The Impact of 'Non-Clinical' Patient Factors (NCpF) on Clinical Decision-making: Uncovering the Impact on Mental Health

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Abstract

This thesis aimed to understand the influence of non-clinical patient factors on mental health-related diagnostic, treatment, and referral decisions. Non-clinical patient factors are characteristics of the patient that are not known to be relevant for the clinical diagnosis or prognosis. Examples of non-clinical patient factors in mental health care include gender, age, and socioeconomic status.

Focus groups were conducted to understand the perceptions of patient's mental health care experiences and identify any NCpF that varied from past literature. Then, using the Secure Anonymised Information Linkage Databank, administrative data for participants with a gold standard indicator of mental health were linked with their healthcare records to determine associations between NCpF and being diagnosed, treated, or referred for mental health-related conditions. Finally, an experimental clinical vignette study was conducted. General practitioners were invited to answer clinical decisions based on the clinical vignettes which depicted patients with bulimia, anxiety, and bipolar disorder. All participants saw one of each disorder, however they were randomly allocated to either male, female or a control condition for bulimia, young, old or control condition for age, or high- or low- socioeconomic status or no reference for bipolar disorder.

Utilising a combined methodological approach, gender, age and socioeconomic status were found to impact the clinical decision-making process. The effect of this influence varied depending on the clinical decision and disorder type. This thesis demonstrated the feasibility of using administrative and health care records to study mental health-related clinical decision-making.

Declarations and Statements

DECLARATION

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Signed ....[redacted]

Date 23/10/2021

STATEMENT 1

This thesis is the result of my own investigations, except where otherwise stated. Where correction services have been used, the extent and nature of the correction is clearly marked in a footnote(s). Other sources are acknowledged by footnotes giving explicit references. A bibliography is appended.

Signed ....[redacted]

Date 23/10/2021

STATEMENT 2

I hereby give consent for my thesis to be available for photocopying and for inter-library loan, and for the title and summary to be made available to outside organisations.

Signed ....[redacted]

Date 23/10/2021

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Acknowledgements

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Finally, special thanks are extended to Swansea Mind for allowing me the opportunity to collect data, as well as the clinicians who were involved across this thesis, those doctors who continually strive to keep the person at the centre and in doing so replace the fear of illness with trust in recovery.

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Abbreviations

A&E = Accident and Emergency

ADDE = Annual District Death Extract

ADHD = Attention deficit/hyperactivity disorder

ALF = Anonymised Linking Field

API = Autonomy Preference Index

BMI = Body Mass Index

BMJ = British Medical Journal

CBT = Cognitive behavioural therapy

CMD = Common mental disorder

COPD = Chronic obstructive pulmonary disease

CPS = Control Preferences Scale

DPP = Developing professional practice

ECSTAT-3 = 3-item Economic Activity Status

ECG = Electrocardiogram

EDDS = Emergency Department Dataset

EHR = Electronic Health Records

GAD = Generalised anxiety disorder

GDPR = General Data Protection Regulation

GP = General Practitioner

HIRU = Health Information Research Unit

HSW = Health Solutions Wales

ICD10/11 = International Classification of Diseases 10/11

IGRP = Information Governance Review Panel

I-IMR = Integrated Illness Management and Recovery

LGBTQ+ = Lesbian, Gay, Bisexual, Transgender, Queer, Questioning, Transsexual, Intersex, Asexual, Pansexual, Non-binary, Bigender, Pangender, Ally

LSOA = Lower super output area

MCS = Mental Health Component Score

MHI-5 = Five-item Mental Health Inventory

MHS = Mental Health Score

NCpF = Non-clinical patient factors

NHS = National Health Service

NS-SEC5 = National Statistics Socioeconomic Classification

NSW = National Survey for Wales

NWIS = NHS Wales Informatics Service

ONS = Office of National Statistics

OPR = Outpatient Referral Data

PEDW = Patient Episode Database for Wales

RCT = Randomised control trial

SAES = Skills and Employment Survey

SAIL = Secure Anonymised Information Linkage databank

SDM = Shared decision-making

SES = Socioeconomic status

SF-36 = Short-Form 36

SMI = Serious mental illness

SSRI = Selective Serotonin Reuptake Inhibitor

UK = United Kingdom

WEMHWS = Warwick-Edinburgh Mental Health Wellbeing Scale

WHO = World Health Organisation

WDS = Welsh Demographic Survey

WHS = Welsh Health Survey

Chapter 1: Introduction

1.1. The Problem

Clinical mental health-related decisions, as with all decisions, are prone to unconscious bias. These biases can unknowingly promote health inequality and inequity. Most common mental disorders (CMD) can be successfully managed in primary care; however, many individuals with diagnosable CMD do not seek help and of those that do some may not receive any treatment, receive unsuitable treatment, have delayed referral times or suffer from diagnostic errors (Altamura et al., 2015; Strother et al., 2012; Wetherell et al., 2009; Singh & Rajput, 2006).

According to the national charity, Mind, one in four people experience some form of mental ill-health (Mind, 2018). Approximately 60% of patients with bipolar receive an initial misdiagnosis (Singh, Tanvir, & Rajput, 2005), the average duration of time taken for people with bipolar disorder to receive a correct diagnosis is three years, with 20% reporting a lack of diagnosis for over five years (Hong et al., 2016). Erroneously using non-clinical patient factors (NCpF) such as age or gender to make a clinical decision may contribute to these delays or errors in diagnosis (Mojtabai et al., 2011).

The majority of research to date explores the association between patient factors and physical health related clinical decisions, less explores mental health clinical decisions and that which exists is limited; pertaining to problem drinkers or mental health as a comorbidity (Berner et al., 2007; Raine et al., 2000), or the research foci is treatment and management options (Lorion, 1973; Patel et al., 2007; Snowden, 2001; Watts & Priebe, 2002; Wells, Klap, Koike, & Sherbourne, 2001). Furthermore, previous research typically uses qualitative or survey methodology (Hyde, Evans, et al., 2005). Individual's unconscious bias cannot be reliably detected by these methods, their very nature means they are often inaccessible to the individuals making them. Therefore, a more appropriate way to understand these biases in mental healthcare is by identifying patterns of behaviours in large data over time; doing so can address institutional cultural issues that are difficult to access on the basis of small local data collections. Further, there are gaps in using routinely collected data to examine trends in clinical decision-making as well as using standard experimental techniques to determine whether altering patient factors subsequently alters decisions made. Therefore, it is necessary to gain a better understanding of the impact of patient factors on mental health clinical decisions and use multiple research methods to achieve this.

The path to understanding whether NCpF influence clinical decisions is complex, requiring multiple research methods to explore. Utilising focus groups, linking routinely collected health data to administrative data, and conducting experimental research, can grant better understanding of the impact of NCpF on clinical decision-making in order to reduce medical error while promoting more targeted system change.

1.2. Research Question

- Do non-clinical patient factors influence mental health clinical decision-making?

1.3. Purpose

This research seeks to identify the impact of NCpF on mental health related clinical decisions, specifically: treatment, diagnosis and referrals. NCpF are patient characteristics, such as age or gender, that within the specific 'mental health' clinical context, are unrelated to the clinical criteria but may still influence clinical decision-making. By identifying these factors in the literature, exploring the association between these factors and mental health decision-making in greater depth through linked electronic health data, as well as gauge greater understanding through a controlled experimental study, I hope to improve the awareness of the impact of said patient factors. Awareness of these factors will support improvement of clinical decision-making and in turn care itself. For healthcare to be of the highest quality, it is essential that healthcare professionals consider potential elements that may impact the interactions between the professionals and their patients as well as decisions made regarding an individuals' healthcare. Given the shift towards patient-centred care and the reported increase in mental ill-health (John, Marchant, Fone, McGregor, et al., 2016; John et al., 2015; Twenge, Joiner, Rogers, & Martin, 2018), this is a timely research project.

If this research concludes that NCpF influence clinical decisions made, I will suggest ways to target inequity and inequality within the identified areas of mental ill-health and clarify areas that are less prone to equity and equality. Achieving this can reduce risks of medical error and increase cultural safety. Further, understanding the role of NCpF can lead to the development or improvement of decision support tools, inform the implementation and development of shared decision support models, as well as may lead to the creation of individual or system-based interventions that recognise the specific needs of different groups (Joosten et al., 2008; Shay & Lafata, 2015).

1.4. Aim

To understand the impact of NCpF on mental health clinical decision-making, utilising a combination of social science and health data science methodologies.

1.5. Objectives

The over-arching objectives of this thesis were to:

1. Understand patients with mental ill-health's clinical decision-making experiences.
2. Identify whether NCpF are associated with clinical decisions in treatment, diagnosis, and referral of people with mental ill-health.
    a. If so, which NCpF impact clinical decisions?
    b. How do the NCpF identified impact the clinical decisions in mental health?
3. Determine whether specific NCpF can lead to differences in treatment, diagnostic or referral decisions regarding patients with mental ill-health.

Each chapter outlines the subsidiary objectives that evolved as the research developed.

1.6. Research Overview

Figure 1.1. and Table 1.1. outline how the research is connected and provides an overview of the objectives, questions, and methods for each chapter.

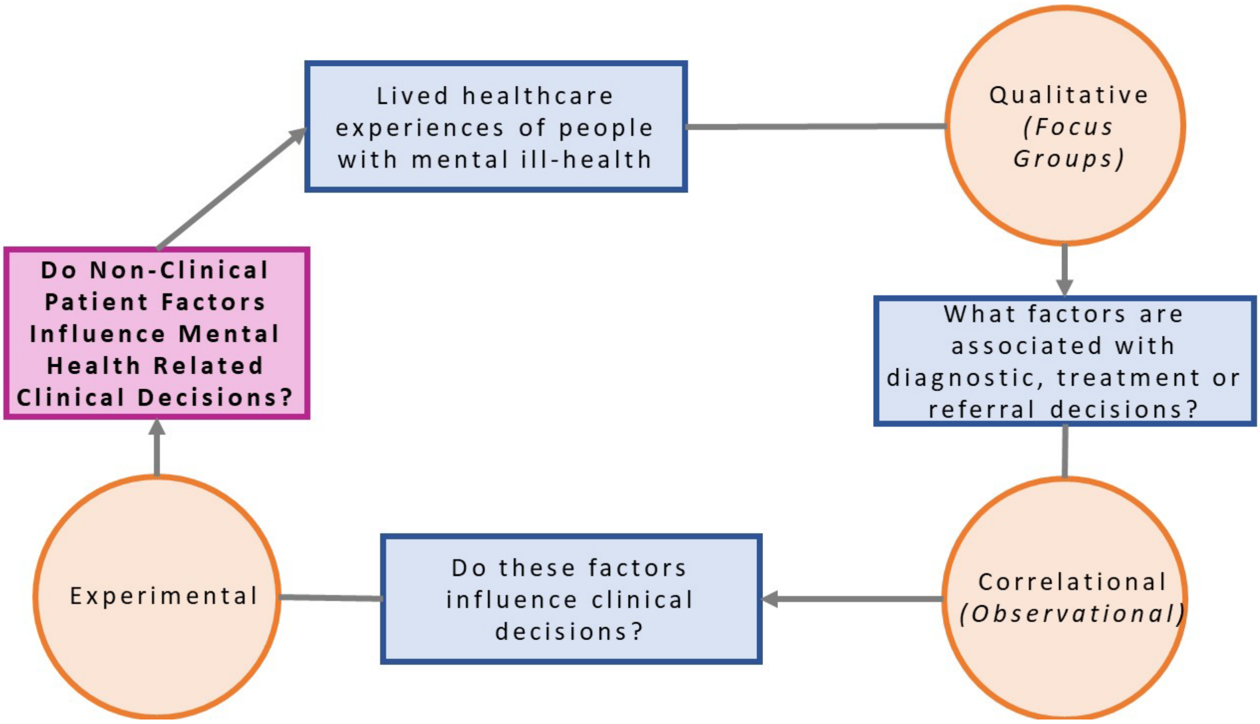

Figure 1.1: Flow diagram of how both qualitative and quantitative methodology impact each other, to explore the overarching research question

To assess the lived healthcare experiences of people with mental ill-health, two semi-structured focus groups were conducted. Thematic analyses were utilised to analyse the data, the results of which used to understand; overall perceptions of healthcare, level of involvement, and any factors associated with clinical decisions.

Following the focus groups, the Welsh Health Survey (WHS) and electronic health data were linked then subsequently analysed. Identification of people with mental ill-health was achieved by gaining responses to the 5-item Mental Health Inventory (MHI-5) of the Short Form-36 (SF-36) within the WHS. The MHI-5 has been approved and used as one 'gold-standard' measure for mental ill-health (Cornish, John, Boyd, Tilling, & Macleod, 2016; Matcham, Norton, Steer, & Hotopf, 2016). Assessing CMD using the MHI-5 from the WHS has been researched prior (Fone & Dunstan, 2006; Skapinakis, Weich, Lewis, & Singleton, 2006). Those identified as having mental ill-health were anonymously linked to their own health records to understand whether there are trends in which NCpF lead to more or less recognition by the healthcare system and use this information for further analysis.

The NCpF identified from the health data research were used to create fictitious clinical vignettes in an experimental study. The aim of this final sub-project was to determine whether including details of a patient, such as age or gender, affects the clinical decisions. The vignettes used were co-produced with General Practitioners (GPs) and Psychiatrists to develop cases that were as representative as possible.

Table 1.1: Research Objectives, Questions, Methods and Chapters

Research Objectives	*Research Questions*	*Methodology*	*Design*	*Data Analysis Method*	*Chapter Reported*
1. Understand patients with mental ill-health clinical decision-making experiences.	What are the lived healthcare experiences of people with mental ill-health?	Qualitative	Qualitative	Focus Groups; Inductive Analysis	3
2. Identify whether NCpF are associated with clinical decisions in treatment, diagnosis, and referral of people with mental ill-health.	Are NCpF associated with differences in treatment, diagnosis and referral decisions of people with mental ill-health? If so, which factors are associated with these differences? What is the direction of those associations?	Quantitative	Correlational (observational)	Data Linkage, Descriptive, Inferential Statistics	4
3. Determine whether specific NCpF can lead to differences in treatment, diagnostic or referral decisions regarding patients with mental ill-health.	Do non-clinical patient factors influence clinical decisions?	Quantitative + Qualitative	Experimental	Descriptive, Inferential Statistics	5

1.7. Underpinning Philosophical Theory

Past research has been criticised for not fully abiding by the basic philosophy of science, which is the foundation of any research (Ponterotto, 2002, 2005). This research is a complex network of qualitative focus groups, linking health data to survey data, brought together to run an experimental project to test the hypotheses developed based on the results of the preceding chapters. As such, the philosophical stance reflects this, allowing for an interpretation during the analysis that complements all the research methodologies used. Therefore, a critical pragmatist stance was applied. Critical pragmatism is a philosophical variant from pragmatism, that teaches one to recognise the influence of social construction on research and education (Feinberg, 2012; Forester, 2012; Ulrich, 2007). Critical pragmatism is suited to the wider aims of this project as through this lens it is possible; to change the decision-making processes to reduce inequality and inequity, to be aware that NCpF may be prevalent in medical care as well as wider society but can be overcome, to understand that knowledge can only be gained by taking the perspective of every member of society, and to believe in the fluidity of research methodologies, the importance of which is depending on the question in hand (Given, 2008).

1.8. Thesis Structure

To understand the multifaceted topic that is clinical decision-making, specifically within the mental health field, this thesis uses multiple methodologies. This first chapter outlines the philosophical stance of the thesis (critical pragmatism) as well as an overview and structure of the thesis.

Given the breadth of the research question, Chapter 2 provides an in-depth background and explanation to the various aspects of this thesis. This was approached in the form of a narrative review to understand the various facets that constitute the research question, to critically appraise the research to date and highlight the importance of this research project.

The third chapter is a qualitative research study. Specifically, focus groups involving those with mental ill-health and their perceptions, thoughts, experiences of the healthcare system and shared decision-making. This was conducted to gain a better understanding of this population, as research should include those it influences (Jefford

& Tattersall, 2002; Szmukler, Staley, & Kabir, 2011). The focus groups also sought to determine any NCpF, in addition to that outlined in the narrative review, that participants deem important to the clinical decision-making process, to be explored in Chapter 4.

Chapter 4 presents the results of a correlational (observational) research design, whereby population-level health data and administrative survey data are linked and examined using regressional analyses. This was used to understand the complex relationship between pre-specified patient factors and the diagnostic, treatment, and referral patterns of the clinicians. Using the WHS as a 'gold-standard' indicator of mental ill-health, it may be possible to determine whether NCpF could be associated with receiving a diagnosis, treatment, or a referral.

The results of Chapter 4 were used to create a controlled experiment in Chapter 5. This tests whether NCpF influence clinical decisions of people with specific mental ill-health, by using fictitious clinical cases. This provides an opportunity to determine whether the NCpF identified in Chapter 4 influence clinical decisions surrounding mental health disorders.

The penultimate chapter provides a summary of the aims, objectives and results of the focus groups, vignettes and health data analyses. It discusses the interrelation between these findings and examines how the outcomes fit into the wider context of past research.

Finally, the last chapter provides a short summary of the key findings of this thesis, highlights the societal and academic impact of the research, provides suggestions for future research, practice and education, considers the overall strengths and limitations of this thesis, ultimately leading to final remarks and conclusions.

1.9. Author Background and Degree Targets

When choosing to pursue a higher degree, I had completed an Undergraduate degree in Psychology and was underway with a taught Master's in Research Methods in Psychology and Cognitive Neuroscience. I saw this PhD project as an opportunity to develop new skills and expand on those I held already. My past research experience primarily entailed experimental psychology, with elements of qualitative research. As such, this degree was an opportunity to expand on my qualitative research knowledge, develop skills in computer coding, data linkage and regressional analyses, as well as take my prior experimental knowledge and utilise it in the clinical decision-making setting. Moreover, I used this experience to take advantage of additional training and opportunities including public engagement, presenting, and teaching to increase my competencies and expand my skills as an academic and researcher.

Chapter 2: Background

This chapter provides the background of the thesis; by doing so this chapter contributes to achieving the aim of this research study, and all subsequent objectives, by providing an overview of the literature in this filed and providing the wider research context.

2.1. Subsidiary Objectives for Chapter 2

To achieve the over-arching objectives, the following subsidiary objectives will be targeted in this chapter:

1. Review the literature to understand the research to date on clinical decision-making, specifically relating to health equity and equality, mental health and data science.
2. Gain understanding of the methodologies often used in clinical decision-making research.
3. Identify gaps in the research that this thesis can seek to fill.

2.2. Chapter Overview

Chapter 2 sets the research into NCpF in context and identifies the key aspects of literature relating to this project. The areas of research that most strongly influence this thesis include health equity, specifically social determinants of health, mental health clinical decision-making within decision sciences and data sciences, specifically health and administrative data (Figure 2.1).

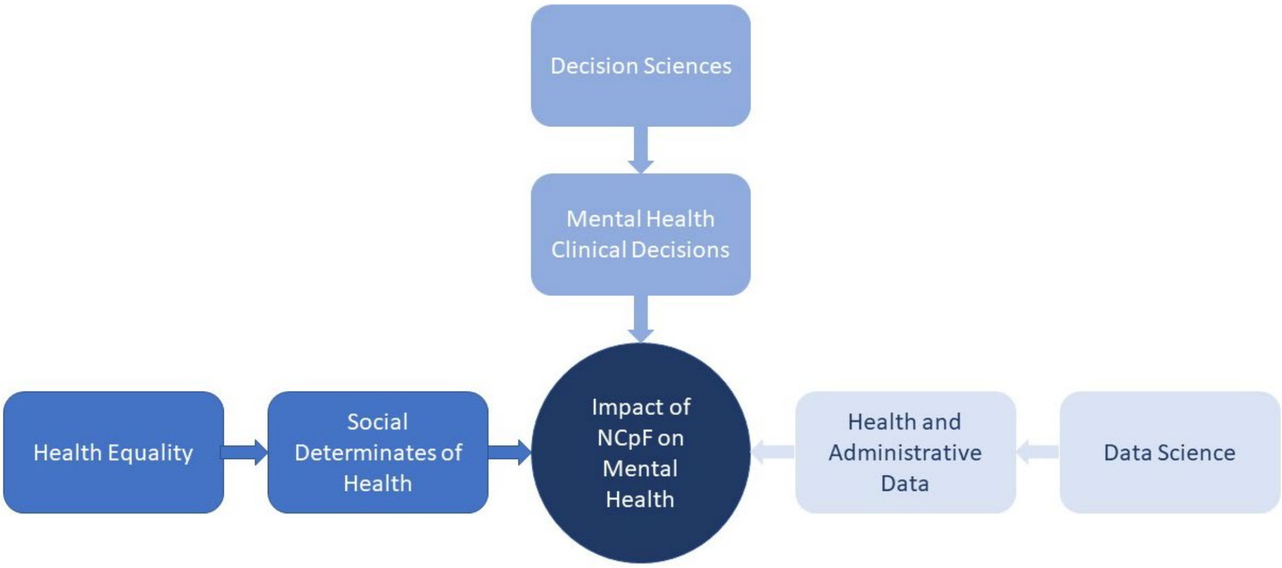

Figure 2.1: The three wider areas of research and sub-categories that, when combined, formulate the research aim: to understand the impact of non-clinical patient factors (NCpF) on mental health clinical decisions.

This chapter is split into three sections, where the relevant literature on NCpF across those research areas will be reviewed. The three sections are:

1. Health Equity and Equalities
2. Clinical Decision-Making in Mental Health
3. Administrative and Health Data

Each section describes and discusses past research within each area to identify the unanswered questions that form the foundation of this thesis. It concludes with the identification of the research question and aims.

2.3. Health Equality and Equity

In line with the World Health Organisation's (WHO) aims, this research seeks to improve healthcare and provide better quality of care for patients. This can be done by ensuring patients are correctly diagnosed and receive the most suitable treatment, early in care, avoiding unnecessary costs for the patient and the healthcare system. This section will provide a discussion of health equality and equity, an overview of the development of patient care with a justification of why patient factors are explored more readily. It also critically evaluates research, exploring the part patient factors play in health inequality and inequity. The conclusion identifies how this thesis can be used to support the greater health equality and equity agenda.

2.3.1. Overview of Health Equity and Equality

Achieving full health equity is one of the many targets the WHO seeks to attain. Health equity is defined as all members of society having an equal opportunity to reach their full health potential. Though often conflated, equity is different from equality. Equality refers to everyone being treated the same, while equity in healthcare refers to everyone having access the same opportunities (Pickett & Wilkinson, 2017). Inequity is unfair, avoidable differences resulting from, for example, cultural exclusion or poor governance (Whitehead, 1992). It is when those who require, in this instance healthcare, are unable to access it when other individuals are, or if they can access it are unable to receive the care they require. Inequality on the other hand refers to an uneven distribution of health or health resources due to genetic or societal factors (Stewart, 2013). Those in countries such as the United Kingdom (UK) who have national health services, access to health is based on need rather than the ability to pay for the service, as a result there is a greater potential to achieve equality, nevertheless barriers to full equality and equity still persist as a result of socio-economic circumstances, location, or even social environment (Marmot, Allen, Goldblatt, Herd, & Morrison, 2020). For example, though financial costs may be covered, farmers may face health inequity due to their rural location and lack of resources in said locations.

The impact of NCpF on medical decision-making is an important part of implementing the health equity agenda and one facet to resolve the long-standing disparities in quality of care (Braveman & Gruskin, 2003; WHO, 2011). As many mental disorders are linked with social, economic and environmental factors, it is especially relevant to overcome these disparities in mental health clinical decisions (World Health Organisation & Calouste Gulbenkian Foundation, 2014).

2.3.2. Social Determinates of Health

Social determinates of health are non-medical factors that influence health outcomes and are mostly responsible for health inequalities (WHO, 2017). They are the economic and social conditions that affect individual and group differences in health, functioning, quality of life, clinical outcomes and risk (Braveman & Gottlieb, 2014), and can include patient factors. These circumstances are shaped by the distribution of money, power and resources from global through to local levels of society as highlighted in Figure 2.2 below (Dahlgren & Whitehead, 2007; Whitehead & Dahlgren, 1991).

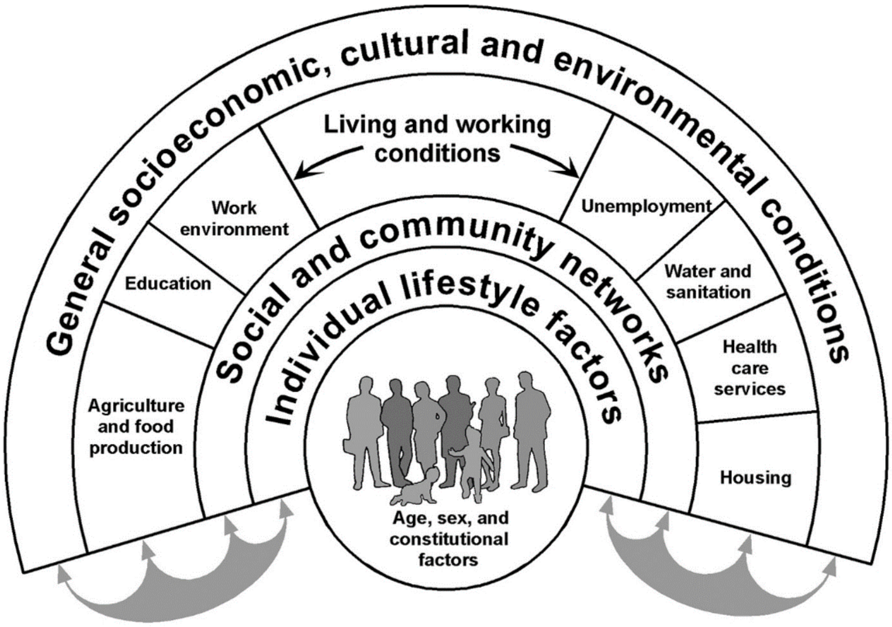

Figure 2.2: The Dahlgren-Whitehead Rainbow Model (2007 revision)

Examples of social determinants include (Healthy People, 2020; Office of Disease Prevention and Health Promotion, 2010; Wilkinson & Marmot, 2003):

- Availability of resources to meet daily needs (safe housing, local food markets)
- Access to educational, economic stability and job opportunities
- Quality of education and job training
- Access to healthcare services
- Transportation options
- Social exclusion and social support
- Exposure to crime, violence and social disorder

Social determinants of health can impact the patient-practitioner interaction, understanding how such non-medical factors impact the patient-practitioner interaction is key to designing more equitable healthcare systems. However, the patient-practitioner interaction has developed over the years from the medical model to patient-centred care and this change may have altered the impact of social determinants of health by tailoring care to the patient and involving them in clinical decisions. The two models of patient care are discussed in greater detail in the following section.

Social determinants of health are important in relation to this research as non-clinical patient factors (NCpF) are nested within social determinants of health. Further, having a broad understanding of the models of patient care is key to identifying ways of minimising the impact of social determinants of health and start to gauge how the patient-practitioner interaction may impact mental health clinical decision-making.

2.3.3. Patient Care

2.3.3.1. The Medical Model

Traditionally, the doctor-patient interaction focused on the doctor driving the consultation based on the disease and symptoms presented, which has also been referred to as 'medical paternalism' (Buchanan, 1978). This traditional method stems from the belief that the medical practitioner has been taught about disease, classification, treatment, and abides by the Hippocratic Oath; 'primum non nocere' meaning 'first do no harm'. Therefore, given the vast knowledge, training and ethical code, the best person to decide about a patient's treatment is the medical practitioner.

Part of this paternalistic view accompanies with it the right to withhold information, as should all the information regarding risks of treatment be passed onto the patients, there is a risk the patient would not have any treatment, resulting in disease progression. Therefore, by withholding information, more people may have a positive outcome (Buchanan, 1978).

Another aspect of paternalism is making clinical decisions without consulting the patient, or patient's guardians. During the time of paternalistic care, this could be viewed as a method of relieving patients when difficult decisions have to be made, for example, (Shaw, 1973, pg. 886) commented 'it is… cruel to ask the parents whether they want their child to live or die…'. Therefore, the clinical practitioner could make this decision based on what they perceive is in the best interest for the child. It can also be extrapolated to adult patients, particularly if they were seen to not understand the options due to having a lower educational background or concerns around capacity such as with mental ill-health.

This model of clinical decision-making involves accounting for the persons' circumstances and requirements and communication to understand the patient's condition. However, it is highly reliant on trusting the practitioner to make the best decision. Though, there may be every intention to keep the patient at the centre of the decision, internal biases influence the decisions being made, which can result in medical error.

Further, there was an ethical debate around fully informed consent when undergoing treatment, which started the paradigm shift in clinical decision-making. This shift was enhanced by the belief that a parent should be able to make whichever choice they desire when it comes to their children, regardless of the outcome or potential for harm. For example, the case of Ashya King, a five-year-old boy whose parents took him to Prague to receive treatment that was unavailable in the UK (BBC News, 2015).

With the move into a more technological age, the paternalistic style of consultation was challenged on an additional level. With the increase of knowledge and resources available to patients, the paternalistic method was difficult to maintain due to the online resources readily available for patients to gain knowledge about their condition (Gerber & Eiser, 2001; Lagan, Sinclair, & George Kernohan, 2010; Wald, Dube, & Anthony, 2007). As such, education level of the patient, or background of the younger patients in westernised society, who may be familiar with technology and more readily attending university, may mean they could be better equipped to gain more knowledge about their condition, at least enough to make an informed decision.

Further, research investigated the medical outcomes, adherence to medication and quality of life of patients who receive traditional care compared to patient-centred care. When care is patient-centred, it is associated with better recovery, fewer diagnostic tests and referrals, better emotional health as well as increased affective-cognitive outcomes (Robinson, Callister, Berry, & Dearing, 2008; Shay & Lafata, 2015; Weston & Jordan, 2000). However, patient-centred care may increase staffing pressures and workloads and may not necessarily be possible due to environmental constraints (Lloyd, Elkins, & Innes, 2018). Regardless, as a result of the increased adherence and patient satisfaction, care has moved away from the classical paternalistic model towards one that is more patient-centred.

2.3.3.2. Patient-Centred Care

With the aim to improve health outcomes, quality of life, medication adherence and patient-practitioner relations, the patient-centred care model took flight. This is important to understand within the wider exploration of the impact of NCpF on mental health clinical decision-making as the patient can be responsible for the advocacy of their own health rather than passively follow guidance. The current research becomes even more prominent because the patient must engage in a discussion with the medical professional, this discussion is susceptible to the influence of the impact of NCpF such as patient's education level and socioeconomic status on the clinical decision.

Despite this movement towards patient-centred care, there were inconsistencies around what makes care 'patient-centred' and which aspects were most important. Little et al. (2001) conducted an observational study which reported three elements consistently regarded as necessary for care to be 'patient-centred'; patient-practitioner communication, patient-practitioner partnerships, and a focus wider than the specific condition (Little et al., 2001). This encompassed health promotion and a healthy lifestyle. A questionnaire exploring patient preferences towards patient-centred care was created. Eight hundred and sixty-five participants completed the questionnaire and from this it was concluded that patients hold a strong desire for a patient-centred approach, however the level of participation altered. Further, only three GP practices were approached to recruit participants, therefore results could reflect opinions in Southampton but may not be generalisable to a wider scale. Further, study participants were approached before attending their GP appointment, which meant the survey was approximately five minutes long and used Likert scales to account for this short time-allocation. Therefore, questions asked are limited by the timescale, with no room for elaboration or explanation. Further, participants may respond without fully considering the question due to the time restraints. Sample demographics were supposedly representative of the general population therefore may be a useful indicator of the positive perception of patient-centred care. Since Little et al. (2001), what makes care "patient-centred" has been widened to include the involvement of family as part of the care team, ensuring optimum communication between all care parties and education, which has become a requirement of the health system's mission and values (Epstein & Street, 2011; NEJM Catalyst, 2017).

Patient-centred approaches to medical management can increase patient satisfaction, engagement, and task orientation; reduce anxiety and improve quality of life; as well as increase satisfaction with one's doctor (Stewart, 1995). This review found 16 studies that reported positive influence of patient-centred approaches as well as five that were either non-significant or inconclusive even though these results are not unanimous, it does provide insight into the potential for patient-centred care. There is also evidence to suggest patient-centred care is more efficient as it leads to fewer diagnostic tests and unnecessary referrals (Stewart et al., 2000). More than curative care, patient-centred care has been approached as a method for preventative care. To prevent disease, patients should be given regular, brief advice about the benefits of a healthy lifestyle and physical activity (Bauman, Fardy, & Harris, 2003). This can also include secondary prevention, or screening those at high risk.

Though there is evidence of positive outcomes of patient-centred care, there are drawbacks that include unintentional unfairness due to empathy or exclusion of patient groups such as the elderly (Meranius et al., 2020). Regardless, one response to ensuring care is "patient-centred" is by implementing shared decision-making (Makoul & Clayman, 2006). Involving patients in the decision-making process may make care more patient-orientated.

2.3.3.3. Shared Decision-Making

The term 'shared decision-making' (SDM) within the healthcare context began in the 1980s, but only since the 1990s literature in this field started advocating for its use in clinical practice (Elwyn, Cochran, & Pignone, 2017). The greatest shift towards SDM in the UK occurred in the years following 2015, when the Shared Decision-Making Collaborative was established. This collaborative involved a group of organisations and individuals who aimed to promote and optimise the use of SDM throughout the UK (Leng, Clark, Brian, & Partridge, 2017). It implemented methods such as calls for patients and communities to be supported with education and information through training, to create evidence-based decision aids, and update primary and secondary care computer systems to facilitate access to patient decision aids (Shared Decision Making: NICE 2020).

It is a varied concept used in teaching, research, and healthcare (Adams & Drake, 2006; Makoul & Clayman, 2006; NHS, 2018; Slade, 2017). The most common definition of SDM is whereby; both patient and practitioner exchange information, relay their preferences for action, then discuss and reach an agreement (Best & Hagen, 2004; Charles, Gafni, & Whelan, 1997, 1999, 2003; Elwyn et al., 2017; Joosten et al., 2008; Leng et al., 2017; Makoul & Clayman, 2006; Pollard, Bansback, & Bryan, 2015; Shay & Lafata, 2014; Stiggelbout, Pieterse, & De Haes, 2015). In patient-provider models, SDM is the “middle ground” between the physician choosing the outcome (paternalism) and the patient having full control over the decision made.

A thorough systematic review of the literature explored the association between patient’s experience of patient-centred care on patient satisfaction, patient clinical outcomes and organisational outcomes (Rathert, Wyrwich, & Boren, 2012). Most of the studies identified found positive relationships between patient-centred care and patient satisfaction and wellbeing; methodologies included randomised control trials (RCTs), surveys, observational studies, and longitudinal research. This has also been reported elsewhere (Aning, Wassersug, & Goldenberg, 2012; Coulter & Collins, 2011; Weingart et al., 2011). Mixed results were found for the impact of patient clinical outcomes in Rathert’s systematic review, but the clinical outcome that appeared to be most continually positively influenced is treatment adherence (Rathert et al., 2012). For example, Glasgow et al (2004) conducted an RCT that compared a personalised action plan versus a control of receiving a list of health risks and how to reduce them. They found that participants in the intervention group received more exams, achieved higher levels of self-management goal setting and greater adherence to therapy (Glasgow et al., 2004). It was also found this effect was even greater for those patients who are less educated, which suggests this demographic may benefit even greater from patient-centred care interventions. Glasgow’s research was a high quality RCT, recruiting approximately 800 participants out of 1,200 requested across Colorado. In addition, another high-quality study which had over 2000 participants, conducted multivariable logic regression analyses and found patients with high participation were half as likely to have at least one adverse event during admissions. Reliably informed shared decisions may also lead to better, more efficient resource providing, which can in turn ensure value for public money and preventing waste as identified in the British Medical Journal by Leng, Clark, Brian and Partridge (2017).

One systematic review focusing on mood disorders and SDM found 14 randomised control trials that observed patients with depressive disorder and SDM processes. All studies showed significant improvement in either depression outcomes or medication adherence (Samalin et al., 2018). Though the search strategy appears sound, of the 14 RCTs identified, only one studied patients with bipolar disorder, the others focused on depression. Though depression is a CMD, there are a plethora of mood disorders and results based on depression cannot be generalised across them all. This either highlights a potential weakness in the search strategy, or a lack of research that explores bipolar and other mood disorders. Within Samalin et al.'s (2018) review, a study by Aljumah and Hassali (2015) was identified. They conducted an RCT with 239 patients with depression aged 18 to 60 with no history of bipolar disorder or psychosis (Aljumah & Hassali, 2015). An increase in medication adherence and treatment satisfaction was found. Notably, this study was conducted at one psychiatric hospital site, which decreases the generalisability of the results. Further, the use of subjective measures such as self-report scales and questionnaires were used to measure patient outcomes, which may be subject to bias.

Despite these benefits of SDM, there are reported challenges of implementing it in routine mental health services, such as access to high-quality decision support tools or training, integrating SDM with other recovery-supporting interventions, and responding to cultural changes as patients develop the normal expectations of citizenship (Slade, 2017). Decision-support tools such as the Common Ground system (Deegan, 2010) have been identified as potentially helpful ways to overcome these barriers. Finally, the dominant course of decision-making is typically clinician-led, so the flow of communication is from clinician to patient which means the patients' values and treatment preferences being acknowledged in the interaction is still reliant on the clinician's request (Deegan, 2010).

