kalkman GA, Schellekens A, van den Brink W. Is Europe facing an opioid crisis like the United States? An analysis of opioid use and related adverse effects in 19 European countries between 2010 and 2018. Eur Psychiatry. 2021 Jun 21;64(1):e47.

100. Cooper AJM, Willis J, Fuller J, Benecke H, Leighton-Scott J, Andersohn F, et al. Prevalence and Incidence Trends for Diagnosed Prescription Opioid Use Disorders in the United Kingdom. Pain Ther. 2017 Jun 1;6(1):73–84.

101. Jani M, Girard N, Bates DW, Buckeridge DL, Sheppard T, Li J, et al. Opioid prescribing among new users for non-cancer pain in the USA, Canada, UK, and Taiwan: A population-based cohort study. PLOS Med. 2021 Nov 1;18(11):e1003829.

102. Day C, Degenhardt L, Hall W. Changes in the initiation of heroin use after a reduction in heroin supply. Drug Alcohol Rev. 2006;25(4):307–13.

103. Wood E, Stoltz JA, Li K, Montaner JSG, Kerr T. Changes in Canadian heroin supply coinciding with the Australian heroin shortage. Addiction. 2006;101(5):689–95.

104. Rahman S, Trussell A, Pearson SA, Buckley NA, Karanges EA, Cairns R, et al. Trends in transdermal fentanyl utilisation and fatal fentanyl overdose across Australia (2003–2015). Drug Alcohol Rev. 2022;41(2):435–43.

105. Fischer B, Vojtila L, Rehm J. The 'fentanyl epidemic' in Canada – Some cautionary observations focusing on opioid-related mortality. Prev Med. 2018 Feb 1;107:109–13.

106. Claridge H, Williams BD, Copeland CS. A deadly trend in fentanyl fatalities (England, 1998–2017). Br J Clin Pharmacol. 2020;86(3):437–44.

107. Degenhardt L, Charlson F, Ferrari A, Santomauro D, Erskine H, Mantilla-Herrara A, et al. The global burden of disease attributable to alcohol and drug use in 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet Psychiatry. 2018 Dec 1;5(12):987–1012.

108. Degenhardt L, Grebely J, Stone J, Hickman M, Vickerman P, Marshall BDL, et al. Global patterns of opioid use and dependence: harms to populations, interventions, and future action. The Lancet. 2019 Oct 26;394(10208):1560–79.

109. Addiction. EMC for D and DA. Drug-related deaths and mortality in Europe: update from the EMCDDA expert network : May 2021. [Internet]. LU: Publications Office; 2021 [cited 2022 Apr 29]. Available from: https://data.europa.eu/doi/10.2810/777564

110. Amsterdam J van, Brink W van den, Pierce M. Explaining the Differences in Opioid Overdose Deaths between Scotland and England/Wales: Implications for European Opioid Policies. Eur Addict Res. 2021;27(6):399–412.

111. Ford BR, Bart G, Grahan B, Shearer RD, Winkelman TNA. Associations Between Polysubstance Use Patterns and Receipt of Medications for Opioid Use Disorder Among Adults in Treatment for Opioid Use Disorder. J Addict Med. 2021 Apr;15(2):159.

112. Lin LA, Bohnert ASB, Blow FC, Gordon AJ, Ignacio RV, Kim HM, et al. Polysubstance use and association with opioid use disorder treatment in the US Veterans Health Administration. Addiction. 2021;116(1):96–104.

113. Jacotte-Simancas A, Fucich EA, Stielper ZF, Molina PE. Chapter Five - Traumatic brain injury and the misuse of alcohol, opioids, and cannabis. In: Calipari ES, Gilpin NW, editors. International Review of Neurobiology [Internet]. Academic Press; 2021 [cited 2022 May 5]. p. 195–243. (Neurobiology of Addiction and Co-Morbid Disorders; vol. 157). Available from: https://www.sciencedirect.com/science/article/pii/S0074774220301410

114. Denis CM, Dominique T, Smith P, Fiore D, Ku YC, Culhane A, et al. HIV Infection and Depression Among Opiate Users in a US Epicenter of the Opioid Epidemic. AIDS Behav. 2021 Jul 1;25(7):2230–9.

115. Emery GD, Steer RA, Beck AT. Depression, Hopelessness, and Suicidal Intent among Heroin Addicts. Int J Addict. 1981 Jan 1;16(3):425–9.

116. Langdon KJ, Dove K, Ramsey S. Comorbidity of Opioid- and Anxiety-Related Symptoms and Disorders. Curr Opin Psychol. 2019 Dec;30:17–23.

117. Jones CM, McCance-Katz EF. Co-occurring substance use and mental disorders among adults with opioid use disorder. Drug Alcohol Depend. 2019 Apr 1;197:78–82.

118. Sordo L, Chahua M, Bravo MJ, Barrio G, Brugal MT, Domingo-Salvany A, et al. Depression among regular heroin users: The influence of gender. Addict Behav. 2012 Jan 1;37(1):148–52.

119. Havard A, Teesson M, Darke S, Ross J. Depression among heroin users: 12-Month outcomes from the Australian Treatment Outcome Study (ATOS). J Subst Abuse Treat. 2006 Jun 1;30(4):355–62.

120. Semenkovich K, Chockalingam R, Scherrer JF, Panagopoulos VN, Lustman PJ, Ray JM, et al. Prescription Opioid Analgesics Increase Risk of Major Depression: New Evidence, Plausible Neurobiological Mechanisms and Management to Achieve Depression Prophylaxis. Mo Med. 2014;111(2):148–54.

121. Martins SS, Fenton MC, Keyes KM, Blanco C, Zhu H, Storr CL. Mood/Anxiety disorders and their association with non-medical prescription opioid use and prescription opioid use disorder: longitudinal evidence from the National Epidemiologic Study on Alcohol and Related Conditions. Psychol Med. 2012 Jun;42(6):1261–72.

122. Mahoney JJ, Winstanley EL, Lander LR, Berry JH, Marshalek PJ, Haut MW, et al. High prevalence of co-occurring substance use in individuals with opioid use disorder. Addict Behav. 2021 Mar;114:106752.

123. Jones CM, McAninch JK. Emergency Department Visits and Overdose Deaths From Combined Use of Opioids and Benzodiazepines. Am J Prev Med. 2015 Oct 1;49(4):493–501.

124. Saporito RC, Lopez Pineiro MA, Migden MR, Silapunt S. Recognizing Skin Popping Scars: A Complication of Illicit Drug Use. Cureus. 10(6):e2726.

125. Ciccarone D, Bourgois P. Explaining the Geographical Variation of HIV Among Injection Drug Users in the United States. Subst Use Misuse. 2003 Jan 1;38(14):2049–63.

126. Strada L, Vanderplasschen W, Buchholz A, Schulte B, Muller AE, Verthein U, et al. Measuring quality of life in opioid-dependent people: a systematic review of assessment instruments. Qual Life Res. 2017 Dec 1;26(12):3187–200.

127. Pérez-Figueroa RE, Obonyo DJ, Santoscoy S, Surratt H, Lekas HM, Lewis CF, et al. Housing Instability, Structural Vulnerability, and Non-Fatal Opioid Overdoses Among People Who Use Heroin in Washington Heights, New York City. Behav Med. 2021 Jun 4;0(0):1–11.

128. Monwell B, Bülow P, Gerdner A. Type of opioid dependence among patients seeking opioid substitution treatment: are there differences in background and severity of problems? Subst Abuse Treat Prev Policy. 2016 Jul 11;11(1):23.

129. Stavseth MR, Røislien J, Bukten A, Clausen T. Factors associated with ongoing criminal engagement while in opioid maintenance treatment. J Subst Abuse Treat. 2017 Jun 1;77:52–6.

130. UK Government. GOV.UK. 2021 [cited 2023 Jan 17]. From harm to hope: A 10-year drugs plan to cut crime and save lives. Available from: https://www.gov.uk/government/publications/from-harm-to-hope-a-10-year-drugs-plan-to-cut-crime-and-save-lives

131. GOV.UK [Internet]. [cited 2022 Aug 5]. Independent review of drugs by Professor Dame Carol Black. Available from: https://www.gov.uk/government/collections/independent-review-of-drugs-by-professor-dame-carol-black

132. Jiang R, Lee I, Lee TA, Pickard AS. The societal cost of heroin use disorder in the United States. PLOS ONE. 2017 May 30;12(5):e0177323.

133. Ford ES, Murphy LB, Khavjou O, Giles WH, Holt JB, Croft JB. Total and State-Specific Medical and Absenteeism Costs of COPD Among Adults Aged 18 Years in the United States for 2010 and Projections Through 2020. CHEST. 2015 Jan 1;147(1):31–45.

134. Quaderi SA, Hurst JR. The unmet global burden of COPD. Glob Health Epidemiol Genomics. 2018 Apr 6;3:e4.

135. Coyne CJ, Hall A. Four Decades and Counting: The Continued Failure of the War on Drugs [Internet]. Rochester, NY: Social Science Research Network; 2017 Apr [cited 2022 May 12]. Report No.: 2979445. Available from: https://papers.ssrn.com/abstract=2979445

136. Skinner HA. The drug abuse screening test. Addict Behav. 1982 Jan 1;7(4):363–71.

137. WHO ASSIST Working Group. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. Addict Abingdon Engl. 2002 Sep;97(9):1183–94.

138. Yudko E, Lozhkina O, Fouts A. A comprehensive review of the psychometric properties of the Drug Abuse Screening Test. J Subst Abuse Treat. 2007 Mar 1;32(2):189–98.

139. Humeniuk R, Ali R, Babor TF, Farrell M, Formigoni ML, Jittiwutikarn J, et al. Validation of the Alcohol, Smoking And Substance Involvement Screening Test (ASSIST). Addict Abingdon Engl. 2008 Jun;103(6):1039–47.

140. McCabe SE, Boyd CJ, Cranford JA, Morales M, Slayden J. A modified version of the Drug Abuse Screening Test among undergraduate students. J Subst Abuse Treat. 2006 Oct 1;31(3):297–303.

141. Gryczynski J, Kelly SM, Mitchell SG, Kirk A, O'Grady KE, Schwartz RP. Validation and performance of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) among adolescent primary care patients. Addiction. 2015;110(2):240–7.

142. Wickersham JA, Azar MM, Cannon CM, Altice FL, Springer SA. Validation of a Brief Measure of Opioid Dependence: The Rapid Opioid Dependence Screen (RODS). J Correct Health Care Off J Natl Comm Correct Health Care. 2015 Jan;21(1):12–26.

143. Smith PC, Schmidt SM, Allensworth-Davies D, Saitz R. A Single-Question Screening Test for Drug Use in Primary Care. Arch Intern Med. 2010 Jul 12;170(13):1155–60.

144. World Health Organisation (WHO). ICD-11 [Internet]. [cited 2022 May 5]. Available from: https://icd.who.int/en

145. World Health Organisation (WHO). International Standards for the Treatment of Drug Use Disorders [Internet]. [cited 2022 May 5]. Available from: https://www.who.int/publications-detail-redirect/international-standards-for-the-treatment-of-drug-use-disorders

146. Wu LT, Zhu H, Swartz MS. Treatment utilization among persons with opioid use disorder in the United States. Drug Alcohol Depend. 2016 Dec 1;169:117–27.

147. Saloner B, Karthikeyan S. Changes in Substance Abuse Treatment Use Among Individuals With Opioid Use Disorders in the United States, 2004-2013. JAMA. 2015 Oct 13;314(14):1515–7.