Each individual case's suitability to the SDM paradigm is dependent on clinical context, practitioner responsibility and patient preference (Duncan, Best, & Hagen, 2010;

Trevena & Barratt, 2003). There has been increased interest in patient's preferences regarding their role in the decision-making process, equally as to the patients' interpretation of what they perceived as a "shared decision". Though some patients may desire involvement in decision-making, some may not. Research suggests factors that influence a patient's shared decision-making preference include age, education level, gender, experience of illness and medical care, diagnosis and health status, and the amount of knowledge about their condition (Say, Murtagh, & Thomson, 2006).

That said, research into whether age impacts preferences for involvement in clinical decision-making conveys conflicting results. Some studies identified that younger adults prefer decisions to be shared when compared with older adults (Thompson, Pitts, & Schwankovsky, 1993; Benbassat, Pilpel, & Tidhar, 1998; Hill & Laugharne, 2006; Say, Murtagh, & Thomson, 2006). Other articles indicate either no differences between the age groups, or that older adults prefer involvement (Say, Murtagh, & Thomson, 2006; Xie, Wang, Feldman, & Zhou, 2014). Politi and colleagues caution that clinicians should not assume patients' desire for involvement and should discuss evidence-based information without assuming patients' desire for engagement (Politi, Dizon, Frosch, Kuzemchak, & Stiggelbout, 2013). By undertaking this approach, it may improve patients' satisfaction, understanding, and confidence in their choices.

One factor that may account for these differences in results is the lack of consistency when defining an older adult. An 'older adult' in the SDM literature has ranged from people over 50 to only those over the age of 75 (Say, Murtagh, & Thomson, 2006; Ekdahl, Andersson, Wiréhn, & Friedrichsen 2011; Jimenez, Bartels, Cardenas, Dhaliwal, & Alegría, 2012). Another factor that may highlight differences in results is type of health or ill-health examined i.e., there may be differences in preference when faced with a general health-related decision compared to a mental health-related decision. Most literature exploring SDM researches physical health conditions (Okonkwo et al., 2008; Thomas, Jenkins, McManus, & Gracey, 2016; Paillaud et al., 2017). Two previous reviews focus on patient preferences for decisions relating to physical health (Benbassat, Pilpel, & Tidhar, 1998; Say, Murtagh, & Thomson, 2006). These give a useful indication of factors that influence patient's preferences to be involved in SDM, namely: age; gender; education level; and ethnicity. However, neither were systematic in nature, thus may be biased (Podsakoff, MacKenzie, & Jeong-Yoen, 2003).

One systematic review (Duncan, Best & Hagen, 2010) that explored SDM interventions for individuals with mental ill-health, examined the effect of SDM-centred care on clinical outcomes, health service outcomes, and global patient satisfaction whilst excluding patient preferences for involvement in SDM. This review only included two studies, with conflicting results so could not draw any conclusions. Another systematic scoping review of SDM interventions in mental health (Zisman-Ilani, Barnett, Harik, Pavlo, & O'Connell, 2017) identified that information exchange was a central component of the studies identified, but additional elements such as clinicians prompting patient preferences and values, patients engaging in communication skills training, clinicians being involved in shared care planning, motivating patients and involving patients in goal setting.

It has been suggested that older patients receive less time with the doctor, offered less information and fewer options for sharing decisions (Nease & Brooks, 1995; Butterworth, & Campbell, 2014). If older adults wish to be involved and are not given the opportunity due to preconceptions about their preference for involvement, this could lead to patients being less satisfied with care, and make a vulnerable population feel even more isolated or unheard.

As the existing synthesis of literature is over ten years old, primarily focuses on physical ill-health or practitioner perspectives, and dates from before the 2015 shift towards SDM, a new review was timely. As such, the author of this thesis conducted a systematic review to understand the preferences of older adults for involvement in mental health clinical decisions, which has been published in a peer-reviewed journal (Burns, da Silva & John, 2020; Appendix 1; Appendix 2 holds the Author Declaration). This systematic review found five publications comprising of three unique studies that fit the inclusion criteria. The review found that, in contrast with two earlier reviews, one article identified a preference for active involvement in mental health related clinical decisions (Lechner et al., 2016), and two reported a shared preference, though the one RCT identified preferences are susceptible to change (McKinstry, 2000; Bartels et al., 2013, 2014; O'Neal et al., 2008). This systematic review emphasised the need for more high-quality research in the mental health SDM literature; studies should seek to follow the Makoul and Clayman's (2006) SDM model to ensure research seeking to understand SDM does so and not other forms of patient-clinician interaction such as information-seeking. There is a need to better understand whether the type of treatment may influence the older adults' preferences for SDM. For example, there may be differences in preferences for SDM when presented with options to start, stop or change psychiatric drug treatment as opposed to talking therapies. This review also highlighted uncertainty around how disorder type or severity, or patient's and clinician's familiarity of the disorder, may impact the patients' preference for involvement or influence on the decision made, which could be better understood with further research. Though steps were taken to minimize the influence of bias, publication bias impacts any review (Rothstein et al., 2005). Given the small number of studies reported and of varying quality, generalizability of the review is limited, specifically towards Caucasian populations in high income countries. This could suggest more research is needed in lower income countries or be a result of selection bias (as only articles written in English were included).

Understanding the health equity agenda, the development of patient care, and ways to improve the patient-practitioner interaction, such as through shared decision-making is important to provide the optimum care to patients. These changes increase the autonomy and involvement of patients in their health care. The more healthcare services emphasise the patient as a person, with their own sets of values, beliefs, and habits, the more important it is to fully understand how clinicians' clinical decisions may or may not be influenced by patient characteristics presented to them. Understanding this relationship allows future clinicians, patients and wider public to be better prepared for these types of interactions. Further, by doing this, better healthcare can be provided to individuals. In order to prepare for the patient-practitioner interaction, a better understanding of clinical decision-making is required. As such, the next section provides an overview of clinical decision-making, how decisions are made, the areas prone to bias and factors that influence mental health decision-making specifically.

2.4. Clinical Decision-Making in Mental Health

Clinical decisions are choices made using a balance of experience, awareness, knowledge, information gathering and providing, assessment tools, and evidence-based practice, that will influence healthcare (Banning, 2008). These can be made by nurses, doctors, general practitioners (GP), specialists, even assistants; anyone who makes a decision that may impact the health, care and treatment of a person. Clinical decisions can also be made at various levels such as the institutional level (hospital, GP practice), clinical team, or the encounter level. For the purpose of this research, we focused on the decisions that impact the clinical outcome at the encounter level, specifically the practitioner and patient interaction. That is, the decisions regarding patient diagnosis, treatment or referral as identified by their unique health record. Although these decisions will inevitably be influenced by those system decisions, it is beyond the scope of this thesis to investigate those.

Clinical decision-making research to date has primarily explored practitioners' characteristics and their influence on management, referral, diagnostic and treatment decisions, less is known about the influence of patient factors. That which exists has primarily used qualitative or experimental data. Health data science is at a point where it is possible to explore healthcare records of patients for trends in order to better understand this relationship. This section provides an overview of decision-making, concentrating on clinical decision-making, and medical error in mental health care, in addition to ethical considerations around capacity with mental ill-health. It then critically evaluates the research to date and identifies gaps for further research exploration.

2.4.1. The Science of Decision-Making

Research in the field of decision-making seeks to understand; what is a decision, how and why decisions are made, what or who can influence them, the time taken to form decisions, and how to improve this process. To understand clinical decision-making in mental health, it is first important to understand what a decision is, specifically within the clinical context, and gain knowledge of the current models and theories of decision-making as these inform the direction of our study, as well as identify how this study builds on the research currently available.

A decision is a choice among possibilities (Smith & Kosslyn, 2014). A decision is made by assessing the potential actions available and selecting which action (or nonaction) to take. Decision-making has been a topic of discussion for around 1000 years, initially capturing the interest of philosophers. For example, the French philosopher, Jean Buridan (c.1295-c.1358), introduced the paradox now known as “Buridan’s Ass”, whereby a donkey, standing equidistant from a bale of hay and a pail of water, would die of hunger and thirst as there is no reason known to the donkey to differentiate between the two. This is a deterministic view of the world, which rejects the existence of free will, therefore, though it may seem the logical action would be to make an arbitrary decision, as both appear equally favourable to the donkey, there is no free-will to make such an arbitrary decision. However, another philosopher, Abu Hamid al-Ghazali (c.1100) suggests when people actually make a decision; humans have an inherent internal ability to assist with a decision being made between two equally positive courses.

Some decisions are simple. Simple decisions are where there are only a small number of likely outcomes, the potential outcomes are relatively similar, or out of the potential outcomes (if dissimilar) there may be an inherent desire for one outcome over another. Other decisions are more difficult. Difficult decisions can occur when; each action has a number of potential outcomes; a number of unknown outcomes may accompany the actions; each outcome or action may have an equal level of desirability; or there may be conflict between the desirability of conducting an action in order to gain a desired outcome, or vice versa. All decisions, be they simple or complex, involve three aspects: alternatives, beliefs, and consequences.

‘Alternatives’ are the various choices or courses of action the decision maker can take. A ‘belief’ in the decision-making context refers to the likelihood that a certain outcome will occur should a particular alternative be chosen. ‘Consequences’ are the subjective evaluation of the outcome, necessary to make a decision that is based on one’s values and goals.

Clinical decisions are particularly complicated as there are multiple foci (diagnosis, intervention, interaction, and evaluation), within dynamic contexts, using a diverse knowledge base, with multiple variables and, potentially, individuals involved. In addition, clinical decisions are characterised by situations of uncertainty where not all the information needed is known. Orasanu and Connolly (1993, pg. 7) described the characteristics of decision-making in healthcare in the following way:

- Problems are ill-structured and made ambiguous by the presence of incomplete information
- The decision-making environment is fluid, and may change while decisions are being made
- Goals may be shifting, ill-defined or competing
- Decision-making occurs in the form of action-feedback loops, where actions result in effects and generate further information that decision makers have to reach to and use in order to make further decisions
- Decisions contain elements of time pressure, personal stress and highly significant outcomes for the participants
- Multiple individuals act together with different roles
- Organizational goals and norms influence the decisions made

Clinical decision-making is complex and medical errors may occur, such as surgical or treatment inaccuracies or complications (Dean, Schachter, Vincent, & Barber, 2002b; Krizek, 2000), referral delays, inaccurate (or lack of) diagnoses. These medical errors may lead to worsening symptoms, additional symptoms, or even fatality (Leape et al., 1995; Wilson et al., 1995).

The aims of the first decision-making models were to understand how to make a "perfect" decision, given a set of circumstances (Edwards, 1954). These models, also described as normative theories, suggest decisions are made by examining the feasibility of each alternative, how desirable each alternative is, then combine both desirability and feasibility to provide one ideal decision (Oliveira, 2007). This model has several underlying assumptions, two of which are the key difference between mathematical or economic decisions and human decisions, the assumption that; every alternative is known, and there is a definitive preference ranking for all alternatives. Moreover, this decision-making model is based on logical, rational choice, which humans rarely make. As such, these theories were based on the idea of how to make a perfect decision, but from this, the question turned into: how are human decisions made?

The Expected Utility model is a deterministic model of decision-making. The phrase "expected utility" was first introduced by Daniel Bernoulli, a mathematician and physicist, who used it to solve the St Petersburg paradox in economics - whereby accounting only for the expected value as the only decision criterion, the decision maker will be misguided into an irrational decision. By making the distinction between expected value (weighted outcomes) and expected utility (weighted utility, multiplied by probabilities), Bernoulli identified a rational decision can be made. Therefore, 'expected utility' is the desirability (utility) of a particular outcome, weighted by the likelihood of that outcome occurring (Smith & Kosslyn, 2014).

According to this model of decision-making, one first weighs each potential alternative by multiplying the utility (or subjective desirability) of each of its consequences, by the probability of occurrence to create the expected utilities, then the course of action with the highest expected utility is the decision made (Cohen, 1996). The Expected Utility model is a type of economic model that incorporates the idea of subjective utility. It allows for individual preference, choice under uncertainty and the variation between different circumstances, unlike other economic models. Usually, expected utility is examined in terms of risk, or gambling behaviours, and as such relies on knowledge of all potential outcomes. Moreover, the Expected Utility model does not account for human biases and irrationality. This can be best seen, and has most research, in gambling behaviours (Grether & Plott, 1979; Tversky, 1969). Expected Utility theory of decision-making is supposedly an inefficient explanation of medical decision-making given the reliance on all potential factors being known (Cohen, 1996).

The rational models of decision-making were a good foundation to decision-making theory. However, often with complex decisions, there are many aspects to compute, and a potential reason the Expected Utility model leads to intransitivity and preference reversals could be related to humans having a limited attention and working memory system. Simply by applying a new question or focus (as the bookie rather than the gambler), this in itself changes the context of the decision being made. Therefore, it has been suggested that people are as rational as they can be given the limits of the capacities for attention, working memory and executive control (Smith & Kosslyn, 2014).

Herbert Simon’s work focuses on decision-making as a descriptive theory. He identified a Bounded Rationality model, whereby decision-making is as rational as possible, given the cognitive limitations on our information processing system (Simon, 1955). Simon posed that, when making a complex or cognitively exhaustive decisions, rather than choosing the optimum alternative, there is a trade-off between the best alternative and the amount of cognitive effort input to make that decision. To achieve this, he identified a strategy known as satisficing, an algorithmic method of finding the alternative that may be a good fit, but not the optimal outcome. This is biased by the order in which the possible options are searched, and unlike the Expected Utility model, will not produce the best outcome but will involve less cognitive expenditure.

The Bounded Rationality model is a view increasing in popularity within healthcare as Bounded Rationality is about finding a solution that is good enough, given the information provided by a patient, compared with the quantity of knowledge the practitioner is required to search through. Coupled with the limited cognitive capacity for information processing and memory limitations, a solution that is ‘good enough’ is more realistic than trying to identify the optimum decision (Djulbegovic, Elqayam, & Dale, 2018).

Simon’s work expands beyond decision-making and specifies a whole range of strategies are used daily when solving problems. They suggest the cognitive system is a “toolbox” whereby the “tools” can be computational algorithms, learned through instruction, such as arithmetic skills or expert imitation. Other tools are based on personal learning experiences, built up over time. Eventually, these “tools” become heuristics, simple and effective rules that work in most daily circumstances. The adaptive decision-maker model incorporates all these aspects of the “toolbox” in addition to expected utility. Under this model, decisions are made through adaptive strategies, varying based on the importance of the decision. Complex, important decisions (such as clinical decisions) will be made with cognitively demanding tools, while less important decisions are made by heuristic methods.

Clinical decisions have a number of context-specific challenges. In the UK and other countries with public healthcare, complex decisions are made within a short period of time as a result of staffing pressures. Resultantly, less demanding cognitive tools may be used to assist with making a decision in the designated timeframe. This idea of two methods of decision-making was also discussed in Kahneman's book, 'Thinking Fast and Slow' (Kahneman, 2011). From this, the cognitively demanding route to decision-making is the 'slow', logical way of deciding, while the 'fast' route is the intuitive, heuristic method. Though many clinical decisions are cognitively demanding, the temporal pressures may result in the 'fast' route being used in consultations.

Dual-process theories can be traced back to the 1990s. One researcher in an attempt to map various dual-processes of reasoning, judgement and social cognition, compiled labels attached to dual-processes in the literature and found four clusters of features that are attributed to dual processes and systems; consciousness, evolution, functional characteristics and individual differences (Evans, 2003; Evans, 2008). There is an argument that too many dual-process theories exist and one unifying theory should be established instead (Evans, 2008).

Whichever dual-process theory in decision-making is the most accurate, there are similarities among them all. The key aspect across theories is that there are differences in cognitive processes that can be separated into two streams: a 'fast' system (system one or process one) and an opposite 'slow' system (system two or process two). System one uses heuristic judgements based on previous experiences, learned behaviour, with low cognitive effort, which may be prone to bias (Magnavita, 2016). System two uses controlled, logical, effortful thought processes, which is why it has been suggested to be less sensitive to bias (Croskerry, 2013).

Norman and colleagues tested whether diagnostic errors arose significantly more with system one than system two (Norman et al., 2014). They found no significant difference between system one condition and system two in terms of accuracy, however system one was significantly quicker. Therefore, authors conclude that slowing down and increasing attention to analytical thinking is insufficient to increase diagnostic accuracy. However, cases presented in the same fixed sequence to both cohorts, thus leaving open to order effects and participants may suffer with fatigue given that the experiment ran between 30 and 120 minutes, depending on the condition. Further, candidates were medical students sitting a clinical skills examination to gain the license to practice in Canada, not current practicing clinicians, as such their skills and knowledge may not be as consolidated as practicing clinicians meaning their heuristics have not fully developed. There is also little ecological validity, with the added complexity that medical students may be familiar with examining case studies in the same paper-based format as presented in this study, thus accustomed to identifying the key information compared to experienced clinicians who have been out of education.

If biases do influence complex decisions, it may lead to a string of undesired events, especially for clinical decisions. Many biases have been described in the literature (Magnavita, 2016) but for the purpose of this thesis we will focus on those particularly applicable in the clinical setting.

Biases that may impact clinical decisions include:

- Availability Bias
- Attributional Bias
- Anchoring Bias
- Confirmation Bias
- Sunk-Cost Effect
- Overconfidence Bias
- Egocentrism
- Status-quo Bias

Availability bias is where one tends to estimate the likelihood of a phenomenon, such as diagnosis, using the ease in which relevant examples are recalled (Magnavita, 2016). For example, if a medical practitioner who has seen several female patients with sleep apnoea in a week, then consults a patient who is female, voices having low mood, disturbed sleep and weight gain the medical practitioner may lean towards sleep apnoea as a result of availability bias rather than explore the potential for depression. As such, these cognitive biases may be related with NCpF. One study found a significant interaction between years of training and recent experiences with similar problems (Mamede et al., 2010). This experimental study involved first- and second-year medical residents, the second-year residents made errors consistent with availability bias. Thirty-six medical residents took part and examined a total of 16 clinical cases.

However, this research used students rather than clinical professionals, as well as a low number of participants, so limited generalizability to real-world applications.

Attributional bias is another form of cognitive bias that refers to the systematic errors made when people evaluate their own and others' behaviours. Attributional bias in decision-making refers to people tending to view their own decisions more favourably than others; either by minimising their own errors while maximising others' or maximizing their own successes while minimising others'. Limited research has explored the effect of attributional bias on clinical decision-making. One study explored attributional bias in neurorehabilitation therapists (Macciocchi & Eaton, 1995). This study gave 51 therapists self-report questionnaires to complete. Results showed therapists accepted personal responsibility for positive outcomes observed, but responsibility for negative outcomes was placed on external factors. This study uses self-reported measures, which are prone to bias (Rosenman, Tennekoon, & Hill, 2011), therefore results may not be a true reflection. Another article discusses the impact of attribution on psychotherapists' treatment recommendations, suggesting that treatment recommendation may differ depending on whether a clinician attributes the cause of patient behaviour to be due to the patients' disposition or situational factors (Murray & Thomson, 2009).

Anchoring bias is where too much weight is put on one aspect, resulting in a distorted view of subsequent knowledge gained. For example, placing too much weight on one condition or symptom mentioned, such as 'drinking excess alcohol' may result in placing less importance in following conditions or symptoms mentioned, such as 'low mood', which may lead to weighting a diagnosis of 'alcoholism' as more likely than other potential diagnoses such as 'depression'. This could be related with NCpF such as gender, whereby men are more likely to be diagnosed with alcoholism than depression, while women see the reverse (Berner et al., 2007), potentially a result of the NCpF influencing which symptom is rated as having greater importance. A couple studies have identified anchoring bias as a cognitive bias that influences clinical decisions. One such study explored this effect with undergraduate students (Richards & Wierzbicki, 1990). This looked at four types of mental health issues (alcohol abuse, antisocial behaviour, anxiety and depression) and found that initial judgements predicted the later judgements, demonstrating anchoring bias. Interestingly, they found that the effect was strongest for the antisocial behaviour and anxiety, showing that the level of anchoring bias is fluid and disorder dependent. Though it should be noted, this study was unable to isolate whether the outcome was influenced by some other form of internal bias towards the disorder, symptoms or the individuals therefore causation should not be implied.

Confirmation bias is the tendency to honour data that supports one's approach and dismiss that which calls it into question, often seen in patients with depression – the tendency to take any negative aspects and reject any positive aspects. This can also happen when one has a strong belief or feelings surrounding certain topics, people or places. Pines presents a paper outlining the risk of confirmation bias in emergency medicine (Pines, 2006) however this is a case study rather than a research paper, though rich in information for the one case, holds very low generalizability, ecological validity and prone to bias as there is no control. Mendel found that thirteen per cent of psychiatrists and 25% of students showed confirmation bias after making a preliminary diagnosis (Mendel et al., 2011). Further, they saw that participants who chose the wrong diagnosis prescribed different treatment options compared with participants choosing the correct one. They used a case vignette describing a 65-year-old male patient, which is unreliable as there may be inherent biases surrounding the patients' age or gender, thus not a reflection of confirmation bias, but reflect age or gender biases.

The sunk-cost effect occurs when one invests in something where they have already made a time, energy or monetary investment. If a specialist has spent several weeks providing a certain therapy to a patient, but the patient does not appear to be making any improvements, they may increase the number of sessions rather than change the therapeutic type or style, due to the resources invested into it. Sunk-cost effect is reported as a potential clinical bias (Magnavita, 2016), however the research reporting this effect is mixed. One study found that when investigating the influence of sunk-cost effect on commitment to medical treatment, there was a significant effect of invested effort and money but no effect of time (Coleman, 2010). This research used undergraduate students, rather than medical students specifically or medical professionals. Another research project explored medical students and found treatment decisions were not influenced by the investment of either time or money (Bornstein, Emler, & Chapman, 1999). In addition, they saw that the medical residents did demonstrate a sunk-cost effect in non-medical situations, which implies any learned techniques to avoid sunk-cost effect in the medical encounter was not generalised to external domains.

Two forms of bias that often co-occur are overconfidence bias and egocentrism. The tendency to overestimate one's ability is known as overconfidence bias while egocentrism is the tendency to rate oneself more favourably than an outside party would. Professionals and specialists, people high in their field, tend to overestimate their own ability and knowledge – there is a belief that they can do an action when they may not be able to. Egocentrism is based on how one perceives their ability compared to how an external person would rate their ability. One study compared diagnoses of 72 medical students' cases, 72 senior medical residents and 72 faculty developments (Friedman et al., 2005). They found that medical residents were overconfident in 41% of their cases, faculty were overconfident in 36% of cases, and medical students in 25%, demonstrating that experienced clinicians may be prone to overconfidence bias. This research involved working real cases and included clinicians, therefore holds relatively high ecological validity. Gaining feedback from patients or colleagues is one approach to reduce overconfidence bias and egocentrism (Magnavita, 2016).

In clinical decision-making, there may be a tendency to stick to the 'status quo'. This may be seen in prescribing, where there is a preference for an older medication or treatment that has been used before, potentially frequently, by the prescriber over a newer form of medication or treatment. One study used clinical vignettes to determine whether pulmonologists' decisions relating to commonly occurring clinical dilemmas such as the evaluation of pleuritic chest pain and the treatment decision (Aberegg, Haponik, & Terry, 2005). They found the participants were more likely to allow the preservation of the status quo in treatment. This study utilised clinical vignettes, but the participants were 125 pulmonologists, thus more likely to represent real decisions, though this representation is limited given the use of vignettes rather than patients. However, these findings could have far-reaching implications for patient outcomes and medical errors.

There is a lack of research that investigates the impact of patient factors on cognitive biases in mental health clinical decision-making. However, some reviews have explored bias in relation to wider clinical decision-making. One recent review aimed to understand the impact of bias of clinical practice, research and decision-making (Gopal, Chetty, O'Donnell, Gajria, & Blackadder-Weinstein, 2021). This systematic review highlighted research biases towards individuals who are obese, the gender disparity in myocardial infarction presentation and survival and the mortality differences between ethnic groups with pregnancy. Another was conducted by FitzGerald and Hurst and explored implicit biases in healthcare professionals (Fitzgerald & Hurst, 2017). Articles used a mix of implicit measures (such as the Implicit Association Test and subliminal priming) and between-subject designs (such as vignettes). Of the 42 articles identified, 35 found evidence of implicit bias in healthcare professionals. The majority of studies explored physical health, however some explored implicit bias towards mental ill-health. One of the studies found more negative attitudes as measured across clinicians towards psychiatric patients than to non-psychiatric patients (Chow, Kam, & Leung, 2007) though this study only had a response rate of 36.1% and all distributed in one hospital, which is subject to sample bias. Another found that medical residents who were assigned vignettes that included psychiatric illness labels reported being less at ease becoming the person's neighbour, colleague, housemate as well as having to examine them when they visit the emergency room (Neauport et al., 2012). This demonstrates the wide-stem stigma of a psychiatric diagnosis, however both this and the Chow et al.'s study uses clinical vignettes, which are clinical scenarios asking to make an educated decision about the future, however this does not necessarily mean that decision predicted would be the same as the decision made (Chow et al., 2007).

This demonstrates how such cognitive biases may lead to mistakes in treatment, disease identification, management plans, diagnostic decisions or referral decisions. This research seeks to further understand the impact that NCpF have in creating the potential for bias in clinical decisions in order to help prevent errors. Therefore, the next section will explore medical errors in greater detail to highlight how identifying the impact of NCpF on mental health clinical decisions can help minimise them.

2.4.2. Medical Error

> Once we realize that imperfect understanding is the human condition, there is no shame in being wrong, only in failing to correct our mistakes. (George Soros, 1995, p.3)

Definitions of medical error have changed over time; a reflection of the approaches valued in medicine at those points in time, or development of health insurance, as well as research in medical management (Grober & Bohnen, 2005; Kapp, 1997; Leape et al., 1998; Makary & Daniel, 2016). However, after reviewing the literature, Grober and Bohnen (2005, pg. 42) put forward a definition that attempts to combine all factors of medical error; 'an act of omission or commission in planning or execution that contributes or could contribute to an unintended result'.

Medical errors can be costly to the healthcare system and the individual (Towse & Danzon, 1999). The exact amount of financial burden may fall between $1 billion (Johnson et al., 1992), to $5 billion (Bates et al., 1997; Classen, Pestotnik, Evans, Lloyd, & Burke, 1997), or as much as $17 billion (Thomas, Studdert, Newhouse, & Zbar, 1999; Van Den Bos et al., 2011). This cost includes alternate treatment solutions to correct the adverse event caused by the error, funds provided by insurances for medical companies as a result of legal action, and the elongation or initiation of hospitalisation (Grober & Bohnen, 2005). Determining the instances of harm due to medical error is difficult due to the subjectivity often found in medical healthcare, the balance between pressures from the organisation, hospital space, and waiting list availability.

Medical error is thought to be the third most common cause of death in the United States of America (USA; Makary & Daniel, 2016). Though, there is debate surrounding the number of adverse events resulting from medical error (Hayward & Hofer, 2001; McDonald, Weiner, & Hui, 2008). Leape claimed that approximately 100,000 people in the USA die of preventable medical errors each year (Leape, 1994). Kohn et al. suggests this number falls between 44,000 and 98,000 (Kohn, Corrigan, & Donaldson, 1999). A South Australian study (Wilson et al., 1995) examined 14,179 admission records to 28 hospitals, of which approximately 16% were associated with an adverse event, 8% of which judged to have a high preventability. The adverse event caused minimal disability in 47% of people, 14% lead to permanent disability and approximately 5% resulted in death. The Agency for Healthcare Quality and Research Patient Safety Indicators in the Medicare Population estimated that between 2000 and 2002, 575,000 deaths were caused by some form of medical error; approximately 195,000 a year (HealthGrades, 2004), further patients reported approximately 980,000 incidents and near misses a year, which are estimated to cost £2 billion annually (Coombes, 2005). These estimates vary dramatically due to the difficulty in examining medical error. There are several reasons that justify such discrepancies: poor recording, different consequences, different sources of error and different types of error.

2.4.2.1. Poor Recording

There are few systematic ways to register errors unless there is a negative impact on a patient or organisational outcome. Even in those cases, data from errors may not fully integrate (such as data from hospital records or psychiatrist notes to GP records) in a way that is easily accessible to research.

One study examined the patient records of adverse events in 21 hospitals (Zegers et al., 2011). They found the absence of record components was associated with lower rates of adverse events. From this they conclude that missing record components lead to an underassessment of adverse events, while poor quality of the information in patient records was associated with higher rates of adverse events, implying that the quality of the patient information is a predictor of the quality of care.

Accurate clinical records are essential for care. It is necessary for continuity of care and to ensure a level of communication between the various professionals involved in ones' care (Mathioudakis, Rousalova, Gagnat, Saad, & Hardavella, 2016). These records are also important to research, and inaccurate or inconsistent records may lead to such discrepancies in adverse events occurrence estimates.

2.4.2.2. Different Consequences: Near Misses

The WHO does not distinguish near-misses from other events where there was no harm (Cooper et al., 2018). However, near misses have been described in the literature as adverse situations that have the potential to cause a negative consequence on patient outcomes but are prevented due to swift identification and mitigation, patient resilience, or good fortune (Kohn et al., 1999; Reason, 1995).

One research team conducted a feasibility study attempting to integrate a near-miss reporting system in primary care (Crane et al., 2015). They implemented the system into seven practices, 632 near-miss events in nine months were detected. The most frequent events reported were breakdown in office processes (47%) such as filing errors, with electronic medical errors being the primary cause of error in 8% of these cases and secondary cause in 14%. The system required staff to anonymously report the near-miss events which is reliant on members of staff reporting the events and doing so accurately, therefore it is likely that underreporting occurred. Given an event was recorded anonymously, it is possible that one event was reported more than once if it was witnessed by different individuals. Further, an awareness of the potential for harm is required therefore some near-miss events may go undetected.

Though there is the potential for recording near-misses in healthcare, there is already enough pressure in the patient-practitioner interaction that it is difficult to justify implementing on a nationwide level. When errors are measured or recorded based on their impact on patient outcomes, some errors may be identified but some will be missed. Therefore, recording of such errors is unlikely and it would be unlikely that any reporting would be done with complete accuracy. Moreover, even if this was implemented in a way that was standardised, there may be challenges analysing the data for research purposes.

2.4.2.3. Different sources of error

The dramatic differences in estimates between examining medical error may be due to the source of the error, specifically cognitive or system related. System errors include organisational flaws, technical failure and equipment problems (Graber, Franklin, & Gordon, 2005), while cognitive errors stem from innate practitioner biases. According to Wilson et al., cognitive errors were more likely to have been preventable and result in permanent disability than technical errors (Weingart, Wilson, Gibberd, & Harrison, 2000; Wilson et al., 1995).

Graber and colleagues report that diagnostic errors may be cognitively or system based, as a diagnosis relies upon the clinician's knowledge, clinical acumen and problem-solving skills (Graber et al., 2005). Diagnostic errors resulting from cognition are difficult to detect retrospectively. According to Graber et al. (2005), 46% (out of 100 cases) of diagnostic error occur as a result of a combination of cognitive and system-related factors, cases solely involving cognitive factors or system-related factors are less common, with 28% and 19% respectively. This resulted in 65% of the cases having at least one form of error.

Through medical record reviews, one study identified that in 190 cases of diagnostic error at two sites, 68 unique diagnoses were missed. Most diagnoses missed were common conditions in primary care with pneumonia (7%), decompensated congestive heart failure (6%), acute renal failure (5%), cancer (primary) (5%), and urinary tract infection or pyelonephritis (5%). The patient-practitioner clinical encounter appeared to be the most common moment for a process breakdown (78.9%), leading to the missed diagnosis. The process breakdown was primarily related to problems with history-taking (56%), examination (47%) and/or ordering diagnostic tests for further workup (57%) (Singh et al., 2013).

Cognitive errors may arise from uncertainty surrounding the diagnosis (Rost, Smith, Matthews, & Guise, 1994), biases, health insurance considerations (particularly in some areas of the world such as the USA), or as a result of non-clinical factors such as patient or practitioner factors (Pérez-Stable, Miranda, Muñoz, & Ying, 1990; Rost et al., 1994; Suite, La Bril, Primm, & Harrison-Ross, 2007).

Though medical errors can be costly, this is not a reflection of the individual practitioners themselves, but a reflection of the healthcare system or organisations in which the errors are made (Reason, 1990). Errors in healthcare typically occur from a combination of contributing factors and individuals, therefore if errors occur, they should be perceived as an opportunity for education and constructive changes in the delivery of health care and the system itself (Grober & Bohnen, 2005). Given the increased temporal and monetary pressures placed on the National Health Service (NHS) in the UK (Graber, 2013), if medical errors are a contributing cause to such pressures, finding a way to decrease these errors are worthwhile on both an individual and national level.

The discrepancy in the occurrence of adverse events and errors may be due to not all errors being equal, and not all will result in a negative outcome for the patient, James Reason presented a "Swiss Cheese" model of defences, which describes the layers of defence that complex work environments, such as healthcare organisations, have in place to protect against adverse consequences of error (Reason, 1997). When such organisations create the layers of defence, it is believed these protections cannot be penetrated, though in reality each layer has gaps that may lead to, in this context, an adverse event. Figure 2.3 demonstrates pictorially the "ideal" versus the "reality" of these defensive layers at the start of a system's or organisation's conception. The gaps in defences may be caused by latent or active failures. As it would be improbable to know every possible scenario that may lead to an adverse outcome at the start of a system's life, there will be unknown gaps since conception, or gaps that are developed throughout its lifespan. These are latent failures. Active failures are created through deliberate disabling of certain defences to achieve local operational objectives, or mistakes (Figure 2.4).

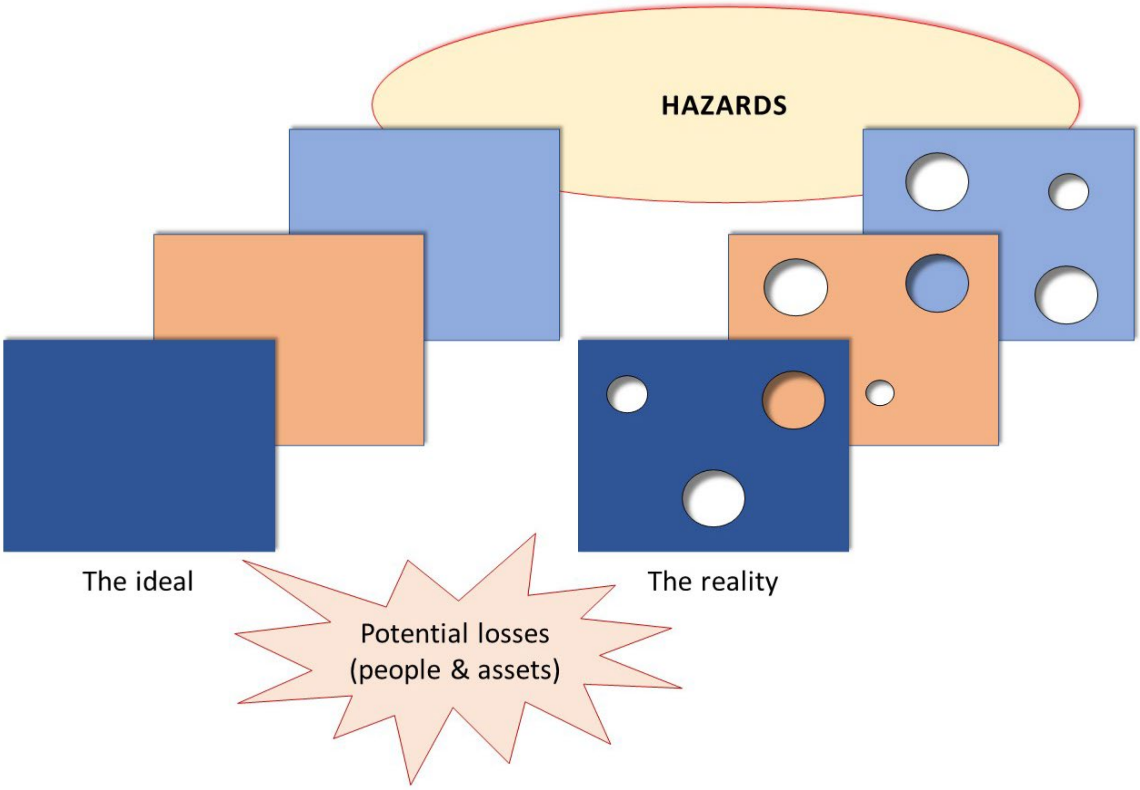

Figure 2.3: The "Swiss Cheese" model of defences by Reason (1997)

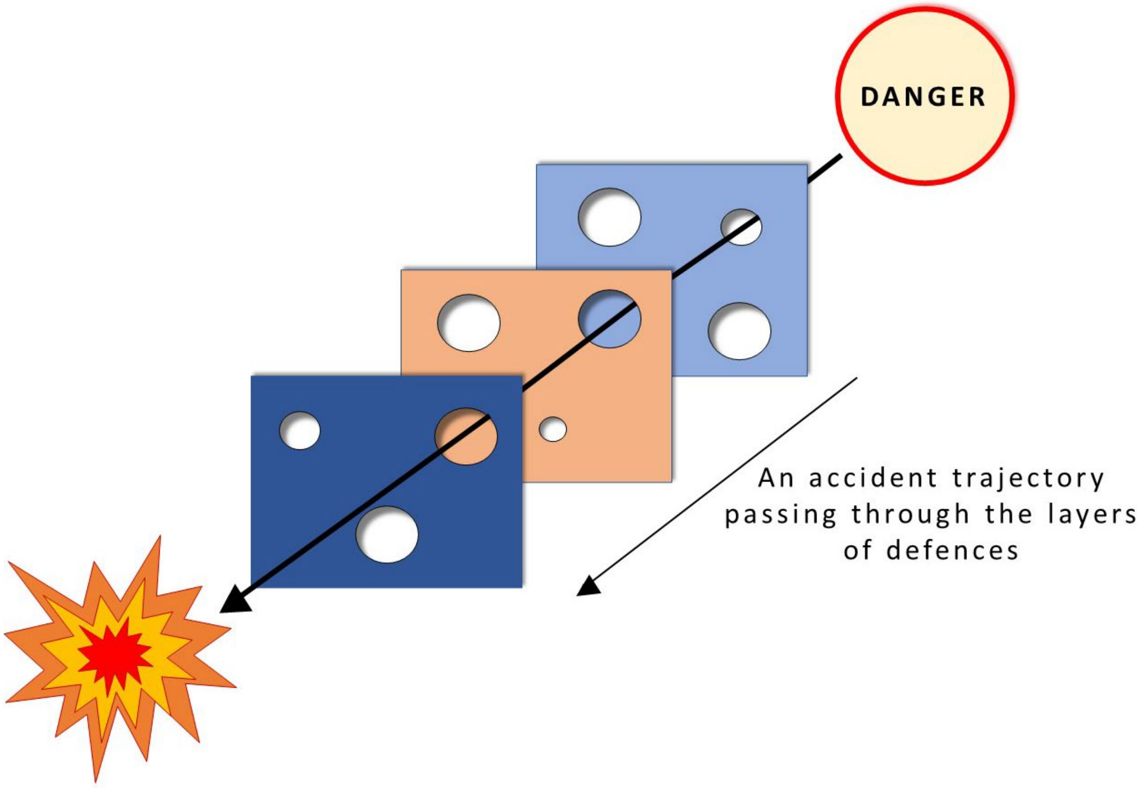

Figure 2.4: Reason's (1997) accident trajectory passing through the gaps in the layers of defences

2.4.2.4. Medical Errors

Errors can occur at different stages of the clinical cycle. For the purposes of this thesis, we focused on the errors that happen at the treatment, referral and diagnostic stages.