148. Korownyk C, Perry D, Ton J, Kolber MR, Garrison S, Thomas B, et al. Opioid use disorder in primary care: PEER umbrella systematic review of systematic reviews. Can Fam Physician Med Fam Can. 2019 May;65(5):e194–206.

149. Strang J, Sheridan J. Effect of national guidelines on prescription of methadone: analysis of NHS prescription data, England 1990-2001. BMJ. 2003 Aug 9;327(7410):321–2.

150. Weinrich M, Stuart M. Provision of Methadone Treatment in Primary Care Medical PracticesReview of the Scottish Experience and Implications for US Policy. JAMA. 2000 Mar 8;283(10):1343–8.

151. GOV.UK [Internet]. [cited 2022 Aug 5]. Drug misuse and dependence: UK guidelines on clinical management. Available from: https://www.gov.uk/government/publications/drug-misuse-and-dependence-uk-guidelines-on-clinical-management

152. World Health Organisation (WHO). Methadone maintenance treatment [Internet]. Clinical Guidelines for Withdrawal Management and Treatment of Drug Dependence in Closed Settings. World Health Organization; 2009 [cited 2022 May 6]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK310658/

153. Methadone hydrochloride | Drugs | BNF content published by NICE [Internet]. [cited 2022 Dec 31]. Available from: https://bnf.nice.org.uk/drugs/methadone-hydrochloride/

154. Brugal MT, Domingo-Salvany A, Puig R, Barrio G, García de Olalla P, De La Fuente L. Evaluating the impact of methadone maintenance programmes on mortality due to overdose and aids in a cohort of heroin users in Spain. Addiction. 2005;100(7):981–9.

155. Nolan S, Hayashi K, Milloy MJ, Kerr T, Dong H, Lima VD, et al. The impact of low-threshold methadone maintenance treatment on mortality in a Canadian setting. Drug Alcohol Depend. 2015 Nov 1;156:57–61.

156. Jayawardana S, Forman R, Johnston-Webber C, Campbell A, Berterame S, Joncheere C de, et al. Global consumption of prescription opioid analgesics between 2009-2019: a country-level observational study. eClinicalMedicine [Internet]. 2021 Dec 1 [cited 2022 May 9];42. Available from: https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(21)00479-X/fulltext

157. Marsch LA. The efficacy of methadone maintenance interventions in reducing illicit opiate use, HIV risk behavior and criminality: a meta-analysis. Addiction. 1998;93(4):515–32.

158. Bao Y ping, Liu Z min, Epstein DH, Du C, Shi J, Lu L. A Meta-Analysis of Retention in Methadone Maintenance by Dose and Dosing Strategy. Am J Drug Alcohol Abuse. 2009;35(1):28–33.

159. Heinemann A, Iwersen-Bergmann S, Stein S, Schmoldt A, Püschel K. Methadone-related fatalities in Hamburg 1990–1999: implications for quality standards in maintenance treatment? Forensic Sci Int. 2000 Sep 11;113(1):449–55.

160. Sunjic S, Zador D. Methadone syrup-related deaths in New South Wales, Australia, 1990–95. Drug Alcohol Rev. 1999;18(4):409–15.

161. Dahan A, Yassen A, Romberg R, Sarton E, Teppema L, Olofsen E, et al. Buprenorphine induces ceiling in respiratory depression but not in analgesia. BJA Br J Anaesth. 2006 May 1;96(5):627–32.

162. Johnson RE, Fudala PJ, Payne R. Buprenorphine: Considerations for Pain Management. J Pain Symptom Manage. 2005 Mar 1;29(3):297–326.

163. Buprenorphine | Prescribing information | Opioid dependence | CKS | NICE [Internet]. [cited 2022 Dec 31]. Available from: https://cks.nice.org.uk/topics/opioid-dependence/prescribing-information/buprenorphine/

164. Mendelson J, Jones RT, Fernandez I, Welm S, Melby AK, Baggott MJ. Buprenorphine and naloxone interactions in opiate-dependent volunteers. Clin Pharmacol Ther. 1996;60(1):105–14.

165. Alderks CE. Trends in the Use of Methadone, Buprenorphine, and Extended-Release Naltrexone at Substance Abuse Treatment Facilities: 2003-2015 (Update). In: The CBHSQ Report [Internet]. Rockville (MD): Substance Abuse and Mental Health Services Administration (US); 2013 [cited 2022 May 6]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK469748/

166. Positive report on the use of Buvidal in prisons [Internet]. [cited 2022 Aug 5]. Available from: http://www.gov.scot/news/positive-report-on-the-use-of-buvidal-in-prisons/

167. Evaluation of Buvidal - Find a Tender [Internet]. [cited 2022 Dec 31]. Available from: https://www.find-tender.service.gov.uk/Notice/035551-2022

168. Barnett PG, Rodgers JH, Bloch DA. A meta-analysis comparing buprenorphine to methadone for treatment of opiate dependence. Addiction. 2001;96(5):683–90.

169. West SL, O'Neal KK, Graham CW. A meta-analysis comparing the effectiveness of buprenorphine and methadone. J Subst Abuse. 2000;12(4):405–14.

170. Schmidt H, Vormfelde S v, Klinder K, Gundert-Remy U, Gleiter CH, Skopp G, et al. Affinities of dihydrocodeine and its metabolites to opioid receptors. Pharmacol Toxicol. 2002 Aug;91(2):57–63.

171. Carney T, Van Hout MC, Norman I, Dada S, Siegfried N, Parry CD. Dihydrocodeine for detoxification and maintenance treatment in individuals with opiate use disorders. Cochrane Database Syst Rev. 2020 Feb 18;2:CD012254.

172. Zamparutti G, Schifano F, Corkery JM, Oyefeso A, Ghodse AH. Deaths of opiate/opioid misusers involving dihydrocodeine, UK, 1997–2007. Br J Clin Pharmacol. 2011 Aug;72(2):330–7.

173. Greenstein RA, Arndt IC, McLellan AT, O'Brien CP, Evans B. Naltrexone: a clinical perspective. J Clin Psychiatry. 1984 Sep;45(9 Pt 2):25–8.

174. Goonoo N, Bhaw-Luximon A, Ujoodha R, Jhugroo A, Hulse GK, Jhurry D. Naltrexone: A review of existing sustained drug delivery systems and emerging nano-based systems. J Controlled Release. 2014 Jun 10;183:154–66.

175. Wang D, Sun X, Sadee W. Different Effects of Opioid Antagonists on μ-, δ-, and κ-Opioid Receptors with and without Agonist Pretreatment. J Pharmacol Exp Ther. 2007 May 1;321(2):544–52.

176. Ritter AJ. Naltrexone in the Treatment of Heroin Dependence: Relationship with Depression and Risk of Overdose. Aust N Z J Psychiatry. 2002 Apr 1;36(2):224–8.

177. Minozzi S, Amato L, Vecchi S, Davoli M, Kirchmayer U, Verster A. Oral naltrexone maintenance treatment for opioid dependence. Cochrane Database Syst Rev. 2011 Apr 13;2011(4):CD001333.

178. Larney S, Gowing L, Mattick RP, Farrell M, Hall W, Degenhardt L. A systematic review and meta-analysis of naltrexone implants for the treatment of opioid dependence. Drug Alcohol Rev. 2014;33(2):115–28.

179. Johansson BA, Berglund M, Lindgren A. Efficacy of maintenance treatment with naltrexone for opioid dependence: a meta-analytical review. Addiction. 2006;101(4):491–503.

180. Urits I, Patel A, Zusman R, Virgen CG, Mousa M, Berger AA, et al. A Comprehensive Update of Lofexidine for the Management of Opioid Withdrawal Symptoms. Psychopharmacol Bull. 2020 Jul 23;50(3):76–96.

181. Pergolizzi JV, Annabi H, Gharibo C, LeQuang JA. The Role of Lofexidine in Management of Opioid Withdrawal. Pain Ther. 2019 Jun;8(1):67–78.

182. Rehman SU, Maqsood MH, Bajwa H, Tameez Ud Din A, Malik MN. Clinical Efficacy and Safety Profile of Lofexidine Hydrochloride in Treating Opioid Withdrawal Symptoms: A Review of Literature. Cureus. 11(6):e4827.

183. Kuszmaul AK, Palmer EC, Frederick EK. Lofexidine versus clonidine for mitigation of opioid withdrawal symptoms: A systematic review. J Am Pharm Assoc JAPhA. 2020 Feb;60(1):145–52.

184. Wakeman SE. Opioid Use Disorder Diagnosis and Management. NEJM Evid. 2022 Mar 22;1(4):EVIDra2200038.

185. O'Farrell TJ, Schein AZ. Behavioral Couples Therapy for Alcoholism and Drug Abuse. J Subst Abuse Treat. 2000 Jan;18(1):51–4.

186. Mutschler C, Malivoire BL, Schumm JA, Monson CM. Mechanisms and moderators of behavioural couples therapy for alcohol and substance use disorders: an updated review of the literature. Behav Cogn Psychother. 2022 Feb 22;1–22.

187. Meis LA, Griffin JM, Greer N, Jensen AC, MacDonald R, Carlyle M, et al. Couple and family involvement in adult mental health treatment: A systematic review. Clin Psychol Rev. 2013 Mar 1;33(2):275–86.

188. Fals-Stewart W, O'Farrell TJ, Birchler GR. Behavioral Couples Therapy for Substance Abuse: Rationale, Methods, and Findings. Sci Pract Perspect. 2004 Aug;2(2):30–41.

189. Meyers RJ. Get Your Loved One Sober: Alternatives to Nagging, Pleading, and Threatening. Illustrated edition. Center City, Minn: Hazelden Trade; 2018. 240 p.

190. Archer M, Harwood H, Stevelink S, Rafferty L, Greenberg N. Community reinforcement and family training and rates of treatment entry: a systematic review. Addict Abingdon Engl. 2020 Jun;115(6):1024–37.

191. Roozen HG, De Waart R, Van Der Kroft P. Community reinforcement and family training: an effective option to engage treatment-resistant substance-abusing individuals in treatment. Addiction. 2010;105(10):1729–38.

192. Kelly PJ, Deane FP, Baker AL. Group Cohesion and Between Session Homework Activities Predict Self-Reported Cognitive–Behavioral Skill Use Amongst Participants of SMART Recovery Groups. J Subst Abuse Treat. 2015 Apr 1;51:53–8.

193. Beck AK, Forbes E, Baker AL, Kelly PJ, Deane FP, Shakeshaft A, et al. Systematic review of SMART Recovery: Outcomes, process variables, and implications for research. Psychol Addict Behav. 2017;31(1):1–20.

194. Alcoholics Anonymous (AA). Alcoholics Anonymous: The Story Of How More Than One Hundred Men Have Recovered From Alcoholism. Literary Licensing, LLC; 2012. 410 p.

195. Mackarness R. The Allergic Factor in Alcoholism. Int J Soc Psychiatry. 1972 Sep 1;18(3):194–200.

196. McCabe I. Carl Jung and Alcoholics Anonymous: The Twelve Steps as a Spiritual Journey of Individuation. 1st edition. London: Routledge; 2015. 188 p.

197. Narcotics Anonymous N. NA UK Information. [cited 2022 May 12]. NA Demographics. Available from: https://www.ukna.info/uk-na

198. Harvey LM, Fan W, Cano MÁ, Vaughan EL, Arbona C, Essa S, et al. Psychosocial intervention utilization and substance abuse treatment outcomes in a multisite sample of individuals who use opioids. J Subst Abuse Treat. 2020 May 1;112:68–75.

199. Hai AH, Franklin C, Park S, DiNitto DM, Aurelio N. The efficacy of spiritual/religious interventions for substance use problems: A systematic review and meta-analysis of randomized controlled trials. Drug Alcohol Depend. 2019 Sep 1;202:134–48.