2.4.2.4.1. Diagnostic Errors

Diagnostic errors in mental health are not well explored. Some research pertains to diagnostic errors in specific scenarios such as correctional facilities (Martin, Hynes, Hatcher, & Colman, 2016), evaluating mental health screening tools (Leon, Portera, & Olfson, 1999), and deliberate misdiagnosis (Braun & Cox, 2005; Kirk & Kutchins, 1988).

Misdiagnoses take place in approximately 11% of hospital admissions (Graber, 2013). A systematic review to identify the common characteristics of diseases that GPs may misdiagnose found studies exploring misdiagnosis investigated malignancies, myocardial infarctions, meningitis, dementia, anaemia (iron deficiency), asthma, tremors in the elderly, and HIV (Kostopoulou, Delaney, & Munro, 2008). There was no exploration of diagnostic errors in mental health; this may be a result of the search strategy, type of articles included, or a lack of research in this area.

Leiros and colleagues sought to estimate the level of agreement between the clinical diagnosis of a patient and their post-mortem diagnosis of dementia (Leiros et al., 2018). They included 114 cases, at clinical level prevalence was 39% for Alzheimer disease compared to 22% at the autopsy level, while mixed dementia saw 18% prevalence at clinical level compared to 34% at autopsy level. Though they report that none of the drug treatments given to the patient would have a significant impact on the course of the disease, the correct therapeutic management can help slow the progression of dementia.

One study examined physician recognition of depression compared to Diagnostic Interview Schedule identification in 265 medical outpatients. The Diagnostic Interview Schedule identified depression in 70 patients, while physicians accurately recognised 25 of the 70 patients. Physicians recognised an additional 35 patients, who were not 'depressed' according to the Diagnostic Interview Schedule. They found that patients misdiagnosed as presenting with depression were older, less educated, had more outpatient visits and held more prescriptions (Pérez-Stable et al., 1990).

Ruggero et al.'s (2010) research group compared a group of people with misdiagnosed bipolar disorder and those who were not misdiagnosed (i.e., diagnosed with borderline personality disorder). They found no differences in demographics between those who were misdiagnosed and those who were not (Ruggero, Zimmerman, Chelminski, & Young, 2010). Interestingly, the greater the number of borderline personality disorder criteria the patient met, the greater the likelihood of reporting a previous misdiagnosis of bipolar disorder.

Some studies identified found differences across patients who had missed diagnoses or misdiagnoses, delayed referrals, or errors in treatment (Pérez-Stable et al., 1990; Ruggero et al., 2010). The factors that influence treatment decisions are discussed in greater depth next.

2.4.2.4.2. Treatment Errors

Treatment or therapeutic errors, specifically adverse drug events, have been investigated extensively due to their prevalence and preventability (Weingart et al., 2000). They are supposedly the most common avoidable error (Leape et al., 1995) which occur due to slips, attention lapses, or lack of knowledge (Dean et al., 2002b; Dean, Schachter, Vincent, & Barber, 2002a). The decision for a patient to move from an inpatient to an outpatient setting may be referred to as discontinuity of care (Moore, Wisnivesky, Williams, & McGinn, 2003). Deciding to move a patient from inpatient to outpatient care at the 'wrong' time may also lead to adverse outcomes and medical errors.

In a study conducted by Leape, 57% of the 257 adverse drug events were significant, 30% serious, 12% classed as life-threatening, and 1% were fatal (Leape et al., 1995). Of the events identified as fatal or life-threatening, 42% were deemed preventable. According to the Medical Practice Study, 4% of patients hospitalised in New York suffered an adverse drug event. The same study found that 19% of medical injuries were related to adverse drug events (Brennan et al., 1991). Another found of the 277 operations observed, 124 (45%) included at least one medication error and/or adverse drug event. A total of 193 events were detected and from these, 153 (79%) were deemed preventable (Nanji, Patel, Shaikh, Seger, & Bates, 2016). Lisby and colleagues investigated the frequency, type and consequences of medication errors in various stages of the medication process, of a total of 2467 opportunities for error, they found 1,065 errors (43%) (Lisby, Nielsen, & Mainz, 2005).

A systematic review explored medication errors in mental health care (Maidment & Lelliott, 2006). They found most errors reported in the studies identified relate to clerical aspects of prescribing or administration, with only four studies relating to errors in judgement. These four studies quantified the number of errors identified by pharmacists, primarily in an inpatient setting. These studies did not seek to explore why these errors occurred.

2.4.2.4.3. Referral Errors

To refer a patient is a decision made by a medical practitioner to pass the patient along to another medical professional, typically because they feel unable to manage a patient's care without specialist input (Foot, Naylor, & Imison, 2010). Referrals may be made to establish the diagnosis, for treatment, for advice on disease management, to hand-over management, for a second opinion or to reassure the patient (Coulter, Noone, & Goldacre, 1989).

Errors in referral can include making an unnecessary referral, deciding not to refer, delays or referrals that take too long, inappropriate destination, even administrative errors such as in referral letters (Foot et al., 2010). For example, GPs believe denying an x-ray to patients with back-pain would adversely affect the doctor-patient relationship (Baker, Lecouturier, & Bond, 2006). Though in itself this may not be an error, a tarnished doctor-patient relationship can impact adherence to medication, which can have adverse effects on the patient.

There is evidence linking delays in referral to poor patient outcomes. Literature exploring delays in referral looks at breast cancer (Richards, Westcombe, Love, Littlejohns, & Ramirez, 1999) and chronic renal failure (Levin, 2000; Roderick, 2002). Richards et al. conducted a systematic review exploring the influence of referral delay on survival in patients with breast cancer (Richards et al., 1999). They found that delays of three to six months are associated with lower survival rates. Renal failure studies found the consequences of late referral include increased morbidity, mortality and resource utilization, and in some circumstances, late referral can limit therapeutic options, which have consequences on long-term outcomes (Levin, 2000).

Roderick et al. reported that patients who were referred later were older and had more co-morbidity, were less likely to receive standard treatments, and had longer hospital stays (Roderick, 2002). In a study exploring the clinical management of patients in primary care following self-harm it was found that only a small percentage of the patients were referred to mental health services (Carr et al., 2016). Further, those from more deprived areas had a reduced likelihood of being reported.

2.2.3. Factors Influencing Decision-Making

Given the multidimensional, complex nature of clinical decision-making, factors influencing it may arise from multiple sources, resulting in differing effects for different individuals. Three factors that will be focused on here are environmental, practitioner, and patient factors. These factors are also called ‘non-clinical factors’, as they are aspects unrelated to clinical criteria that influence diagnostic, referral and treatment decisions, relating to either the physician, practice, patient or a combination of the three. The influence of non-clinical factors may lead to medical errors, thus if it is possible to prevent, at least in part, these factors from influencing clinical decisions, errors may be less likely (Pérez-Stable et al., 1990; Suite et al., 2007).

2.2.3.1. Practitioner Factors

Practitioner factors that may impact clinical decisions include the physician’s approach to patient management (Mojtabai et al., 2011), physician demographics (Berner et al., 2007; Newton, Hayes, & Hutchinson, 1991; Prosser & Walley, 2003), and level of interaction with the community (Hajjaj, Salek, Basra, & Finlay, 2010; Mojtabai et al., 2011; Prosser & Walley, 2003). The majority of research into CDM explores the influence of physician characteristics.

One qualitative study explored GP’s decisions to prescribe antidepressants (Hyde, Calnan, et al., 2005). Their sample included 27 GPs from a mix of urban and rural areas.

The average age of participants was 44 years, with an average of 14 years of experience in general practice. Results showed that clinical decisions were primarily driven by clinical criteria. However, the GP's beliefs about depression influenced this decision. Some GPs preferred the 'wait and see' strategy and tried to identify any adverse life events that brought on the depressive symptoms, while the primary concerns of others were the symptoms presented. It was also found that some GPs are comfortable prescribing medication without a diagnosis, or sometimes diagnostic labels are placed on records for administration purposes but not used during consultation. This study held five focus groups, which though rich in individual's perspectives, may be subject to bias given the ability for the group dynamics to sway belief and opinion. Though the sample used a mix of urban and rural GPs, there is limited generalizability based on the opinions of 27 GPs.

Another qualitative study interviewed 73 family practitioner doctors and focused on prescribing decisions, mainly around those that cause the doctor discomfort. Responses included decisions to prescribe having been influenced by fear of criticism from peers, and the time of day or day of the week (Bradley, 1992). This research interviewed 69 medical practitioners, who were recruited by letters inviting them to take part. However, there may be an element of response bias in this study, whereby people with strong opinions on the topic or high levels of engagement in research. Another study (Weiss, Fitzpatrick, Scott, & Goldacre, 1996) also identified that practitioners may prescribe differently depending on workload and timings, one GP was quoted:

> Much prescribing is pragmatic. One functions much better when one is fresh and alert. After a long Monday following a weekend on-call I am not at my best and may well 'overprescribe'. (Weiss et al., 1996, p.g.434)

It was also noted that respondents used prescriptions to cope with work pressures in general practice, though 65% of those said they felt guilty when prescribing for a non-pharmacological reason. Other studies have suggested GPs are aware of the 'quick fix' prescription but are unable to modify this due to high demand, lack of time, and raised patient expectation (Bandyopadhyay & Boothby, 1994; Gilley, 1994).

One study examined patient and practitioner influences on detection and referral of 'problem drinkers' (Berner et al., 2007). Fifty-six GPs were included, who recorded

3,003 patients over 3 months. It was found that less than half the patients with problem drinking were identified by their GP. Female GPs were better at detecting problematic alcohol consumption in male patients than their male colleagues, while older GPs had greater success at identifying alcohol problems than their younger colleagues.

Bailey, King and Newton (1994) analysed whether GPs who hold high referral rates differed in their referral decisions to those who have low referral rates. Both clinical and non-clinical factors influenced the differences. Such non-clinical factors included a higher degree of clinical certainty for high referrers than low. Non-clinical background factors (such as workload, psychosocial background, GP characteristics, financial/legal considerations) were a greater influence for low referrers to not refer than high referrers. It was also found that high referrers during the interview justified their referral decisions more than low referrers (Bailey, King, & Newton, 1994).

Research exploring factors associated with clinical decision-making primarily examines clinician's characteristics and their influence on management, referral, diagnostics and treatment (Eisenberg, 1979; Elstein, 2009; Rikers & Verkoeijen, 2007), less is known about the influence of practice and patient factors.

2.2.3.2. Environmental Factors

Bandura (1989) in a classic study of the influence of the environment on human behaviour explored the interaction between context and decision-making. Bandura suggested that cognition, environment, and behaviour are all interacting determinants of each other (Bandura, 1989). Specifically in healthcare, decisions made can be influenced by organisational policy, workplace or group norms. New medical practitioners may fall to expertise of co-workers, due to practical limitations, to avoid social rejection, or to use other people's decision-making to avoid the responsibility of their own decisions, especially in the face of uncertainty.

One qualitative study examined the non-clinical factors that influence GPs and consultants' management of lower back pain (Fullen, Doody, David Baxter, Daly, & Hurley, 2008). Two main themes emerged: patient related factors and policy factors. All GPs and the majority of consultants believed the Irish Health Service had a negative impact on the management of lower back pain. It was suggested that the lack of available beds and access to secondary services, as well as long waiting lists, resulted in less out-patient management. Other non-clinical environmental factors may relate to the clinical practice, such as practice type (Franks & Bertakis, 2003), size (Murray, 2000) and location (Forrest, Nutting, von Schrader, Rohde, & Starfield, 2006).

Weiss, Fitzpatrick, Scott and Goldacre (1996) created a questionnaire that was coproduced with GPs to determine the factors that influence GPs prescribing decisions. Two hundred and twenty-eight questionnaires were completed by GPs, who identified a high level of concern regarding various pressures that affect prescribing decisions. Those respondents who were concerned about adverse effects of financial pressures prescribed less generically, issued more practice prescriptions, and had higher costs than those in Family Health Service Authorities (Weiss et al., 1996). Notably, the researchers did not explore GPs ethnicity; the age, gender and years practicing had a good spread, but being unable to determine the ethnicity and the exact number of practices that were contacted suggests the GPs may not be entirely representative.

Other aspects such as workloads, interruptions, organisational policies and procedures, available resources as well as the healthcare system itself (Eisenberg, 1979); size of practice, geographic location, and practice type may all influence clinical decision-making (Hajjaj et al., 2010). For example, in Chile there appeared to be a higher rate of Caesarean sections among pregnant women in the private sector than public sector (Murray, 2000). This was due to pressure on hospitals, employees and medical practitioners, to take into account cost when considering patient care. Resource constraints may result in premature discharge of patients which can be associated with increased rate of mortality (Lin, Chaboyer, & Wallis, 2009).

2.2.3.3. Patient Factors

Research within the field of clinical reasoning and decision-making has primarily focused on understanding how expert and novice clinicians solve clinical cases with some attention on how patient characteristics may impact this process (Elstein, 2009; Rikers & Verkoeijen, 2007). Past research exploring the impact of non-clinical patient factors (NCpF) (Eisenberg, 1979) identifies the patients'; socioeconomic status (Duncan, Best, & Hagen, 2008; Lorion, 1973), demographics (Mojtabai et al., 2011), academic background (Leng et al., 2017), patient attitudes and preferences (Hajjaj et al., 2010;

Petursson, 2005), even medical history (Berner et al., 2007; Kaner, Heather, Brodie, Lock, & Mcavoy, 2001; Pérez-Stable et al., 1990).

Specific NCpF shown to influence diagnostic, referral, treatment, and management decisions are patient demographics, medical history, socioeconomic status, and patient educational level, as well as attitudes and preferences. Demographic characteristics include age (Adams et al., 2006; Berner et al., 2007; Pérez-Stable et al., 1990; Watts et al., 2002), sex (Berner et al., 2007; Raine et al., 2000), and ethnicity (Kaner et al., 2001). One hundred and twenty-eight practice nurses were requested to provide a brief intervention on all risk drinkers (Lock & Kaner, 2004). They found out of 1,500 'risk' drinkers only 62% received the brief intervention, the factor that influenced treatment was sex. Though the study methods were sound, 99% of the nurses who responded were female and primarily worked in group practices, thus response bias may be high and results only extrapolated to similar environments.

Socioeconomic cues include owning a property (Kaner et al., 2001) and unemployment (Raine et al., 2000). Another study examined which factors were associated with the likelihood of a GP providing mental health care (Kaner et al., 2001). A number of factors displayed varying levels of influence on the GP's likelihood of providing care, those with the most influence were ethnic group, owning a property, and previous symptoms. Life events showed an influence on intervention but only in combination with low health scores.

Medical history-related factors are good health (Berner et al., 2007), high utilisers (Pérez-Stable et al., 1990), previous symptoms (Kaner et al., 2001), and high number of prescriptions (Pérez-Stable et al., 1990). The study from Berner et al. (2007) examined patient and practitioner influences on detection and referral of 'problem drinkers.' Female patients were more likely to be overlooked, as were younger people and people with good health status. Whereas, male patients, people who were classed as 'high utilizers' of the general practice, and those with severe drinking problems are more subject to detection.

Patient's educational levels, such as those who have received technical training, are a current student (Raine et al., 2000), or have lower educational level (Pérez-Stable et al., 1990), have been associated with NCpF that influence medical decisions. One study examined misdiagnosis of depression, showing that patients who were misdiagnosed as having depressive disorder were less educated, older, held more prescriptions and a greater number of outpatient visits (Pérez-Stable et al., 1990). One study identified only 50% of people classed as a 'risk' drinker received a brief alcohol intervention, despite the request to provide the intervention to all risk drinkers (Raine et al., 2000). Some of the factors associated with receiving the intervention were gender (male), unemployment and having technical training. Factors associated with not receiving intervention were gender (female), being university educated, and being a student.

Patient attitudes and preferences include upbeat personality (Escher, Perneger, & Chevrolet, 2004), 'difficult' personality types (Steinmetz & Tabenkin, 2001), as well as general preferences towards treatment (Hajjaj et al., 2010; Petursson, 2005). Patients perceived as having 'difficult personalities' are more often referred to different medical consultants and specialists (Steinmetz & Tabenkin, 2001). The difficult personalities in this research identified were aggressive, rude, manipulative, violent, exploitive of the doctor, and demanding. Often, it is patients with mental ill-health who are perceived as difficult (Hahn, 2001; Jackson & Kroenke, 1999; Schafer & Nowlis, 1998; Steinmetz & Tabenkin, 2001).

Though the research identified here has explored the impact of NCpF, the majority of research within CDM examines how NCpF impact treatment and management options (Lorion, 1973; Patel et al., 2007; Snowden, 2001; Wells et al., 2001). Research pertaining to how NCpF influence mental health decisions is limited and that which exists occurs around problem drinkers or mental health as a comorbidity. Moreover, most research involves qualitative or survey research methods. The research to date primarily explores physical health, and that which explores mental health in clinical decision-making has been discussed here. As mental health impacts approximately one in four people (WHO, 2000), more research focusing on this aspect of health is required.

2.2.4. Mental Health

'Mental health' refers to a level of psychological wellbeing that, like physical health, can vary between being at a 'good' level to 'poor'. There is a rise in the number of people identified as having mental ill-health, though it is unclear whether this is due to modern societal influences or increased recognition. The annual population prevalence of mental ill-health is one in four people, while the lifetime prevalence of mental ill-health increases to approximately 40% (WHO, 2000). These statistics emphasise the fluidity of mental health, as people may have relapsing or remitting conditions, have isolated episodes, or regain mental stability. Therefore, it is necessary to meet mental healthcare needs, from finite resources, requiring effective, equitable and targeted delivery of services.

Over the last 25 years, there has been an increase in the presence of mental health within the GP consultations. Mental health accounted for approximately one-fifth (20%) of consultations (Craig & Boardman, 1997; Shepherd, Cooper, Brown, & Kalton, 1966), but the national charity, Mind, conducted a recent survey of over 1,000 GPs, which showed that GP's reported two in five (40%) of their appointments now involve mental health (Mind, 2018).

The topic of 'mental health' is a broad research category and can span from understanding the specific mental disorders, to general well-being, to treatment techniques or causes. Given the plethora of research on physical health, this research hopes to explore clinical decision-making within the field of mental health, to understand how NCpF impact diagnostic, treatment and referral decisions. Mental health conditions can be split into either Common Mental Disorders (CMDs) or Serious Mental Illnesses (SMIs).

CMDs are a group of mental health conditions comprising depression, anxiety, panic disorders, somatisation, and syndromes with combination of these symptoms. While SMIs include bipolar and related disorders, psychosis, schizophrenia spectrum and other psychotic disorders, dissociative disorders, and personality disorders.

CMDs are often comorbid to other mental or physical health conditions. For example, Ho and colleagues examined patients with rheumatoid arthritis who suffered from anxiety, depression or both. They found that the income of the patient is associated with depression, though no factors were associated with anxiety following adjustment for confounding variables (Ho, Fu, Chua, Cheak, & Mak, 2011).

An international Primary Care study (Simon, Goldberg, Tiemens, & Ustun, 1999) examined over 900 patients aged 65 or under with depression across 15 countries to understand the outcomes for people with recognised and unrecognised depression.

Patients who presented more symptoms at baseline, were more likely to be recognised and diagnosed. They saw greater significance in clinical improvement over a three-month period, however no relationship was observed at the 12-month outcome. This may be due to the study recognising patients with symptoms with greater severity, therefore more likely to remain depressed than those who were unrecognised. Around half of patients who were classed as unrecognised at baseline had an element of recognition, such as a prescribed antidepressant or a mental health visit over the subsequent three months.

One study (Hong et al., 2014), explored patient characteristics associated with treatment initiation among paediatric patients with attention-deficit/hyperactivity disorder (ADHD) symptoms. This was a one-year prospective observational study of 1,068 newly diagnosed patients with ADHD across Central Europe and East Asia. They found that in East Asia, people who were older, male, and had a higher Clinical Global Impression ADHD Severity score were more likely to have treatment. In Central Europe, parental psychological distress, higher Child-Symptom Inventory-4 scores and no involvement in bullying, were associated with treatment initiation. This is similar to the focus of this thesis; however, the study here only looks at children and adolescents, is across central Europe and East Asia, and specifically observes ADHD, rather than other CMDs.

The prevalence of CMDs demonstrates large inequalities in health, such as income inequality (Mangalore, Knapp, & Jenkins, 2007; Weich, Lewis, & Jenkins, 2001), lowering material standard of living (Lorant, Weich, Deliège, Machenbach, & Ansseau, 2007), and higher amounts of debt (Jenkins et al., 2008). There are gender inequalities within mental health (Afifi, 2007; Simon & Barrett, 2010) as well as race and ethnicity related inequality (Evans-Campbell, Lincoln, & Takeuchi, 2007; Kilgus, Pumariega, & Cuffe, 1995). These social markers interact in a multiplicative way within mental health, making it difficult to identify causality (Williams, Yu, Jackson, & Anderson, 1997). There is under-recognition of mental health problems for people over 65 at the primary care level (Watts et al., 2002).

People with mental ill-health have an increased risk of mortality, varying dependent on the condition (Chesney, Goodwin, & Fazel, 2014; Lawrence & Kisely, 2010; Newman &

Bland, 1991; Thornicroft, 2011). Chesney, Goodwin and Fazel (2014) in their meta-review found that substance use disorders and anorexia nervosa had mortality risks larger than heavy smoking, which translate into a reduction in life expectancy of 10-20 years. Approximately 14% of deaths worldwide are attributable to mental disorders, which equates to around eight million deaths per year (Walker, McGee, & Druss, 2015). Many deaths linked with mental health disorders are unrelated to suicide but associated with physical health problems. Unmet healthcare needs can exacerbate these vulnerable populations, leading to patients experiencing worsening symptoms or suffering longer before reaching services, meaning patients develop more entrenched complex problems and have greater risk of future serious outcomes, such as attempted suicide, hospitalization and work disability (Kessler et al., 2001, 2003). Therefore, it is important for the most appropriate clinical decision to be made for these patients to inhibit the advancement of this cycle.

Decisions around who should receive treatment for CMD are influenced by higher symptom severity and gender, specifically men (Hyde, Evans, et al., 2005); those who are widowed, separated or are divorced; and income (Starkes, Poulin, & Kisely, 2005). Even those who are suffering from high levels of symptoms may not seek help from professionals (Bebbington et al., 2000), though exact levels vary between disorders. The gender difference in treatment decisions may occur as a result from women being 70% more likely than men to contact their doctor with a mental health problem, even when controlling for severity of illness (Bebbington et al., 2000). A study by Tiemens et al. explored the recognition and outcomes of various mental health disorders (Tiemens, Ormel, & Simon, 1996). They followed 11 GPs over two years and saw the greater the initial severity of psychopathy, the greater the likelihood of recognition. It was noted that the recognition rate was better for anxiety than for depression. Though, the outcomes for people whose symptoms were recognised and those who were not did not show significance.

The majority of research on the influence of mental health clinical decisions explores treatment and management options, focuses on individual CMDs such as problem drinkers, or mental health as comorbidity. However, understanding mental health diagnostic, treatment and referral decisions is important given the vast number of people that have mental ill-health. Mental health clinical decision-making is important to study given the great level of uncertainty as symptoms are often unspecific and do not have the benefit of unbiased diagnostic test data. There are a vast number of mental health conditions, with different treatments that would be appropriate in a variety of circumstances. As this research seeks to understand the influence of NCpF on clinical decision-making in mental health, it needs to be undertaken with a large scope of mental health, to determine where decisions may vary.

Diagnosing, treating, and referring mental ill-health is potentially susceptible to bias as they are reliant on good patient-practitioner interaction; the patient to accurately voice their symptoms in a clear, objective manner without fear of stigma and the practitioner to ask the correct questions and be receptive to the patients' answers from an unbiased perspective. However, as demonstrated in this section, being human is being prone to bias therefore makes this more challenging and prone to error, therefore determining the impact of NCpF may minimise the magnitude of the error. Most research within clinical decision-making and mental health utilises either qualitative or experimental research designs with relatively small sample sizes. Given the movement towards utilising health care data for research, there is an opportunity for a novel research study, which examines mental health care and clinical decision-making, utilising a combination of social sciences and health sciences research designs.

2.5. Administrative and Health data

Administrative and health data for research has become more prominent in the 21st century due to the technological developments. Though administrative and health data research does not hold a significant presence in the clinical decision-making field, what has been explored is discussed in this section. The potential for studying clinical decision-making overall and within the mental health context using administrative data is also identified, as well as the challenges with and considerations for this method of research.

2.5.1. Data Science

Data science is a multidisciplinary blend of data inference, algorithm development and statistical modelling, as well as technological advances to solve analytically complex problems. Data science typically uses secondary data, be it in health, business, education or other areas, to gain knowledge. This project was based upon accessing population-level survey data and linking the desired respondents to their own health data, in order to better understand mental health related clinical decisions. Using data science for clinical decision-making research is novel, though given the vast potential for data science, and the swift increase in its use over recent years, it could provide a good opportunity to explore aspects of decision-making in a way not yet achieved, through a correlational (observational) research design.

In the UK, every 36 hours the NHS provides aid to approximately one million people (Crisp, 2005). If recorded on a nationwide scale, this could result in incredibly large amounts of rich data. The advancement of modern technology makes it possible to store, manage and analyse this primary health data, then further analyse for secondary research (Chen, Mao, & Liu, 2014; Schneeweiss, 2014).

2.5.2. The SAIL Databank

The Secure Anonymised Information Linkage Databank (SAIL) is a UK-based databank that holds billions of anonymised person-based records that can be sourced, accessed, linked and analysed (Austin et al., 2017; Ford et al., 2009; Lyons et al., 2009a). SAIL holds two types of data: administrative and health records. Administrative data are collected by local or national government departments and agencies. They routinely gather information that was originally collected for information, record keeping, carrying out transactions, or to deliver a service. Such data includes that from the Electoral Register, National Pupil Database, Welsh Demographics Service, or nation-wide surveys (such as the Welsh Health Survey, Skills and Employment Survey, National Survey for Wales).

Health records are the information relating to the care of a patient. These records can be GP records, emergency department, hospital inpatient, outpatient, referrals, or death and birth data among others. Though these data are collected without the intention of being used for research, they are often useful resource for research, so long as the research itself abides by the ethical agreements surrounding its use.

All records (health or administrative) are anonymised using the split-file process. This means, the data provider (for example, the Office of National Statistics, Welsh Government or NHS) splits each dataset into two components: identifiable information (name, date of birth, gender, address and NHS number) and content (such as medication, diagnoses, referral information). Both components are provided with a join-key that on its own holds no meaning but can be used to later join the anonymised fields to the content information.

The identifiable information is sent to the NHS Wales Informatics Service (NWIS), where information is validated and records anonymised then, using the NHS number, assigned a unique, non-identifiable encrypted code (called an Anonymous Linking Field, or ALF). Other identifiable information is transformed to become less identifiable, meaning date of birth becomes week of birth; address becomes lower super-output area (LSOA; see figure 2.5.). This anonymised information is then sent back to SAIL.

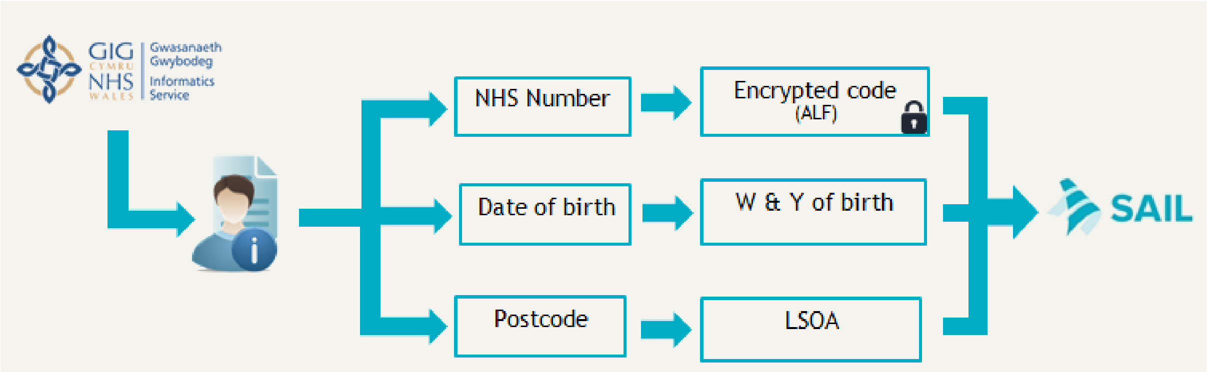

Figure 2.5: NWIS Data Anonymisation Process

The content component is sent directly to SAIL. When the anonymised fields are created, the join-key (ALF) is used to link to the two components back together (see figure 2.6). The ALF is then re-encrypted to ensure neither SAIL nor NWIS can decrypt the data to patient identifiers. This de-identified data can then be used for research (subject to ethical and data-provider approvals).

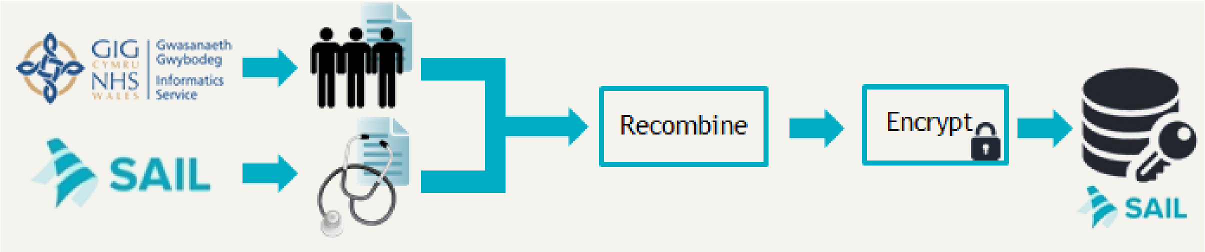

Figure 2.6: SAIL Databank and Data Linkage

The SAIL databank is used to explore correlational (observational) research designs, typically questions with an epidemiological stance. One such study looked at the association between neighbourhood deprivation and excess alcohol consumption (Fone, Farewell, White, Lyons, & Dunstan, 2013). This cross-sectional study of over 50,000 respondents across Wales found that respondents in the most deprived neighbourhoods were more likely to binge drink than in the least deprived areas. One study on childhood head injury and key stage one results found that of approximately 90,000 children 290 had sustained a head injury (Gabbe et al., 2014). These children were statistically less likely to achieve a satisfactory key stage one result than those who had not sustained a head injury.

In an investigation of the link between epilepsy and deprivation, over 8 million records were reviewed. It was found that the prevalence and incidence of epilepsy are associated with deprivation (Pickrell et al., 2015). Finally, in a study exploring the recognition of anxiety in children and young people in primary care, a population-based retrospective study of six- to eighteen-year-olds was conducted between 2003 and 2011. It was found that incidence of anxiety symptoms more than tripled over the study period, while the incidence of diagnoses remained stable (John et al., 2015). These research studies show the breadth of research conducted utilising health data with routinely collated data, thus there is potential for its use in exploring mental health and clinical decision-making research. John et al.'s paper exploring antidepressant prescribing was used to inform updated guidance to GPs regarding patterns of prescribing in children and young people, an example of the potential for the mental health work using this data can be used to impact policy (John, Marchant, Fone, Mcgregor, et al., 2016).

Though there is capacity for the use of health and administrative data in research, it comes with its challenges. There are costs associated with creating and housing the data and converting it to something usable. The data was collected with the aim of recording health records, not for research. Therefore, time and resources are required to prepare this data for research, for example, to deal with missing data. To link administrative to health data the records must be matched. There are different ways of matching – either deterministic or probabilistic. Deterministic is all the exact key variables have been matched, however this does not account for data entry errors. Probabilistic matching may account for the data entry errors, but it may result in mistakenly linking two people together (see table 2.1).

Table 2.1: Deterministic vs. Probabilistic Matching

Deterministic Match					Deterministic Match			
Forename	Surname	Date of Birth	Gender		Forename	Surname	Date of Birth	Gender
Joe	Bloggs	18/04/1965	M	→	Joe	Bloggs	18/04/1965	M
Maggie	Smith	01/02/2001	F	→	Maggie	Smith	01/02/2001	F
Sarah	Jones	24/09/1992	F	→	Sarah	Jones	24/09/1992	F
Richard	Davies	15/05/1982	M	→	Richard	Davies	15/05/1982	M

Probabilistic Match					Probabilistic Match			
Forename	Surname	Date of Birth	Gender		Forename	Surname	Date of Birth	Gender
Joe	Bloggs	18/04/1965	M	→	Joseph	Blogs	18/04/1965	M
Maggie	Smith	01/02/2001	F	→	Maggie	Smith	01/02/2100	F
Sarah	Jones	24/09/1992	F	→	Sarah	Jones	24/09/1992	M
Richard	Davies	15/05/1982	M	→	Davies	Richard	15/05/1982	M

2.5.3. Welsh Health Survey

The Welsh Health Survey (WHS) was a type of administrative data, held within SAIL and a key source of information about the health of the general population of Wales. It was an annual survey that ran between 2003 and 2015, with approximately 15,000 people over 16 years of age taking part. The information it collected was used to monitor health, illness, lifestyle choices and health service use. It has now been joined with, and under the umbrella of, the National Survey for Wales, though no longer includes the Short-Form 36 (SF-36).

The SF-36 is a 36-item, patient-reported survey of health (Ware, 1993). It has eight sections: vitality, physical functioning, bodily pain, general health perceptions, physical role functioning, emotional role functioning, social role functioning, and mental health. This can be split into an overall physical health component score (including vitality, physical functioning, bodily pain, general health perceptions and physical role functioning), and a mental health component score (vitality, emotional role functioning, social role functioning, and mental health). The mental health component score is sometimes referred to as the mental health summary score, and when used separately from the physical component, it is referred to as the Mental Health Inventory (MHI-5).

The SF-36 can be used as a gold-standard indicator of CMDs, and has high reliability, validity and internal consistency (McHorney, Ware, Lu, & Sherbourne, 1994; Scott, Tobias, Sarfati, Haslett, & Scott, 1999), the reliability and validity of which has been demonstrated for the Welsh region (Burholt & Nash, 2011). The MHI-5 isolated from the rest of the SF-36 has also been defined as a useful aid when measuring mental health status (Cornish et al., 2016), even compared to other measures, such as the General Health Questionnaire 12 (GHQ-12; McCabe, Thomas, Brazier, & Coleman, 1996). The scores range from 0 to 100 (low health score to high), with 50 being the normative score (Jenkinson, Stewart-Brown, Petersen, Paice, & Jenkinson, 1999; Von der Heyde, 2007). The cut-off for scores indicating mental ill-health lies between scores less than 50 to less than 56 for depression, anxiety or either, though some researchers have used a more liberal cut-off of <60 (John, McGregor et al., 2016). Sensitivity ranges from 58% (Silveira et al., 2005) to 92.6% (Matcham, Norton, Steer, & Hotopf, 2016), specificity ranging from 71.4% (Matcham et al., 2016) to 92.0% (Silveira et al., 2005), and accuracy from 73.5% (Matcham et al., 2016) to 94.0% (Pfoh et al., 2016).