200. Jones M, Rakovshik S. Inflated sense of responsibility, explanatory style and the cognitive model of social anxiety disorder: a brief report of a case control study. Cogn Behav Ther [Internet]. 2019 ed [cited 2022 May 10];12. Available from: https://www.cambridge.org/core/journals/the-cognitive-behaviour-therapist/article/abs/inflated-sense-of-responsibility-explanatory-style-and-the-cognitive-model-of-social-anxiety-disorder-a-brief-report-of-a-case-control-study/CFD24B6A92966227F728E39503E91F31

201. McHugh RK, Hearon BA, Otto MW. Cognitive-Behavioral Therapy for Substance Use Disorders. Psychiatr Clin North Am. 2010 Sep;33(3):511–25.

202. Steven C. Hayes. Relational frame theory: A post-Skinnerian account of human language and cognition. New York, NY, US: Kluwer Academic/Plenum Publishers; 2001. xvii, 285 p. (Barnes-Holmes D, Roche B, editors. Relational frame theory: A post-Skinnerian account of human language and cognition).

203. Dutra L, Stathopoulou G, Basden SL, Leyro TM, Powers MB, Otto MW. A Meta-Analytic Review of Psychosocial Interventions for Substance Use Disorders. Am J Psychiatry. 2008 Feb;165(2):179–87.

204. Magill M, Ray LA. Cognitive-behavioral treatment with adult alcohol and illicit drug users: a meta-analysis of randomized controlled trials. J Stud Alcohol Drugs. 2009 Jul;70(4):516–27.

205. Gregory VL, Ellis RJB. Cognitive-behavioral therapy and buprenorphine for opioid use disorder: A systematic review and meta-analysis of randomized controlled trials. Am J Drug Alcohol Abuse. 2020 Sep 2;46(5):520–30.

206. López G, Orchowski LM, Reddy MK, Nargiso J, Johnson JE. A review of research-supported group treatments for drug use disorders. Subst Abuse Treat Prev Policy. 2021 Jun 21;16(1):51.

207. Öst LG. The efficacy of Acceptance and Commitment Therapy: An updated systematic review and meta-analysis. Behav Res Ther. 2014 Oct 1;61:105–21.

208. Hacker T, Stone P, MacBeth A. Acceptance and commitment therapy – Do we know enough? Cumulative and sequential meta-analyses of randomized controlled trials. J Affect Disord. 2016 Jan 15;190:551–65.

209. Osaji J, Ojimba C, Ahmed S. The Use of Acceptance and Commitment Therapy in Substance Use Disorders: A Review of Literature. J Clin Med Res. 2020 Oct;12(10):629–33.

210. Chan B, Gean E, Arkhipova-Jenkins I, Gilbert J, Hilgart J, Fiordalisi C, et al. Retention Strategies for Medications for Opioid Use Disorder in Adults: A Rapid Evidence Review. J Addict Med. 2021;15(1):74–84.

211. Sindelar J, Elbel B, Petry NM. What do we get for our money? Cost-effectiveness of adding contingency management. Addiction. 2007;102(2):309–16.

212. Dugosh K, Abraham A, Seymour B, McLoyd K, Chalk M, Festinger D. A Systematic Review on the Use of Psychosocial Interventions in Conjunction With Medications for the Treatment of Opioid Addiction. J Addict Med. 2016 Apr;10(2):93–103.

213. Blanken P, Hendriks VM, Huijsman IA, van Ree JM, van den Brink W. Efficacy of cocaine contingency management in heroin-assisted treatment: Results of a randomized controlled trial. Drug Alcohol Depend. 2016 Jul 1;164:55–63.

214. Ainscough TS, Brose LS, Strang J, McNeill A. Contingency management for tobacco smoking during opioid addiction treatment: a randomised pilot study. BMJ Open. 2017 Sep 1;7(9):e017467.

215. Miller WR, Rollnick S. Motivational Interviewing: Helping People Change. 3rd edition. New York, NY: Guilford Press; 2012. 482 p.

216. Lundahl BW, Kunz C, Brownell C, Tollefson D, Burke BL. A Meta-Analysis of Motivational Interviewing: Twenty-Five Years of Empirical Studies. Res Soc Work Pract. 2010 Mar 1;20(2):137–60.

217. Zhong N, Yuan Y, Chen H, Jiang H, Du J, Sun H, et al. Effects of a Randomized Comprehensive Psychosocial Intervention Based on Cognitive Behavioral Therapy Theory and Motivational Interviewing Techniques for Community Rehabilitation of Patients With Opioid Use Disorders in Shanghai, China. J Addict Med. 2015 Aug;9(4):322–30.

218. Jones CM, Logan J, Gladden RM, Bohm MK. Vital Signs: Demographic and Substance Use Trends Among Heroin Users — United States, 2002–2013. Morb Mortal Wkly Rep. 2015 Jul 10;64(26):719–25.

219. Lambdin BH, Bluthenthal RN, Zibbell JE, Wenger L, Simpson K, Kral AH. Associations between perceived illicit fentanyl use and infectious disease risks among people who inject drugs. Int J Drug Policy. 2019 Dec 1;74:299–304.

220. Yockey A. Straight to the point: A systematic review of needle exchange programs in the United States. J Behav Health [Internet]. 2019 Jan 1 [cited 2022 May 10]; Available from: https://www.academia.edu/41328733/Straight_to_the_point_A_systematic_review_of_needle_exchange_programs_in_the_United_States

221. World Health Organisation (WHO). Community management of opioid overdose. [cited 2022 May 10]. Community management of opioid overdose. Available from: https://www.who.int/publications-detail-redirect/9789241548816

222. Advisory Council on the Misuse of Drugs (ACMD). GOV.UK. [cited 2022 May 10]. Naloxone: a review. Available from: https://www.gov.uk/government/publications/naloxone-a-review

223. Public Health Scotland P. National Naloxone programme Scotland - Monitoring report 2019-2020. [cited 2022 May 10]. National Naloxone programme Scotland - Monitoring report 2019-2020. Available from: https://publichealthscotland.scot/publications/national-naloxone-programme-scotland-annual/national-naloxone-programme-scotland-monitoring-report-201920-202021/

224. McDonald R, Strang J. Are take-home naloxone programmes effective? Systematic review utilizing application of the Bradford Hill criteria. Addiction. 2016;111(7):1177–87.

225. Walley AY, Xuan Z, Hackman HH, Quinn E, Doe-Simkins M, Sorensen-Alawad A, et al. Opioid overdose rates and implementation of overdose education and nasal naloxone distribution in Massachusetts: interrupted time series analysis. BMJ. 2013 Jan 31;346:f174.

226. Metrebian N, Carnwath T, Stimson GV, Storz T. Survey of doctors prescribing diamorphine (heroin) to opiate-dependent drug users in the United Kingdom. Addiction. 2002;97(9):1155–61.

227. Bell J. Pharmacological maintenance treatments of opiate addiction. Br J Clin Pharmacol. 2014 Feb;77(2):253–63.

228. Lange BCL, Bach-Mortensen AM. A systematic review of stakeholder perceptions of supervised injection facilities. Drug Alcohol Depend. 2019 Apr 1;197:299–314.

229. Smart R, Reuter P. Does heroin-assisted treatment reduce crime? A review of randomized-controlled trials. Addiction. 2022;117(3):518–31.

230. Potier C, Laprévote V, Dubois-Arber F, Cottencin O, Rolland B. Supervised injection services: What has been demonstrated? A systematic literature review. Drug Alcohol Depend. 2014 Dec 1;145:48–68.

231. Behrends CN, Paone D, Nolan ML, Tuazon E, Murphy SM, Kapadia SN, et al. Estimated impact of supervised injection facilities on overdose fatalities and healthcare costs in New York City. J Subst Abuse Treat. 2019 Nov 1;106:79–88.

232. Demaret I, Quertemont E, Litran G, Magoga C, Deblire C, Dubois N, et al. Efficacy of Heroin-Assisted Treatment in Belgium: A Randomised Controlled Trial. Eur Addict Res. 2015;21(4):179–87.

233. Strang J, Groshkova T, Uchtenhagen A, Brink W van den, Haasen C, Schechter MT, et al. Heroin on trial: Systematic review and meta-analysis of randomised trials of diamorphine-prescribing as treatment for refractory heroin addiction. Br J Psychiatry. 2015 Jul;207(1):5–14.

234. Spruit IP. Ecstasy Use and Policy Responses in the Netherlands. J Drug Issues. 1999 Jul 1;29(3):653–77.

235. Harper L, Powell J, Pijl EM. An overview of forensic drug testing methods and their suitability for harm reduction point-of-care services. Harm Reduct J. 2017 Jul 31;14(1):52.

236. WEDINOS - Welsh Emerging Drugs & Identification of Novel Substances Project [Internet]. [cited 2022 Aug 11]. Available from: https://www.wedinos.org/

237. The Loop [Internet]. [cited 2022 Aug 11]. The Loop. Available from: https://wearetheloop.org

238. Mema SC, Sage C, Xu Y, Tupper KW, Ziemianowicz D, McCrae K, et al. Drug checking at an electronic dance music festival during the public health overdose emergency in British Columbia. Can J Public Health Rev Can Santé Publique. 2018 Sep 24;109(5–6):740–4.

239. Drug checking as a harm reduction tool for recreational drug users: opportunities and challenges | www.emcdda.europa.eu [Internet]. [cited 2022 Aug 11]. Available from: https://www.emcdda.europa.eu/document-library/drug-checking-pill-testing-harm-reduction-tool-recreational-drug-users-opportunities-and-challenges_en

240. Brunt TM, Niesink RJM. The Drug Information and Monitoring System (DIMS) in the Netherlands: Implementation, results, and international comparison. Drug Test Anal. 2011;3(9):621–34.

241. Long V, Arredondo J, Ti L, Grant C, DeBeck K, Milloy MJ, et al. Factors associated with drug checking service utilization among people who use drugs in a Canadian setting. Harm Reduct J. 2020 Dec 14;17(1):100.

242. Guirguis A, Moosa I, Gittins R, Schifano F. What About Drug Checking? Systematic Review and Netnographic Analysis of Social Media. Curr Neuropharmacol. 2020 Oct;18(10):906–17.

243. Betzler F, Helbig J, Viohl L, Ernst F, Roediger L, Gutwinski S, et al. Drug Checking and Its Potential Impact on Substance Use. Eur Addict Res. 2021 Jan;27(1):25–32.

244. Schroers A. Drug Checking: Monitoring the Contents of New Synthetic Drugs. J Drug Issues. 2002 Apr 1;32(2):635–46.

245. Stokes M, Schultz P, Alpaslan A. Narrating the journey of sustained recovery from substance use disorder. Subst Abuse Treat Prev Policy. 2018 Sep 27;13(1):35.

246. Webb JR, Toussaint LL. Self-forgiveness as a critical factor in addiction and recovery: A 12-step model perspective. Alcohol Treat Q. 2018;36(1):15–31.

247. White WL. Medication-Assisted Recovery from Opioid Addiction: Historical and Contemporary Perspectives. J Addict Dis. 2012 Jul 1;31(3):199–206.

248. Pycroft A. Key Concepts in Substance Misuse [Internet]. 55 City Road, London; 2015 [cited 2022 May 12]. Available from: https://sk.sagepub.com/books/key-concepts-in-substance-misuse

249. McCrady BS, Epstein EE, editors. Addictions: A Comprehensive Guidebook. New York: Oxford University Press; 1999. 664 p.