From the data stored within SAIL, it is possible to use the SF-36 as a gold-standard indicator of mental ill-health. Then, link these anonymised individuals to their own health records to determine how many have records relating to mental health, and understand the NCpF differences between those who have and those who hold no mental health records. Thus, exploring CDM from a different perspective, allowing greater understanding and identifying factors that influence mental health clinical decisions which are yet to be defined.

2.6. Summary

This research seeks to explore the impact of NCpF on clinical decision-making surrounding mental health conditions.

2.6.1. Why is this research important?

This research seeks to understand the impact of NCpF on clinical decision-making in mental health to help improve the quality of the decisions and the care given to patients. It uses healthcare data linked with administrative records to research clinical decision-making, demonstrating the potential for further research to be developed in the clinical decision-making field using these methodologies.

This is necessary as medical errors can be costly both in terms of wider healthcare and individual patients. As the errors researched here are cognitive, and past research suggests cognitive errors are more likely to be preventable as well as result in permanent disability than technical errors (Weingart et al., 2000; Wilson et al., 1995), not only is it important to identify how or where such cognitive errors occur, but the act of identification is a strong step to combating them.

Moreover, the focus of this research is mental health. This is important because the annual population prevalence of CMDs is one in four people. Given the increase over the last 25 years of presence of mental health within GP consultations, if by decreasing the number of preventable errors in this field of health can decrease the numbers seen by the GP and other healthcare professionals, it would assist with the strain on resources. People with mental ill-health have an increased risk of mortality and comorbidities, therefore is an important population to examine. Moreover, unmet healthcare needs can lead to patients worsening symptoms or suffering longer before reaching services, this can result in increasingly complex problems and have greater risk of future serious outcomes, such as attempted suicide, hospitalization, and work disability (Kessler et al., 2001, 2003).

2.6.2. Contributions to research and practice

Using qualitative, experimental and correlational (observational) research designs to gain a holistic view of mental health clinical decision-making, provides the ability to better understand the complex web that is mental health clinical decision-making, from the perspective of the patient, practitioner on a population level.

Exploring the impact of NCpF on mental health decisions with healthcare data provides a new framework to understand and research the impact of NCpF in clinical decision-making. Decision-making sciences span across disciplines, therefore can be used as a foundation to further mental health research, such as with other mental health disorders not explored here or applied to other areas entirely such as education and the legal field. Moreover, this research will utilise experimental and qualitative research methods to provide a well-rounded view of the impact of NCpF on mental health clinical decision-making.

Finally, it can contribute to better, more informed evidence-based education of future doctors for example by working in collaboration with stakeholders and interest groups such as crème (Clinical Reasoning in Medical Education Group - http://www.creme.org.uk/) and the Wales Deanery to ensure knowledge translation into both undergraduate and postgraduate medical education.

2.6.3. Conclusion

This research explores the influence of NCpF on mental health, it specialises in common mental health disorders excluding problem drinking or mental health as a comorbidity. To achieve this, the research uses a combination of healthcare records and administrative records to explore the impact of NCpF on mental health decisions, combined with qualitative and experimental methods to account for the shortcomings of each research method individually, while utilising their strengths.

Given the research designs utilised, most research exploring medical errors were unable, or did not seek to determine why or how medical errors relating to judgement occur (Maidment & Lelliott, 2006). This research hopes to explore this question in a way that involves the patient and practitioner, to gain a better overall understanding. The following chapter outlines the first step taken to explore the influence of NCpF on mental health clinical decisions, specifically by recognising the healthcare journey of adults with mental ill-health, to identify their perspectives on involvement in healthcare decisions, discover what is important to those individuals, and determine whether any NCpF were identified as being significant to these individuals' care.

Chapter 3: Focus Groups

This chapter comprises of the first empirical study underpinning this research project. Patient and service user perspectives are fundamental to research as they ensure research is conducted with those it impacts in mind. Therefore, this study explores clinical decision-making from the patients' perspective. The results reported here will help to inform the discussion of results reported in subsequent chapters. It will start with an introduction to shared decision-making (SDM), with reference primarily to mental health service user involvement in research. Then, it will outline the focus group study methodology. The themes and sub-themes that arise will be described. Finally, a discussion of the results, with reference to the wider literature as well as this project.

3.1. Research Aim and Objectives

This chapter seeks to contribute to the wider aim of this thesis by focusing on achieving the first over-arching objective:

- To understand patients with mental ill-health's clinical decision-making experiences.

To achieve this objective, the following subsidiary objectives will be targeted.

3.1.1. Subsidiary Objectives for Chapter 3

1. To gain the patient perspective of SDM in mental healthcare by conducting qualitative research with people with lived experiences of mental ill-health.

2. To use the qualitative research to answer the following questions:

    - What are patients' experiences of SDM throughout their healthcare journey?

    - Do patients desire involvement in the decision-making process regarding their mental health?

    - Where along the patients' healthcare journey should SDM lie?

3. To determine whether people with lived experience identified any NCpF as influential on their mental health care, to guide later Chapters.

4. To discuss the findings of the qualitative research in relation to the existing SDM and mental health literature, while making recommendations to research, policy, and practice.

Patients and service users may hold a different perspective from professionals and policy makers. The need to hear patient voices is at the core of this study, as is the desire to understand how their healthcare pathway was shaped by their involvement in the diagnosis, treatments, management and support decisions.

3.2. Background

3.2.1. Why is SDM Important in Mental Healthcare?

SDM is important in mental healthcare as it is linked with better patient outcomes (Coulter & Collins, 2011), fewer hospitalisations (Hamann, Cohen, Leucht, Busch, & Kissling, 2007) better experiences (Weingart et al., 2011), and less regret about their decisions (Aning et al., 2012). Reliably informed shared decisions can also lead to better, more efficient resource providing, which may in turn ensure value for public money and preventing waste (Leng et al., 2017).

In addition, a randomized control trial comparing a SDM program for treatment planning with routine care found that the SDM program led to lower perception of decisional conflict among depressed patients, which was associated with better treatment outcomes (Metz et al., 2017). Service users taking ownership of their treatment and increasing their control over the impact of their condition is concluded as being a key part to recovery in studies investigating bipolar disorder treatment (Todd, Jones, & Lobban, 2012a).

Less research has explored SDM in the context of mental health patients than those with physical health. As such, the present chapter will focus on the qualitative research conducted to date that explores mental health decision-making from the patient or service user perspective and the barriers to SDM identified by patients or service users with mental ill-health.

3.2.2. Service User Views on SDM in Mental Health

Gaining the perspective of service users provides research outputs that are more relevant, results that are more meaningful and engages the public or individuals outside of academia. By engaging a different population, it shares the importance of research with stakeholders, while, in the field of SDM, potentially improves their own experiences of clinical decision-making (Faulkner, 2013; Staley, 2009; Szmukler, 2009; Szmukler et al., 2011).

Of the research that explores patient involvement in mental health care, the majority looks at implementation of SDM, specifically; best practice, tool implementation, and barriers (Brooks et al., 2017; Slade, 2017; Stacey et al., 2015; Stiggelbout, Pieterse, & De Haes, 2015). A thematic analysis of 25 individual service users from three mental health centres in Norway showed that SDM was essential in four contexts: during admission, in individualised treatment, in different treatment contexts, and in user-professional relationships (Klausen, Blix, Karlsson, Haugsgjerd, & Lorem, 2016).

Some research explores specific SDM in certain phases of contact within mental health care, such as treatment (Mahone et al., 2011; Simon, Loh, Wills, & Harter, 2006) and how SDM aligns with recovery (Coffey, Hannigan, Meudell, Hunt, & Fitzsimmons, 2016; Todd et al., 2012a; Todd et al., 2012b). One study explored patient preferences for, and appraisal of, involvement in treatment-related decisions. The research team conducted 54 qualitative interviews of US veterans with psychiatric conditions (Eliacin, Salyers, Kukla, & Matthias, 2015). Using an inductive thematic approach, (Braun & Clarke, 2006), this cohort reported a broad range of preferences for participation in treatment. Some reported positive perception of SDM, and others even felt friends and family should be included in decision-making. Some felt they rather the decision lie with the clinicians, as themes of trust, professionalism, and status-quo were identified. This demonstrates the individualised nature of preference for involvement.

Patients with a diagnosis of schizophrenia, were also approached to understand whether they seek involvement in treatment decisions (Hamann, Cohen, Leucht, Busch, & Kissling, 2005). It was found that, following administration of the Autonomy Preference Index to 122 inpatients, participants wish to be involved in SDM. Further, negative attitudes toward medical treatment and younger age were associated with a higher desire for participation. Despite people with severe mental ill-health desiring participation in decisions, one research article only identified 37% (n=11) of patients as recording their current role as more than passive in the clinical encounter (Adams, Drake, & Wolford, 2007).

One study explored how service users with bipolar disorder can be supported through a self-management intervention (Todd et al., 2012a). They had 12 service users take part in a series of focus groups where four key themes were identified; recovery is not about being symptom free, recovery requires taking responsibility for your own wellness, self-management, and overcoming barriers to recovery (Todd et al., 2012a; Todd et al., 2012b).

Other review articles explore SDM tool implementation. Following a systematic search of instruments that record the extent to which health professionals involve patients in treatment and management decisions (Elwyn et al., 2001), authors found eight instruments that met the inclusion criteria, but none of these were specifically designed to measure 'involving patients' in decisions, only using it as a sub-measure.

Further, a narrative review explored SDM literature in both physical and mental healthcare (Curtis et al., 2010). The article sought to understand the compatibility of physical health SDM tools to mental health-related decisions. Their review concluded that material created for physical health does not translate perfectly to mental health. They surmised that there is a different practice dynamic when exploring physical health conditions than mental health due to the complexity and recurrence of the condition, that mental health decisions are embedded in day-to-day choices rather than 'one-time crossroads decisions' typically found with physical ailments. Further, unlike most physical health decisions, the healthcare professional can use the mental health state of the patient to override patient preferences.

In studies involving participants views, a frequently reported outcome reported is barriers to implementing SDM.

3.2.3. Barriers to SDM in Mental Health

Barriers to SDM is a common theme in the mental health literature. Barriers include the patient-practitioner interaction, training, and accountability.

Those barriers which stem from the patient-practitioner interaction are broad. One study (Farrelly et al., 2016) ran focus groups involving 50 service users and 45 clinicians. They focused on barriers to clinician engagement, from both the service user and clinician perspective. Four barrier themes were identified: conflict regarding planning care, belief that decisions they make were shared, concerns about service user choices, and limited availability of service users' choices.

A commonly reported barrier to the patient-practitioner interaction is that the patient reports concerns about the practitioner making the decisions for them, with the patient having little choice in the matter. This was observed by Mahone et al. (2011) where a total of 44 people attended the various focus groups, made up of prescribers, providers, clinical staff and consumers.

One review article observed the contemporary challenges and evidence regarding SDM in mental health with a particular focus on the perspectives of service users (Castillo & Ramon, 2017). It reports barriers to utilising SDM that include ethical and legal frameworks, accountability and risk. In addition, they report that the medical model of psychiatry and diagnostic stigma contributes to a lack of professional acknowledgement of service user expertise. Resulting in service users experiencing an imbalance of power, feeling they have little choice and treatment is being "done to" the patient rather than "worked with".

On the other hand, some researchers found patients are not comfortable with making decisions. For example, semi-structured interviews were conducted with 40 patients to explore depressed patients' perceptions of their treatment decision-making process (Simon et al., 2006). They found that patient themselves felt they lacked the insight to make clinical decisions. It was felt that patient engagement was further delayed with increased depression severity. Patients also revealed that patients expected GPs to be a first and main source of objective information about depression and treatment and be able to provide emotional support. This was reflected by some service users involved in

Farrelly et al.'s (2015) article, where service users spoke of having to regain trust in themselves as they are aware they lost insight when experiencing extreme delusions and psychosis.

In a study which involved only healthcare providers, the consumers' lack of competence was also reported as a barrier by the mental health speciality providers (Chong, Aslani, & Chen, 2013). This was also found in Farrelly et al.'s (2015) study, whereby clinicians have concerns that the service users will make a choice the clinician considers to be not in the patients' best interests. This may be a true challenge when incorporating people with serious mental illness in the decision-making process or could be a reflection of a form of stigma held by healthcare providers themselves, as identified by Castillo and Ramon (2017), or perhaps as Curtis et al. (2010) put forward it may be using the mental health state of the patient to override patient preferences.

The view that patients lack insight is not reflected in all research; some articles advocate involvement (Todd et al., 2012a; Todd et al., 2012b). These articles state that service users may be the equipped to managing their own care and are "experts by experience". It may be that the current self-management interventions for some disorders, such as bipolar disorder, are incompatible with service users' definition of recovery, due to a prescriptive focus on treatment and over-emphasis on symptom recovery (Todd et al., 2012a). Further, Rise et al. (2011) found that if patients are experiencing strong symptoms but are still being involved in the mental health decisions, it actually helps in "strengthening the psyche" of the patient, as "nobody is saying "oh you're so ill, we aren't listening to you" " (Rise et al., 2011).

One study sought to explore the use of a tool designed to enhance collaborative antipsychotic prescribing from the perspectives of secondary care mental health service users, carers, and professionals. Semi-structured interviews and focus groups used a convenience sample of 33 participants (10 mental health service users, 10 carers, and 13 professionals) involved in antipsychotic prescribing (Brooks et al., 2017). Participants were asked about the potential implementation of a tool to support SDM within secondary mental health services. The study revealed a divergence in the views of service users and professionals, there was a tendency for the stakeholder groups to blame the other for implementation failure. Specific influences related to paternalism, legislative frameworks, accountability and lack of resources.

However, a study conducted by McCloughen, Gillies, and O'Brien (2011) held focus groups with a total of 13 patients and 13 mental health nurses, they also received 34 completed surveys from nurses (mailed to 118 staff) and 18 completed surveys from consumers (mailed to 113 people). It was found that mental health consumers and nurses conceptualise SDM implementation in similar ways, though sharing different lived experiences. The key areas identified for practical suggestions of implementation; mutual recognition of knowledge and expertise in both the nurse and consumer, understanding of which areas to collaborate and communicate behaviours and expectations of working together (McCloughen, Gilles, & O'Brain, 2011).

3.2.4 Training and Accountability as a Barrier to Shared Decision-Making in Mental Health

A barrier continually reported by service users and providers in the literature is related to professional training. For example, a longitudinal, qualitative study to establish the influences on SDM implementation at the service user, carer, mental health professional and organisational levels was conducted (Brooks et al., 2018). From the results of 54 participants, a failure to embed and normalise training in local provision was identified due to a lack of organisational readiness to accept change, and underestimation or lack of investment in the amount and range of relational work required to successfully enact the intervention.

Similarly, Laitila et al. sought service users' views regarding user involvement in mental health services (Laitila, Nummelin, Kortteisto, & Pitkänen, 2018). Three focus groups were conducted, which concluded that service user involvement could be enhanced by strengthening service users' position by developing the mental health care system and providing specific training for professionals. Training to be conducted could involve utilising decision aids that encourage SDM, however service users believe that practitioners would benefit from training in speaking with person-centred, person-first language (to emphasize that they are people first and have mental ill-health second) and should learn to actively listen ("listen to our consumers and hear their preferences")

(Mahone et al., 2011). This training could also include appreciation of the experiential knowledge on behalf of the patients (Castillo & Ramon, 2017; Laitila et al., 2018).

However, some practitioners may not be open to training. As found by Brooks et al. (2019), practitioners felt there was no room for training or improvement in their practice and that training would not benefit them as it would not teach anything new (Brooks et al., 2018). Considering the models of decision-making, as highlighted in Chapter 2, the current most widely accepted model focuses on a cognitive perspective, based on the clinician's own way of thinking. This does not account for how the process may be impacted by requiring an accurate explanation of the decisions to the patients and listen to patients' thoughts. Patients may also benefit from training, specifically in how to work collaboratively and become involved in the decision-making process (McCloughen et al., 2011).

The final barrier relayed is accountability. Castillo and Ramon (2017) and Brooks et al. (2017) report accountability as a barrier to SDM. Accountability stems from ethical and legal concerns held by the medical practitioner when making decisions that may lead to poor outcomes or with patients who lack insight, health literacy or impaired decisional capacity (Hamann & Heres, 2014; Kaminskiy, Ramon, & Morant, 2013; Rise et al., 2011). This was reflected by practitioners in focus groups with service users, family members, and clinical practitioners. Mahone et al. (2011) found that legal and other obligations were identified as a barrier to care as the practitioner has a responsibility of care and must manage risk of harm to self or others. From a systematic review of barriers and facilitators of implementing SDM in clinical practice, a plethora of barriers were identified including characteristics of the patient, clinical situation, increased cost, patient outcome, increased uncertainty, and increase in malpractice liability (Légaré, Ratté, Gravel, & Graham, 2008). If clinicians are, or are trained to feel, solely responsible for the clinical decisions, coinciding with a lack of training to share knowledge and decisions appropriately, this may reinforce the barrier to SDM.

Concerns around individuals with severe mental ill-health may be misplaced. Though nonadherence and rehospitalisation rates are high in individuals with severe mental ill-health, some research indicates those in a SDM intervention had fewer hospitalisations than the control group (Hamann et al., 2007). Interestingly, those patients with higher participation preferences are at lower risk for poor treatment outcomes, which may indicate involving individuals who seek involvement could have better outcomes. Further, an RCT comparing a SDM programme with routine care found that patients in the intervention group had a better knowledge about their condition, a higher perceived involvement in clinical decisions and increased uptake of psychoeducation (Hamann et al., 2006). It was also found that the SDM programme did not take up more of the clinicians' time, therefore is feasible with individuals with severe mental ill-health.

Along with the barriers identified, research examining level of actual involvement in mental healthcare shows that SDM for mental health is practiced at the level of information exchange, but not developed beyond this in the three-stage model proposed by Charles and colleagues (Charles, Gafni, & Whelan, 1997; Goossensen, Zijlstra, & Koopmanschap, 2007; Loh et al., 2006; Patel, Bakken, & Ruland, 2008). As the process of decision-making occurs below the conscious level, it would be difficult to make a decision that is shared without training. This may explain why research to date is still reporting patients' desiring more involvement.

3.2.4. Summary

Research conducted in the early 2000's concluded that little attention has been given to a detailed assessment of the processes of patient involvement in decision-making (Elwyn et al., 2001). In recent years, an increase in service-user and patient feedback has been received. However, most studies conducted in this manner reveal that service users are still not sufficiently involved in clinical decisions.

This chapter will outline a qualitative research study that explores the experience of SDM from the service user perspective, specifically; whether SDM is being implemented in healthcare of local people with mental ill-health, if not, where along the patients' healthcare journey should SDM take place, and whether patients seek involvement. This qualitative research will also provide an opportunity to identify whether participants reveal NCpF as influential to the mental health care received. At the core of this research is the need to hear service users' voices, and to understand how their healthcare pathway was shaped by their involvement in the diagnosis, treatments, management and support decisions made.

3.3. Methods

3.3.1. Design

A qualitative design was chosen, specifically utilising focus groups with a semi-structured interview guide. This allows participants to discuss their experiences, without being led, of healthcare in a non-judgmental and safe environment. It was also used as this reflects the format of their group sessions, and so may feel more comfortable than one-to-one.

3.3.2. Procedure

3.3.2.1. Access, Sampling and Recruitment

Service users at a local branch of a mental health support charity, Swansea Mind, were opportunistically recruited to discuss their healthcare experience in two focus groups. The Swansea Mind centre acted as the gatekeeper, facilitating access and collaborating with the research team in ensuring this vulnerable group was supported throughout their participation in the research project.

The charity supported the research team in ensuring all participants were over 18 and able to provide informed consent prior to the focus groups; that they would be able to take part in the focus group discussion; and, that further support would be available if participants felt in any way affected by their participation in this research.

Service users were informed of the study by the volunteer-workers at the centre, leaflets and posters were also placed around the centre, with information of the study details and contact details to use to express their willingness to take part. Those who took part received a nominal sum for their time (£5), however, they were not informed of this prior in order to prevent the monetary gain being used to incentivise participation.

This research used a convenience sampling framework (Lavrakas, 2013), of a critical case sample (Etikan, Abubakar Musa, & Sunusi Alkassim, 2016; Luborsky & Rubinstein, 1995; Marshall, 1996) with the following inclusion criteria:

- Must be a member of Swansea Mind, and;
- Have a diagnosed mental health condition, and;
- Be aged 18 years or older, and;
- The ability to provide informed consent.

3.3.2.2. Ethical Considerations

Ethical approval for this research was granted on June 26th 2018 by the Swansea University Medical School Research Ethics Sub-Committee, project reference number 2018-0032 (Appendix 3).

Risks to Participant

As this study seeks the involvement of vulnerable adults with mental ill-health, special ethical considerations were identified. Ways to ameliorating the potential risks identified when involving vulnerable people in research stem from reports provided by the NHS and the NSPCC (Barnard, Drey, & Bryson, 2012; Faulkner, 2013). Specific considerations revolved around; consent from the Swansea Mind centre, ensuring participants had the right to withdraw, preventing coercion, minimising distress, maintaining confidentiality, limiting interviewer power, providing a substantial debrief, and promote publication of findings. Though outlined below, these were all identified in greater detail in the ethical application (Appendix 4).

Written consent was provided by Swansea Mind, who agreed to identify any service users that would not be able to provide informed consent. Further, Swansea Mind provided consent for their contact details being placed on the information, brief and debrief sheets.

To ensure participants were not coerced, the service users were not informed of the £5 as a thank-you for taking part. Further, the interviewer went through the consent and information sheets verbally, answering any questions the participants may have, to ensure they felt comfortable taking part. All participants were asked whether they were happy to take part at the start of the focus group, after each person relayed their experiences, and at the end. As the focus groups were run in Swansea Mind and led by a volunteer of Swansea Mind, it was important to ensure the participants did not take part in fear that the service they receive would be affected. To overcome this, all information provided explicitly stated the research was run through Swansea University, not Swansea Mind. Further, the Service User Representative was approached in a Board of Trustee meeting to inform their fellow Service Users about the project, ensuring they did not feel coerced to participate.

As vulnerable people may be apprehensive of taking part in research, qualitative focus groups were chosen as the research design. Most individuals in Swansea Mind have taken part in the support groups at the centre, so this research design reflects the groups they are familiar with, to ease the participants. Further, as focus groups took place on the Swansea Mind premises, they were in a familiar environment, they could leave the focus group and receive support from the centre immediately should they have become overwhelmed or distressed. However, the questions themselves were not sensitive in nature, and focused more on opinions than facts surrounding treatment or diagnosis, therefore risks of distress were limited.

Confidentiality is important here, as participants were vulnerable adults talking about their mental healthcare experiences. As such, the researcher was the sole transcriber of the tape as first names and identifiable information were provided. Researcher transcribing has been described as an essential part of the analysis as the researcher can fully familiarise themselves with the research data (Braun & Clarke, 2006).

Participants were fully informed of the process of anonymising the transcript and outputs, in the event of publication. All subjects were provided a debrief leaflet to take away should any participants wish to later withdraw or feel affected by the research. It was verbally confirmed at the start, during and end of the study, whether participants wished to withdraw.

Risks to Interviewer

The interviewer (LB) was a volunteer for Swansea Mind, giving her access to this population which otherwise would not have been possible, and having built a rapport with the service users. This is a benefit to the research as participants will have familiarity with the researcher, so feel more comfortable sharing their opinions than with a stranger. However, certain standard procedures, such as including researcher contact details on the information, consent, and debrief sheets, were not possible as providing contact details would violate the volunteer agreement. This was overcome by providing Swansea Mind's contact details (with their consent), who can forward any questions to LB. This was in addition to the Ethical Committee contact details and the first supervisor contact information.

The focus groups took place during the Swansea Mind opening hours, this was done for two reasons. The first, to ensure the researcher's safety. The second, in the event that any service users are openly emotional, or conversations become heated. Every floor has CCTV, so the Swansea Mind centre workers could monitor in case they needed to intervene.

3.3.3. Focus Groups

Two focus groups took place at the Swansea Mind centre, during the centre's opening hours, for the ease and familiarity of the service users; for security of both the participants and researcher; and to assist with moving the participants and researcher to an equal sharing of power (Gilburt, Rose, & Slade, 2008; Long & Godfrey, 2004). Participants selected which group they wanted to take part depending on ease of access and availability.

Two members of the research team (LB and ADS) planned the focus group and designed the interview schedule, they were also advised by an experienced member of the research team (AJ). Both focus groups had the same aims, facilitator (LB) and the same semi-structured interview schedule. The discussions lasted between 46 minutes and 1 hour 47 minutes and were digitally recorded (following participant consent) and transcribed verbatim.

A semi-structured focus-group schedule was created to guide the conversation and to prompt discussion on key moments of the service user's healthcare journeys: 1) firstly diagnosed with a mental health problem; 2) treatments and management decisions; and 3) their views involvement in decision-making.

3.3.4. Analysis

Braun and Clarke (2006; 2012) describe the procedure to use thematic analyses, which was followed in the analysis phase of the study. The focus groups were transcribed and imported into NVivo 12 by LB, where the transcripts of each focus group were read with care to identify individual meaningful units of text. Subsequently, these individual text units were then grouped into analytical categories and given a provisional definition. Braun and Clarke (2006; 2012) provide differences between theory and data-driven approaches to coding themes. The coding themes here were data-driven, with the sole aim of answering the research questions. The data were reviewed by two researchers (LB and ADS) independently to ensure all categories were suitable to the text units, and all adequately represented the overall discussions. Following this thematic analysis, ten categories were identified, which were grouped into three key themes. All researchers examined, discussed, and agreed on the final key themes.

3.3.5. Qualitative Rigour

Qualitative rigor is a way to establish confidence in the findings of a qualitative research study. There are four components in relation to qualitative rigor: credibility, dependability, confirmability, and transferability (Lincoln, & Guba, 1991; Thomas, & Magilvy, 2011).

Credibility in this context refers to the accuracy of portraying the participant's lived experience and when others can recognise the experiences. This was achieved in this research through prolonged time spent with participants, using direct quotes in this thesis, and peer debriefing.

Dependability in terms of qualitative rigour is an easily followed decision trail and is similar to the notion of “reliability” in quantitative research. This was achieved by providing a detailed description of the research methods and involving another expert researcher in the analysis process to review the transcribed material and validate themes identified.

Confirmability refers to the researcher’s openness to the study and results, without researcher preconceptions. This was achieved by asking open-ended questions, allowing the participants to relay their healthcare journey and not providing leading questions that may bias the participants response (i.e. regarding the impact of NCpF). An audit trail was kept, recording the processes of data collection, analysis and interpretations to track the study development.

Transferability is the ability to transfer research findings or methods from one group or another. Though focus groups were based in the one location, this study sought to achieve transferability by involving participants with a range of experiences, backgrounds and mental health conditions. It was enhanced by using a critical case sample and robust data with a wide possible range of information through the questions asked.

3.4. Results

3.4.1. Participant characteristics

Eleven participants in total partook in the focus groups, six of which were female. Age ranges were used to ensure anonymity, the median age range was 35-44, for overview of patient demographics, see Table 3.1.

Table 3.1: Participant Demographics (n=11)

Participant Number	Sex	Age	Ethnic Background	Diagnosis Disclosed
1	M	35-44	White	Schizophrenia
2	F	25-34	White	Asperger's Syndrome Attention-deficit/Hyperactivity Disorder
3	F	35-44	White	Post-natal Depression; Intermittent Explosive Disorder
4	F	45-54	Asian	Depression; Anxiety
5	F	55-64	White	Did not disclose*
6	M	55-64	White	Schizophrenia
7	M	35-44	White	Autism
8	F	35-44	White	Psychosis Depression
9	M	25-34	White	Obsessive Compulsive Disorder
10	M	35-44	White	Depression Alcohol Dependency
11	F	18-24	White	Depression; Anxiety

* All participants were told they did not have to disclose their mental health diagnosis should they not wish to. Only one person chose not to disclose this information.

3.4.2. Key Themes

Three over-arching themes emerged from this: doctor-patient relationship, doctor-patient communication, and ending the cycle.

3.4.2.1. Doctor-Patient Relationship

When given the opportunity to talk about their healthcare experiences, participants spoke about positive relationships with the medical practitioner, negative relationships with medical practitioners and times when they trusted the doctors’ advice (n=11).

Positive Relationships

Participants' perceptions of the medical encounter appeared to be greatly influenced by the relationship they had with the medical practitioner. Some practitioners were described as "amazing" [#4], "marvellous" [#3, #8] and "brilliant" [#2, #4, #5, #8] (n=9). Positive relationships were relayed when the medical practitioner talks to the patient, when the practitioner specialises in mental health, and when they help patients with treatment or referrals. One participant described their experiences as follows:

> I went to see a psychiatrist, a brilliant psychiatrist because he specialises in autism and mental health and managed to get referred then, and they said about my condition, Asperger's and ADHD, and went back to my psychiatrist and all that and then I felt relieved, but still scared about that, like I was getting perhaps a bit more support. [#2]

Negative Relationships

While participants had reported positive experiences within the doctor-patient encounter, they also reported times when the relationship with a practitioner was strained (n=7). One participant when asked how they would describe the process of gaining a diagnosis reported it to be "horrible" [#2], another relayed having a "sense of negativity" [#5] from the practitioner, while another described the attitude of a doctor as "horrendous" [#9]. These comments were based on participants reporting a lack of empathy from the practitioner, a lack of continuity of care, and feeling the interaction was impersonal, as identified by one individual:

> The NHS system anyway needs better care, especially when it comes to emotional intelligence, especially when it comes to… You know, recognising… Instead of seeing them as numbers. [#7]

Trusted the Doctor

There were times when the participants did not agree with the medical practitioners' decision but trusted their advice (n=4). Decisions made during these times were related to hospital referral, the diagnosis, or treatment. The following is an example of such an incident:

> One thing they have said is that they have to take me off the sleeping tablets, that was one thing I wasn't happy about, but at least you know; at least it shows that you care. You know, they could just carry on giving me the pills. They could have just carried on giving them to me and I would have just harmed myself with it. [#4]

3.4.2.2. Doctor-Patient Communication

A common theme identified by participants (n= 11) was the communication between doctor and patient. This theme is built of four sub-themes: No Discussion, No Choice; Included in Care; Referral; and Patient Knowledge.

No Discussion, No Choice

When speaking of their health journey, some participants (n=5) relayed instances where they felt a decision was made for them. These decisions were relating to entering into hospital, receiving treatment they did not want, and even diagnoses. The following participant talked about one such experience:

> I was disagreeing with my doctor how I should be cared for and they decided in the end that I tried so many medications so I was going to have to be injected, which I didn't want, um well then they had to send the riot police in [to hospital] because I barricaded myself into like a bathroom so they wouldn't inject me. I kind of feel it could have been handled a lot better and that I was able to talk about it, but I didn't want to be injected against my will. [#1]

Included in Care

When asked, a small number of participants reported feeling involved in their own care (n=3). One individual talked about their experiences about wishing to change medications after receiving the same treatment for a long period of time:

> As for the medication, um I was on depo injections for 35 years successfully and in 2003 I seen my psychiatrist called [D3], and uh, I asked if I could come off the depo injections and go on tablets and she trusted me to self-medicate [#6]

Referral

Some participants discussed the referral process, though these experiences varied greatly. Some discussed the desire to go to hospital but were unable to (n=6):

> I went to the local um… mental hospital similar to Cefyn Coed and they told me I had to go somewhere else, another field clinic and they said I had to have a referral from the doctor [#5]

While other participants wanted a referral and were able to:

> I think I was given an appointment then within two weeks, I thought that was absolutely marvellous. You know, the NHS as it is, I was extremely grateful for you, for them. [#3]

Patient Knowledge

Participants held a good amount of knowledge about the medication they were on at the time, or had received in their past, and their side-effects (n=9). The following individual was one example of this:

> The lorazepam? Well it's in the same family as diazepam but much, much stronger and I was on an incredibly high dose of it. Uh but it should only have been for a few months, not three years, so that was a massive oversight. [#8]

A couple participants sought more information about their diagnosis and the medication options available, as one participant eloquently stated:

> I didn't really know what schizophrenia was so I would have liked more information about the diagnosis, what it means for life, because it is a condition for my life basically. [#1]

3.4.2.3. Ending the Cycle

The final theme identified was coined 'Ending the Cycle', all reported at least one of the three sub-themes (n=11). 'Treatment Cycle', as participants reported a cycle of taking, changing, and stopping treatment. Participants also identified finding the 'Right Care' for them. The last sub-theme identified that may prevent the cycle ending is 'Barriers to Care'.

Treatment Cycle

Most participants relayed a cycle of taking, changing, and stopping treatment, the reasons why they were caught in the cycle, as well as the effects of the cycle (n=10).

> I said 'look now this is too strong for me'. I was on 400mg in the night and 500mg in the morning, it was completely… Oph, it… I was like a zombie all the time. I said 'look now, this is too much'. … Then he prescribed me a new medication… A drug… Didn't get on with it at all. In fact, I was worse than ever on that drug. I said, 'look now, I am willing to go back on the first one, but please can you like, you know, you know like, lower my dose slightly'. [#3]

"Right" Care

'Right' care looks different to everyone. Discussions under this sub-theme revolved around diagnosis and treatment (n=9). Some participants spoke of the challenges that occur if no diagnosis was provided, referring to it as not "very helpful" [#1]. Others highlighted the value in gaining a diagnosis:

> It just flares up, I can just lose my temper like that, uh that's how he's like… Uh, it's kind of put a label on it then. …After that day, I was so relieved it was like a weight off my shoulder [#3]

Some participants identified the importance of receiving treatment that works for them, though some believed medication did not help at all. Other participants found a lack of prescription to be unhelpful, while some comments identified a need for therapeutic treatment rather than solely pharmaceutical.

> It's very focused on; are you on the right medication, is it working… Yeah and there's no, or little sense of therapeutic treatment. [#8]

Sometimes, it is a combination of both medical and alternative support that suits people. When asking one person how they and their family coped following the struggles they reported, they believed it was due to "the right medication, also this nurse… she specialises in adults who have been diagnosed with Asperger's, autism and things" [#2].

Barriers to Care

The final sub-theme stems from participants identifying barriers to receiving help for mental ill-health (n=7). The barriers reported in this focus group surrounded access to counselling services, referral times, stigma, and a lack of funding for the NHS.

One person [#9] spoke about their mental health journey, specifically their challenges accessing counselling services, feeling they "had been passed aside", "had to really fight" for what they needed and feeling there were other patients who suffer with the same ailments which were seen to and they wondered why they "had to suffer". When asked by the interviewer why they feel they were treated differently, the participants said:

> Because of my OCD I couldn't really go anywhere, I couldn't really I… couldn't eat because of my OCD, I couldn't really do anything because of… Because I was just so trapped, and the mental health board didn't really see that. [#9]

A few participants spoke of long referral times as barriers to receiving care:

> I'd love to have more healthcare professionals in the mental health profession because it is such long waiting times and it's not all just for me, I want everyone to be able to get better, quicker mental health help [#11]

The stigma about mental health revolved around "playing" [#9] or "fiddling" [#8] the benefits system, which is why some believe they were not able to get the treatment they require. Others mentioned stigma of mental ill-health in a wider context such as society and the healthcare professionals:

> You are treated as guilty until proven innocent, you know it is very much you are fiddling the system unless we prove otherwise, and it makes you feel like shit quite frankly. [#8]

The final barrier from the perspective of some participants, stems from a lack of NHS funding:

> They were difficult times because the case, due to its sensitive nature, and um the way the health authority funded things, they didn't fund everything and they sent me this pie chart showing how they portioned the money and what have you … I had to show 'exceptional clinical need' and it, it took me four years to show that exceptional clinical need. [#5]

3.4.3. Did Non-Clinical Patient Factors Influence Clinical Decisions?

This question was not asked explicitly to patients, as the semi-structured nature of the interviews allowed the participant the freedom to share what they wish to and not lead the participant to provide answers they do not believe, or make them doubt the medical practitioner.

Very few entries relating to non-clinical patient factors occurred. One participant questioned why they were passed aside while other people who had the same ailments were being treated [#9]. However, the participant did not identify any reason this may have been the case. Further, another participant reported in passing that there is stigma relating to young people “attention-seeking” [#11]. This was not mentioned in relation to their own experiences, but on reflection to other people they know who have been doubted.

3.5. Discussion

This study had four subsidiary objectives relating to; gaining patient insight into SDM, using the focus groups to understand SDM, identifying any NCpF highlighted by participants, and discussing findings in relation to current SDM literature.

3.5.1. Focus Group Findings and Existing Literature

3.5.1.1. What are patients’ experiences of SDM throughout their healthcare journey?

From the results of the focus groups, one theme identified may be most suited to understanding whether patients experience SDM throughout their healthcare journey. The theme termed ‘Doctor-Patient Communication’ will be highlighted and compared to existing literature in order to answer this research question. ‘Doctor-Patient Communication’ has four sub-themes: No Discussion, No Choice; Included in Care; Referral; and Patient Knowledge.