250. Mckeganey N, Morris Z, Neale J, Robertson M. What are drug users looking for when they contact drug services: Abstinence or harm reduction? Drugs Educ Prev Policy. 2004 Oct 1;11.

251. Laudet AB. What does recovery mean to you? Lessons from the recovery experience for research and practice. J Subst Abuse Treat. 2007 Oct;33(3):243–56.

252. Spitzer RL, Kroenke K, Williams JBW, and the Patient Health Questionnaire Primary Care Study Group. Validation and Utility of a Self-report Version of PRIME-MDThe PHQ Primary Care Study. JAMA. 1999 Nov 10;282(18):1737–44.

253. Ling W, Nadipelli VR, Solem CT, Farabee D, Ronquest NA, Perrochet B, et al. Measuring recovery in opioid use disorder: clinical utility and psychometric properties of the Treatment Effectiveness Assessment. Subst Abuse Rehabil. 2019 Jun 5;10:13–21.

254. Mayer JD, Allen JL. A Personality Framework for the Unification of Psychology. Rev Gen Psychol. 2013 Jun 1;17(2):196–202.

255. Hofstee WK, de Raad B, Goldberg LR. Integration of the big five and circumplex approaches to trait structure. J Pers Soc Psychol. 1992 Jul;63(1):146–63.

256. Depue RA, Collins PF. Neurobiology of the structure of personality: dopamine, facilitation of incentive motivation, and extraversion. Behav Brain Sci. 1999 Jun;22(3):491–517; discussion 518-569.

257. Sharma L, Kohl K, Morgan TA, Clark LA. "Impulsivity": Relations between self-report and behavior. J Pers Soc Psychol. 2013;104(3):559–75.

258. Zaaijer ER, Bruijel J, Blanken P, Hendriks V, Koeter MWJ, Kreek MJ, et al. Personality as a risk factor for illicit opioid use and a protective factor for illicit opioid dependence. Drug Alcohol Depend. 2014 Dec 1;145:101–5.

259. Kornør H, Nordvik H. Five-factor model personality traits in opioid dependence. BMC Psychiatry. 2007 Aug 6;7(1):37.

260. Conway KP, Kane RJ, Ball SA, Poling JC, Rounsaville BJ. Personality, substance of choice, and polysubstance involvement among substance dependent patients. Drug Alcohol Depend. 2003 Jul 20;71(1):65–75.

261. Martínez-Loredo V, Macipe V, Errasti Pérez JM, Al-Halabí S. Clinical symptoms and personality traits predict subpopulations of treatment-seeking substance users. J Subst Abuse Treat. 2021 Jun;125:108314.

262. Chen F, Yang H, Bulut O, Cui Y, Xin T. Examining the relation of personality factors to substance use disorder by explanatory item response modeling of DSM-5 symptoms. PLOS ONE. 2019 Jun 13;14(6):e0217630.

263. Tacheva Z, Ivanov A. Exploring the Association Between the "Big Five" Personality Traits and Fatal Opioid Overdose: County-Level Empirical Analysis. JMIR Ment Health. 2021 Mar 8;8(3):e24939.

264. Delić M, Kajdiž K, Pregelj P. Association of the Five-Factor Model personality traits and opioid addiction treatment outcome. Psychiatr Danub. 2017 Sep;29(Suppl 3):289–91.

265. Loree AM, Lundahl LH, Ledgerwood DM. Impulsivity as a predictor of treatment outcome in substance use disorders: Review and synthesis. Drug Alcohol Rev. 2015;34(2):119–34.

266. Cattell RB. The description of personality: principles and findings in a factor analysis. Am J Psychol. 1945;58:69–90.

267. McCrae RR. The five-factor model of personality traits: Consensus and controversy. In: The Cambridge handbook of personality psychology. New York, NY, US: Cambridge University Press; 2009. p. 148–61.

268. McCrae RR, Costa PT. Personality trait structure as a human universal. Am Psychol. 1997 May;52(5):509–16.

269. Craig RJ. Personality characteristics of heroin addicts: Review of empirical research 1976–1979. Int J Addict. 1982;17(2):227–48.

270. Vandenbroucke JP, Elm E von, Altman DG, Gøtzsche PC, Mulrow CD, Pocock SJ, et al. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): Explanation and Elaboration. PLOS Med. 2007 Oct 16;4(10):e297.

271. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. BMJ. 2009 Jul 21;339:b2535.

272. Zotero | Your personal research assistant [Internet]. [cited 2023 Jan 1]. Available from: https://www.zotero.org/

273. Draycott SG, Kline P. The Big Three or the Big Five—the EPQ-R vs the NEO-PI: a research note, replication and elaboration. Personal Individ Differ. 1995 Jun 1;18(6):801–4.

274. Iliescu D, editor. What Is Equivalence? In: Adapting Tests in Linguistic and Cultural Situations [Internet]. Cambridge: Cambridge University Press; 2017 [cited 2022 May 12]. p. 125–6. (Educational and Psychological Testing in a Global Context). Available from: https://www.cambridge.org/core/books/adapting-tests-in-linguistic-and-cultural-situations/what-is-equivalence/CE549D5C5CD68267628530083114A5F4

275. Hathaway SR, McKinley JC. A multiphasic personality schedule (Minnesota): I. Construction of the schedule. J Psychol Interdiscip Appl. 1940;10:249–54.

276. Ben-Porath YS, Butcher JN. The comparability of MMPI and MMPI-2 scales and profiles. Psychol Assess J Consult Clin Psychol. 1989;1(4):345–7.

277. Forbey JD, Ben-Porath YS. Minnesota Multiphasic Personality Inventory-Adolescent (mmpi-a). In: Dorfman WI, Hersen M, editors. Understanding Psychological Assessment [Internet]. Boston, MA: Springer US; 2001 [cited 2022 May 12]. p. 313–34. (Perspectives on Individual Differences). Available from: https://doi.org/10.1007/978-1-4615-1185-4_16

278. Ben-Porath YS, Tellegen A. Minnesota Multiphasic Personality Inventory-3 [Internet]. 2020 [cited 2022 May 20]. Available from: https://www.pearsonclinical.co.uk/store/ukassessments/en/mmpi/Minnesota-Multiphasic-Personality-Inventory-3/p/P100009138.html

279. Wiggins JS, Vollmar J. The content of the MMPI. J Clin Psychol. 1959;15:45–7.

280. Graham JR. MMPI-2: Assessing Personality and Psychopathology. 5th edition. New York: OUP USA; 2011. 688 p.

281. Berry DF. An MMPI Handbook, Vol. II: Research Applications, revised ed. Am J Psychiatry. 1976 Apr;133(4):460-a.

282. Borsboom D, Mellenbergh GJ, van Heerden J. The concept of validity. Psychol Rev. 2004 Oct;111(4):1061–71.

283. Rubio DM, Berg-Weger M, Tebb SS, Lee ES, Rauch S. Objectifying content validity: Conducting a content validity study in social work research. Soc Work Res. 2003 Jun 1;27(2):94–104.

284. Beck AT, Steer RA, Carbin MG. Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. Clin Psychol Rev. 1988 Jan 1;8(1):77–100.

285. Liebowitz MR. Liebowitz Social Anxiety Scale [Internet]. 2013 [cited 2024 Jan 13]. Available from: http://doi.apa.org/getdoi.cfm?doi=10.1037/t07671-000

286. Connor KM, Davidson JRT, Churchill LE, Sherwood A, Weisler RH, Foa E. Psychometric properties of the Social Phobia Inventory (SPIN): New self-rating scale. Br J Psychiatry. 2000 Apr;176(4):379–86.

287. Hathaway SR, Briggs PF. Some normative data on new MMPI scales. J Clin Psychol. 1957;13:364–8.

288. Greene RL. Ethnicity and MMPI performance: A review. J Consult Clin Psychol. 1987 Aug;55(4):497–512.

289. Butcher JN, Cheung FM, Kim J. Use of the MMPI-2 With Asian Populations. Psychol Assess. 2003 Sep;15(3):248–56.

290. Colligan RC, Offord KP. Revitalizing the MMPI: The development of contemporary norms. Psychiatr Ann. 1985;15(9):558–68.

291. Litz BT, Penk WE, Walsh S, Hyer L, Blake DD, Marx B, et al. Similarities and differences between MMPI and MMPI-2 applications to the assessment of posttraumatic stress disorder. J Pers Assess. 1991 Oct;57(2):238–53.

292. Bachna K, Sieggreen MA, Cermak L, Penk W, O'Connor M. MMPI/MMPI-2: Comparisons of Amnesic Patients. Arch Clin Neuropsychol. 1998 Aug 1;13(6):535–42.

293. O'Neill TA, Goffin RD, Tett RP. Content Validation Is Fundamental for Optimizing the Criterion Validity of Personality Tests. Ind Organ Psychol. 2009 Dec;2(4):509–13.

294. Murphy KR. Content Validation Is Useful for Many Things, but Validity Isn't One of Them. Ind Organ Psychol. 2009 Dec;2(4):453–64.

295. Fisher DM, Milane CR, Sullivan S, Tett RP. A Critical Examination of Content Validity Evidence and Personality Testing for Employee Selection. Public Pers Manag. 2021 Jun 1;50(2):232–57.

296. Costa Jr. PT, Busch CM, Zonderman AB, McCrae RR. Correlations of MMPI Factor Scales With Measures of the Five Factor Model of Personality. J Pers Assess. 1986 Dec 1;50(4):640–50.

297. Han K, Weed NC, McNeal TP. Searching for conscientiousness on the MMPI-2. J Pers Assess. 1996 Oct;67(2):354–63.

298. Quirk SW, Christiansen ND, Wagner SH, McNulty JL. On the Usefulness of Measures of Normal Personality for Clinical Assessment: Evidence of the Incremental Validity of the Revised NEO Personality Inventory. Psychol Assess. 2003 Sep;15(3):311–25.

299. Rojdev R, Nelson III WM, Hart KJ, Fercho MC. Criterion-related validity and stability: Equivalence of the MMPI and the MMPI-2. J Clin Psychol. 1994;50(3):361–7.

300. Derogatis LR, Cleary PA. Confirmation of the dimensional structure of the scl-90: A study in construct validation. J Clin Psychol. 1977;33(4):981–9.

301. Derogatis LR, Lipman RS, Covi L. SCL-90: an outpatient psychiatric rating scale--preliminary report. Psychopharmacol Bull. 1973 Jan;9(1):13–28.

302. Derogatis LR, Rickels K, Rock AF. The SCL-90 and the MMPI: A Step in the Validation of a New Self-Report Scale. Br J Psychiatry. 1976 Mar;128(3):280–9.

303. Rossi G, Van den Brande I, Tobac A, Sloore H, Hauben C. Convergent validity of the MCMI-III personality disorder scales and the MMPI-2 scales. J Personal Disord. 2003 Aug;17(4):330–40.

304. Morasco BJ, Gfeller JD, Elder KA. The utility of the NEO-PI-R validity scales to detect response distortion: A comparison with the MMPI-2. J Pers Assess. 2007 Jun;88(3):276–83.

305. Conley JJ, Kammeier ML. MMPI item responses of alcoholics in treatment: Comparisons with normals and psychiatric patients. J Consult Clin Psychol. 1980 Oct;48(5):668–9.

306. Burgess PM, Campbell IM, Zylberberg A. Face Validity Vs. Item Subtlety in the Mmpi D Scale. J Clin Psychol. 1984 Mar;40(2):499–504.

307. Hryckowlan MJ, Gynther MD. Mmpi Item Subtlety: Another Look. J Clin Psychol. 1988 Mar;44(2):148–52.

308. Dubinsky S, Gamble DJ, Rogers ML. A Literature Review of Subtle-Obvious Items on the MMPI. J Pers Assess. 1985 Feb;49(1):62.

309. Tellegen, A., Ben-Porath, Y. S., McNulty, J. L., Arbisi, P. A., Graham, J. R., & Kaemmer, B. MMPI-2 Restructured Clinical (RC) Scales: Development, validation, and interpretation. Minneapolis: University of Minnesota Press.; 2003.

310. Schoenfeld LS, Kobos JC, Phinney IR. Screening Police Applicants: A Study of Reliability with the MMPI. Psychol Rep. 1980 Oct 1;47(2):419–25.

311. Deskovitz MA, Weed NC, McLaughlan JK, Williams JE. Interpretive Reliability of Six Computer-Based Test Interpretation Programs for the Minnesota Multiphasic Personality Inventory–2. Assessment. 2016 Apr 1;23(2):250–61.

312. Butcher JN, Pope KS. The research base, psychometric properties, and clinical uses of the MMPI-2 and MMPI-A. Can Psychol Can. 1992;33(1):61–78.

313. Protogerou C, Hagger MS. A checklist to assess the quality of survey studies in psychology. Methods Psychol. 2020 Dec 1;3:100031.

314. Sutker PB. Personality differences and sociopathy in heroin addicts and nonaddict prisoners. J Abnorm Psychol. 1971;78(3):247–51.

315. Kojak G, Canby J. Personality and behavior patterns of heroin-dependent American servicemen in Thailand. Am J Psychiatry. 1975 Mar;132(3):246–50.

316. Gerra G, Bertacca S, Zaimovic A, Pirani M, Branchi B, Ferri M. Relationship of Personality Traits and Drug of Choice by Cocaine Addicts and Heroin Addicts. Subst Use Misuse. 2008 Jan 1;43(3–4):317–30.

317. Penk WE, Fudge JW, Robinowitz R, Neman RS. Personality characteristics of compulsive heroin, amphetamine, and barbiturate users. J Consult Clin Psychol. 1979 Jun;47(3):583–5.

318. Penk WE, Robinowitz R, Woodward WA, Hess JL. MMPI Factor Scale Differences Among Heroin Addicts Differing in Race and Admission Status. Int J Addict. 1980 Jan 1;15(3):329–37.

319. Galankin T, Lioznov D, Nikolaenko S, McNutt LA, Leckman-Westin E, Smith PF. Psychological features of abstinent heroin users before and after rehabilitation in Saint Petersburg, Russia. BMC Res Notes. 2018 Aug 14;11:589.

320. Marsh DT, Stile SA, Stoughton NL, Trout-landen BL. Psychopathology of Opiate Addiction: Comparative Data from the MMPI and MCMI. Am J Drug Alcohol Abuse. 1988 Jan 1;14(1):17–27.

321. Dolan MP, Roberts WR, Penk WE, Robinowitz R, Atkins HG. Personality differences among black, white, and Hispanic-American male heroin addicts on MMPI content scales. J Clin Psychol. 1983 Sep;39(5):807–13.

322. McKernan LC, Nash MR, Gottdiener WH, Anderson SE, Lambert WE, Carr ER. Further Evidence of Self-Medication: Personality Factors Influencing Drug Choice in Substance Use Disorders. Psychodyn Psychiatry. 2015 Jun;43(2):243–75.

323. Gerra G, Zaimovic A, Moi G, Bussandri M, Bubici C, Mossini M, et al. Aggressive responding in abstinent heroin addicts: neuroendocrine and personality correlates. Prog Neuropsychopharmacol Biol Psychiatry. 2004 Jan 1;28(1):129–39.

324. Gerra G, Zaimovic A, Timpano M, Zambelli U, Begarani M, Marzocchi GF, et al. Neuroendocrine correlates of temperament traits in abstinent opiate addicts. J Subst Abuse. 2000;11(4):337–54.

325. Haertzen CA, Hooks Jr. NT. Changes in personality and subjective experience associated with the chronic administration and withdrawal of opiates. J Nerv Ment Dis. 1969;148(6):606–14.

326. Zeng H, Su D, Jiang X, Zhu L, Ye H. The similarities and differences in impulsivity and cognitive ability among ketamine, methadone, and non-drug users. Psychiatry Res. 2016 Sep 30;243:109–14.

327. Roszell DK, Calsyn DA. Personality and Demographic Characteristics Associated with the Prescribing of Psychoactive Medications for Methadone Maintenance Patients. Int J Addict. 1986 Jan 1;21(2):175–90.

328. Husband SD, Iguchi MY. Comparison of MMPI-2 and MMPI clinical scales and high-point scores among methadone maintenance clients. J Pers Assess. 1995 Apr;64(2):371–5.

329. Craig RJ, Olson RE. Predicting methadone maintenance treatment outcomes using the Addiction Severity Index and the MMPI-2 Content Scales (Negative Treatment Indicators and Cynism scales). Am J Drug Alcohol Abuse. 2004 Nov;30(4):823–39.

330. Sutker PB, Allain AN. Incarcerated and street heroin addicts: a personality comparison. Psychol Rep. 1973 Feb;32(1):243–6.

331. Novo R, Gonzalez B, Peres R, Aguiar P. A meta-analysis of studies with the Minnesota Multiphasic Personality Inventory in fibromyalgia patients. Personal Individ Differ. 2017 Oct 1;116:96–108.

332. Pierce M, Bird SM, Hickman M, Millar T. National record linkage study of mortality for a large cohort of opioid users ascertained by drug treatment or criminal justice sources in England, 2005–2009. Drug Alcohol Depend. 2015 Jan 1;146:17–23.

333. Puigdollers E, Domingo-Salvany A, Brugal MT, Torrens M, Alvarós J, Castillo C, et al. Characteristics of Heroin Addicts Entering Methadone Maintenance Treatment: Quality of Life and Gender. Subst Use Misuse. 2004 Jan 1;39(9):1353–68.

334. Duckworth J, Duckworth E. MMPI Interpretation Manual for Counselors and Clinicians. Muncie, IN: Accelerated Development; 1986.

335. Lippa RA. Sex Differences in Personality Traits and Gender-Related Occupational Preferences across 53 Nations: Testing Evolutionary and Social-Environmental Theories. Arch Sex Behav. 2010 Jun 1;39(3):619–36.

336. Schmitt DP, Realo A, Voracek M, Allik J. Why can't a man be more like a woman? Sex differences in Big Five personality traits across 55 cultures. J Pers Soc Psychol. 2008;94(1):168–82.

337. Costa Jr. PT, Terracciano A, McCrae RR. Gender differences in personality traits across cultures: Robust and surprising findings. J Pers Soc Psychol. 2001;81(2):322–31.

338. Shand FL, Slade T, Degenhardt L, Baillie A, Nelson EC. Opioid dependence latent structure: two classes with differing severity? Addict Abingdon Engl. 2011 Mar;106(3):590–8.

339. Grenyer BF, Williams G, Swift W, Neill O. The prevalence of social-evaluative anxiety in opioid users seeking treatment. Int J Addict. 1992 Jun;27(6):665–73.

340. Tragesser SL, Jones RE, Robinson RJ, Stutler A, Stewart A. Borderline personality disorder features and risk for prescription opioid use disorders. J Personal Disord. 2013 Aug;27(4):427–41.

341. Wojciechowski T. Borderline personality disorder symptoms and exposure to violence as risk factors for opioid use in adulthood. Psychiatry Res. 2019 Nov;281:112549.

342. Yamamoto A, Needleman J, Gelberg L, Kominski G, Shoptaw S, Tsugawa Y. Association between homelessness and opioid overdose and opioid-related hospital admissions/emergency department visits. Soc Sci Med. 2019 Dec 1;242:112585.

343. Deaths related to drug poisoning in England and Wales Statistical bulletins - Office for National Statistics [Internet]. [cited 2022 Aug 22]. Available from: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsrelatedtodrugpoisoninginenglandandwales/previousReleases

344. European Monitoring Centre for Drugs and Drug Addiction. Drug-related deaths and mortality in Europe: update from the EMCDDA expert network : May 2021. [Internet]. LU: Publications Office; 2021 [cited 2022 Aug 22]. Available from: https://data.europa.eu/doi/10.2810/777564

345. Nechuta SJ, Tyndall BD, Mukhopadhyay S, McPheeters ML. Sociodemographic factors, prescription history and opioid overdose deaths: a statewide analysis using linked PDMP and mortality data. Drug Alcohol Depend. 2018 Sep 1;190:62–71.

346. Roxburgh A, Hall WD, Gisev N, Degenhardt L. Characteristics and circumstances of heroin and pharmaceutical opioid overdose deaths: Comparison across opioids. Drug Alcohol Depend. 2019 Dec 1;205:107533.

347. Ryan JM, Spronken I. Drug related deaths in the community: A preventive role for accident and emergency departments? Emerg Med J. 2000 Jul 1;17(4):272–3.

348. Reeve R, Srasuebkul P, Langton JM, Haas M, Viney R, Pearson SA, et al. Health care use and costs at the end of life: a comparison of elderly Australian decedents with and without a cancer history. BMC Palliat Care. 2017 Jun 21;17(1):1.

349. Qureshi D, Tanuseputro P, Perez R, Pond GR, Seow HY. Early initiation of palliative care is associated with reduced late-life acute-hospital use: A population-based retrospective cohort study. Palliat Med. 2019 Feb 1;33(2):150–9.

350. Lyons RA, Jones KH, John G, Brooks CJ, Verplancke JP, Ford DV, et al. The SAIL databank: linking multiple health and social care datasets. BMC Med Inform Decis Mak. 2009 Jan 16;9(1):3.

351. Bohensky MA, Jolley D, Sundararajan V, Evans S, Pilcher DV, Scott I, et al. Data Linkage: A powerful research tool with potential problems. BMC Health Serv Res. 2010 Dec 22;10(1):346.

352. Schneeweiss S, Avorn J. A review of uses of health care utilization databases for epidemiologic research on therapeutics. J Clin Epidemiol. 2005 Apr 1;58(4):323–37.

353. Johns LE, Madsen AM, Maduro G, Zimmerman R, Konty K, Begier E. A Case Study of the Impact of Inaccurate Cause-of-Death Reporting on Health Disparity Tracking: New York City Premature Cardiovascular Mortality. Am J Public Health. 2013 Apr;103(4):733.

354. Gallagher AM, Dedman D, Padmanabhan S, Leufkens HGM, de Vries F. The accuracy of date of death recording in the Clinical Practice Research Datalink GOLD database in England compared with the Office for National Statistics death registrations. Pharmacoepidemiol Drug Saf. 2019 May;28(5):563–9.

355. Harshfield A, Abel GA, Barclay S, Payne RA. Do GPs accurately record date of death? A UK observational analysis. BMJ Support Palliat Care. 2020 Sep;10(3):e24.

356. Tuffin R, Quinn A, Ali F, Cramp P. A Review of the Accuracy of Death Certification on the Intensive Care Unit and the Proposed Reforms to the Coroner's System. J Intensive Care Soc. 2009 Apr 1;10(2):134–7.

357. Nashelsky MB, Lawrence CH. Accuracy of cause of death determination without forensic autopsy examination. Am J Forensic Med Pathol. 2003 Dec;24(4):313–9.

358. Ong BB, Wong JJ, Hashim J. A retrospective study of the accuracy between clinical and autopsy cause of death in the University of Malaya Medical Centre. Malays J Pathol. 2004 Jun;26(1):35–41.