Little or No Involvement in Care

Some participants’ responses fell under the ‘No Discussion, No Choice’ sub-theme. These are individuals who relayed instances where they felt a decision regarding referral, hospitalisation, treatment, or diagnoses, was made without their input. From this, it can be concluded that some individuals, at least at certain points in time or when interacting with certain practitioners, did not feel included in the decisions about their care.

Other qualitative, quantitative, and review articles report that patients believe they have little or no involvement in decision-making, this perspective spans across the SDM literature (Castillo & Ramon, 2017; Hamann et al., 2005; McCloughen et al., 2011;

Puschner et al., 2016). As an example, one service user in Farrelly et al.'s study describes her involvement as one must "do what you're told" (Farrelly et al., 2016).

As evidenced by a study exploring the preferences for involvement of service users with serious mental ill-health (Adams et al., 2007), people with severe mental ill-health desired participation in decisions. Despite this, only 37% (n=11) of the patients recorded their current role in the clinical encounter as more than passive.

Two-way communication is important to patients (Mahone et al., 2011). One participant in this study highlighted their story about practitioners focusing on their relationship with alcohol, rather than the pre-existing and underlying depression. A similar comment has been made in another study by Eliacin and colleagues; "D48: Within the last year I was seen by a physician who told me that I had no issues related to [post-traumatic stress disorder] and all I needed was quit smoking and my problems would be solved … I asked for a new [doctor]" (Eliacin et al., 2015). Further, this communication should be clear, as McCloughen, Gillies and O'Brian (2011) identified in their study involving nurses and mental health service users that, from the patients' perspective, nurses provide information that is inadequate, confusing, and inconsistent. On the other hand, nurses felt that the consumer should become more effective in communicating their wants and needs and not feel intimidated to relay this information.

When faced with clinical encounters that hold this paternalistic approach, it can create a type of trauma, as expressed by Mahone et al. (2011). They concluded that pressures placed on the patient to receive treatment when it is unwanted leaves them experiencing helplessness.

Experiences of Involvement in Care

A small number of participants reported feeling involved in their own care, this theme was termed 'Included in Care'. This coincides with other literature, in that most participants will report suboptimum levels of inclusion, with a minority reporting inclusion. However, one study found 85% of the patients interviewed were included in the clinical decision-making process (Hill & Laugharne, 2006). Doctors were reported to have considered the patients' opinions, talked through the options available, and a decision was arrived at together.

The overall lack of SDM between patient and practitioner may stem from the perceived power imbalance between the two parties (Castillo, & Ramon, 2017). Farrelly observed that in focus groups and interviews, medical practitioners may believe they were involving patients but failed to account for the patient's perceived power differential between the clinician and the patient (Farrelly et al., 2015). In Eliacin et al.'s research, one patient reported "lots of people go through life believing doctors and nurses are semi-omnipotent" (Eliacin, Salyers, Kukla, & Matthias, 2014). A similar sentiment was iterated in Roe and colleagues' study, whereby one participant described turning to the doctor "as though he is God", and therefore if the doctor tells the patient to take medication, they will do (Roe, Goldblatt, Baloush-Klienman, Swarbrick, & Davidson, 2009). Despite this power imbalance, the participant reported "but I don't think this is the way it is supposed to be; each person has the right to know the risks and benefits of medication, and based on that, decide what is good for him."

Though some service users feel as though they are not being involved in care, as a study involving nurses and consumers shows, medical practitioners may feel they are already taking part in SDM (McCloughen et al., 2011). This was also found by Farrelly et al. (2015) who, in a study involving 50 service users and 45 clinicians in focus groups and interviews, reported that some practitioners thought they were involving the service users in decisions, but service users did not believe this was the case. The majority of nurses who completed the survey and took part in the focus groups felt they were working collaboratively with patients. However, the patient perspective paints a different picture and generally conceded to the nurses' directions and ideas without understanding or agreeing with them. However, in a recent study when interviewing healthcare professionals and service users, a practitioner shared their view that "we haven't really progressed very far in terms of being more person centred. We're still quite stuck in the medical model" (Brooks et al., 2018). They suggest this may be a result of the healthcare environment institutionalising practitioners into older ways of working.

Other researchers suggest the lack of shift towards SDM in the practitioner encounter may be due to doctors not learning about the alternative decision-making techniques when they attend Medical School (Mahone et al., 2011). Service users in this study also report having years spent whereby a decision is made for them, therefore there is little benefit in trying to make the decisions, when these decisions will be overridden by the healthcare practitioner. Practitioners in this study thought that older clients "want you to make decisions for them" as they are familiar with the traditional model. This matches the themes of keeping with the status quo as mentioned by Eliacin et al. (2014).

Under the 'Referral' sub-theme, participants identified a great variety in their referral experiences. Some participants voiced a desire to be admitted into hospital but were unable to, others spoke about being able to be referred should they wish to be. This perspective has not been often cited in the literature, though this may reflect most literature focusing on treatment and general communication with medical practitioners, rather than referral. This would perhaps be beneficial to understand the patients' view on this in greater detail by focusing on SDM in relation to referrals in future literature.

Information Exchange

Finally, patients discussed the medication they were taking, or had received in their past, as well as the side-effects. A couple of participants voiced a desire for more information about the diagnosis and the treatment options. These points were discussed in greater detail under 'Patient Knowledge'.

Patient's becoming "experts by experience" is reflected across the literature (Castillo & Ramon, 2017; Laitila et al., 2018; Roe et al., 2009; Todd et al., 2012a). It is felt that consumers "know [their] body and… mind better than [practitioners] do" (Mahone et al., 2011), they understand how the medication is affecting them, and whether they are experiencing side-effects. The wider literature highlights some situations where service users feel they have more knowledge about their condition than the medical practitioners, specifically when communicating with a healthcare professional who was not an expert in mental health (Laitila et al., 2018). Some patients develop skills or techniques to manage their mental health before seeking help (Todd et al., 2012a).

Therefore, the practitioner should acknowledge the patients' skills gained and work with them to develop these which will in hand assist with self-management. However, those who may seek help early on require support in putting together self-management techniques (Todd, et al., 2012b).

Despite this, there is apparently a lack of acknowledgement on the part of the practitioner for the patients' knowledge, which feeds into the practitioners' preference for traditional approaches to decision-making (Kaminskiy et al., 2013; Laitila et al., 2018; McCloughen et al., 2011). Castillo and Ramon (2017) conclude in their review of service users' perspectives on SDM in mental health that the traditional approach to clinical decision-making hinders the clinicians' acknowledgement of service user expertise. Moreover, it has been reported that consumers can sense when the medical practitioner feels the consumer does not have expert knowledge (McCloughen et al., 2011), therefore may hinder any collaborative relationship they may be working towards, which is supported by the results of this study.

In Simon et al.'s (2006) focus groups involving people with depression, 65% of patients described the GP or other healthcare professionals to be the main source of information regarding mental health diagnoses (Simon et al., 2006). Thirteen percent of the patients only received a diagnosis, but not more information about what the diagnosis may entail. Some patients identified future improvements to healthcare, and 32% of the interviewees disclosed they expected more information about their condition and treatment options, as well as more knowledge on the doctors' side (12%). This reflects what has been identified in this study, whereby those who do not receive information or have up-to-date knowledge about mental ill-health wish to be informed by the medical practitioners. Further, nurses in the study conducted by McCloughen, Gillies and O'Brian (2011) felt that consumers need and should be provided with more information, as the lack of illness and treatment understanding impacts the ability of the consumer to work collaboratively.

In short, patients are still not experiencing great amounts of SDM in the patient-practitioner encounter. This slow change from the traditional paternalistic model to one that involves shared decisions may stem from concern that the patient does not hold adequate knowledge, even though patients do desire knowledge. It could be due to practitioners believing they are involving patients, but these efforts are not perceived by patients, or it may be the case that the healthcare system has been built upon a medical model that is resistant to change.

3.5.1.2. Do patients desire to be involved in the decision-making process regarding their mental health?

Though this question was not asked explicitly to patients, as the semi-structured nature of the interviews allowed the participant the freedom to share what they wish to and not lead the participant. However, to answer this question, the ‘Doctor-Patient Relationship’ theme will be primarily used in addition to the existing literature. Three sub-themes encompass the ‘Doctor-Patient Relationship’ theme; Positive Relationships, Negative Relationships, and Trusted Doctors Advice.

Patients Desire Involvement

Positive relationships with the practitioner were identified here primarily by the descriptions of the practitioners, such as “amazing”, “marvellous” and “brilliant”. These positive relationships were relayed when the medical practitioner talks to the patient, when the medical practitioner is a specialist in mental health, and when the medical practitioner appears to be helpful or informative about treatment and referrals. Thus, a shared-decision is associated with greater satisfaction with the doctor-patient relationship.

In the wider SDM literature, aspects that make a patient feel positively about their relationship with their practitioner are also considered core aspects for SDM, therefore may coincide. For example, Rise et al. (2011) highlighted how respect and dialogue were core aspects for SDM. Service users identified respect as both parties being able to talk and be listened to. This respect and mutual discussion may assist with the power imbalance between the patient and practitioner. Interestingly, providers felt that respect was inherently implied, however service users did not feel it was self-evident. Service users felt respect was a precursor to dialogue, leading to a greater sense of quality between the patient and practitioner as well as self-worth. Practitioners on the reverse, saw dialogue as the key to gain better outcomes.

Laitila et al. (2018) conducted three focus groups with service users. From these, service user involvement requires patients to be respected, appreciated, listened to, and provided with the opportunity to act alongside professionals. Service users felt that respect means being appreciated as an expert of one's own situation and having a voice. Part of this respect is wider aspects of a good interaction such as eye contact, a sentiment also highlighted by participants in this research.

From the studies that explicitly explored patients' preferences for involvement, there is a consensus that people with mental ill-health do seek involvement in their care (Castillo & Ramon, 2017; Hamann et al., 2005), and that SDM is related to achieving human dignity in the patient-practitioner interaction (Mahone et al., 2011). Puschner et al. (2016) provided 588 adults with mental illness with two questionnaires: The Decision-Making Style Scale, and the Clinical Decision-Making Satisfaction Scale. It was found that service users preferred being included in discussions and preferred having a clinician who also shared their preferred decision-making style (Puschner et al., 2016). When exploring the "unmet need" of service users, the unmet need was seen to decrease when clinicians involved the patients in the decision-making, while those who did not involve patients saw the same amount of unmet need.

Adams, Drake and Wolford (2007) in their study of perceived roles and preferences for SDM among people with severe mental ill-health, 77% of their participants preferred autonomous or shared roles, though only 37% rated their current roles as more than passive (Adams et al., 2007). In Roe et al. (2009), participants continually reported the desire to be involved in their own decision-making, for example, one participant said, "I never want to reach a situation where a decision is made for me."

Eliacin's research group found some patients feel full engagement in decision-making is necessary as it provides effective communication between patient and practitioner to ensure they receive the care than matches their needs (Eliacin et al., 2014; Mahone et al., 2011). Some patients viewed active participation in treatment as their responsibility and an important aspect of recovery. It provides them with a sense of responsibility, and empowerment (Eliacin et al., 2014; Farrelly et al., 2015). Mahone et al. (2011)

identified participants who believed control in decisions assists with the healing process; as one participant stated “how can they recover when their control is taken away?”.

Trust

Even if a positive relationship was identified, there were times participants did not agree with the medical practitioner. These recollections were placed under the ‘Trusted the Doctor’ sub-theme. As, even though participants may have disagreed with the decisions relating to hospital admission, diagnosis or treatment, a good relationship with the practitioner meant they were more likely to trust the practitioner. Some researchers found that trust is of utmost importance to the patient-practitioner relationship (Roe et al., 2009; Puschner et al., 2016).

As with the participants in this study, Simon et al. (2006) reported patients who originally disagreed with the doctor, who then later understood the decision made. However, in Simon’s study, this was placed under the theme “ambivalence towards treatment options”. This has also been reported in Eliacin et al. (2014) whereby one participant did not originally agree with the provider, but they trusted the practitioners’ judgement and the medication was of benefit. The trust in the relationship was built, as the participant identified times where the practitioner trusted them. Violating this trust however, can not only damage the doctor-patient relationship with the practitioner at the time, but also any subsequent practitioners (Eliacin, et al. 2014).

Further, if participants trust the medical practitioner, they may be more likely to believe the practitioner considers their best interests when deciding on treatment, therefore may be happy to leave decisions to the practitioner (Eliacin et al., 2014). Some patients fear that a poor decision may hinder their mental health, and sometimes feel ill-equipped to make appropriate judgements, therefore if they trust the medical practitioner, they may be satisfied with their level of care received. Repercussions or judgements from the provider may lead to compliance from the service user (Eliacin et al., 2014). However, at the cost of patient satisfaction, or feelings of mutual respect.

As mental health is fluid, level of involvement is varied depending on how they are presenting at the time of seeing the doctor. In Kaminskiy et al.'s (2013) UK study, service users felt there was an increased need for guidance during periods of mental health crisis, but if there is a good therapeutic relationship and trust built with the clinician, who still listens during these challenging times, it may be well-suited for the decision to be authoritative, so long as the patients' autonomy is returned over time (Kaminskiy et al., 2013). This is reflected in Laitila et al. (2018) whereby the service users emphasised the importance of knowing "when the illness is speaking" and not the person; this is possible when there is trust and a good patient-practitioner relationship.

Further, Rise et al. (2011) found that both patients and practitioners feared not being included in care. Therefore, if trust is established in the patient-practitioner relationship, both parties should not fear the lack of inclusion from the other, as there is mutual respect, trust and understanding.

Poor Practitioner Engagement

Focus group participants occasionally reported a negative relationship with the practitioner. These encounters elicited negative reactions from the participants, using words with negative connotations to describe the interaction. These perceptions stemmed from a lack of empathy from the practitioner, a lack of continuity of care, and impersonal interactions. The aspects that lead to a patient feeling negatively about their relationship with the practitioner, are associated with not being included in care.

Throughout the SDM literature, there are reports of poor engagement from the practitioner, mistrust, and feelings of patronisation and being devalued (McCloughen, et al., 2011; Rise, et al., 2011; Kaminskiy, et al., 2013; Castillo et al., 2017). Roe et al. (2009) found the doctor-patient relationship can influence the motivation to adhere to medication. One of their participants described their doctor as "condescending" and as such stopped using it. Rise et al. (2011) found patients did not feel respected in some interactions though themes of respect and dialogue were important to both patient and practitioner. Participants reported occasions where they were not listened to and not asked their opinion. This was also identified in Farrelly et al.'s (2015) research, whereby lack of engagement and doctors being perceived as “rude” can negatively impact the patient’s desire to try involvement.

Feelings of condescension from the practitioner also negatively influenced willingness to engage, one participant in Mahone et al.’s (2011) focus group likened their experience to “how I would discipline my kids”. This communication style feeds the power imbalance between patient and practitioner; therefore patients feel the need to comply to please the providers or for fear of reprimand, disapproval, or withholding treatment. Mahone’s team found that being treated “like a person” leads to consumers feeling valued, as though they are respected by the practitioner and empowers them to take care of themselves.

A lack of continuity of care is also referred to in these focus groups as well as Laitila et al.’s (2018) research. Some participants in Laitila’s focus groups reported repeating the same information, either to a new practitioner which led to the patient feeling not listened to or a lack of empathy, but also with new professionals which lead to frustration. Frustration regarding lack of continuity of care was also reported by Brooks et al. (2019), where one participant stated that “it’s very difficult seeing a different person every single time that doesn’t know me from Adam”.

Results from these focus groups and the past literature suggests patients do seek involvement (McCloughen, Gillies, & O’Brian, 2011), although patients acknowledge the challenges when they are in a moment of crisis. Therefore, if a good patient-practitioner relationship is built and there are mutual feelings of trust, then when in the moments of crises, the practitioner will be able to take a more authoritative stance, without hindering the relationship. As one patient in Mahone et al. (2011) stated, “it’s all about relationships”.

3.5.1.3. Where along the patients’ healthcare journey should SDM lie?

Finally, where along the patients’ healthcare journey would benefit from SDM can be answered by the ‘Ending the Cycle’ theme and comparing it to the current literature. ‘Ending the Cycle’ is built of three sub-themes; Treatment Cycle, Right Care, and

Barriers to Care, which identify where shared decisions could take place, as well as why they may or may not be perceived to be taking place.

SDM and Treatment

Participants frequently relayed a cycle of taking, changing, and stopping treatment, the reasons why they were caught in the cycle, as well as the effects of the cycle. This was typically around changing doses and medications, or even stopping them completely. When someone first sees a practitioner about mental ill-health, it can take years to acquire treatment that works for them, however they appeared caught in the cycle when the practitioner did not communicate with the patient and instead took a more authoritative stance. Further, the effects of this continual change can exacerbate symptoms, frustrating patients and may lead to learned helplessness regarding their condition.

These focus groups have identified the ability to involve patients in decisions in the diagnostic, treatment, referral and admission to hospital stages, as well as throughout the patient-practitioner interaction. Other studies have reflected these or identified other areas that may benefit from patient involvement (Klausen et al., 2016).

Most of the literature focuses on shared decisions in treatment (Mahone et al., 2011; Simon et al., 2006), but some refers to recovery (Adams et al., 2007; Coffey et al., 2016; Stacey et al., 2015; Todd et al., 2012a). However, there is variation across the literature regarding the treatment cycle. In Simon et al. (2006) for example, pharmacotherapeutic decisions, appeared as a sub-category. In their interviews, decisions to start, change or reduce medication were hindered by fear of adverse side-effects, perceptions of medication influencing personality or consciousness, addiction, or relapse. Some patients also felt a new medication may not prove effective. Simon found the fear regarding implementing a decision, such as a new treatment method, most often resulted from a lack of information about the treatment options available. Thus, a truly shared decision, that involves a practitioner identifying the treatment options available and discussing it with the patient, could reduce the fear associated with a decision.

Individual Preferences in Care

The ‘right’ care looks different to everyone, this is across the healthcare journey – from gaining a diagnosis to treatment and referral. In this group of participants, gaining a diagnosis was associated with positive care. Attitudes towards treatment methods showed variety. Some believed medication did not help, others saw great value in receiving medication, while some thought the emphasis was more on pharmacotherapeutic treatment than therapeutic. Though it is difficult finding the ‘right’ care as this looks different to everyone, involving the patient in the decisions and discussions around treatment and care can help smooth the journey.

That which constitutes as the “right care” is dependent on the individual. One individual in this focus group felt a combination of medication with specialised care was beneficial. This debate around specialised versus generalised care has been mentioned in the literature prior. In Simon et al.’s (2006) study, a similar discussion is identified. Some patients preferred to be treated by their GPs as this way it avoids the wider-societal stigma associated with specialised treatment, though it comes with limited treatment options and knowledge. On the other hand, specialist treatment may result in more adequate treatment and knowledge, resulting in a more stable health status, but comes with greater risk of stigmatization. This is reflected in Laitila et al. (2018). Therefore, the decisions-making should start even before treatment has initiated, with the decision of who to be responsible for the patients’ care.

Discussions with service users, carers, nurses, and all members of a healthcare team showed the levels of inclusions that are possible across the health service (Stacey et al., 2015). This included treatment and recovery, as well as when being entered into, and let out of, hospitals and appeals against sections. The more choice a person has, throughout their healthcare, the better outcomes, even for serious mental illness (Stanhope, Barrenger, Salzer, & Marcus, 2013).

This emphasises the importance of including the wider healthcare team, as well as the patient and practioner in decisions made (McCloughen, Gillies, & O’Brian, 2011; Rise et al., 2011; Laitila et al., 2018). Others suggest even family or friends should have the opportunity to be involved, though this will vary depending on the individual’s preferences (Stacey et al., 2015).

One study explored how service users with bipolar disorder can be supported through a self-management intervention (Todd et al., 2012a). They had 12 service users take part in a series of focus groups where four key themes were identified; recovery is not about being symptom free, recovery requires taking responsibility for your own wellness, self-management and overcoming barriers. Within the 'self-management' theme, family and friends were identified as additional means of support, thus potentially important to the decisions made (Todd et al., 2012a; Todd et al., 2012b).

Another research team reported that the family can put additional pressures on patients, putting their opinions onto the patient about whether the patient should receive help or medication. As such, actively including the family in the medical encounter may make it easier to come to an informed decision, to understand the patients' perspective alongside their social pressures, and more likely to adhere to treatment. It may also be more successful in ensuring the practitioner feels comfortable to stop treatment as it involves all individuals who may be affected or influenced (Roe et al., 2009). It has been suggested by service users that, when in moments of crisis, involving the wider team and even family can help ensure the best decision is made (Mahone et al., 2011).

In Eliacin et al. (2014), some participants reported feeling comfortable involving their friends or family in treatment decisions and believe they should be involved. However, some individuals do not wish to involve family or friends in treatment decisions, either for privacy, a lack of trust in the family member's knowledge, or trust solely placed on the practitioner. As suggested by Laitila et al., (2018) professionals should communicate with the service users to understand whether they wish to have family or friends involved in decisions made, and if so, which members should be included in the decision-making process.

Barriers to SDM Implementation

Though SDM can be implemented throughout the healthcare journey, and has been advocated for the last couple decades, it still occurs infrequently (Stiggelbout et al., 2015). Barriers to care were identified in this study, and these barriers may hinder SDM or wider care. Such barriers included stigma, access to counselling services, long waiting times, and a lack of funding for the National Health Service (NHS).

This study identified stigma from wider society as well as healthcare professionals, though focused on “playing” the benefits system. Stigma of mental ill-health has been reported by patients across the literature and creeps into play across their mental health journey (Stacey et al., 2015).

Patients have reported the specific stigma that comes with a mental health condition, there is an assumption that “their brain can’t think correctly”, therefore other people have to think for them, which is not necessarily the case (Mahone et al., 2011). In Todd et al. (2012a), 12 service users with bipolar disorder were involved in focus groups, they felt that stigma, negativity and taboo are barriers to recovery and SDM. Those with bipolar disorder felt stigmatised due to society’s ignorance about the condition. For example, one patient reported a time when their community psychiatric nurse suggested the patient keeps their diagnosis a secret.

Roe et al. (2009) reported that even stopping medication, which is an important part of recovery, brings fear of judgement. One participant reported: “people looked at me in horror, with this fear of: “what will she do to us?” As though I’m a lunatic who doesn’t take medication.” Though in Castillo and Ramon’s (2017) review article, they found that medication non-compliance may be interpreted by the practitioner as the illness, as opposed to a patient being ready to initiate steps to recovery.

Though lack of funding was identified as a barrier by several participants in this focus group, it rarely appears to feature in other similar studies. Following a systematic review of barriers and facilitators of implementing SDM in clinical practice, Légaré and colleagues identified increased cost as a barrier, however this was relating to the practical implications of introducing SDM, not identifying cost as a barrier to having the participant access the care they require and would like to have (Légaré et al., 2008).

Though cost may not be identified, the wider system support has been reported as a barrier to SDM (Mahone et al., 2011). There is a need for every part of the mental health clinic to be committed to recovery and the SDM system. This was also reflected in Laitila et al. (2018), whereby service users perceive the healthcare system to be inflexible and rigid, with different rules, such as varying referral practices. This exacerbated beliefs that no continuity of care exists. A lack of staff time and resources were also identified as barriers by patients (Laitila et al., 2018) and practitioners (McCloughen et al., 2011).

Another barrier to SDM implementation as reported in the literature stems from concerns about the ability of people with severe mental ill-health being able to make an informed decision. This barrier has different levels, some researchers find that once a person is diagnosed with mental ill-health, there is a belief they do not hold insight (Brooks et al., 2019), while some research focuses on the lack of insight as being isolated in moments of crisis (Mahone et al., 2011). One study exploring barriers and facilitators to mental health SDM from the practitioner's perspective (Chong et al., 2013) found consumers' lack of competence to participate to be a perceived barrier.

However, self-management and involvement in decisions can be a crucial part of the journey to recovery. In fact, services that do not encourage self-management may be detrimental to the patients' recovery (Todd et al., 2012a). Todd and colleagues go on to say that that when a relapse occurs or at peaks in mental ill-health, then there can be a shift towards more clinical recovery.

Mahone et al. outlines, irrespective of the mental health diagnosis, there is more support for shared decision-making in the community and healthcare for patients who are not in crisis (Mahone et al., 2011). They found that practitioners felt concerned about the consumers' competence, literacy levels, as well as insight during crisis. However, giving individuals choice about their recovery, even in moments of crisis, can help the recovery process. Hamann and Heres (2014) suggest an integrated approach for more challenging patients called SDM-PLUS. This is an approach settled between directed and SDM, as identified in figure 3.1 below (Hamann & Heres, 2014):

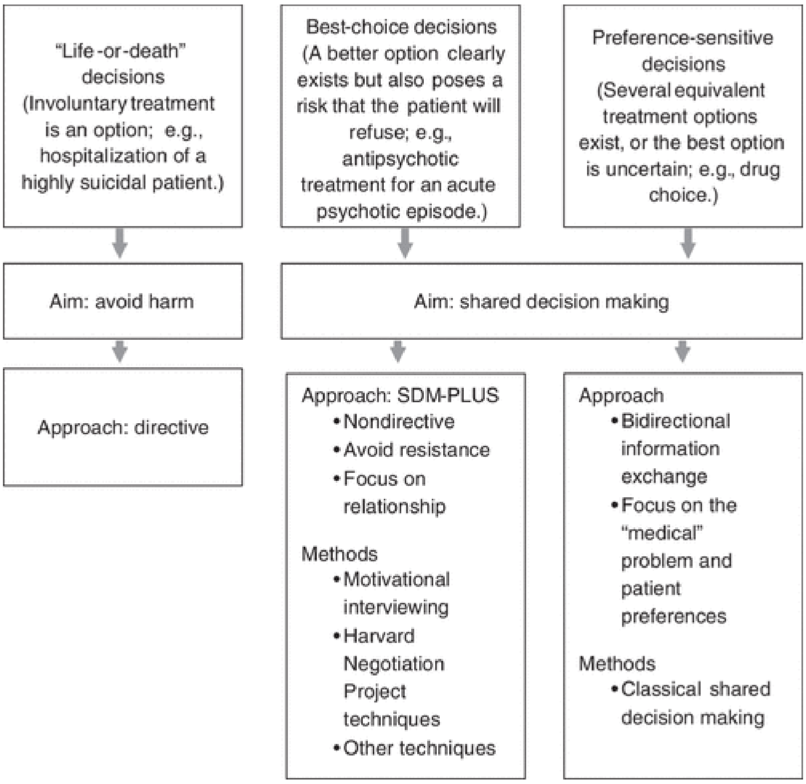

Figure 3.1: SDM-Plus as found in Hamann and Heres (2014)

Therefore, the SDM approach can be flexible even if practitioners are concerned about patients who have poor health literacy, impaired decisional or cognitive capacity, or who lack insight.

Shared decisions can, and according to patients should, occur from the start of engagement with the medical practitioner. The initial clinical encounter should relay who the patient would like to see involved in their care, be it family or wider healthcare team, it should determine who oversees the care and gauge an understanding of the level that patients wish to be involved. There is a potential for SDM to occur when making decisions about diagnosis, treatment, referral, admissions to hospital, and recovery.

3.5.2. Identification of NCpF

In addition to the NCpF that have been identified in the past literature, as highlighted in Chapter 2, it was thought to explore whether any participants identified any additional

NCpF. However, this question was not asked explicitly to patients, in order to prevent any leading responses or make them doubt the medical practitioner.

Resultantly only one person identified age as a potential factor, which is reflected in the literature (Berner et al., 2007; Pérez-Stable et al., 1990; Watts & Priebe, 2002). Another participant felt they were overlooked while other people with same ailments were being treated. However, the participant did not identify any reason this may have been the case, as such we cannot extrapolate further. This may demonstrate that, for the individuals present, patient characteristics did not impact the clinicians' decisions, or it highlights the difficulty for the patients to know whether their characteristics are impacting the clinical decisions, unless they experience explicit racism, sexism or other form of discrimination. Therefore, to study the impact of NCpF, larger samples of participants are required in order to identify patterns in decision-making, which will be explored in Chapter 4.

3.5.3. Limitations

The participants were not asked directly about their involvement in the decisions, to avoid any type of perceived judgement about the actions of the healthcare professionals involved. participants had the choice to reveal important moments in their journeys, therefore our data may be skewed towards highly negative or positive events, or events that occur.

This study is useful as it identifies what aspects of the healthcare journey patients feel are important, as well as the opportunities and challenges within each. However, this is not without its limitations. Utilising an opportunistic sampling technique is potentially prone to bias, though this sample was only accessible due to the opportunistic nature of it. As all service users are members of the local mental health charity, Swansea Mind, there is a potential for sampling bias as all may be high engagers of third sector services, individuals who do not or cannot access such services may hold different perspectives.

Gender, race, age, and familiarity with the interviewer may be confounding factors and influence the study. Such factors may impact the level of detail disclosed by interviewees, numbers of and which individuals who consent to participate in research, and the length of interview (Cleary, Mechanic, & Weiss, 1981; Herod, 1993; Padfield & Procter, 1996). Other elements such as researcher personality or clinical beliefs can also impact various aspects of qualitative study. However, so long as the research is rigorous and transparent, an insider researcher can be a strength within emancipatory research, as it can be used to understand an area from a unique perspective (Gilburt et al., 2008).

3.6. Conclusion

3.6.1 Recommendations to Research, Policy and Practice

Considering the focus groups and the wider literature, there is evidence that SDM is possible across the patient-practitioner interaction and should be incorporated in standard care practices. It was clear in our focus groups that building relationships with patients, listening and understanding their concerns, respecting their views as an "expert by experience", are all elements that the participant would like to see in their care.

Given that those who seek involvement may also be more likely to engage in research (Castillo & Ramon, 2017), research should seek to target those who are less involved to confirm the generalisability of these results. Building on Castillo and Ramon's (2017) recommendation, there are still few studies that explore patients' wishes to make decisions on their own, with minimal input from the practitioner. It would also be important to understand whether there are certain contexts in which patients would rather be involved as this may be creating another barrier in the SDM process.

In addition, accountability and legal aspects were not voiced in the focus groups here. Though these aspects are typically reported by the practitioner and not the patient in the literature (Castillo, & Ramon, 2017; Brooks et al., 2017). It may be of benefit to understand patients' views of accountability and legality when in SDM, to determine whether this concern is shared with the patients, and whether being involved in their own decisions would impact accountability, either negatively or positively.

The literature highlights that SDM is a consultation skill and may be improved across healthcare if it is taught as such. If clinicians are trained on how to share knowledge and actively listen to patients and their families/carers, and work together to create a beneficial outcome, it may improve the presence of SDM in healthcare. This will be challenging as the literature suggests clinicians believe that their decisions are shared, however the research focusing on patients highlights there is more to be done.

3.6.2 Final Remarks

These focus groups provided valuable insight into patients' mental health journeys and their interaction with practitioners. The focus groups concluded that SDM in mental health is possible and seen as positive by patients if grounded in good patient-practitioner interaction. It was clear in our focus groups that SDM requires effective communication and rapport. Only one NCpF was mentioned directly (age) as a potential to influence clinical decisions, further exploration of this will require a different methodological approach.

SDM can lie across the healthcare journey, from first interaction with the medical practitioner, through to the identification of the "right care" and beyond. This data demonstrated that decisions can be "shared" even when not perceived as such. The experience of the patient is influenced by how they are perceived to be treated by the practitioner and the extent to which they felt listened to and their concerns respected. Therefore, all interactions even if not shared should, at least, work together to build mutual trust. Positive patient-practitioner relationship and building trust can result in a positive experience, even when the safety of the participant is in question such as during moments of crisis.

As mental health is fluid and spans across the lifetime, shared decisions should be the aim at every medical interaction. What is perceived as a "shared" decision may vary between individuals, and as such should be identified early on. This is evident when discussing medication and treatment options as the patient is searching to find the "right" treatment for them in order to manage their mental ill-health, but can vary across individuals. Our participants reported being an "expert by experience", creating a picture of what they wished to see in their care (e.g. "I said look now, this is too strong for me" [#3]) and should be utilised as such.

Shared decisions can involve more than the patient and practitioner. There is an opportunity to involve the wider healthcare team and family. This can assist with moments where the 'blurring' between shared and authoritative care occurs, such as in times of crises. This way, the patient is empowered, feels safe, and always at the centre of their own care.

Practitioner-focused and healthcare-focused aspects were identified in accordance with previous research, such as a lack of empathy and resources. Therefore, a larger sample and a different study methodology may be necessary to better understand whether there is an association between NCpF and clinical decision-making. The only NCpF that was alluded to by participants as a potential influence in the practitioner's decision-making was age. As such, the following chapter will explore the associations between NCpF and clinical decisions using health and administrative data linkage techniques. The NCpF to be explored will be age (as identified in the literature review and focus-groups) as well as other demographic variables as identified in the literature and available in the SAIL databank. This will be discussed in greater detail in the following chapter.

Chapter 4: Data Science

Chapter 4 will begin with a summary of the research aims and objectives relevant to this section and their importance. It will provide a brief background to the SAIL Databank (building on Chapter 2), detailing the data sources used and the rationale for their choice over other alternatives. The research methodology will be described, and an overview of the data linkage process reported. Finally, the results of this project will be presented and discussed.

4.1. Research Aim and Objectives

The purpose of this chapter is to continue contributing to the thesis aim by focusing on the second over-arching research objective:

- To identify whether NCpF are associated with clinical decisions in treatment, diagnosis, and referral of people with mental ill-health.
    - If so, which NCpF impact clinical decisions?
    - How do the NCpF identified impact the clinical decisions in mental health?

This will be achieved by completing the following subsidiary objectives.

4.1.1. Subsidiary Objectives for Chapter 4

1. To utilise health data science, specifically a correlational (observational) research design, to explore clinical decision-making.
2. To determine the association, and direction of association, between NCpF and receiving a mental health diagnosis and receiving treatment for mental ill-health.
3. To determine whether NCpF are associated with the amount of time between gaining a referral and being seen by a mental health specialist.

Given that most research into clinical decision-making utilises qualitative or experimental research methods, this data linkage study provides unique insight into the multifactorial association between NCpF and clinical decision-making. The correlational (observational) research design, utilising data linkage and regressional analyses can benefit clinical decision-making research particularly as it utilises real-patient data, as well as counteracts the issues of generalizability and some forms of bias seen with other forms of research (Murdoch & Detsky, 2013). As will be identified later in this chapter, this research method is not without its own challenges, but used in combination with other methods, can enlighten mental health clinical decision-making research and creates a richness of data on which to inform policy and service provision.

4.2. Background

4.2.1. Secure Anonymised Information Linkage (SAIL) Databank

This study used the SAIL databank to access the health and administrative data required to fulfil the research aims and objectives. The SAIL databank (www.saildatabank.com) is an expanding data repository (around three billion records) of privacy protected anonymised person-based linkable data from healthcare and public settings to support research. Robust policies, structures and controls are in place to protect privacy through reliable matching, anonymization and encryption processes achieved in conjunction with NHS Wales using a split file approach (Ford et al., 2009; Lyons et al., 2009b). This process involves the separation of identifiable information from clinical content, identity matching and creation of anonymised linkage keys, followed by reassembling and further encryption of datasets. Figure 4.1 outlines the stages from the data source to the SAIL databank, whereby data providers split their datasets into demographic and clinical data. The demographic data are transferred to Health Solutions Wales (HSW) for anonymisation and assignment of the Anonymous Linking Field (ALF). This is transferred to the Health Information Research Unit (HIRU). The clinical data are transferred directly from the data provider to HIRU. A join-key is provided by the data provider that allows the two files to be joined to build the SAIL databank (Ford et al., 2009; Lyons et al., 2009). All data within the SAIL gateway are treated in accordance with the Data Protection Act (2017) and as such are compliant with the General Data Protection Regulation (GDPR) (SAIL Databank, 2021b).