359. Jones KH, Ford DV, Thompson S, Lyons R. A Profile of the SAIL Databank on the UK Secure Research Platform. Int J Popul Data Sci [Internet]. 2019 [cited 2022 Jun 16];4(2). Available from: https://ijpds.org/article/view/1134

360. Population estimates by local authority and year [Internet]. [cited 2022 Aug 19]. Available from: https://statswales.gov.wales/Catalogue/Population-and-Migration/Population/Estimates/Local-Authority/populationestimates-by-localauthority-year

361. Schoonjans F. MedCalc. [cited 2022 Aug 19]. MedCalc's Comparison of proportions calculator. Available from: https://www.medcalc.org/calc/comparison_of_proportions.php

362. GOV.UK [Internet]. [cited 2022 Sep 27]. United Kingdom drug situation 2019: Focal Point annual report. Available from: https://www.gov.uk/government/publications/united-kingdom-drug-situation-focal-point-annual-report/united-kingdom-drug-situation-focal-point-annual-report-2019

363. Pardo B, Reuter P. Facing fentanyl: should the USA consider trialling prescription heroin? Lancet Psychiatry. 2018 Aug 1;5(8):613–5.

364. Watts BV, Gottlieb DJ, Riblet NB, Gui J, Shiner B. Association of Medication Treatment for Opioid Use Disorder With Suicide Mortality. Am J Psychiatry. 2022 Apr;179(4):298–304.

365. Mooney LJ. Medication Treatment for Opioid Use Disorder Reduces Suicide Risk. Am J Psychiatry. 2022 Apr;179(4):262–3.

366. Kestler A, Buxton J, Meckling G, Giesler A, Lee M, Fuller K, et al. Factors Associated With Participation in an Emergency Department-Based Take-Home Naloxone Program for At-Risk Opioid Users. Ann Emerg Med. 2017 Mar;69(3):340–6.

367. Moore C, Lloyd G, Oretti R, Russell I, Snooks H. Paramedic-supplied 'Take Home' Naloxone: protocol for cluster randomised feasibility study. BMJ Open. 2014 Mar 1;4(3):e004712.

368. Ministry of Housing, Communities & Local Government. English Housing Survey 2017 to 2018: headline report. [cited 2022 May 12]. English Housing Survey 2017 to 2018: headline report. Available from: https://www.gov.uk/government/statistics/english-housing-survey-2017-to-2018-headline-report

369. Bailey N. Poverty and the re-growth of private renting in the UK, 1994-2018. PLOS ONE. 2020 Feb 5;15(2):e0228273.

370. Inside Housing [Internet]. [cited 2022 Sep 29]. Dry houses: what are they and why are they disappearing? Available from: https://www.insidehousing.co.uk/insight/insight/dry-houses-what-are-they-and-why-are-they-disappearing-61474

371. NHS Digital [Internet]. [cited 2022 Aug 25]. Hospital Accident and Emergency Activity, 2017-18. Available from: https://digital.nhs.uk/data-and-information/publications/statistical/hospital-accident--emergency-activity/2017-18

372. Spilsbury K, Rosenwax L, Arendts G, Semmens JB. The Association of Community-Based Palliative Care With Reduced Emergency Department Visits in the Last Year of Life Varies by Patient Factors. Ann Emerg Med. 2017 Apr 1;69(4):416–25.

373. NHS Digital [Internet]. [cited 2022 Aug 25]. Hospital Episode Statistics (HES). Available from: https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics

374. Kaczorowski J, Bilodeau J, M Orkin A, Dong K, Daoust R, Kestler A. Emergency Department-initiated Interventions for Patients With Opioid Use Disorder: A Systematic Review. Acad Emerg Med Off J Soc Acad Emerg Med. 2020 Nov;27(11):1173–82.

375. Lagisetty P, Klasa K, Bush C, Heisler M, Chopra V, Bohnert A. Primary care models for treating opioid use disorders: What actually works? A systematic review. PLOS ONE. 2017 Oct 17;12(10):e0186315.

376. Wakeman SE, Barnett ML. Primary Care and the Opioid-Overdose Crisis — Buprenorphine Myths and Realities. N Engl J Med. 2018 Jul 5;379(1):1–4.

377. D'Amico EJ, Paddock SM, Burnam A, Kung FY. Identification of and Guidance for Problem Drinking by General Medical Providers: Results From a National Survey. Med Care. 2005 Mar;43(3):229–36.

378. Hassan AN, Le Foll B. Polydrug use disorders in individuals with opioid use disorder. Drug Alcohol Depend. 2019 May 1;198:28–33.

379. Smith N, Wilson A, Weekes T. Use of Read codes in development of a standard data set. BMJ. 1995 Jul 29;311(7000):313–5.

380. Robinson D, Comp D, Schulz E, Brown P, Price C. Updating the Read Codes. J Am Med Inform Assoc. 1997;4(6):465–72.

381. Connolly JP, McGavock H, Wilson-Davis K. Research methodology: coding perceived morbidity in general practice—an evaluation of the read classification and the international classification of primary care (ICPC). Pharmacoepidemiol Drug Saf. 1997;6(5):325–30.

382. Williams CT, Latkin CA. Neighborhood Socioeconomic Status, Personal Network Attributes, and Use of Heroin and Cocaine. Am J Prev Med. 2007 Jun 1;32(6, Supplement):S203–10.

383. Rudolph KE, Kinnard EN, Rivera Aguirre A, Goin DE, Feelemyer J, Fink D, et al. The Relative Economy and Drug Overdose Deaths. Epidemiol Camb Mass. 2020 Jul;31(4):551–8.

384. Friebel R, Yoo KJ, Maynou L. Opioid abuse and austerity: Evidence on health service use and mortality in England. Soc Sci Med. 2022 Apr 1;298:114511.

385. Hobbs FDR, Bankhead C, Mukhtar T, Stevens S, Perera-Salazar R, Holt T, et al. Clinical workload in UK primary care: a retrospective analysis of 100 million consultations in England, 2007–14. The Lancet. 2016 Jun 4;387(10035):2323–30.

386. Othman F, Card TR, Crooks CJ. Proton pump inhibitor prescribing patterns in the UK: a primary care database study. Pharmacoepidemiol Drug Saf. 2016;25(9):1079–87.

387. Dolk FCK, Pouwels KB, Smith DRM, Robotham JV, Smieszek T. Antibiotics in primary care in England: which antibiotics are prescribed and for which conditions? J Antimicrob Chemother. 2018 Feb 1;73(suppl_2):ii2–10.

388. Davies-Kershaw H, Petersen I, Nazareth I, Stevenson F. Factors influencing recording of drug misuse in primary care: a qualitative study of GPs in England. Br J Gen Pract. 2018 Apr 1;68(669):e234–44.

389. Drummond C. Cuts to addiction services are a false economy. BMJ. 2017 Jun 5;357:j2704.

390. Statistics for Wales WG. GOV.WALES. [cited 2022 May 13]. GP access: 2015. Available from: https://gov.wales/gp-access-2015

391. Salisbury H. Helen Salisbury: The 10 minute appointment. BMJ. 2019 Jun 4;365:l2389.

392. Public Health England UG. GOV.UK. [cited 2022 May 13]. Substance misuse treatment for adults: statistics 2020 to 2021. Available from: https://www.gov.uk/government/statistics/substance-misuse-treatment-for-adults-statistics-2020-to-2021

393. Li KJ, Chen A, DeLisi LE. Opioid use and schizophrenia. Curr Opin Psychiatry. 2020 May;33(3):219–24.

394. Batel P. Addiction and schizophrenia. Eur Psychiatry J Assoc Eur Psychiatr. 2000 Mar;15(2):115–22.

395. McGrath J, Saha S, Chant D, Welham J. Schizophrenia: a concise overview of incidence, prevalence, and mortality. Epidemiol Rev. 2008;30:67–76.

396. Moscarelli M, Maffei C, Cesana BM, Boato P, Farma T, Grilli A, et al. An international perspective on assessment of negative and positive symptoms in schizophrenia. Am J Psychiatry. 1987;144(12):1595–8.

397. Harrison G, Hopper K, Craig T, Laska E, Siegel C, Wanderling J, et al. Recovery from psychotic illness: A 15- and 25-year international follow-up study. Br J Psychiatry. 2001 Jun;178(6):506–17.

398. Folsom DP, Hawthorne W, Lindamer L, Gilmer T, Bailey A, Golshan S, et al. Prevalence and Risk Factors for Homelessness and Utilization of Mental Health Services Among 10,340 Patients With Serious Mental Illness in a Large Public Mental Health System. Am J Psychiatry. 2005 Feb;162(2):370–6.

399. Marwaha S, Johnson S, Bebbington P, Stafford M, Angermeyer MC, Brugha T, et al. Rates and correlates of employment in people with schizophrenia in the UK, France and Germany. Br J Psychiatry. 2007 Jul;191(1):30–7.

400. Winklbaur B, Ebner N, Sachs G, Thau K, Fischer G. Substance abuse in patients with schizophrenia. Dialogues Clin Neurosci. 2006 Mar;8(1):37–43.

401. Hjorthøj C, Albert N, Nordentoft M. Association of Substance Use Disorders With Conversion From Schizotypal Disorder to Schizophrenia. JAMA Psychiatry. 2018 Jul 1;75(7):733–9.

402. Mallard TT, Harden KP, Fromme K. Genetic risk for schizophrenia is associated with substance use in emerging adulthood: an event-level polygenic prediction model. Psychol Med. 2019 Sep;49(12):2027–35.

403. Chambers RA, Krystal JH, Self DW. A neurobiological basis for substance abuse comorbidity in schizophrenia. Biol Psychiatry. 2001 Jul 15;50(2):71–83.

404. Howes OD, McCutcheon R, Owen MJ, Murray RM. The Role of Genes, Stress, and Dopamine in the Development of Schizophrenia. Biol Psychiatry. 2017 Jan 1;81(1):9–20.

405. John A, McGregor J, Fone D, Dunstan F, Cornish R, Lyons RA, et al. Case-finding for common mental disorders of anxiety and depression in primary care: an external validation of routinely collected data. BMC Med Inform Decis Mak. 2016 Mar 15;16(1):35.

406. Torrey EF. Prevalence Studies in Schizophrenia. Br J Psychiatry. 1987 May;150(5):598–608.

407. Castaneda R. Empirical assessment of the self-medication hypothesis among dually diagnosed inpatients. Compr Psychiatry. 1994 May;35(3):180–4.

408. Schneier FR, Siris SG. A review of psychoactive substance use and abuse in schizophrenia: Patterns of drug choice. J Nerv Ment Dis. 1987;175:641–52.

409. Goswami S, Mattoo SK, Basu D, Singh G. Substance-Abusing Schizophrenics: Do They Self-Medicate? Am J Addict. 2004 Jan 1;13(2):139–50.

410. Ayuso-Mateos JL, Vázquez-Barquero JL, Dowrick C, Lehtinen V, Dalgard OS, Casey P, et al. Depressive disorders in Europe: prevalence figures from the ODIN study. Br J Psychiatry. 2001 Oct;179(4):308–16.

411. Asher CJ, Gask L. Reasons for illicit drug use in people with schizophrenia: Qualitative study. BMC Psychiatry. 2010 Nov 22;10(1):94.

412. Farrell M, Boys A, Bebbington P, Brugha T, Coid J, Jenkins R, et al. Psychosis and drug dependence: results from a national survey of prisoners. Br J Psychiatry. 2002 Nov;181(5):393–8.

413. Sørensen HJ, Jepsen PW, Haastrup S, Juel K. Drug-use pattern, comorbid psychosis and mortality in people with a history of opioid addiction. Acta Psychiatr Scand. 2005 Mar;111(3):244–9.