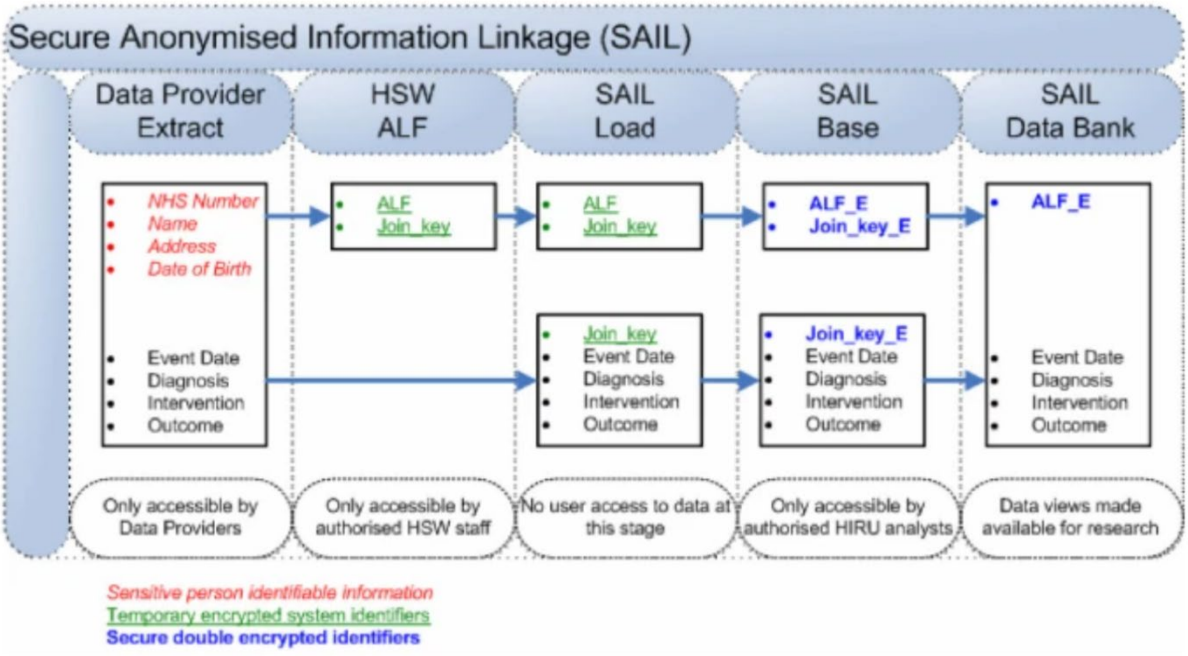

Figure 4.1: Stages from Data Source to Databank (Ford et al., 2009)

4.2.1.1. Administrative Data

4.2.1.1.1. Viable Survey Options

The SAIL databank has a plethora of administrative data available to access including; the National Survey for Wales (NSW), the Welsh Demographic Survey (WDS), the Welsh Health Survey (WHS) and the Skills and Employment Survey (SAES). In order to understand the impact of NCpF on mental ill-health, the survey selected should have; participant sex and age, an indicator of educational level, an indicator of socioeconomic status, as well as a gold-standard indicator of mental health. A diagnosed mental health condition would not be a satisfactory indicator, as the data linkage (in theory) would not show anyone without a diagnosis yet showing symptoms. It would skew the data to only those with conditions and thus the research question cannot be answered as it would not be possible to compare those with diagnoses or being treated and those with symptoms but no diagnoses or treatment.

The NSW was introduced to streamline the surveys; combining the WHS, Active Adults Survey, Arts in Wales Survey and Welsh Outdoor Recreation Survey, however it uses the Warwick-Edinburgh Mental Wellbeing Scale (WEMHWBS) instead of the Short-Form 36 (SF-36) which is a gold-standard indicator of mental health. The WHS uses the SF-36 and, as seen from Table 4.1, has all the components required to answer the research question. Therefore, the WHS was chosen as the Administrative Data for this study.

Table 4.1: Comparison of the NCpF and Mental Health Indicators between National Survey for Wales (NSW), Welsh Demographic Survey (WDS), the Welsh Health Survey (WHS) and the Skills and Employment Survey (SAES)

		NSW	**WDS**	**WHS**	**SAES**
		2012-present	*2009-present*	*2003-2015*	*1986-2017*
Mental Disorder	Gold standard indicator			X	
	Other indicator	X	X	X	
Socioeconomic status	Employment	X		X	X
	Other indicator	X		X	
Demographics	Sex	X	X	X	X
	Age	X	X	X	X
	Other indicator	X		X	
Education	Education indicator	X		X	X

4.2.1.1.2. Welsh Health Survey (WHS)

The Welsh Health Survey is a Welsh Government run, national survey that gathers information about the health of people living in Wales. It was established in 2003, and developed to meet a range of needs, including; providing estimates of health status, health related-lifestyle, health service use at a national level, and can be used to allocate resources within the NHS.

The survey is based on a representative sample of people living in private households in Wales, selected using a random sample from the Post Office's Postcode Address File. The WHS collects information on households (through a short interview) and on individuals (through a self-completion questionnaire). At each household, all adults (18 years and older) and two children maximum (16-18 years old) are eligible for inclusion. Every year, addresses sampled for the survey are added to a historical database held by the sampling agency, meaning the addresses chosen for sampling are excluded from future being approached for another survey for at least two years. This development of a historical database was only introduced in the 2005/2006 survey.

The use of the WHS came to an end in 2015, as it was merged with the NSW. The NSW is now the primary survey that records health and health-related lifestyles in Wales.

Short Form 36 (SF-36)

In the WHS, the mental and physical health of the population is recorded using the SF-36, a standardised quality-of-life measure that includes both physical and mental health scores. The SF-36 has eight dimensions; physical functioning, role limitations (physical), bodily pain, general health perceptions, energy and vitality, social functioning, role limitations (emotional), and mental health. It is a reliable and valid scale (Jenkinson, Coulter, & Wright, 1993; Matcham et al., 2016; Silveira et al., 2005), the reliability and validity of which has been demonstrated for the Welsh region (Burholt & Nash, 2011).

The Mental Health Summary Score (MHS) is the term coined for the compilation of the four mental health dimensions of the SF-36 (energy and vitality, social functioning, role limitations (emotional), and mental health), which is a validated tool to identify common mental ill-health. When this score is used independently of the physical aspects of the SF-36, it is referred to as the Mental Health Inventory (MHI-5; McHorney, & Ware, 1995). The scores range from 0 to 100 (low health score to high), with 50 being the normative score (Jenkinson et al., 1999; Von der Heyde, 2007).

Only one administrative data set was requested from the SAIL databank; the Welsh Health Survey. The entirety of this survey was requested in order to obtain non-clinical patient factors of those with a score indicative of mental ill-health. The exact cut-off for scores indicating mental ill-health has been debated, research suggests the number lies between scores less than 50 to 56 for depression, anxiety or either, with the sensitivity ranging from 58% (Silveira et al., 2005) to 92.6% (Matcham et al., 2016), specificity ranging from 71.4% (Matcham et al., 2016) to 92.0% (Silveira et al., 2005), and accuracy from 73.5% (Matcham et al., 2016) to 94.0% (Pfoh et al., 2016). Though some studies have more liberal cut-offs (<60) to ensure all patients with mental health are identified (John, McGregor et al., 2016).

The WHS came to an end in 2015. The NSW is still running, it arguably provides more non-clinical patient factors than the WHS and greater depth in other areas of health and wellbeing, given the greater number of fields. It does not however use the SF-36. Instead, it utilises the WEMHWS as the marker for mental health. While the WEMHWS is a useful tool for examining mental wellbeing, the SF-36 is a better fit to explore clinical decision-making of mental ill-health as it is a standardised tool, which has been established as a gold-standard identifier of common mental disorders.

4.2.1.2. Health Data

The health data used here were core datasets in SAIL.

4.2.1.2.1. General Practitioner Dataset (GP Dataset)

This dataset contains attendance and clinical information for all GP interactions including symptoms, diagnoses, and prescriptions. GP practices opt-in to supplying SAIL with data. Currently 333 practices (out of 432 in Wales) contribute regularly updated data covering 77% of GP practices and 79% of the population (above 70% threshold for acceptable response in prevalence studies (Boyle, 1998)). The population covered by the data are representative of the population as a whole in terms of sex (all Welsh practices 50% male; SAIL supplying practices 50% male) age range (all Welsh practices 20% aged 0-17 years, 60% aged 18-64 years, 20% aged 65+; SAIL supplying practices 20% aged 0-17 years, 61% aged 18-64 years, 19% aged 65) and deprivation indices (all Welsh practices 19% most deprived fifth, 18% least deprived fifth; SAIL supplying practices 20% most deprived fifth, 19% least deprived). Different practices contribute varying numbers of records, averaging around 5,000 per practice, though the range is between 1,000 and 30,000 (SAIL Databank, 2019). Data are usually recorded by the clinician during the patient consultation, though test results are electronically transferred from secondary care systems. Typically, Read codes are used though sometimes local codes are recorded. Read codes are a coded thesaurus of clinical terms (NHS Digital, 2020). They have been used in the NHS since 1985 and are widely used in primary care. Read codes provide a standard vocabulary for GPs to record diagnoses, symptoms, procedures, tests, prescriptions, referrals and administrative activity (NHS Digital, 2020).

4.2.1.2.2. Patient Episode Database for Wales (PEDW Dataset)

This dataset contains clinical information for all NHS Wales hospital admissions (inpatient and day cases) including data regarding diagnoses, operations performed and admission specialty (SAIL Databank, 2021a). A hospital admission in this study refers to period of continuous care whilst admitted to hospital (spell of care). This can encompass multiple episodes of consultant care and reflects a patient's stay in hospital. This includes both inpatient and day cases and encompasses all consultant specialities. It is not possible to distinguish dedicated psychiatric hospitals from general hospitals however, data regarding the broad speciality under which an individual is admitted is available. It holds approximately 950,000 hospital admissions per year, from 1997 until present. The data are at an individual level, collected and coded at each hospital. Administrative information is collected from the central patient administrative system, such as speciality of care, admission and discharge dates. After the patient is discharged, the hand-written patient notes are transcribed by a clinical coder into medical coding terminology (International Classification of Diseases 10 and 11 (ICD10/11) and the Office of Population Censuses and Surveys Classification of Surgical Operations and Procedures (OPCS, N.D.).

4.2.1.2.3. Emergency Department Dataset (EDDS Dataset)

The EDDS dataset contains administrative and clinical information for all NHS Wales Accident and Emergency (A&E) Department attendances. Data are available from August 2009 onwards. Data are collected at the individual level and coded at each hospital. There are approximately 750,000 attendances per year, and records span from 2009 until present day. This data uses EDDS-specific coding, a standard coding system employed across emergency departments in Wales grouping by attendance type and diagnosis (NHS Digital, 2021). Emergency department coding systems do not contain the same level of diagnostic detail as Read codes and ICD-10 and as such, it is not possible to choose codes equivalent to those available in Read or ICD-10.

4.2.1.2.4. Outpatient Referral Data (OPR dataset)

The OPR dataset contains attendance information for all NHS Wales hospital outpatient appointments from 2004 onwards. It is collected and stored in SAIL monthly, submitted by the Local Health Boards. It holds a complete referral pathway to secondary care, including referrals received from the GP, general dental practitioners, A&E departments, self-referrals, walk-ins and emergency patients. Within SAIL, this tends to have approximately 1,000,000 records per year, at the individual level. OPR-specific coding is used, which does not contain the same level of information as Read or ICD-10 codes, it is coded by specialty rather than diagnosis.

4.2.1.2.5. Annual District Death Extract Data (ADDE dataset)

Mortality statistics have been collected by the General Register Office since 1837. The Annual District Death Extract dataset is now owned by the Office for National Statistics (ONS), they register all deaths relating to Welsh residents, including those who died outside of Wales. The data are collected from death registrations and holds person-level information. There are approximately 550,000 records across England and Wales per annum. The key census variables recorded are age, date of birth, nationality, country of birth, marital status, sex, and cause of death.

4.3. Methods

4.3.1. Study Design

This was a correlational (observational) research design. The WHS data derived from the 2011, 2013 and 2014 waves that are available in the SAIL databank was used; along with certain aspects of health data provided in the GP, hospital, A&E, outpatient and death datasets. This has been reported in accordance with the Reporting of Studies

Conducted using Observational Routinely Collected Health Data (RECORD; Benchimol et al., 2015).

4.3.2. Ethics

The WHS dataset, with selected variables for this analysis, was supplied and permission given to use the data by the Welsh Assembly Government. Consent for linkage is not required in situations where the linkage is occurring within large and de-identified datasets according to the Data Protection Act (2018), however ethical approval was sought and approved by the Swansea University Medical School Research Ethics Sub-Committee (project number: 2018-0011). Additional ethical checks were conducted and approved through SAIL's Information Governance Review Panel (IGRP; project number: 0822, Appendix 5). It was essential for the IGRP process to be conducted and completed prior to accessing the SAIL electronic health records (EHR). Once completed, a project number was provided and access to data within the SAIL platform granted. Ethnicity was requested but not granted due to risk of identification. Additional permissions were requested following data retrieval to grant access to ethnicity data but not granted.

4.3.3. Data Sources and Measures Used

The administrative and health data were accessed from within the Secure Anonymised Information Linkage (SAIL) Databank.

The following patient-level linked datasets were utilised for this analysis; Welsh Health Survey, General Practice Database, Emergency Department Dataset, Patient Episode Database for Wales, Outpatient Data, Office of National Statistics Death Data. Each of these are briefly outlined below, but full details can be found at www.saildatabank.com.

The specific measures used within each data source are identified below:

4.3.3.1. Welsh Health Survey (WHS) 2011, 2013 and 2014 Waves

a. Individual demographics: sex, age-bands, socio-economic status (5-item National Statistics Socio-economic Classification (NS-SEC5) and 3-item Economic Activity Status (ECSTAT-3), work status, and highest qualification level

b. Mental Health Outcome Measure: SF-36 Mental Health Score (MHS), SF-36 Mental Component Score (MCS).

SF-36 scores were capped at 50 for a conservative approach.

4.3.3.2. General Practitioner Dataset

a. Depression, anxiety, and mixed depression-anxiety diagnoses

b. Depression and anxiety symptoms

c. Antidepressant, hypnotic and anxiolytic prescriptions as treatments

d. Number of mental health diagnosis, symptom and treatment events recorded

Validated diagnostic and treatment Read code lists were used for anxiety, depression and both anxiety and depression (Cornish et al., 2016; John et al., 2015; John, Marchant et al., 2016).

4.3.3.3. Patient Episode Database for Wales

a. Depression and anxiety diagnoses (any position in the diagnostic list)

b. Number of treatment and diagnostic events

4.3.3.4. Emergency Department Dataset

a. Psychological and psychiatric conditions

b. Recorded patient diagnoses during study period

4.3.3.5. Outpatient Referral Dataset

a. Mental health consultant referral

b. Number of different events

c. Days between referral and consultant

4.3.3.6. Annual District Death Extract Dataset

a. Date of death

4.3.4. Study Population

The purpose of this research was to determine whether NCpF impacted clinical decisions. Therefore, it was necessary to first select those identified as having mental ill-health by the SF-36 then split this group into those with, and those without clinical mental health records. Those individuals who scored over 50 in the SF-36 did not appear to have any mental ill-health, therefore comparing these to those who were identified as having mental ill-health does not answer the research question, instead it seeks to observe whether NCpF are relating to differences in having good or poor mental health, not differences in clinical decisions. By isolating those with a score of less than 50 the whole cohort should, theoretically, have some mental ill-health EHR. If they do not have an EHR, it could be because of NCpF impacting the clinician’s clinical decisions and that is what the research sought to determine.

Therefore, participants who completed the WHS (over 16 years) waves 2011, 2013 or 2014 WHS were first identified. Then, the individuals with a mental health summary score of less than 50 were selected for data linkage, as this was the cut-off for an indicator of common mental ill-health that Ware (1993) proposed, further, this score has a high sensitivity, specificity and accuracy (Ware, 1993). Therefore, the risk of false-positive errors is minimised. Figure 4.2 shows a flow-chart describing the process of identifying the final study population of 2,770 for analysis, and the number of records at each stage of the process. The lifetime records for these 2,770 unique individuals were selected.

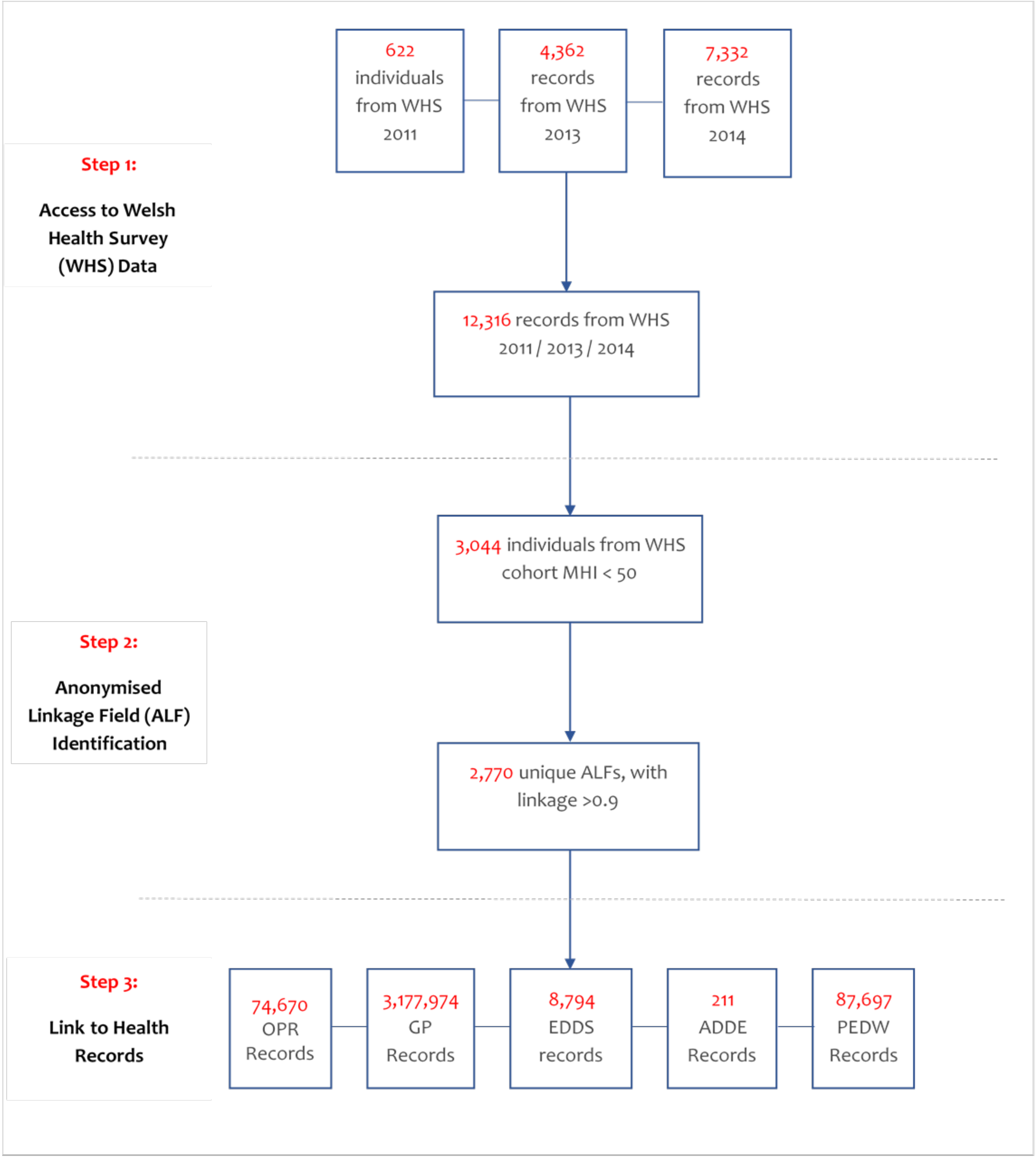

Figure 4.9: Flowchart of Study Population

4.3.5. Statistical Analysis

Outputs analysed used descriptive, binary and multinomial modelling. The NCpF explored were sex, age, socioeconomic status (socioeconomic classification, level of socioeconomic activity, employment), education (highest qualification) and number of GP visits. The descriptive statistics were calculated, Binary logistic regressions were used to assess the odds of a diagnostic or treatment decision being made based on the independent variables. Binary logistic regressions were conducted before collating all independent variables into multinomial logistic regressions to explore the influence of NCpF on diagnosis (Section 5.5.2) and treatment (Section 5.5.3) respectively.

The dependant variables for the logistic regression were presence of mental health diagnosis in GP data and the presence of mental health treatment in GP data. A logistic regression was deemed the most appropriate analysis as the dependant variable (i.e. presence of mental ill-health in health records) was binary (yes/no) and the independent variables (demographics, SES and GP events) ware categorical. This method of analysis has been used in similar research, such as one study which explored patient characteristics associated with treatment initiation among paediatric patients with ADHD symptoms and results here are reported in a manner that reflects this study (Hong et al., 2014).

Finally, a Cox Proportional-Hazards Regression was used to explore the impact of NCpF on time-to-referral (Section 5.5.4) as this type of regressional analyses is appropriate for both quantitative predictor variables and for categorical variables, it can also assess the effect of several risk factors on survival time (or in this instance, time-to-referral) simultaneously. All analyses were conducted using R version 3.5.3. All results presented here underwent examination and received permission to be withdrawn from the SAIL Platform.

4.4. Data Preparation and Linkage

4.4.1. Access to the Secure Anonymised Information Linkage Platform

The programme Eclipse (version 2019-03, 4.11) was used to view the data. Eclipse had the ability to be set to differing ‘perspectives’ which allow the user to set which driver is used. SQL DB2 iSeries/AS 400 was selected for the data preparation and linkage stage of this project. The project view schemas within SAIL are the original, de-identified datasets and cannot be edited or manipulated. Every project within SAIL is provided with another schema – the working schema, whereby the original tables can be edited without risk of losing the original data. As there is no identifying information in the data, ALFs are used to indicate one person. As ALFs indicate one person, and are consistent across datasets, the record can be linked using the ALF identifier. In accordance with the guidelines of using anonymised health data, should any values be less than five, it would not be possible to withdraw these results from the SAIL platform. As such any values of less than five have been suppressed.

4.4.2. Data Preparation

4.4.2.1. Welsh Health Survey Preparation and Linkage

The first task of this project was to identify the cohort of individuals who scored less than 50 on the SF-36, as this is an indicator of common mental ill-health, in order for them to be linked to their own health data. Using DB2, the project view schema presented the three separate WHS 2011-2014 cohorts. The ALFs are used to represent an individual, these ALFs are used to link across datasets.

After dataset familiarisation, the three WHS tables were joined. The 2011 and 2013 waves joined cleanly, however wave 2014 appeared to have an extra column recording how long ago the participant stopped smoking. As this was unrelated to our research, this column was dropped. Then, the 2014 wave joined to the other two without further issue.

After the three waves were joined, there were a total of 12,316 ALFs. The next stage was to isolate those who had low mental health scores from those with higher mental health scores. Within SAIL, two mental health scores were present, a more liberal mental health score (MHS) and a more conservative mental component score (MCS), both of which have high levels of sensitivity, specificity and accuracy of identifying mental health disorders. Of the 12,316 ALFs, 3,044 had a MHS of <50 or a MCS of <42. Including both the MCS in addition to the MHS was done to ensure any ‘borderline’ mental health identification, as this research chose a more conservative approach to cut-off.

A list of these 3,044 ALFs were then sent back to the SAIL administration team, to identify and return the lifetime GP, hospital, emergency department, out-patient and death data of these individuals.

Once access to the health data was granted, the 3,044 cohort was decreased to 2,770, as the data was checked to ensure there were no duplicates and all ALF matches had a 0.9% match rating or higher. As a result, only unique ALFs and those with either a deterministic match, or probabilistic match of >0.9% were retained. A diagram describing the matching process can be seen in Figure 4.3.

Then, a ‘spine’ of the cohort was created, using only the ALFs. This acted as the foundation to build a table with all the information required from each dataset. From the combined WHS table, sex, age (5-year bands), MHS, MCS, work, education level, NS-SEC5, and ECSTAT-3 were taken. The list of categories for each factor is in Table 4.2.

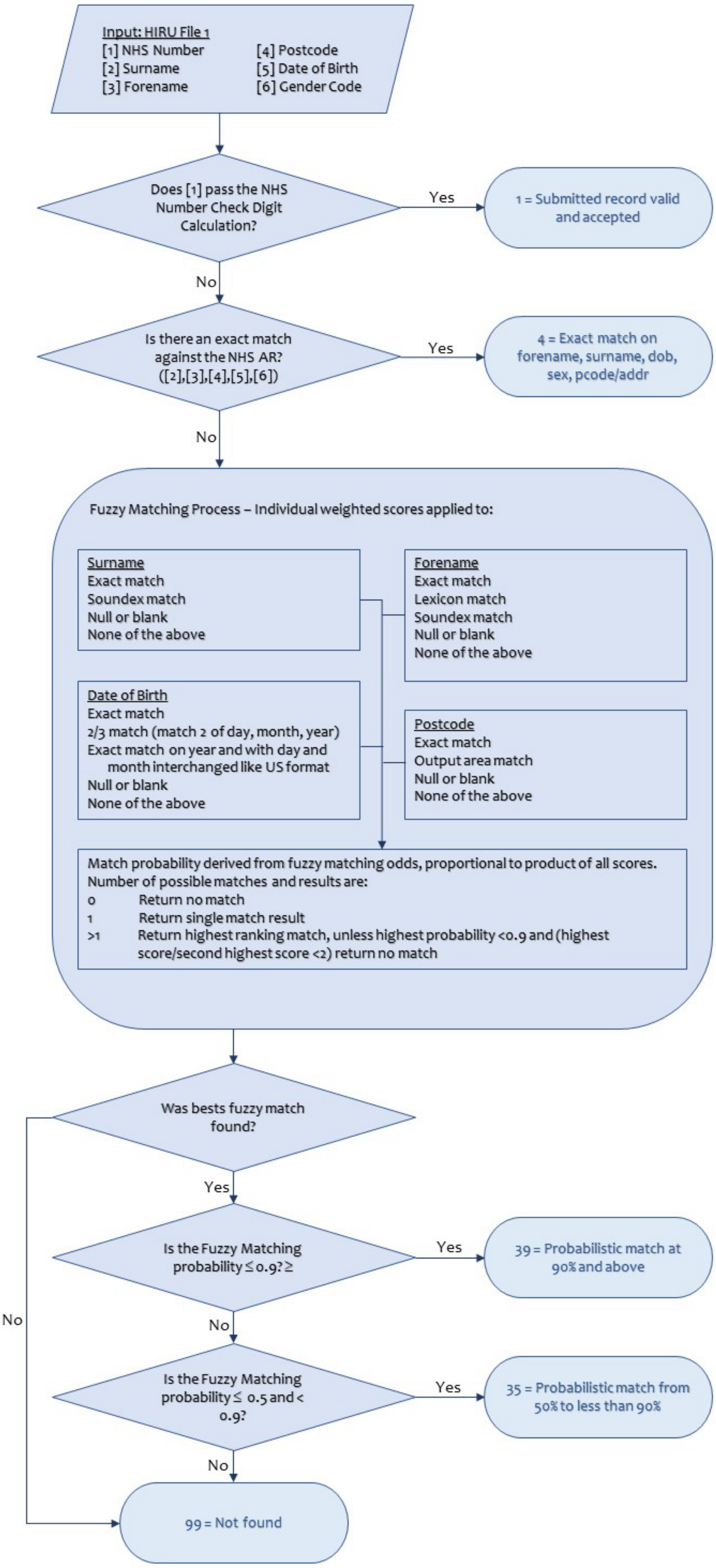

Figure 4.3: Matching Process

Table 4.2: Overview of Factors and Categories

Group	Factor	Categories
Demographics	Sex	Male Female
	Age	16-20 21-25 26-30 31-35 36-40 41-45 46-50 51-55 56-60 61-65 66-70 71-75 75+
	Education	No qualifications Other Qualifications Degree or higher No response
SES	Employment	In paid (self-) employment (or away temporarily) Looking for paid work or a Government Training Scheme Waiting to take up paid work already obtained Going to school or college full-time (including on vacation) Doing unpaid work for a business you or a relative owns On a government scheme for employment training Intending to look for work but prevented by temporary sickness or injury (less than 28 days) Permanently unable to work due to long-term sickness/disability Retired from paid work Looking after the home or family Doing something else No response
	NS-SEC5	Higher managerial and professional occupation Intermediate occupations Small employer Lower supervisory and technical occupations (Semi) Routine occupations Long-term unemployed No Response
	ECSTAT-3	In employment Unemployed Economically inactive No response

Once the 'spine' was created with the WHS information, the anonymised health data were linked one dataset at a time to build up to one complete dataset.

4.4.2.2. General Practitioner Data Preparation and Linkage

The GP data was prepared first, given this had the greatest number of records, greatest number of complete records, and has been used most frequently for research. This data was presented differently to the WHS as the ALFs were in a separate table from the event and patient data. Therefore, the tables were linked on source extract, practice ID and local number ID, as guidelines recommend. The GP data uses Read codes to categorise diagnoses, symptoms and treatment.

Validated diagnostic Read code lists for anxiety, depression and mixed (anxiety and depression) were used (Cornish et al., 2016; John, Marchant et al., 2016). It was possible to link depression, anxiety, and mixed (a Read code that identifies both depression and anxiety) diagnoses to the ALFs in our foundation table (with the necessary WHS information). There were symptom Read codes as well for anxiety and depression, which were also identified and linked to the foundation table. Finally, treatment Read codes for depression and anxiety were also linked. The treatment codes here were antidepressants, hypnotics and anxiolytics in accordance with the Read codes identified in John (2016) and Cornish (2016). A full list of the Read codes used can be seen in Appendix 6.

After identifying treatment, it was thought to determine whether the diagnostic or treatment incident occurred before the individual completed the WHS, during the year the WHS was running, or after completing it. This was done to gain a better picture of the timeline of diagnosis, treatment or symptoms. As such, death date was brought into the foundation table to exclude those who die in any of the timeframes. Less than 5 people died during the research period, specifically in the 2014 ‘after’ cohort.

Errors were identified when checking the data. The earliest record in the dataset was 0001-01-01 and the oldest record was 2085-01-01, potentially due to data-entry errors or system malfunction. Given EHR only started coming to the forefront of health data recording since mid-1990’s, and the SAIL reliable data runs from 2000’s, setting accurate timepoints for ‘before’, ‘during’ and ‘after’ periods with each SF-36 wave was necessary for reliability. This is important because though an individual may have a mental health condition, mental ill-health is fluid. Therefore, if someone was diagnosed earlier in their life, they may be mentally well at different points in time. As the SF-36 responses were ‘within the last 4 weeks’, and ran between January-December of the year, the ‘during’ was identified first. Then, as with other studies that examine a year over a population, 24 months were used as the ‘before’ and ‘after’ timelines. Overviews of the dates are in Table 4.3 below:

Table 4.3: Overview of Timeline Dates

	2011	2013	2014
Before	01/12/2007 – 30/11/2010	01/12/2009 – 30/11/2012	01/12/2010 – 30/11/2013
During	01/12/2010 – 31/12/2011	01/12/2012 – 31/12/2013	01/12/2013 – 31/12/2014
After	01/01/2012 – 31/12/2014	01/01/2014 – 31/12/2016	01/01/2015 – 31/12/2017

Whether someone attended the GP with a mental health related query before, during or after completing the WHS was recorded in the foundation table. Upon further exploration, this was disregarded from analysis due to too small numbers. Further, given that this research seeks to understand the influence of NCpF on mental health clinical decisions – this can, and should, be explored across the lifetime.

The final step was to count the total number of GP events (both mental health and physical health) to determine whether number of GP visits is associated with diagnosis and treatment likelihood. Once this was completed, the next stage was to repeat this process with hospital data.

4.4.2.3. Patient Episode Database for Wales Preparation and Linkage

Hospital data was also provided with separate tables displaying varying information, requiring linkage across. Five schema view tables were provided for PEDW: Diagnosis, Episode, Operations, Spell and Superspell. The ‘operations’ schema was deemed not relevant to this research, as was ‘superspell’. Operations provide no mental health related information and strays from the research question, while superspells are not always used when recording data given their niche nature as they link interhospital transfers (Aylin et al., 2018), therefore spells and episodes hold a greater likelihood of storing information relevant to this research.

Within PEDW a 'hospital spell' is one entry into hospital i.e. someone falls down the stairs and attends hospital would be one spell. An 'episode' is each speciality within this, i.e. a patient may see a fracture doctor as well as a head injury specialist, therefore there are two episodes under the one spell (Rees et al., 2019). The PEDW diagnosis, episode and spell tables were linked on the Unit Code, Spell Number and Episode Number.

From this combined PEDW table, depression and anxiety diagnoses were identified. The ICD10/11 codes do not have symptoms or treatment codes in the way that Read codes do, so only the depression and anxiety codes were used. The total number of separate mental health events was recorded into the foundation table, as was one's attendance to a non-specialist mental health consultant.

4.4.2.4. Emergency Department Data Preparation and Linkage

Within SAIL only one table contained emergency department data, therefore a limited amount of preparation was required. One code encompasses all psychological and psychiatric conditions; 21z. There are other codes that may relate, 'diagnosis type not otherwise specified', 'diagnosis not recorded' or 'social problems/homelessness, other or unspecified' however these codes may be tangential to our target population, therefore only those with the coded psychological and psychiatric conditions ("21z") were used. EDDS has treatment codes, however none of these explicitly refer to mental health. Mental health treatment may fall into; 'guidance/advice only', 'observation', or 'treatment not otherwise stated' but including these may skew the results given the plethora of reasons one may code an interaction as these, as such, no treatment records from this dataset were included in our foundation table.

4.4.2.5. Outpatient Referral Data Preparation and Linkage

Three datasets were provided for outpatient records; outpatient (which contained demographics, attendance information and consultant codes), outpatient diagnosis (which contained diagnosis codes for each case), and outpatients operation (operation information). These datasets were joined using the case number, person attendance ID and unit code. These were not joined as only the 'outpatient' dataset provided useful information to this study. No mental health outpatient codes were identified in the dataset, potentially as the data records were incomplete. As operation data was not required, the only dataset that may provide useful was the outpatient data. The data input into the foundation table was whether a patient saw a mental health consultant (and number of different occasions that they saw one), whether they did not attend a consultation, the total number of consultations had, and the amount of time between each consultation event.

4.4.2.6. Annual District Death Extract Data Preparation and Linkage

One table was provided for ADDE data. The only column of interest for this study within the dataset was the date of death for the individuals. The death data was used for two research objectives, as mentioned prior, to determine whether the diagnostic or treatment incidence occurred before, during, or after completion of the WHS. However, this was not examined in greater depth given the extremely small sample sizes. The other research objective the death data was used for, as a censor in the time-to-referral Cox Proportional-Hazards Regression.

4.5. Results

4.5.1. Descriptive Statistics and Overview of Inferential Statistics

The lifetime records of 2,770 participants were identified, all of whom had WHS score of less than 50 indicating mental ill-health, 1,743 (62.9%) of these participants were identified as having mental health-related EHR (Figure 4.4). Those identified as having mental health-related healthcare records ('EHR MH Record') were compared with those who were identified by the SF-36 but did not have any mental health related records ('WHS Record Only'). Breakdowns of the NCpF descriptive can be seen from tables 4.4 and 4.5 below.

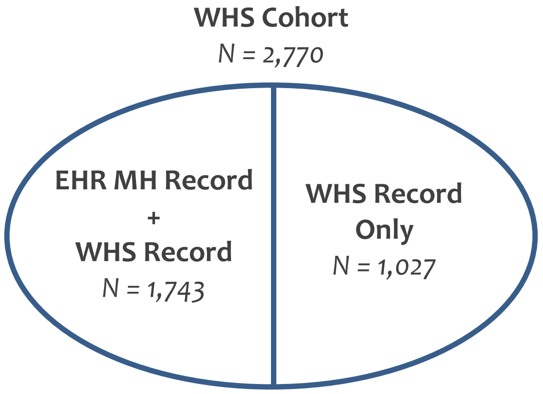

Figure 4.11: Diagrammatic description of cohort split

Table 4.4: Overview of Participants with an Electronic Mental Health Record (EHR MH) as Compared to Those with Only a Welsh Health Survey (WHS) Record Separated by Demographics (Age, Sex and Education)

			EHR MH Record		**WHS Record Only**		*Cohort Total*	
		WHS Label	**N**	**%**	**N**	**%**	*N*	*%*
Sex	**1**	**Male**	610	35.0	462	*45.0*	*1072*	*38.0*
	2	**Female**	1133	65.0	565	*55.0*	*1698*	*62.0*
		Total	*1743*	*63.0*	*1027*	*37.0*	*2770*	*100.0*
Age	1	**16-20**	55	3.0	40	4.0	*95*	*3.0*
	2	**21-25**	89	5.0	75	7.0	*164*	*6.0*
	3	**26-30**	106	6.0	73	7.0	*179*	*6.0*
	4	**31-35**	111	6.0	71	7.0	*182*	*6.0*
	5	**36-40**	121	7.0	68	7.0	*189*	*7.0*
	6	**41-45**	167	10.0	102	10.0	*269*	*10.0*
	7	**46-50**	173	10.0	93	9.0	*266*	*10.0*
	8	**51-55**	155	9.0	88	9.0	*243*	*9.0*
	9	**56-60**	161	9.0	92	9.0	*253*	*9.0*
	10	**61-65**	173	10.0	75	7.0	*248*	*9.0*
	11	**66-70**	148	8.5	76	7.0	*224*	*8.0*
	12	**71-75**	102	6.0	56	5.5	*158*	*6.0*
	13	**75+**	182	10.5	118	11.5	*300*	*11.0*
		Total	*1743*	*63.0*	*1027*	*37.0*	*2770*	*100.0*
Education	-9	**No Response**	118	7.0	61	6.0	*179*	*6.5*
	0	**None**	469	27.0	234	23.0	*703*	*25.0*
	1	**Other**	972	56.0	575	56.0	*1547*	*56.0*
	2	**Degree**	184	10.0	157	15.0	*341*	*12.5*
		Total	*1743*	*63.0*	*1027*	*37.0*	*2770*	*100.0*

Table 4.5: Mean SF-36 Mental Health Scores (MHS) and Mental Component Scores (MCS) for Men and Women from the Welsh Health Survey (WHS)

	MHS	MCS
Male	44.3	44.5
Females	24.0	23.4

4.5.1.1. Demographic Descriptive Statistics

Table 4.4 displays the sex, age and education descriptive statistics for participants, separated by those who have mental health records and those with only a WHS record.

For sex, there were a greater number of women than men in total, with men having a slightly lower percentage of mental health records. Mean MHS did not indicate any difference in mental health severity by sex (Table 4.5). Table 4.4 also shows that most participants fall in the over 75 age band, the least number of participants are below the age of 40 years old.