414. Pierce M, Bird SM, Hickman M, Marsden J, Dunn G, Jones A, et al. Impact of treatment for opioid dependence on fatal drug-related poisoning: a national cohort study in England. Addict Abingdon Engl. 2016 Feb;111(2):298–308.

415. White M, Burton R, Darke S, Eastwood B, Knight J, Millar T, et al. Fatal opioid poisoning: a counterfactual model to estimate the preventive effect of treatment for opioid use disorder in England. Addict Abingdon Engl. 2015 Aug;110(8):1321–9.

416. Merrall ELC, Bird SM, Hutchinson SJ. Mortality of those who attended drug services in Scotland 1996-2006: record-linkage study. Int J Drug Policy. 2012 Jan;23(1):24–32.

417. Smith J, Flowers P, Larkin M. Interpretative Phenomenological Analysis: Theory, Method and Research. 1st edition. Los Angeles: SAGE Publications Ltd; 2009. 232 p.

418. Crowell S. Normativity and Phenomenology in Husserl and Heidegger. Cambridge University Press; 2013. 339 p.

419. Ö E. A system approach to the self: Interpretive phenomenological analysis. Heliyon [Internet]. 2023 Dec 17 [cited 2024 Feb 17];10(1). Available from: https://pubmed.ncbi.nlm.nih.gov/38192778/

420. Crawford R. Using Interpretative Phenomenological Analysis in music education research: An authentic analysis system for investigating authentic learning and teaching practice. Int J Music Educ. 2019 Aug 1;37(3):454–75.

421. Charmaz K. Constructing Grounded Theory: A Practical Guide through Qualitative Analysis. SAGE; 2006. 223 p.

422. Ramanadhan S, Revette AC, Lee RM, Aveling EL. Pragmatic approaches to analyzing qualitative data for implementation science: an introduction. Implement Sci Commun. 2021 Jun 29;2(1):70.

423. Shannon-Baker P. Making Paradigms Meaningful in Mixed Methods Research. J Mix Methods Res. 2016 Oct 1;10(4):319–34.

424. Carminati L. Generalizability in Qualitative Research: A Tale of Two Traditions. Qual Health Res. 2018 Nov;28(13):2094–101.

425. Fade S. Using interpretative phenomenological analysis for public health nutrition and dietetic research: a practical guide. Proc Nutr Soc. 2004 Nov;63(4):647–53.

426. Bright N, Hutchinson N, Oakes P, Marsland D. Families' experiences of raising concerns in health care services: An interpretative phenomenological analysis. J Appl Res Intellect Disabil. 2018;31(3):405–12.

427. Smith JA. Qualitative psychology: A practical guide to research methods. Thousand Oaks, CA, US: Sage Publications, Inc; 2003. ix, 258 p. (Qualitative psychology: A practical guide to research methods).

428. Vasileiou K, Barnett J, Thorpe S, Young T. Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. BMC Med Res Methodol. 2018 Nov 21;18(1):148.

429. Polkinghorne DE. Phenomenological research methods. In: Existential-phenomenological perspectives in psychology: Exploring the breadth of human experience. New York, NY, US: Plenum Press; 1989. p. 41–60.

430. McHugh RK, Votaw VR, Sugarman DE, Greenfield SF. Sex and Gender Differences in Substance Use Disorders. Clin Psychol Rev. 2018 Dec;66:12–23.

431. Kashdan TB. Psychological Flexibility as a Fundamental Aspect of Health. Clin Psychol Rev. 2010 Nov 1;30(7):865–78.

432. Chou WP, Lee KH, Ko CH, Liu TL, Hsiao RC, Lin HF, et al. Relationship between psychological inflexibility and experiential avoidance and internet addiction: Mediating effects of mental health problems. Psychiatry Res. 2017 Nov 1;257:40–4.

433. Wolff M, Mertens LJ, Walter M, Enge S, Evens R. The Acceptance/Avoidance-Promoting Experiences Questionnaire (APEQ): A theory-based approach to psychedelic drugs' effects on psychological flexibility. J Psychopharmacol (Oxf). 2022 Mar 1;36(3):387–408.

434. Levin Y, Lev Bar-Or R, Forer R, Vaserman M, Kor A, Lev-Ran S. The association between type of trauma, level of exposure and addiction. Addict Behav. 2021 Jul 1;118:106889.

435. Moustafa AA, Parkes D, Fitzgerald L, Underhill D, Garami J, Levy-Gigi E, et al. The relationship between childhood trauma, early-life stress, and alcohol and drug use, abuse, and addiction: An integrative review. Curr Psychol. 2021 Feb 1;40(2):579–84.

436. Serowik KL, Orsillo SM. The relationship between substance use, experiential avoidance, and personally meaningful experiences. Subst Use Misuse. 2019 Sep 19;54(11):1834–44.

437. Watts JR, O'Sullivan D, Panlilio C, Daniels AD. Childhood Emotional Abuse and Maladaptive Coping in Adults Seeking Treatment for Substance Use Disorder. J Addict Offender Couns. 2020 Apr;41(1):18–34.

438. Otero López JM, Mirón Redondo L, Luengo Martín A. Influence of family and peer group on the use of drugs by adolescents. Int J Addict. 1989 Nov;24(11):1065–82.

439. Parvizy S, Nikbahkt A, Pournaghash Tehrani S, Shahrokhi S. Adolescents' perspectives on addiction: Qualitative study. Nurs Health Sci. 2005;7(3):192–8.

440. Manninen S, Tuominen L, Dunbar RI, Karjalainen T, Hirvonen J, Arponen E, et al. Social Laughter Triggers Endogenous Opioid Release in Humans. J Neurosci. 2017 Jun 21;37(25):6125–31.

441. Chelnokova O, Laeng B, Løseth G, Eikemo M, Willoch F, Leknes S. The μ-opioid system promotes visual attention to faces and eyes. Soc Cogn Affect Neurosci. 2016 Dec 1;11(12):1902–9.

442. Best D, Gow J, Taylor A, Knox A, White W. Recovery From Heroin Or Alcohol Dependence: A Qualitative Account of the Recovery Experience in Glasgow. J Drug Issues. 2011 Jul 1;41(3):359–77.

443. Berghoff CR, Ritzert TR, Forsyth JP. Value-guided action: Within-day and lagged relations of experiential avoidance, mindful awareness, and cognitive fusion in a non-clinical sample. J Context Behav Sci. 2018 Oct 1;10:19–23.

444. Alase A. The Interpretative Phenomenological Analysis (IPA): A Guide to a Good Qualitative Research Approach. Int J Educ Lit Stud. 2017 Apr 30;5(2):9–19.

445. Chakrabarti S. What's in a name? Compliance, adherence and concordance in chronic psychiatric disorders. World J Psychiatry. 2014 Jun 22;4(2):30–6.

446. Horne R, Chapman SCE, Parham R, Freemantle N, Forbes A, Cooper V. Understanding Patients' Adherence-Related Beliefs about Medicines Prescribed for Long-Term Conditions: A Meta-Analytic Review of the Necessity-Concerns Framework. PLOS ONE. 2013 Dec 2;8(12):e80633.

447. Roseborough DJ, McLeod JT, Wright FI. Attrition in Psychotherapy: A Survival Analysis. Res Soc Work Pract. 2016 Nov 1;26(7):803–15.

448. Guerci B, Chanan N, Kaur S, Jasso-Mosqueda JG, Lew E. Lack of Treatment Persistence and Treatment Nonadherence as Barriers to Glycaemic Control in Patients with Type 2 Diabetes. Diabetes Ther. 2019 Apr;10(2):437–49.

449. Althubaiti A. Information bias in health research: definition, pitfalls, and adjustment methods. J Multidiscip Healthc. 2016 May 4;9:211–7.

450. Allen S. Improving Psychotherapy With AI: From the Couch to the Keyboard. IEEE Pulse. 2022 Sep;13(5):2–8.

451. Trafton JA, Humphreys K, Harris AHS, Oliva E. Consistent adherence to guidelines improves opioid dependent patients' first year outcomes. J Behav Health Serv Res. 2007;34(3):260–71.

452. Langdon KJ, Ramsey S, Scherzer C, Carey K, Ranney ML, Rich J. Development of an integrated digital health intervention to promote engagement in and adherence to medication for opioid use disorder. Addict Sci Clin Pract [Internet]. 2020;15. Available from: https://search.ebscohost.com/login.aspx?direct=true&AuthType=cookie,ip,shib,uid&db=psyh&AN=2020-30583-001&site=ehost-live&scope=site&authtype=shib&custid=s8000044orcid:0000-0001-8404-397Xkirsten.langdon@lifespan.org

453. Stam NC, Gerostamoulos D, Smith K, Pilgrim JL, Drummer OH. Challenges with take-home naloxone in reducing heroin mortality: a review of fatal heroin overdose cases in Victoria, Australia. Clin Toxicol. 2019;57(5):325–30.

454. Wolff K. Characterization of Methadone Overdose: Clinical Considerations and the Scientific Evidence. Ther Drug Monit. 2002 Aug;24(4):457.

455. Parpouchi M, Moniruzzaman A, Rezansoff SN, Russolillo A, Somers JM. Characteristics of adherence to methadone maintenance treatment over a 15-year period among homeless adults experiencing mental illness. Addict Behav Rep. 2017;6:106–11.

456. Zhou K, Li H, Wei X, Li X, Zhuang G. Medication Adherence in Patients Undergoing Methadone Maintenance Treatment in Xi'an, China. J Addict Med. 2017;11(1):28–33.

457. Sawyer S, Aroni R. Sticky issue of adherence. J Paediatr Child Health. 2003;39(1):2–5.

458. Miller TA, Robin DiMatteo M. Treatment Adherence/Compliance. In: The Encyclopedia of Clinical Psychology [Internet]. John Wiley & Sons, Ltd; 2015 [cited 2023 Jan 5]. p. 1–5. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118625392.wbecp167

459. Murphy N, Canales M. A critical analysis of compliance. Nurs Inq. 2001;8(3):173–81.

460. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005 Feb 1;8(1):19–32.

461. Baxley C, Weinstock J, Lustman PJ, Garner AA. The influence of anxiety sensitivity on opioid use disorder treatment outcomes. Exp Clin Psychopharmacol. 2019 Feb;27(1):64–77.

462. Dunphy C, Peterson C, Zhang K, Jones CM. Do out-of-pocket costs influence retention and adherence to medications for opioid use disorder? Drug Alcohol Depend. 2021 Aug 1;225:108784.

463. Guillou Landreat M, Sebille-Rivain V, Victorri Vigneau C, Foucher Y, Venisse JL, Jolliet P. Buprenorphine prescription compliance: an original observational and longitudinal study. J Psychoactive Drugs. 2014 Jun;46(2):162–7.

464. Kim SJ, Marsch LA, Guarino H, Acosta M, Aponte-Melendez Y. Predictors of Outcome from Computer-Based Treatment for Substance Use Disorders: Results from a Randomized Clinical Trial. Drug Alcohol Depend. 2015 Dec 1;157:174–8.

465. Kinsky S, Houck PR, Mayes K, Loveland D, Daley D, Schuster JM. A comparison of adherence, outcomes, and costs among opioid use disorder Medicaid patients treated with buprenorphine and methadone: A view from the payer perspective. J Subst Abuse Treat. 2019 Sep;104:15–21.

466. Liu D, Gu J, Xu H, Hao C, Jiao M, Zhang X, et al. Club drugs and alcohol abuse predicted dropout and poor adherence among methadone maintenance treatment patients in Guangzhou, China. AIDS Care. 2017 Apr;29(4):458–63.

467. Lo-Ciganic WH, Donohue JM, Kim JY, Krans EE, Jones BL, Kelley D, et al. Adherence trajectories of buprenorphine therapy among pregnant women in a large state Medicaid program in the United States. Pharmacoepidemiol Drug Saf. 2019 Jan;28(1):80–9.