For education, the highest qualification of participants was identified for those individuals with any mental health record across all health data and compared it to those with only a WHS record. Most people appear to have either GCSEs or A-levels or the college equivalent as their highest level of qualifications. The least number of people held a degree and the time of the surveys.

4.5.1.2. Socioeconomic Status Descriptives

There were two socioeconomic status measures in the WHS; the NS-SEC5 (socioeconomic classification) and the ECSTAT3 (level of socioeconomic activity), in addition to an 'Employment' measure. For the latter, two options were merged for the outputs (#4 and #5) to ensure no potentially identifiable information was leaked in accordance with the SAIL data access agreement. All scores for participants can be seen in Table 4.6 comparing those with any mental health record across all health data compared to those with only a WHS record, separated by the SES demographic. The majority of people fall under the socioeconomic classification category 'higher managerial and professional occupations' (#1) and '(semi) routine occupations' (#5). While for level of socioeconomic activity the majority of participants are 'economically inactive'. These findings can be explained by looking at the Employment measure whereby the majority of participants are 'looking for paid work or training' (#2), 'permanently unable to work due to long-term sickness or injury' (#8), and 'retired from paid work' (#9). It is most likely a result of the data collection method for the survey, as it most likely will have been recorded during a weekday, conducted by a member of staff from the Welsh Government, therefore the sample may be skewed towards those who are typically home during the week.

Table 4.6: Overview of Participants with a Mental Health (MH) Record as Compared to Those with Only a Welsh Health Survey (WHS) Record Separated by Socioeconomic Status work position (NS-SEC5), Level of Economic Activity (ECSTAT3) and Employment Position

			EHR MH Record		**WHS Record Only**		*Cohort Total*	
		WHS Label	**N**	**%**	**N**	**%**	*N*	*%*
NS-SEC5	-9	**No Response**	37	2.0	29	3.0	*66*	*2.0*
	1	**Higher Managerial and Professional Occupations**	480	27.5	334	32.5	*814*	*29.5*
	2	**Intermediate Occupations**	130	7.5	63	6.0	*193*	*7.0*
	3	**Small Employers**	147	8.5	114	11.0	*261*	*9.5*
	4	**Lower Supervisory and Technical Occupations**	248	14.0	149	14.5	*397*	*14.0*
	5	**(Semi) Routine Occupations**	625	36.0	314	30.5	*939*	*34.0*
	8	**Long Term Unemployed**	76	4.5	24	2.5	*100*	*4.0*
		Total	*1743*	*63.0*	*1027*	*37.0*	*2770*	*100.0*
ECSTAT3	-9	**No Response**	63	4.0	38	4.0	*101*	*4.0*
	1	**In Employment**	536	31.0	428	42.0	*964*	*35.0*
	2	**Unemployed**	54	3.0	28	3.0	*82*	*3.0*
	3	**Economically Inactive**	1090	62.0	533	52.0	*1623*	*58.0*
		Total	*1743*	*63.0*	*1027*	*37.0*	*2770*	*100.0*
Employment	-9	**No Response**	63	4.0	38	4.0	*101*	*4.0*
	1	**In paid employment**	62	3.5	64	6.0	*126*	*4.5*
	2	**Looking for paid work or training**	509	29.0	416	40.5	*925*	*33.0*
	3	**Waiting to take up paid work already obtained**	18	1.0	7	1.0	*25*	*1.0*
	4 + 5	**Full-time school or college / Doing unpaid work for a business you or a relative owns**	18	1.0	8	1.0	*26*	*1.0*
	6	**On a government Training scheme**	45	2.5	25	2.5	*70*	*2.5*
	7	**Temporary sickness or injury (28 days or less)**	30	2.0	11	1.0	*41*	*1.5*
	8	**Permanently unable to work due to long-term sickness or injury**	382	22.0	126	12.0	*508*	*18.5*
	9	**Retired from paid work**	400	23.0	211	20.5	*611*	*22.0*
	10	**Looking after the home or family**	158	9.0	94	9.0	*252*	*9.0*
	11	**Doing something else**	58	3.0	27	2.5	*85*	*3.0*
		Total	*1743*	*63.0*	*1027*	*37.0*	*2770*	*100.0*

4.5.1.3. GP Visits Descriptives

Table 4.7 displays the total number of GP visits of participants, with any mental health record across all health data as compared to those with only a WHS record. The majority of people with an EHR mental health record have between 1001 and 2500 events, which is consistent with Table 4.7 as there are a large percentage of those who have completed the survey are sick or unable to work. As expected, those who have EHR MH records have more GP events than those without. For the WHS only record, 650 participants had no events.

Table 4.7: Total GP Visits

	EHR MH Record		**WHS Record Only**		*Cohort Total*	
	N	**%**	**N**	**%**	*N*	*%*
No events	50	4.0	650	41.0	*700*	*25.5*
1-100 events	28	2.0	126	8.0	*154*	*5.5*
101-500 events	189	16.0	258	16.0	*447*	*16.0*
501-1,000 events	278	23.5	174	11.0	*452*	*16.5*
1,001-2,500 events	394	33.0	219	14.0	*613*	*22.0*
2,501-5,000 events	206	17.5	138	9.0	*344*	*12.5*
5,000 + events	44	4.0	16	1.0	*60*	*2.0*
Total	*1189*	*63.0*	*1581*	*37.0*	*2770*	*100.0*

4.5.2. NCpF and Diagnosis

This section reports the association between sex, age, socioeconomic status (socioeconomic classification, level of socioeconomic activity), education (highest qualification), number of GP visits, and employment (position held in work), and receiving a diagnosis. A binary logistic regression model was built, the significant results for the binary logistic regression and final-stage of the multinomial analysis are reported here while the full diagnostic multinomial model can be found in Appendix 7.

4.5.2.1. The Association Between NCpF and Diagnosis

In order to predict the odds of diagnostic decision (dependant variable) being made based on each individual NCpF (independent variables) a binary logistic regression was conducted. This was used to highlight which NCpF to take into the multinomial logistic regression model. A simple logistic regression was deemed most appropriate given the binary dependant variable and categorical independent variables (as highlighted in Section 5.2.2.4.). The individual NCpF were sex, age, education, socioeconomic status (NS-SEC5 scores, ECSTAT3 scores, employment position), and health factors (GP visits, symptoms recorded). The odds ratio, 95% upper and lower confidence interval and significance are reported in accordance with other research in this area (Hong et al., 2014).

Demographics and Diagnosis: Binary Logistic Regression

Females were approximately 1.8 times more likely to have a diagnosis than males (Table 4.8). Qualification did not show significance so results not displayed.

The age bands shown in Table 4.8 were unchanged from those allocated by the Welsh Government upon completing the WHS. Logistic regression analyses work by comparing the youngest group (16-20) to the other age groups. The likelihood of diagnosis varied between age-bands. From the table below, it can be seen that people aged 26-30 were 1.7 times more likely to have a diagnosis than their 16-20 counterparts. While those aged 31-35, 41-45, and 46-50 were approximately 1.8 times more likely to have a diagnosis. Those in the 56-60 and 61-65 age band were about 1.9 times more likely to have a diagnosis, while those between 36-40 years old were over 2 times more likely to have a diagnosis than those in the other age bands. This has not yet been adjusted for any of the other variables, which were done in the multinomial regression following the binary regressions.

Table 4.8: The Significant Logistic Regression Results for Demographics (Sex, Age and Education)

	Category	O.R. (95% CI)
Sex	Female	1.8 (1.5 - 2.1)[b]
Age	26-30	1.8 (1.1 - 3.0) [a]
	31-35	1.9 (1.1 - 3.1) [a]
	36-40	2.0 (1.2 - 3.5) [b]
	41-45	1.8 (1.1 - 3.0) [a]
	46-50	1.8 (1.1 - 3.0) [a]
	56-60	1.9 (1.2 - 3.1) [a]
	61-65	2.0 (1.2 - 3.3) [b]
Education	-	-

a. significant at 0.01
b. significant at <0.01

Socioeconomic Status and Diagnosis: Binary Logistic Regression

The only group within the NS-SEC5 SES classification that showed significance was for small employers. As shown in Table 4.9, small employers were about half as likely to have a diagnosis. The level of socioeconomic activity (ECSTAT-3) failed to show significance so results are not displayed here. The results of Table 4.9 suggests if someone was in paid employment or retired from paid work, they were half as likely to have a diagnosis, while if they were permanently unable to work they were 1.5 time more likely to have a diagnosis.

Table 4.9: The Significant Binary Logistic Regression Results for Socioeconomic Classification

	Category	O.R. (95% CI)
NS-SEC5	Small Employer	0.6 (0.3 - 1.0) [a]
ECSTAT3	-	-
Employment	In Paid or Self-Employment	0.5 (0.3 - 0.8) [b]
	Permanently unable to work due to long-term sickness/disability	1.6 (1.0 - 2.4) [a]

a. significant at 0.01
b. significant at <0.01

Number of GP Visits and Diagnosis: Binary Logistic Regression

Increased attendance to the GP was associated with a greater likelihood of diagnosis, as was recording symptoms (Table 4.10).

Table 4.10: The Significant Binary Logistic Regression Results for Health Factors

	Category	O.R. (95% CI)
Number of GP Events	1-100 events	2.9 (1.7 - 4.7) [b]
	100-500 events	9.5 (6.8 - 13.5) [b]
	500-1k	20.8 (14.8 - 29.6) [b]
	1k-2500	23.4 (16.9 - 32.9) [b]
	2500-5k	19.4 (13.7 - 28.0) [b]
	5k+	35.8 (19.2 - 69.6) [b]
Symptoms Present	Yes	48.9 (37.4 - 64.9) [b]

a. significant at 0.01
b. significant at <0.01

4.5.2.2. Multinomial Analysis: NCpF and Diagnosis

To predict the odds of diagnostic decision (dependant variable) being made based on all NCpF (independent variables), those that were significant in the binary logistic regression were brought together into a multinomial model. A multinomial logistic regression was deemed most appropriate to see whether the significant independent variables in the binary regression still impact the dependant variable while accounting for each other. This model was conducted in a stepwise manner built with grouped demographics first, then grouped socioeconomic status, then GP events, then finally whether or not symptoms were present. Three versions of the 'NCpF and diagnosis' multinomial model are reported; demographics only, demographics and GP events, as well as demographics, GP events and symptoms present to demonstrate the strength of associations.

NCpF and Diagnosis: Multinomial Logistic Regression

The multinomial analysis when exploring the influence of NCpF only (sex, age, work, and socioeconomic status) showed the following significant results (Table 4.11). This table demonstrates that females were 1.8 times more likely to have a diagnosis. Those aged over 75 years were less than half as likely to have a diagnosis. Being a higher manager, small employer, or holding a lower supervisory role, meant they were about half as likely to have a diagnosis. Those in paid employment or looking for work were about half as likely to have a diagnosis. While someone who was permanently unable to work is 1.5 times more likely to have a diagnosis.

Table 4.11: Multinomial Model Diagnosis and NCpF

	Category	O.R. (95% CI)
Sex[1]	Female	1.8 (1.5 - 2.1) [c]
Age[2]	75	0.4 (0.2 - 0.7) [c]
Employment[3]	Paid employment	0.4 (0.2 - 0.7) [c]
	Looking for work	0.7 (0.4 - 1.1) [a]
	Perm unable to work	1.5 (1.0 - 2.4) [a]
NS-SEC5[4]	Higher Manager	0.6 (0.4 - 1.1) [a]
	Small employer	0.5 (0.3 - 1.0) [b]
	Lower Super. Role	0.6 (0.3 - 1.1) [a]

a. significant at 0.05
b. significant at 0.01
c. significant at <0.01

The binary logistic regression analyses exploring the relationship between number of GP events and likelihood of diagnosis displayed a strong effect (see Table 4.10). The next stage of the multinomial model was to include number of GP events, then symptoms present.

NCpF, Health Factors and Diagnosis: Multinomial Logistic Regression

Including number of GP events in the multinomial analysis changes the model slightly. Overall, more age bands were significant than NCpF on their own and less work bands showed significance (Table 4.12). It showed that people over the age of 75 were approximately 80% less likely to have a diagnosis and people between the ages of 66

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[1] Reference group: Males
[2] Reference group: 16 to 20-year-olds
[3] Reference group: Other forms of employment
[4] Reference group: Professional occupation

and 75 were about half as likely. People in employment were nearly 64% less likely to have a diagnosis while those permanently unable to work were nearly 1.5 times more likely to receive a diagnosis. Moreover, people who held a higher manager, small employer or lower supervisor role were about half as likely to have a diagnosis. Females were still more likely to receive a diagnosis.

Table 4.12: Multinomial Model Diagnosis and NCpF with GP Events and Symptoms

		Excluding Symptoms	**Including Symptoms**
	Category	**O.R. (95% CI)**	**O.R. (95% CI)**
Sex	Female	1.7 (1.4 - 2.1) [c]	1.5 (1.2 - 1.9) [c]
Age	66-70	0.5 (0.2 - 1.1) [a]	-
	71-75	0.4 (0.2 - 0.9) [b]	-
	75+	0.2 (0.1 - 0.5) [c]	0.3 (0.1 - 0.7) [c]
Employment	Paid Employment	0.4 (0.2 - 0.8) [c]	-
	Perm unable to work	1.6 (0.9 - 2.6) [a]	-
NS-SEC5	Higher Manager	0.5 (0.3 - 1.0) [b]	0.5 (0.3 - 1.1) [a]
	Small Employer	0.4 (0.2 - 0.9) [b]	0.5 (0.2 - 1.1) [a]
	Lower Super. Role	0.5 (0.3 - 0.9) [b]	-
GP Events[5]	1-100 events	2.9 (1.7 - 4.8) [c]	2.1 (1.2 - 3.6) [b]
	100-500 events	9.8 (6.9 - 14.2) [c]	3.5 (2.3 – 5.3) [c]
	500-1k	21.2 (15.0 - 30.6) [c]	7.4 (5.0 – 10.9) [c]
	1k-2500	27.2 (19.4 - 38.9) [c]	7.0 (4.8 – 10.3) [c]
	2500-5k	27.8 (18.9 - 41.6) [c]	7.3 (4.7 – 11.5) [c]
	5k+	50.4 (25.7 - 102.9) [c]	8.7 (3.8 – 20.0) [c]
Symptoms[6]	Symptoms Present	-	27.1 (20.4 – 36.6) [c]

a. significant at 0.05
b. significant at 0.01
c. significant at <0.01

The association with symptoms and diagnosis were also observed, as GPs look at symptoms in order to diagnose or treat. As expected, recording symptoms is strongly related to recording a diagnosis. Including this in the model still shows that females have an increased likelihood of diagnosis, while those over 75 years old have a decreased likelihood, while people who are employed as a higher manager or small

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[5] Reference group: No events recorded
[6] Reference group: No symptoms recorded

employer were half as likely. This shows the strength of the association between these NCpF and likelihood of diagnosis. Though symptoms were included originally, it was decided to remove this from the model as it is highly correlated to both diagnosis and treatment. Therefore, the discussion shall focus on the results of the binary analyses and multinomial analysis seen in Table 4.12.

4.5.3. NCpF and Treatment

This section reports the association between sex, age, socioeconomic status (occupation socioeconomic classification, level of socioeconomic activity), education (highest qualification), number of GP visits, and employment (position held in work), and receiving treatment. This section will follow the same outline as Section 4.5.2 whereby the binary logistic regressions will be outlined followed by the multinomial regression model. Only significant results will be shown here, the full table of results can be seen in Appendix 8.

4.5.3.1. The Association Between NCpF and Treatment

In order to predict the odds of a treatment decision (dependant variable) being made based on each individual NCpF (independent variables) a binary logistic regression was conducted. This highlights which NCpF to take into the multinomial logistic regression model. The odds ratio, 95% upper and lower confidence interval and significance are reported in accordance with standard practice and other research in this area (Hong et al., 2014).

Demographics and Treatment: Binary Logistic Regression

As seen in Table 4.13, females were approximately 1.5 times more likely to receive some form of treatment. People aged between 61 and 65 were 1.8 times more likely to receive some form of mental health treatment. Unlike diagnosis, qualifications were significantly associated with treatment, specifically, those with a degree or higher-level qualification were half as likely to receive treatment.

Table 4.13: Binary Model Treatment and Demographics

	Category	O.R. (95% CI)
Sex	Female	1.5 (1.3 - 1.7) [b]
Age	61-65	1.8 (1.1 - 2.8) [a]
Education	Degree level or higher	0.6 (0.4 - 0.8) [b]

a. significant at 0.01
b. significant at <0.01

Socioeconomic Status and Treatment: Binary Logistic Regression

From the table below (Table 4.14), people with higher managerial and professional occupations were 1.6 times more likely to receive treatment, while people in intermediate occupations were 2.3 times more likely to receive treatment. Those in lower supervisory and lower technical occupations were 1.8 times more likely to have treatment. People in (semi) routine occupations were twice as likely to receive treatment and those who have never worked or in long-term unemployment were over three times more likely to have treatment.

Table 4.14: Binary Model Treatment and Socioeconomic Status

	Category	O.R. (95% CI)
NS-SEC5	Higher Managerial and Professional Occupations	1.6 (1.0 - 2.7) [a]
	Intermediate Occupations	2.3 (1.3 - 4.2) [c]
	Lower Supervisory and Technical Occupations	1.8 (1.1 - 3.1) [b]
	(Semi) Routine Occupations	2.1 (1.2 - 3.4) [c]
	Never worked or Long-term unemployed	3.3 (1.7 - 6.4) [c]
ECSTAT3	-	-
Employment	Paid Employment	0.6 (0.4 - 1.1) [a]
	Intending to work but prevented by temporary sick or injury (28 days or less)	2.0 (0.9 - 4.6) [a]
	Permanently unable to work due to long-term sick/disability	1.9 (1.2 - 2.9) [c]

a. significant at 0.05
b. significant at 0.01
c. significant at <0.01

The level of socioeconomic activity (ECSTAT-3) failed to show significance so results not displayed here. Table 4.14 shows that those in paid employment were approximately

40% less likely to receive treatment, while those who were unable to work due to long-term sickness or temporarily unable to work were approximately twice as likely to receive treatment.

Health Factors and Treatment: Binary Logistic Regression

As with diagnosis, the greater number of GP events, the greater the likelihood of receiving treatment (Table 4.15). Further, the presence of symptoms is strongly associated with receiving treatment.

Table 4.15: Binary Logistic Regression of Treatment and Number of GP Events and Symptoms Present

	Category	**O.R. (95% CI)**
	1-100 events	3.4 (2.0 - 9.2) [b]
Number of GP Events	100-500 events	22.4 (15.9 - 32.4) [b]
	500-1k	62.8 (43.3 - 93.2) [b]
	1k-2500	114.8 (78.3 - 171.9) [b]
	2500-5k	194.1 (118.5 - 331.4) [b]
	5k+	858.8 (182.6 - 1535.2) [b]
Symptoms Present	Yes	32.2 (23.1 - 46.2) [b]

a. significant at 0.01
b. significant at <0.01

4.5.3.2. Multinomial Analysis: NCpF and Treatment

In the same manner as the 'NCpF and diagnosis' model, to predict the odds of a treatment decision (dependant variable) being made based on all NCpF (independent variables), those that were significant in the binary logistic regression were brought together into a multinomial model. This model was conducted in a stepwise manner reflecting that of the 'NCpF and diagnosis model', built with grouped demographics first, then grouped socioeconomic status, then GP events, then finally whether or not symptoms were present. Three versions of the 'NCpF and diagnosis' multinomial model are reported; demographics only, demographics and GP events, as well as demographics, GP events and symptoms present. This was done to better understand the strength of associations and key changes as the model was developed.

NCpF and Treatment: Multinomial Logistic Regression

The NCpF that returned significant results for treatment were included in the multinomial model, all factors remained categorical. As level of socioeconomic activity did not show significance in the binary logistic regression analyses, it was not included in the model. The multinomial analysis when exploring the influence of NCpF (sex, age, work, and socioeconomic classification) showed the following significant results (Table 4.16):

Table 4.16: Multinomial Model Treatment and NCpF

	Category	**O.R. (95% CI)**
Sex	Female	1.6 (1.4 - 1.9) [c]
Education	Hold degree or higher	0.7 (0.4 - 1.1) [a]
Employment	Intending to work but prevented by temporary sick or injury (28 days or less)	2.0 (0.9 - 4.9) [a]
	Permanently unable to work due to long-term sick/disability	1.9 (1.2 - 3.1) [c]
	Retired	1.6 (0.9 - 2.6) [a]
NS-SEC5	Intermediate Occupations	1.9 (1.1 - 3.5) [b]
	(Semi) Routine Occupations	1.6 (1.0 - 2.8) [a]
	Never worked or Long-term unemployed	2.1 (1.1 - 4.2) [b]

a. significant at 0.05
b. significant at 0.01
c. significant at <0.01

Sex was significantly associated with treatment, as was intending to work but prevented by temporary sickness or injury, as was permanently unable to work due to long-term sickness or disability. People who were retired were 1.5 times more likely to receive treatment. People who held a degree were approximately 40% less likely to receive treatment, while those in (semi) routine occupations were 1.6 times more likely to receive treatment. Those who either have never worked or those in intermediate occupations were nearly two times more likely to undergo treatment.

NCpF, Number of GP Visits and Treatment: Binary Logistic Regression

Including number of GP events in the multinomial analysis changed the model slightly, three age bands showed significance, more work bands showed significance, as did more socioeconomic classifications (Table 4.17). According to this model, sex still influenced likelihood of diagnosis. However, the addition of GP visits demonstrated that people aged 66 and over were approximately 60% less likely to receive treatment. People with a higher degree were about half as likely to receive treatment. Odds ratios greatly increased for the work categories after including events; people waiting to take up paid work already obtained and those intending to work but prevented by temporary sickness or injury were approximately five times more likely to receive treatment. Those who were permanently unable to work were over three times more likely to be seeking treatment and those who in the ‘doing something else’ category were over twice as likely to have treatment. However, those in paid employment were approximately 5% less likely to receive treatment. Higher managers and those in intermediate occupations were nearly two times more likely to be getting treated, while those in long-term unemployment or never worked were over 2.5 times more likely to gain treatment.

Including symptoms in the model still saw significance in sex and education but only one age category was still significant (Table 4.17). Three work categories, as opposed to five in the analysis prior, were significant with an odds ratio of over three, yet more socioeconomic classification categories showed significance in this model. Though symptoms were included originally, it was decided to remove this from the model as it is highly correlated to both diagnosis and treatment. Therefore, the discussion shall focus on the results of the binary logistic regression analyses and multinomial analysis seen in Table 4.17.

Table 4.17: Multinomial Model Treatment and NCpF with GP Events and Symptoms

		Excluding Symptoms	**Including Symptoms**
	Category	**O.R. (95% CI)**	**O.R. (95% CI)**
Sex	Female	1.7 (1.3 - 2.2) [c]	1.5 (1.2 - 1.9) [c]
Age	66-70	0.4 (0.2 - 1.0) [a]	0.4 (1.2 - 1.1) [a]
	71-75	0.4 (0.1 - 0.9) [b]	-
	75+	0.3 (0.2 - 0.9) [c]	-
Education	Higher Degree	0.5 (0.3 - 1.0) [a]	0.6 (0.3 - 1.1) [a]
Employment	Paid Employment	1.0 (0.4 - 0.1) [c]	-
	Waiting to take up paid work already obtained	5.2 (1.4 - 19.9) [b]	6.6 (1.6 - 2.6) [c]
	Intending to work but prevented by temporary sick or injury (28 days or less)	4.8 (1.5 - 16.5) [b]	5.3 (1.5 - 1.9) [c]
	Perm unable to work	3.4 (1.7 – 7.0) [c]	3.6 (1.7 - 7.9) [c]
	Doing something else	2.2 (0.9 - 5.6) [a]	-
NS-SEC5	Higher Manager	2.0 (1.0 - 3.8) [b]	2.5 (1.2 - 5.3) [b]
	Intermediate Occupations	2.0 (0.9 - 4.3) [a]	2.5 (1.0 - 5.9) [b]
	Lower Super. Role	1.8 (0.9 - 3.7) [a]	2.5 (1.1 - 5.6) [b]
	(Semi) Routine Occupations	-	2.0 (1.1 - 8.6) [a]
	Never worked or Long-term unemployed	2.6 (1.1 - 6.6) [b]	10.0 (6.9 - 14.9) [a]
GP Events	1-100 events	4.1 (2.4 - 6.9) [c]	3.2 (1.8 - 5.5) [c]
	100-500 events	33.0 (22.3 - 49.9) [c]	19.2 (12.8 - 29.5) [c]
	500-1k	90.5 (60.1 - 139.6) [c]	48.3 (31.6 - 75.2) [c]
	1k-2500	165.2 (108.6 - 257.7) [c]	78.0 (50.8 - 122.8) [c]
	2500-5k	308.4 (177.9 - 557.9) [c]	161.0 (92.0 – 293.0) [c]
	5k+	1262.0 (258.5 - 2280.1) [c]	450.5 (88.7 - 826.1) [c]
Symptoms	Symptoms Present	-	10.0 (6.9 - 14.9) [c]

a. significant at 0.05
b. significant at 0.01
c. significant at <0.01

4.5.4. NCpF and Time-to-Referral

This section reports whether NCpF influenced the time-between referral and being seen by a mental health specialist. NCpF explored were sex, age, socioeconomic status (occupation socioeconomic classification, level of socioeconomic activity), education (highest qualification), number of GP visits, and employment (position held in work), and time-to-referral. This was analysed using a Cox Proportional-Hazards Regression as this type of regressional analyses is appropriate for both quantitative predictor variables and for categorical variables, it can also assess the effect of several risk factors on survival time (or in this instance, time-to-referral) simultaneously.

Only 300 people within the cohort had been referred to, and saw, a mental health specialist. As this section looks at the impact of NCpF on referral time, not whether or not someone was referred, only the 300 that had seen someone were selected. As such, some categories held very small numbers, which may impact the reliability of the results. In order to conduct the following analysis, the method in Fox and Weisberg's (2018) "Cox Proportional-Hazards Regression for Survival Data in R" was followed (Fox & Weisberg, 2018). The assumptions for proportional hazards, for influential data and for nonlinearity were met.

5.5.4.1. The Association Between NCpF and Time to Referral

Sex and Time-to-Referral

No significant differences could be seen on referral time based on patients' sex (Figure 4.5).

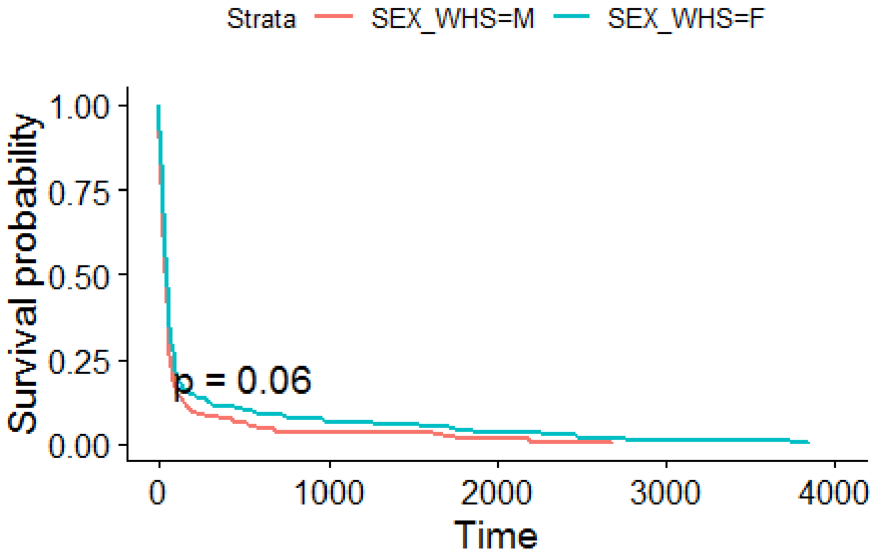


Figure 4.5: Kaplan-Meier Plot of the Survival Probability Stratified by Sex

Age and Time-to-Referral

Though the overall survival probability (as seen in Figure 4.6) was not significant, one age-range did show significance in the cox-regression (Table 4.18). This suggests people within the 56-60 age range had approximately 40% less time between referral and being seen by the mental health specialist.

Table 4.18: Binary Analysis of Referral Time and Age

	Category	Coef	95% CI	HR	Likelihood-Ratio Test
Age	56-60	-0.6	0.3-0.9 [a]	0.6	0.2

a. significant at 0.02

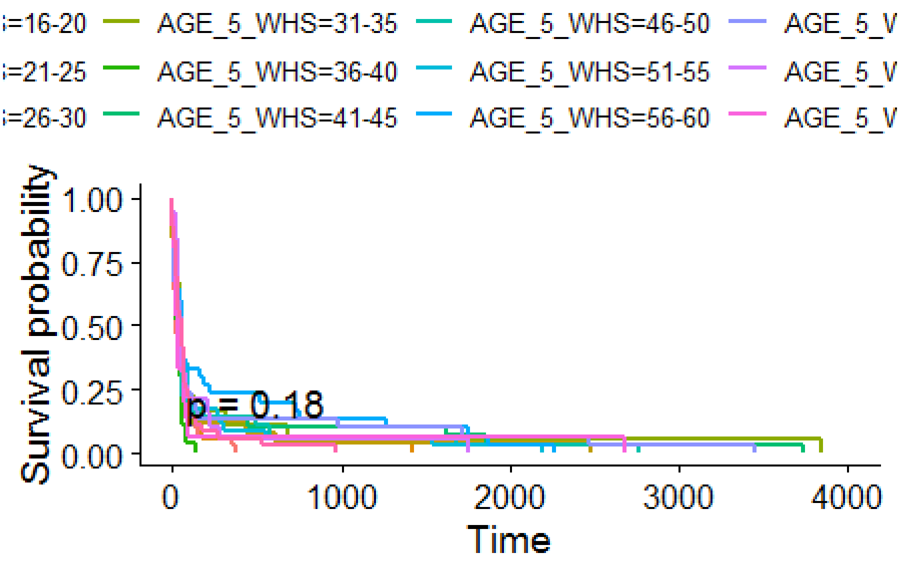


Figure 4.6: Kaplan-Meier Plot of the Survival Probability Stratified by Age

Work and Time-to-Referral

Though the overall survival probability (as seen in Figure 4.7) was not significant, two factors did show significance in the cox-regression. As seen in Table 4.19, those who were undertaking unpaid work for a business they or a relative owns had 25% longer waiting times, and those who were temporarily unable to work due to sickness or injury had 2.5 longer waiting times than those in the other employment categories.

Table 4.19: Binary Analysis of Referral Time and Work

	Category	Coef	95% CI	HR	Likelihood-Ratio Test
Employment	Doing unpaid work for a relative	3.2	3.2-197.6 [b]	25.0	0.1
	Temporary sickness or injury - 28 days or less	0.9	1.0-6.4 [a]	2.6	0.1

a. significant at <0.05
b. significant at <0.01

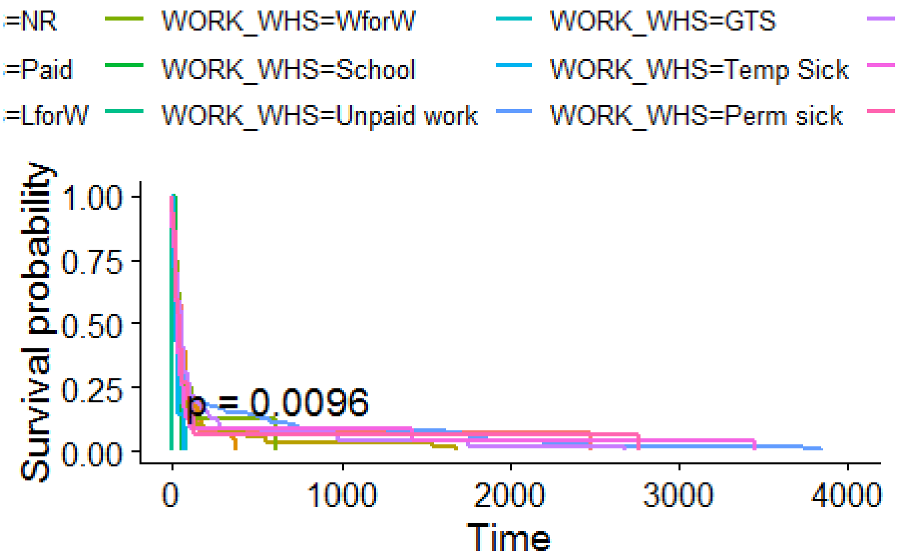


Figure 4.7: Kaplan-Meier Plot of the Survival Probability Stratified by Work

Educational and Time-to-Referral

Qualification level had no influence on time-to-referral (Figure 4.8).

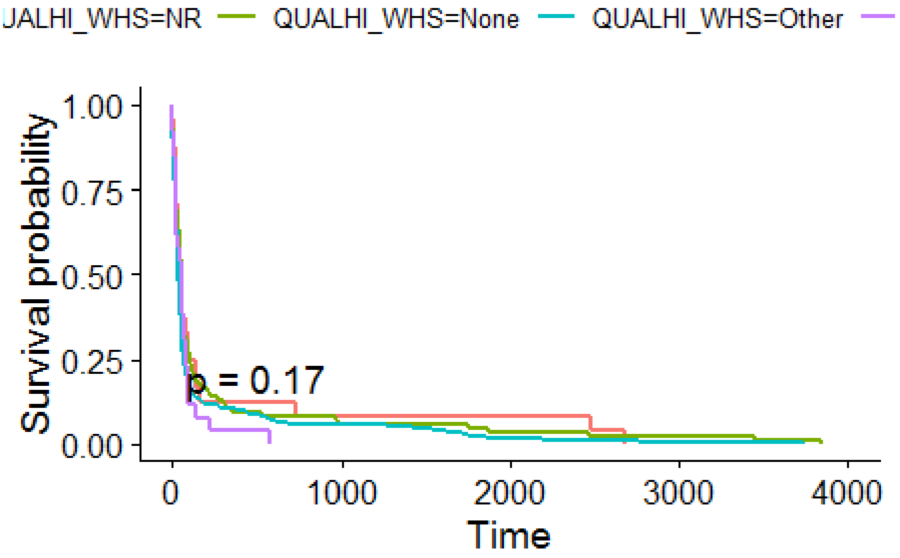


Figure 4.8: Kaplan-Meier Plot of the Survival Probability Stratified by Highest Qualification

Socioeconomic Status and Time-to-Referral

Neither the socioeconomic classification (Figure 4.9) nor level of socioeconomic activity (Figure 4.10) showed significance in the Cox Proportional-Hazards Regression.

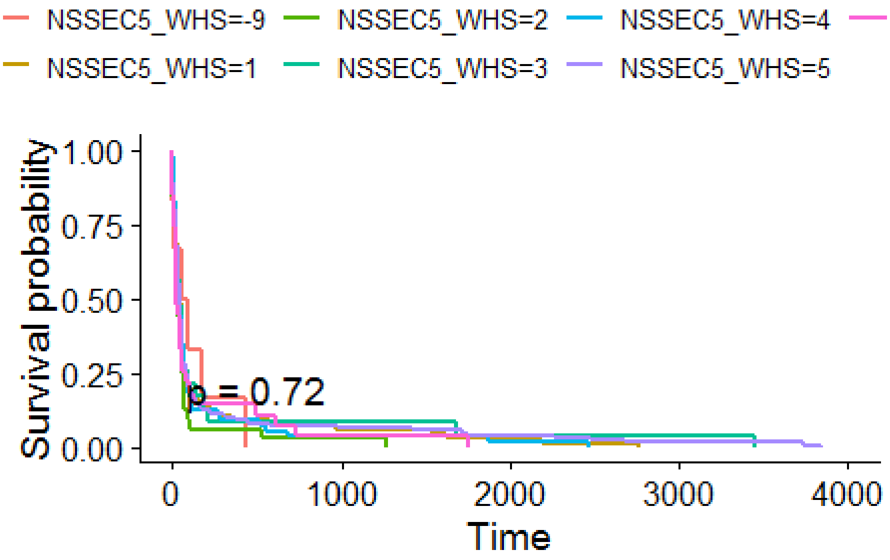


Figure 4.9: Kaplan-Meier Plot of the Survival Probability Stratified by Socioeconomic Classification

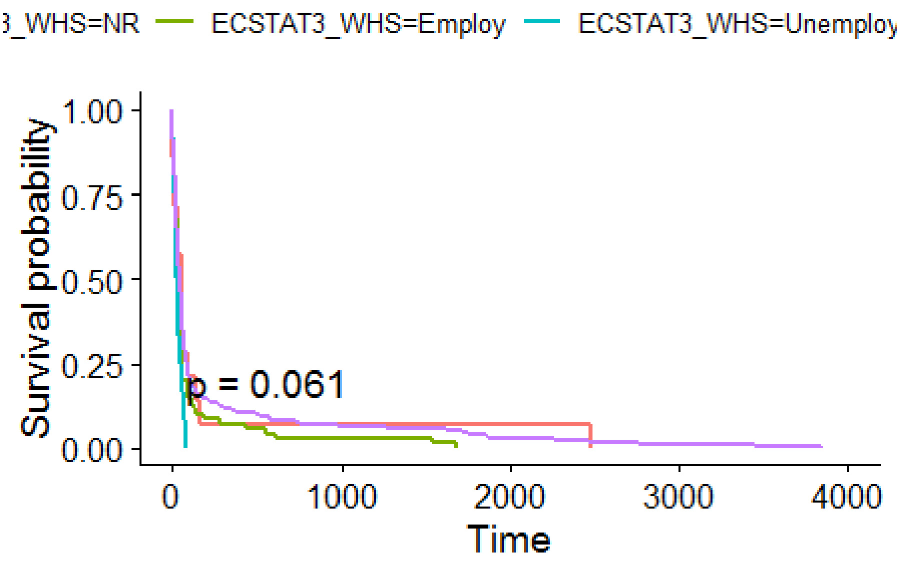


Figure 4.10: Kaplan-Meier Plot of the Survival Probability Stratified by Socioeconomic Activity

5.5.4.2. Cox Proportional-Hazards Regression

For sound rejection, all three tests (Likelihood, Wald and Score (Logrank)) should report significant results. If all are significant, Likelihood Ratio Test is the recommended test for small cohort. This Cox Proportional-Hazards Regression appears to hold overall significance:

Likelihood ratio test	=	p=0.05
Wald test	=	p=0.01
Score (logrank) test	=	p=<0.01

The NCpF that returned significant results for the multinomial analysis, were age and work (Table 4.20). Those between the ages of 51 and 60 took approximately 50% less time between referral and being seen than their younger counterparts (16-20). While those doing unpaid work for a business that they or a relative owns had 22.6 times longer time between referral and the first appointment than those in other forms of employment.