468. Luo X, Zhao P, Gong X, Zhang L, Tang W, Zou X, et al. Concurrent Heroin Use and Correlates among Methadone Maintenance Treatment Clients: A 12-Month Follow-up Study in Guangdong Province, China. Int J Environ Res Public Health. 2016 Mar;13(3):305.

469. Nguyen LH, Nguyen HTT, Nguyen HLT, Tran BX, Latkin CA. Adherence to methadone maintenance treatment and associated factors among patients in Vietnamese mountainside areas. Subst Abuse Treat Prev Policy. 2017 Jun 8;12(1):31.

470. Pizzicato LN, Hom JK, Sun M, Johnson CC, Viner KM. Adherence to buprenorphine: An analysis of prescription drug monitoring program data. Drug Alcohol Depend. 2020 Nov 1;216:108317.

471. Chao E, Hung CC, Lin CP, Ku YCJ, Ain QU, Metzger DS, et al. Adherence among HIV-positive injection drug users undergoing methadone treatment in Taiwan. BMC Psychiatry. 2020 Jul 2;20(1):346.

472. Roux P, Lions C, Michel L, Cohen J, Mora M, Marcellin F, et al. Predictors of non-adherence to methadone maintenance treatment in opioid-dependent individuals: implications for clinicians. Curr Pharm Des. 2014;20(25):4097–105.

473. Liu XS. Implications of statistical power for confidence intervals. Br J Math Stat Psychol. 2012 Nov;65(3):427–37.

474. Smith G. Step away from stepwise. J Big Data. 2018 Sep 15;5(1):32.

475. Miller WR, Tonigan JS. Assessing drinkers' motivation for change: The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES). Psychol Addict Behav. 1996;10(2):81–9.

476. Webster LR. Risk Factors for Opioid-Use Disorder and Overdose. Anesth Analg. 2017 Nov;125(5):1741–8.

477. Silverman IW. Gender differences in inhibitory control as assessed on simple delay tasks in early childhood: A meta-analysis. Int J Behav Dev. 2021 Nov 1;45(6):533–44.

478. Brown SA, Vik PW, Patterson TL, Grant I, Schuckit MA. Stress, vulnerability and adult alcohol relapse. J Stud Alcohol. 1995 Sep;56(5):538–45.

479. Cochran WG, Cochran WG. Sampling Techniques. Wiley; 1977. 456 p.

480. Garcia J, Evans J, Reshaw M. ``Is There Anything Else You Would Like to Tell Us'' – Methodological Issues in the Use of Free-Text Comments from Postal Surveys. Qual Quant. 2004 Apr 1;38(2):113–25.

481. VanGeest JB, Johnson TP, Welch VL. Methodologies for improving response rates in surveys of physicians: a systematic review. Eval Health Prof. 2007 Dec;30(4):303–21.

482. Leary A, Maclaine K, Trevatt P, Radford M, Punshon G. Variation in job titles within the nursing workforce. J Clin Nurs. 2017;26(23–24):4945–50.

483. Watson AC. Finding Common Ground in Case Management: New Titles and Terminology Along the Health care Continuum. Prof Case Manag. 2011 Apr;16(2):52–4.

484. Santo T, Campbell G, Gisev N, Martino-Burke D, Wilson J, Colledge-Frisby S, et al. Prevalence of mental disorders among people with opioid use disorder: A systematic review and meta-analysis. Drug Alcohol Depend. 2022 Sep 1;238:109551.

485. Mills KL, Teesson M, Ross J, Peters L. Trauma, PTSD, and substance use disorders: findings from the Australian National Survey of Mental Health and Well-Being. Am J Psychiatry. 2006 Apr;163(4):652–8.

486. Fernandez SB, Lopez C, Ibarra C, Sheehan DM, Ladner RA, Trepka MJ. Examining Barriers to Medication Adherence and Retention in Care among Women Living with HIV in the Face of Homelessness and Unstable Housing. Int J Environ Res Public Health. 2022 Jan;19(18):11484.

487. Karow A, Verthein U, Krausz M, Schafer I. Association of personality disorders, family conflicts and treatment with quality of life in opiate addiction. Eur Addict Res. 2008;14(1):38–46.

488. Damen KFM, DeJong CAJ, Nass GCM, VanderStaak CPF, Breteler MHM. Interpersonal aspects of personality disorders in opioid-dependent patients: the convergence of the ICL-R and the SIDP-IV. Eur Addict Res. 2005;11(3):107–14.

489. Harrell PT, Mancha BE, Petras H, Trenz RC, Latimer WW. Latent classes of heroin and cocaine users predict unique HIV/HCV risk factors. Drug Alcohol Depend. 2012 May 1;122(3):220–7.

490. Ahmad B, Mufti KA, Farooq S. Psychiatric comorbidity in substance abuse (opioids). JPMA J Pak Med Assoc. 2001 May;51(5):183–6.

491. Hughes L. National e-learning resource for dual diagnosis. Adv Dual Diagn. 2010;3(3):36–9.

492. Haskard KB, Williams SL, DiMatteo MR, Rosenthal R, White MK, Goldstein MG. Physician and patient communication training in primary care: Effects on participation and satisfaction. Health Psychol. 2008;27:513–22.

493. Bricker J, Tollison S. Comparison of Motivational Interviewing with Acceptance and Commitment Therapy: A Conceptual and Clinical Review. Behav Cogn Psychother. 2011 Oct;39(5):541–59.

494. Essau CA. Chapter 11 - Comorbidity of addictive problems: Assessment and treatment implications. In: Essau CA, Delfabbro PH, editors. Adolescent Addiction (Second Edition) [Internet]. San Diego: Academic Press; 2020 [cited 2022 Nov 3]. p. 291–317. (Practical Resources for the Mental Health Professional). Available from: https://www.sciencedirect.com/science/article/pii/B9780128186268000116

495. Zarate D, Ball M, Montag C, Prokofieva M, Stavropoulos V. Unravelling the web of addictions: A network analysis approach. Addict Behav Rep. 2022;15.

496. Frank E, Gonzalez JM, Fagiolini A. The Importance of Routine for Preventing Recurrence in Bipolar Disorder. Am J Psychiatry. 2006 Jun;163(6):981–5.

497. Frank E, Swartz HA, Boland E. Interpersonal and social rhythm therapy: an intervention addressing rhythm dysregulation in bipolar disorder. Dialogues Clin Neurosci. 2007 Sep;9(3):325–32.

498. Ehlers CL, Kupfer DJ, Frank E, Monk TH. Biological rhythms and depression: The role of zeitgebers and zeitstorers. Depression. 1993;1(6):285–93.

499. Morrison KL, Madden GJ, Odum AL, Friedel JE, Twohig MP. Altering Impulsive Decision Making With an Acceptance-Based Procedure. Behav Ther. 2014 Sep 1;45(5):630–9.

500. Berkout OV, Tinsley D, Flynn MK. A review of anger, hostility, and aggression from an ACT perspective. J Context Behav Sci. 2019 Jan 1;11:34–43.

501. Levin ME, Luoma JB, Vilardaga R, Lillis J, Nobles R, Hayes SC. Examining the role of psychological inflexibility, perspective taking, and empathic concern in generalized prejudice. J Appl Soc Psychol. 2016;46(3):180–91.

502. Yasinski C, Hayes AM, Ready CB, Abel A, Görg N, Kuyken W. Processes of change in cognitive behavioral therapy for treatment-resistant depression: psychological flexibility, rumination, avoidance, and emotional processing. Psychother Res. 2020 Nov 16;30(8):983–97.

503. Hallfors DD, Waller MW, Ford CA, Halpern CT, Brodish PH, Iritani B. Adolescent depression and suicide risk: Association with sex and drug behavior. Am J Prev Med. 2004 Oct 1;27(3):224–31.

504. Verona E, Patrick CJ, Joiner TE. Psychopathy, antisocial personality, and suicide risk. J Abnorm Psychol. 2001;110:462–70.

505. Gvion Y, Apter A. Aggression, Impulsivity, and Suicide Behavior: A Review of the Literature. Arch Suicide Res. 2011 Apr 1;15(2):93–112.

506. Mueser KT, Rosenberg SD, Drake RE, Miles KM, Wolford G, Vidaver R, et al. Conduct disorder, antisocial personality disorder and substance use disorders in schizophrenia and major affective disorders. J Stud Alcohol. 1999 Mar;60(2):278–84.

507. Valiente C, Provencio M, Espinosa R, Duque A, Everts F. Insight in paranoia: The role of experiential avoidance and internalized stigma. Schizophr Res. 2015 May 1;164(1):214–20.

508. Staiger T, Waldmann T, Rüsch N, Krumm S. Barriers and facilitators of help-seeking among unemployed persons with mental health problems: a qualitative study. BMC Health Serv Res. 2017 Jan 17;17(1):39.

509. Cuffel BJ, Alford J, Fischer EP, Owen RR. Awareness of Illness in Schizophrenia and Outpatient Treatment Adherence. J Nerv Ment Dis. 1996 Nov;184(11):653–9.

510. Shah P, Quilty L, Kim J, Graff-Guerrero A, Gerretsen P. Impaired Awareness of Problem and Pathological Gambling: A Review. J Gambl Stud. 2020 Mar 1;36(1):39–50.

511. Wu LT, McNeely J, Subramaniam GA, Brady KT, Sharma G, VanVeldhuisen P, et al. DSM-5 substance use disorders among adult primary care patients: Results from a multisite study. Drug Alcohol Depend. 2017 Oct 1;179:42–6.

512. Chen IQ, Chokron Garneau H, Seay-Morrison T, Mahoney MR, Filipowicz H, McGovern MP. What constitutes “behavioral health”? Perceptions of substance-related problems and their treatment in primary care. Addict Sci Clin Pract. 2020 Jul 29;15(1):29.

513. Kennedy-Hendricks A, Barry CL, Stone E, Bachhuber MA, McGinty EE. Comparing perspectives on medication treatment for opioid use disorder between national samples of primary care trainee physicians and attending physicians. Drug Alcohol Depend. 2020 Nov 1;216:108217.

514. Savage SR. Assessment for Addiction in Pain-Treatment Settings. Clin J Pain. 2002 Aug;18(4):S28.

515. Madras BK, Compton WA, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: Comparison at intake and 6 months later. Drug Alcohol Depend. 2009 Jan 1;99(1–3):280–95.

516. Olmstead TA, Yonkers KA, Ondersma SJ, Forray A, Gilstad-Hayden K, Martino S. Cost-effectiveness of electronic- and clinician-delivered screening, brief intervention and referral to treatment for women in reproductive health centers. Addiction. 2019 Sep;114(9):1659–69.

517. Stevens MWR, Harland J, Alfred S, Ali RL. Substance use in the emergency department: Screening for risky drug use, using the ASSIST-Lite. Drug Alcohol Rev. 2022 Nov;41(7):1565–76.

518. Pace CA, Uebelacker LA. Addressing Unhealthy Substance Use in Primary Care. Med Clin North Am. 2018 Jul;102(4):567-+.

519. Hayes SC, Luoma JB, Bond FW, Masuda A, Lillis J. Acceptance and commitment therapy: model, processes and outcomes. Behav Res Ther. 2006 Jan;44(1):1–25.

520. Fu R, Yuan C, Sun W, Wang W, Zhang L, Zhai J, et al. Effectiveness of E-SBIRT intervention in community healthcare institution in China: study proposal for a randomised controlled trial. Gen Psychiatry. 2021 Sep 24;34(5):e100486.