Table 4.20: Multinomial Analysis of Referral Time and NCpF

	Category	Coef	95% CI	HR	Likelihood-Ratio Test
Age	51-55	-0.7	0.3 - 1.0 [a]	0.5	0.05
	56-60	-0.9	0.2 - 0.9 [b]	0.4	0.05
Employment	Doing unpaid work for a relative	3.2	2.7 - 191.9 [c]	22.6	3.15

a. significant at <0.05
b. significant at 0.01
c. significant at <0.01

4.6. Discussion

There are many results and varying aspects to consider, given the aim of this research is to understand the impact of NCpF on mental health clinical decisions, this discussion section will focus on each factor independently and draw comparisons from the literature.

4.6.1. Summary of Key Results

For diagnosis:

- Females were continually more likely to receive a diagnosis for a common mental health disorder than males.
- Those over 65 were less likely to receive a diagnosis when accounting for number of GP events, when incorporating symptoms being recorded those over 75 were still less likely to receive a diagnosis than younger age groups.
- Individuals who held a higher managerial position or lower supervisory role were continually less likely to receive a diagnosis than those who are unemployed.

For treatment:

- Females were continually more likely to receive treatment for a common mental health disorder.

- Those over 65 were less likely to receive treatment when accounting for number of GP events, when also incorporating symptoms being recorded those between the age of 66-70 were still less likely to receive treatment.
- Individuals who were waiting to take up work, intending to work but off due to sickness, and permanently unable to work were are more likely to be receiving treatment.
- Those who were in a higher managerial role, intermediate occupation, lower supervisory post, semi-routine occupation position, or were long-term unemployed had an increased likelihood of receiving treatment.

For Referral:

- Only a small number of patients in this dataset were identified as attending referrals. With that in mind, the following NCpF were associated with longer or shorter referral waiting times.
- Those between 51 and 60 were seen quicker than their counterparts (approximately 50% less time between referral and being seen)
- Individuals doing unpaid work for a business they or a relative owns had 22.6 times longer time between referral and being seen.

4.6.2. Demographics

4.6.2.1. Sex

Females appeared to be more likely to be diagnosed and treated than their male counterparts. This was consistent across the binary and multinomial analyses. It may be that females in the WHS had lower mental health scores; however we found this not to be the case. Sex did not have any influence on the time-to-referral.

The results seen here are in accordance with the literature, in that patient sex influences clinical decisions (Hajjaj, Salek, Basra, & Finlay, 2010). In clinical decision-making research, there is a well-established divide between males and females in the diagnosis, treatment and referral of physical disorders, such as cardiovascular diseases and related complications. For example, females typically see less accuracy with their treatment, diagnosis and referral of; coronary heart disease (Aggarwal et al., 2018; Bönte et al., 2007; Papakonstantinou, Stamou, Baikoussis, Goudevenos, & Apostolakis, 2013), myocardial infarctions (Alabas et al., 2017; Lawesson, Isaksson, Ericsson, Ängerud, & Thylén, 2018; Redfors et al., 2015), acute coronary syndrome (Redfors et al., 2015), and coronary deaths (Tunstall-Pedoe, Morrison, Woodward, Fitzpatrick, & Watt, 1996). Differences are even found between males and females when conducting cardiac exams (Chakkalakal et al., 2013), whereby females are asked less items than males, and males are more likely to be offered health-promotion advice (Little, Slocock, Griffin, & Pillinger, 1999).

The majority of research into clinical decision-making centres around physical illnesses, and primarily cardiovascular signs, symptoms, and diagnoses. The research which explores mental health tends to agree; clinicians make different decisions for male and female patients (Bebbington et al., 2003). However, most research in mental health clinical decision-making and gender differences explores alcoholism and mood disorders.

In a study that explored problem drinking in men and women, it was found that men were more likely to have their problem drinking detected than women (Berner et al., 2007). This same study did however find that females were more correctly referred than males. This was reflected in another project whereby men were more likely to receive a brief intervention than women for alcoholism (Lock & Kaner, 2004). Further, women were found to be more likely to be diagnosed as depressed, even when presenting with identical symptoms, and less likely to be diagnosed as having problems with alcohol (Afifi, 2007; Astbury, 2001), potentially due to an interaction of NCpF, availability bias and anchoring bias. In contrast, another study found there to be no sex differences between depression-related clinical decisions for men and women. However, this was an experimental video-vignette study that used actors who were 67 or 79 years old. Therefore, age may have been the principle NCpF influencing the clinical decision made (Frayne, Skinner, Lin, Ash, & Freund, 2004). Further, these studies focused on ‘correct’ referrals and being referred, while this study looked at time between referral and being seen by a clinician.

Men predominate in diagnoses of alcohol dependence with lifetime prevalence rates of 20% compared with 8% of women (Astbury, 2001). Gender stereotyping during upbringing may have resulted in men responding to various forms of affect through antisocial behaviours, such as aggression or alcohol abuse, while women may have been socialised to express dysphoria in response to the same stressors. Therefore, gender differences in depressive disorders may be counterbalanced by higher alcohol abuse rates and drug dependency in males (Afifi, 2007; Kessler et al., 1994; Salk, Hyde, & Abramson, 2017). This gender stereotyping may be carried into adulthood and explain the findings in this study whereby females were more likely to be diagnosed and treated than males.

As displayed in Table 4.5, of 1,743 individuals with an electronic mental health record, 35% were male, while of 1,027 individuals with only a WHS record, 45% were male. This difference may reflect the widespread societal axiom that men are less likely to seek medical help (Hunt, Adamson, & Galdas, 2012; Wang, Hunt, Nazareth, Freemantle, & Petersen, 2013). Though this would not impact the statistical difference seen between male and female diagnostic and treatment decisions in this study, it is important to consider in the broader clinical decision-making picture.

Overall, this study is in agreement with the general consensus that sex influences diagnosis and treatment of mental ill-health, however, unlike with physical illnesses such as coronary heart disease (Bönte et al., 2008), there was no difference seen with referral times. Research into the clinical decision-making behind mental health referrals has been explored infrequently and the research that does explores practitioner factors (Carey & Kogan, 1971; Kogan, Brumley, Wilbur, & Enguidanos, 2012; Kravitz et al., 2006). Sex may not influence referral times because sex could be a factor that influences diagnosis and treatment, but whether it is a diagnosis of depression or alcoholism, if it still requires a mental health specialist, then the perception is there. However, this is not something that has been research in great depth to date, therefore could be an area of future exploration.

4.6.2.2. Age

Some of the age-bands significantly influenced the likelihood of diagnosis, treatment, and referral times. The binary regression showed a number of age-bands were significantly impacted by the clinical decisions, however when including age in the multinomial model, thus accounting for the other NCpF, those over the age of 66 were shown to be significantly less likely to receive treatment and less likely to have a diagnosis. During the Cox Proportional-Hazards Regression, only those within the age of 56-60 had significantly less time between referral and being seen by the mental health specialist, however this was not found in the multinomial regression analysis.

Past research mirrors these findings in that age influences the clinical decisions made. Once again, mental health findings on this topic are limited while there is a plethora of cardiovascular research. One experimental study found that older patients are less likely to receive a primary psychogenic diagnosis to chest pain, while the older the patient, the more likely they were to receive a primary cardiac diagnosis (McKinlay, Potter, & Feldman, 1996). Further, a cross-sectional study of two UK general practices found health-promotion advice is more likely to be offered to older adults rather than younger adults (Little et al., 1999).

In contrast, another study concluded that patient age does not influence UK or US doctor's decision-making of patients presenting with coronary heart disease, though this study only used two groups of patients; 55-74 and over 75s (Adams et al., 2006). These age bands may be too wide, as the physical ability and lifestyle of a 55-year-old may be very different to that of a 74-year-old. Also, it is difficult to truly determine whether age influences decisions, if younger and middle-aged adults are not accounted for, as it may miss a key trend.

Age has been associated with likelihood of referral, for example, older hospital patients with ischaemic heart disease were less likely than younger people to be referred for exercise tolerance tests, cardiac catheterisation and angiography, independent of sex and condition severity (Bond et al., 2003). This study did not explore likelihood of referral, but instead time between referral (as only referral and treatment read codes were present in the GP data). Though this study found that those within the 56-60 age range had significantly less time between referral and being seen by the mental health specialist, it may be an indicator of patients within this age band being more likely to attend their referral, as SAIL is unable to identify those who were referred but did not attend their appointment. Future research would benefit from gaining a better understanding of referral decisions as such decisions may be influenced by symptom severity, which is not currently possible to explore in SAIL.

With mental health clinical decision-making, supposedly one of the best predictors of GP's acknowledgement of a mental health condition is patient age, whereby the older the patient, the less likely a mental health problem will be identified (Raine et al., 2000). In a German primary care cross-sectional survey, it was found that people aged between 30 and 59 are more likely to be detected for problem drinking (Berner et al., 2007), as opposed to their younger or older counterparts. Moreover, patient age is associated with the physician's decision to provide or order behaviour counselling (Goldberg, Cho, & Lin, 2019). Mental health studies observing patient age and time to referral are scarce.

4.6.2.3 Education

Highest qualification level only showed a significant difference in treatment, it did not impact the time-to-referral or the diagnostic decisions. It was found that patients who held a degree or other higher-level qualifications are approximately 40% less likely to receive mental health treatment. Few studies explore educational attainment as a NCpF in mental health clinical decision-making. One study that explored the NCpF which influence treatment of prostate cancer found that those with a higher education level received more aggressive treatment (radiotherapy versus hormonal therapy) than those with less education (Kane et al., 2003).

Another study explored prescriptions of GPs for general health, they found that independent of health status, respondents who left school before they were 15 were 2.3 times more likely to be prescribed medication compared to those who left school after the age of 15 (Scott, Shiell, & King, 1996).

4.6.3. Socioeconomic Status

4.6.3.1. Socioeconomic Classification and Activity

Two scales were used to explore socioeconomic status; 3-Item Level of Socioeconomic Activity (ECSTAT-3) and the 5-item National Statistics Socioeconomic Classification (NS-SEC5). Of these, the level of socioeconomic activity, failed to show significance for any of the diagnostic, treatment or time-to-referral analysis, though this was because it was deemed redundant when entered into the multinomial model, suggesting it was highly associated with another factor included in the model.

For diagnosis, small employers were the only group to have a significant difference; they were about half as likely to receive a diagnosis. In the multinomial diagnosis however, small employers, lower supervisors and higher managers were all about half as likely to have a diagnosis. Interestingly, the reverse was seen for treatment. Higher managers, those in intermediate occupations, in lower supervisory roles, or who had never worked or long-term unemployed were all around twice as likely to receive treatment. There was no difference in the time-to-referral analyses.

It is difficult comparing socioeconomic status to other literature, as there are various markers for this, such as occupation, income, or national classifications. It is also complex as research in this area cannot be cleanly compared to research gathered in different countries as a result of the differences in healthcare systems. One review for example recognised the influence of patient factors on clinical decision-making, and though the studies identified socioeconomic status as a factor which influences clinical decisions, it hypothesised that in countries with free healthcare systems, the influence on socioeconomic factors may not be as significant, as in other countries care plans are altered to account for those with financial difficulties (Hajjaj et al., 2010). This study identifies socioeconomic status from a purely income-related lens.

Similarly, in a study of GPs, socioeconomic status was significantly associated with the decision to prescribe. Those who had an annual income of less than $15,000 were three times more likely to be prescribed medication as compared to those on a higher income. Furthermore, income was also associated with the decision to receive a diagnostic test, as those with annual income of <$10,000 were less likely to receive a diagnostic test than those who earn over $30,000 (Scott et al., 1996).

In the USA those patients who are insured receive better primary care than those who are uninsured and privately insured patients can receive better primary care than those insured publicly (Shi, 2000). Compared with the insured, patients without health insurance undergo fewer cancer screening tests and have different overall treatment patterns (Hajjaj et al., 2010; O'Malley et al., 2001; Roetzheim et al., 2000). One study found that women of lower socioeconomic status were more likely to be given breast cancer as the most likely diagnosis than women of higher socioeconomic status (McKinlay et al., 1997).

Less research is conducted exploring the influence of socioeconomic status on mental health clinical decisions, though one study found that older adults with insurance were significantly more likely to receive a primary cardiac diagnosis, than those without who were more likely to receive a primary psychogenic diagnosis to chest-pain, though socioeconomic status did not influence decisions of younger adults (McKinlay, Potter, & Feldman, 1996). Further, one paper explored patient determinants of mental health care and found that not owning a property is a predictor of receiving intervention (Raine, et al. 2000). One study explored the NCpF that predicted whether nurses would provide brief alcohol interventions found that social class did not impact the likelihood of an intervention being given (Lock, & Kaner, 2004).

Though cost of care and the patients' ability to pay may influence the physicians' therapeutic plans or other clinical decisions as a result of active financial considerations, this does not explain the differences seen in countries where SES impacts clinical decisions even though the healthcare is free. Therefore, while SES has been claimed to influence clinical decisions, it is important to be cautious when comparing these findings based on the rationale already identified.

4.6.3.2 Work

Patients' work status was found to relate to treatment, diagnosis and referral times. People waiting to take up paid work already obtained, those intending to work but prevented by temporary sickness or injury, those who were permanently unable to work, and those in the 'doing something else' category were all more likely to receive treatment. Those who were permanently unable to work were also more likely to receive a diagnosis. Those in paid employment on the other hand were significantly less likely to receive treatment or a diagnosis. While those doing unpaid work for a business that they or a relative owns have 22.6 times longer time between referral and the first appointment, according to the Cox Proportional-Hazards Regression.

As with education, work status is not often explored in mental health or physical health clinical decision-making. However, it has been shown that, despite physicians having high rates of suicide and depression, 50% of physicians asked in one study believed they had met the criteria for mental illness and yet had not sought treatment, the key reasons for avoiding care were; the belief they could manage independently, limited time, fear of reporting to a medical licensing board and the belief that diagnosis was embarrassing or shameful. Only 6% of physicians with formal diagnosis or treatment of mental illness had disclosed their state (Gold, Andrew, Goldman, & Schwenk, 2016). Therefore, people may decline mental health treatment or actively avoid receiving a diagnosis if they were in paid work because of the limited amount of time to seek therapeutic care, as a result of the stigma, or even because they feel capable of self-managing the mental health problem. However, it could also be a result of clinicians deeming the patients' position in employment and capabilities of maintaining said employment, could be a sign of less severe form of the common mental disorder, thus trust the patients' mental ill-health will improve in time.

4.6.4. Number of Visits to GP

The more visits to the GP, the greater the likelihood of treatment. The results seen here complement past research as one of the factors that best predict GP's acknowledgement of a mental health problem is physical health status (Raine et al., 2000). Should a patient be 'well-known' within the department, clinicians may be more likely to diagnose or treat.

However, it may be that increased frequency in visits is associated with medical practitioners using the 'wait and see' method, therefore people returning after a week or two may be more likely to have maintained their mental ill-health and thus the medical practitioner may be more inclined to diagnose or treat. One study found that frequent GP visits are associated with increased probability of detection of problem drinking (Berner et al., 2007). It has been suggested that patients with alcohol disorders are more likely to have their condition detected, the poorer their physical health status (Berner, et al., 2007). Therefore, the results seen in this study could be a reflection of worse physical health, resulting in more frequent visits to medical services.

Previous mental symptoms (Raine, et al., 2000) and prior mental health service use (Rushton, Bruckman, & Kelleher, 2002) are associated with likelihood of acknowledgement of the presence of mental ill-health and likelihood of referral. Therefore, the more visits to the GP, the greater the likelihood of treatment could be a result of an accumulation of past mental health signs and symptoms.

It is worth noting that approximately 650 participants who scored <50 on the SF-36 had no mental or physical health records. This could be a result of patients not help-seeking or due to patients recently moving in or out of Wales, or simply that they were healthy and have no physical or mental ailments.

Frequency of visits to the GP may influence the likelihood of treatment and diagnosis due to cognitive bias, it could reflect the caution GPs may be taking prior to diagnosis to determine whether the diagnosis is an accurate one, however more research would have to be done to unpick this relationship. Given the pressures on the system, can this be improved?

4.6.5. Strengths and Limitations

This was one of the first studies to explore mental health clinical decision-making using health and administrative records, as such it has its strengths, but equally this will bring with it some limitations. As it is one of the first studies to explore mental health decision-making through this method of research, it highlights the potential for utilising health and administrative records as opposed to other research methods. This research highlights the association between certain NCpF and likelihood of diagnosis, treatment or referral, such as age, work position, sex and educational attainment.

There are challenges when using this data for research, such as the reliance on survey and self-report measures. There are risks of completion bias as a number of participants did not respond to the survey questions, potentially skewing results. Further, surveys are open to sampling bias, this can be seen here as the majority of participants who completed the WHS were middle to older adults, women (though there is no difference in severity between men and women), from higher managerial, semi-routine occupations or long-term unemployed. It is worth noting that the method of data-collection for the survey would have been conducted by a member of staff during a weekday, therefore the sample may be skewed towards those who are home during the week. Also, results may not be generalisable for the time-to-referral analyses given the small cohort, which may reflect data recording quality, patients not attending their appointments, or a combination of factors. The final caution when attempting to understand these results is that these associations do not imply causation.

Though the SAIL databank is a rich source of patient data, with approximately 79% population coverage across Wales, it is unable to show whether someone was referred due to presenting with greater severity symptoms, it currently cannot provide the clinical rationale behind a decision to refer or indicate whether someone was referred from the GP or A&E but did not attend their referral appointment. As such, research that focuses on these elements is required in conjunction with this SAIL study to better understand referral decisions.

4.6.6. Implications to Policy, Research and Practice

From this study, it can be shown that better recording of outpatient data is required, given the small number of patients who are referred. Further, it highlights that of the 2,770 patients, all of these reach the clinical threshold for depression or anxiety, but only approximately 60% of these individuals had clinical records, showing that more can still be done to improve the identification of individuals with poor mental health, as well as research needed to understand why these individuals did not help-seek, or if they did, what came of it. This study could be repeated at a larger scale, however it may be difficult with the adjournment of the WHS. The NSW only uses the WEMHWS, which does not have the same standing as the SF-36 for mental health diagnoses or identification. However, other methods of exploring this on a national scale may arise, or research can be done to fill this gap regardless of the lack of this resource.

4.7. Conclusion

This chapter identified several NCpF that may influence mental health clinical decisions. Namely; sex, age, socioeconomic status, education, work and GP visits for treatment, as well as age and work for time-to-referral. Though these correlational (observational) research designs have a great possibility, arguably the cohort size seen in this project is relatively small, especially for the time-to-referral diagnosis, which may influence results seen. Further, though trends may have been identified, research with clearly defined experimental methods is required to determine whether these NCpF do influence the clinical decisions made. Understanding the clinical reasoning behind said decisions would also prove beneficial when exploring clinical decision-making, which is not possible in data linkage studies. This will be addressed in Chapter 5.

Chapter 5: Vignettes

This chapter is the final piece of research that contributes to the thesis aim. It does so by completing the third of the three wider objectives outlined in Chapter 1:

- To determine whether specific NCpF can lead to differences in treatment, diagnostic or referral decisions regarding patients with mental ill-health.

5.1. Subsidiary Objectives for Chapter 5

The above objective will be achieved using the following subsidiary objectives:

1. To take the NCpF associated with clinical decisions outlined in Chapter 4 to determine whether the presences of such factors lead to differences in treatment, diagnosis or referral of mental health conditions
2. To gain insight into the feasibility of utilising clinical vignettes in an experimental manner within clinical decision-making research
3. To conduct research that involves practitioners across the various stages to ensure quality, validity and reliability.

5.2. Overview

Factors influencing clinical decisions may arise from multiple sources as described previously in Chapters 2 and 4. Typically, a decision is based on the practitioners' knowledge, experiences and assessment tools. However, there are cognitive biases that may unintentionally influence the decisions made. These are environmental, practitioner and patient factors. Research exploring factors that influence clinical decisions primarily examines clinicians' characteristics. Less research explores the impact of the environment and fewer still the influence of patient characteristics. Thus far, a focus group and a data linkage study have been conducted to understand the impact of patient factors on mental health-related clinical decisions. The aim of this chapter is to build on these by testing, in an experimental fashion, the impact of specific NCpF on mental health clinical decisions using distinct mental health disorders.

Methodologically, this study follows on from the previous chapters and aims to test hypotheses defined by the results accumulated in Chapters 3 and 4.

Chapter 4 highlighted NCpF which may impact clinical decisions. The three NCpF chosen were taken from the diagnostic and treatment results given the larger participant numbers and thus has greater reliability. Within this, gender, age, and work (as a reflection of socioeconomic status; SES) were strongly associated with differences in clinical decision-making. As highlighted in Chapter 2, this research seeks to understand the influence of NCpF on clinical decision-making (mental health specifically). Therefore, this study needs to be undertaken with a large scope of mental health as a result of the vast quantity of mental health conditions, with different treatments that are appropriate in a variety of circumstances, to determine where decisions may vary. As such, three mental health conditions that are stereotypically associated with the three chosen NCpF were identified. Specifically, bulimia nervosa, generalised anxiety disorder and bipolar disorder were chosen as they have been associated with gender (National Eating Disorders Association, 2018; Strother, Lemberg, Stanford, & Turberville, 2012), age (Jeste, Blazer, & First, 2005) and SES (Gale et al., 2013; Verdoux & Bourgeois, 1995) respectively. Though Chapter 4 highlighted more NCpF that may influence clinical decision-making, three were chosen to lessen the amount of time required by GPs to take part.

Therefore, this chapter seeks to determine the impact of NCpF on mental health clinical decision-making as well as the feasibility of utilising clinical vignettes in an experimental survey to explore patient factors and pave the way for future research. Chapter 5 provides a background on the three mental health disorders chosen before outlining the vignette creation-process, achieved through participatory design, as well as study methodology, design, and recruitment. The penultimate section will provide an overview of the analysis and results then conclude with a discussion of findings.

5.3. Mental Health Disorders Utilised and Clinical Vignettes

This introduction provides an outline of the three mental health disorders that were used in this study; bulimia nervosa, generalised anxiety disorder and bipolar disorder. It also provides an overview of the clinical vignette methodology. The aim of this review is not clinical, but rather to provide a description of the disorders and the relevant NCpF associated with those as used in the design of the study.

5.3.1. Bulimia Nervosa

Bulimia nervosa (bulimia) is an eating disorder characterised by a process of binge eating followed by purging at least once a week over a period of three months (Engel, Steffen, & Mitchell, 2020; ICD-1o Bulimia Nervosa, 2016). Bingeing is whereby a large amount of food is consumed in a short period of time. Purging is the deliberate attempt to remove the food from the body using methods such as forced vomiting, fasting, excessive exercise as well as a misuse of laxatives and diuretics (BMJ Best Practice, 2020b; Engel et al., 2020; ICD-10 Bulimia Nervosa, 2016; NICE, 2017). Patients often describe “losing control” during episodes of bingeing and often try to conceal their behaviour, they may also have low self-esteem concern about weight, arrhythmias and other symptoms of dehydration and malnourishment (NICE, 2017; Engel, Steffen, & Mitchell, 2020; BMJ Best Practice, 2020). Physically, people with bulimia appear to have a normal weight, though they may present with atypical dental wear due to acid erosion as well as a thickened skin on the knuckles as a result of forced vomiting known as Russel’s sign (ICD-10 Bulimia Nervosa, 2016; BMJ Best Practice (BN), 2020). Bulimia is often found with other comorbid mental health disorders such as anxiety, depression, self-harm and substance abuse (Becker & Grilo, 2015; Fischer & Grange, 2007). Further, bulimia was associated with suicidality, while other eating disorders were not (Bodell, Joiner, & Keel, 2013).

Being female is considered to be a risk factor in British Medical Journal (BMJ) Best Practice (2020) however NICE guidelines suggests considering eating disorders in both young men and women, particularly those with low self-esteem and have who have unexplained physical symptoms (NICE 2017). Bulimia is found in men (Keski-Rahkonen et al., 2007), approximately one in three people who have an eating disorder are male (National Eating Disorders Association, 2018), 40% of those with binge eating disorder are male (Westerberg & Waitz, 2013), approximately 40% of male college athletes are at risk for bulimia nervosa (National Eating Disorders Association, 2018) and other subclinical eating disorder behaviours are nearly as common in males as they are among females including purging, laxative abuse and fasting (Mond, Mitchison, & Hay, 2014). In the USA alone, 10 million males will have an eating disorder at some point during their lives but they are less likely to seek treatment due to cultural bias and a double-stigma, for having a disorder that is associated with women and for seeking psychological help (National Eating Disorders Association, 2018).

Despite this, there is an entrenched societal postulate that it is rare for males to have an eating disorder therefore males do not seek help and as such are missed (Mond et al., 2014). Further, if males do seek help, assessment tests have been criticised to have language geared towards women and girls, reaffirming the misconceptions about the nature of disordered eating in men as well as greater likelihood of a missed diagnosis (National Eating Disorders Association, 2018; Strother et al., 2012). Bulimia may present differently in men and women, with women more likely to report weight dissatisfaction and dieting, while men are more likely to overeat and use exercise to control weight (Striegel-Moore et al., 2009). There are biological elements to the gender difference seen between males and females as there are neurological vulnerabilities that contribute to the pathogenesis of bulimia nervosa, such as the altered brain serotonin levels contributing to the dysregulation of appetite (Kaye, 2008; Timko, DeFilipp, & Dakanalis, 2019). However, men are underrepresented in this field of research, therefore it is difficult to determine the link between biology and eating disorders (Nagata et al., 2017; Timko et al., 2019).

People with eating disorders have a mortality rate of five to seven times higher than compared with the general population, men in all age groups had even higher standardised mortality ratios than women (Iwajomo et al., 2020). A meta-review showed that eating disorders and substance abuse has the highest mortality rate when compared to mental disorders and those with an eating disorder are likely to attempt to take their own life (Chesney, Goodwin, & Fazel, 2014). As a result, it is imperative that those who need help receive it.

5.3.2. Generalised Anxiety Disorder

Generalised anxiety disorder (GAD) is defined as an excessive, uncontrollable and often irrational worry which interferes with daily functioning (BMJ Best Practice, 2020a; ICD-

10 - Generalized Anxiety Disorder, 2016). Patients with GAD typically have greater worry over multiple minor matters and no specific anxiety trigger can be identified. The difficulty with GAD is that patients typically present with physical or somatic symptoms such as fatigue, headaches, muscle tension, restlessness, muscle aches, nausea, difficulty swallowing, excessive stomach acidity, abdominal pain, chest pain, vomiting, diarrhoea, episodes of shortness of breath, insomnia and hot flashes (Baldwin, 2018). These symptoms must be present for six months or more to receive a diagnosis of GAD, identified using the GAD-7 scale (NICE, 2014; Spitzer, Kroenke, Williams, & Löwe, 2006).

It was believed that most psychiatric disorders were less prevalent among the elderly than younger adults as dementia was the greater concern for this population (ADAA, n.d.; Beekman, 2008; Bryant et al., 2013; Jeste et al., 2005). This then shifted to a greater focus and awareness of the loneliness and depression of older adults, but anxiety is still rarely the focus for this population (Mental Health Foundation, 2016; WHO, 2017). There has been a recent increase in recognition of the prevalence of anxiety in older adults (Bryant et al., 2013; King-Kallimanis, Gum, & Kohn, 2009; Mohlman et al., 2012). For example, a literature review found that anxiety disorders were common in older adults (Wolitzky-Taylor, Castriotta, Lenze, Stanley, & Craske, 2010), NHS England has reported that nearly half old adults over 55 years old have experienced anxiety (NHS England, 2017), with a prevalence of approximately 15% at any one point in time (Cohen, Magai, Yaffee, & Walcott-Brown, 2006; WHO, 2017). It has been suggested that anxiety is even more common than depression (King-Kallimanis et al., 2009; Wiesel et al., 2015), though this is debated (Bryant, Jackson, & Ames, 2009; WHO, 2017). However, comorbid anxiety and depression has a poorer outcome than either condition alone (Prina, Ferri, Guerra, Brayne, & Prince, 2011; Schoevers, Beekman, Deeg, Jonker, & Van Tilburg, 2003; Wolitzky-Taylor et al., 2010).

Evidence suggests that anxiety disorders are still under-recognised in older adults (Bryant et al., 2013) and are often misdiagnosed, typically as patients present with a physical complaint (Locke, Kirst, & Shultz, 2015). As well as this complexity, older adults are less accurate than younger adults at identifying symptoms of anxiety and depression (Wetherell et al., 2009). Therefore, it is even more likely to be missed and puts greater pressure on the clinician to understand the mental health aspect.

Therefore, anxiety disorders in older adults should be regarded as conditions of great public health importance.

5.3.3. Bipolar Disorder

Bipolar disorder is a mood disorder characterised by periods of abnormal elevated energy, defined as mania or hypomania if hallucinations or delusions are present, and periods of major depression (ICD-10 - Bipolar Disorder, 2016). Manic episodes typically have a sudden onset and a duration of one or more weeks of abnormal elevated mood, overactivity, increased mental activity or irritability. During a manic episode, the individual can be easily distracted, at risk of making poor decisions, engage in indiscretions, disregard social boundaries, be grandiose, have disinhibited behaviour and a decreased need for sleep. The most common symptom of mania is increased goal-directed activity and planning with increased self-esteem and grandiosity being the lease common (BMJ Best Practice, 2018; NICE, 2020a; Suppes, 2019). Episodes of hypomania have similar presentations but with milder symptoms for four or more days (BMJ Best Practice (BD), 2018; Suppes, 2019; NICE (BD), 2020). During a depressive episode patients can suffer from dysphoria, altered appetite, lack of motivation, low energy, sleep disturbances, may be more likely to self-harm or attempt suicide (ICD-10 – Bipolar Disorder, 2016; BMJ Best Practice (BD), 2018; Suppes, 2019; NICE, 2020a). Mixed episodes are also common whereby patients experience cooccurring features of mania, hypomania and depression (Suppes, 2019). Risk factors for developing bipolar disorder include family history, a previous diagnosis of a mood disorder prior to 20 years of age, a stressful life event as a trigger and substance abuse (BMJ Best Practice (BD)).

There is a belief that bipolar is more prominent in those of high SES (Verdoux & Bourgeois, 1995), often stereotyped as being a high SES mental health disorder, given the association with public figures such as Stephen Fry, Russell Brand and Jimi Hendrix, among many others. Bipolar has been shown to be more common in highly intelligent and creative people (Gale et al., 2013), which may be why it is misconstrued as being associated with SES. However, the research to date does not appear to support the association between bipolar disorder and SES (Eid et al., 2013; Schoeyen et al., 2011).

Other research suggests that people with BD are more likely to end up unemployed, even if they enrol into college, are more likely to face financial difficulty, get divorced and be associated with assault charges (Kupfer et al., 2002).

Approximately 60% of patients with psychotic bipolar receive an initial misdiagnosis (Altamura et al., 2015; Singh & Rajput, 2006), on average a patient with bipolar is expected to wait 5.7 years for a correct diagnosis from the first onset of symptoms (Morselli & Elgie, 2003) a more recent study found the mean duration of undiagnosed bipolar disorder was over three years with 20% reporting a lack of diagnosis for over five years (Hong et al., 2016). Another study found that 69% of patients were misdiagnosed within the first year of symptoms presenting with the most frequent misdiagnosis being unipolar depression, in some instances taking up to ten years (Hirschfeld, Lewis, & Vornik, 2003). Bipolar is often misdiagnosed as major depressive disorder, substance abuse or schizophrenia (Buoli et al., 2020; Hong et al., 2016; Kupfer et al., 2002), however receiving a wrong diagnosis initially is associated with a longer duration between a correct diagnosis (Hong et al., 2016), which may explain the inconsistencies regarding the period of time taken to receive an appropriate diagnosis.

5.3.4 Clinical Vignettes

Associations such as those between bipolar disorder and SES, anxiety and age, as well as eating disorders and gender, may impact the clinical decisions made. In other words, those disorders that are congruent with the 'stereotype' (such as anorexia and females), may be diagnosed or receive the correct treatment quicker than those incongruent with the stereotype (such as anorexia and males; Gillett, 2019). As outlined in Chapter 2, this is important to explore as missed diagnoses, misdiagnoses and 'near misses' are costly, result in incommensurable costs for people's lives and the NHS. If it is the case that some missed or misdiagnoses are relating to the cognitive biases related with common stereotypes of a clinician, then it is possible to implement strategies (individual and organisational) aimed at overcoming the bias and decrease the likelihood of some medical errors.

In 2014, Tiffen and colleagues developed a definition and conceptual framework to enhance clinical decision-making (Tiffen, Corbridge, & Slimmer, 2014). They defined clinical decision-making as “a contextual, continuous, and evolving process, where data are gathered, interpreted, and evaluated in order to select an evidence-based choice of action” (Tiffen et al., 2014, p.399). In order to understand the complexities within clinical decisions an experimental approach is necessary to understand whether any differences are found between the control and experimental conditioners, as well as the rationale behind the decisions made.

One way to understand whether it is the case that treatment, diagnostic or referral decisions may be influenced by the presence of patient factors is by using clinical vignettes that depict each disorder but only changing the NCpF in the text. Vignettes are fictitious clinical cases that are used to investigate a number of phenomena in the social, behavioural and health sciences and are often used to study clinical decision-making (Evans et al., 2015; Fuss, Briken, & Klein, 2018). Clinical vignettes have been shown to be effective tools to study clinical decisions and assess physicians’ practice variation (Evans et al., 2015; Veloski, Tai, Evans, & Nash, 2005). Vignettes appear to be preferred over medical record reviews when measuring differential diagnoses and treatment decisions (Hartley, Charlton, Jarman, & Harris, 1985; Veloski et al., 2005) as they are a comprehensive method to isolate and evaluate clinicians’ rationale and quality of care (Peabody, Luck, Glassman, Dresselhaus, & Lee, 2000).

5.4. Methodology

5.4.1. Research questions and hypothesis

This study set out to answer the following research questions:

- Does patient gender impact diagnostic, treatment or referral decisions of bulimia nervosa?

The independent variable was patient gender and the dependant variables were the clinical decisions (diagnosis, treatment and referral of bulimia nervosa). The null hypothesis was that patient gender does not impact clinical decisions, while the directional hypothesis was that females are more likely to receive a correct diagnosis and less likely to be treated than males or controls.

- Does patient age impact diagnostic, treatment or referral decisions of anxiety disorder?

In this instance, the independent variable was patient age and the dependant variables were the clinical decisions (diagnosis, treatment and referral of anxiety disorder). The null hypothesis was that patient age does not impact clinical decisions, while the directional hypothesis was that younger adults are more likely to receive a diagnosis and treatment than older adults or controls.

- Does patient SES impact diagnostic, treatment or referral decisions of bipolar disorder?

In this instance, the independent variable was the SES of the patient and the dependant variables were the clinical decisions (diagnosis, treatment and referral of bipolar disorder). The null hypothesis was that patient SES does not impact clinical decisions, while the directional hypothesis was that patients with a high SES are less likely to receive a diagnosis and more likely to receive treatment than patients with a low SES or controls.

5.4.2. Participants

General Practitioners (GPs) were chosen to be the participants for this study given that most of the mental health care is under the responsibility of the GPs and that they are typically the first point of contact for most people seeking mental health support.

Those who fit the following criteria were included in the study:

- GPs who have an active registration on the GMC specialist register, and
- Practiced within the last six months, and
- Practicing in England and Wales, and
- Any age, gender or ethnicity.

Those who did not fit the above criteria were excluded in the study, or those:

- GPs in training, not yet registered on the GMC specialist register, or

- Last practiced more than six months ago, or
- Practicing outside of England and Wales.

There were no requirements as to the location of participants to complete it as participants can choose the best time and place.

5.4.3. Study Design

This section outlines the sequence and various aspects of the experimental study design, instrument and protocol development, data collection and the data analysis (Figure 5.1).

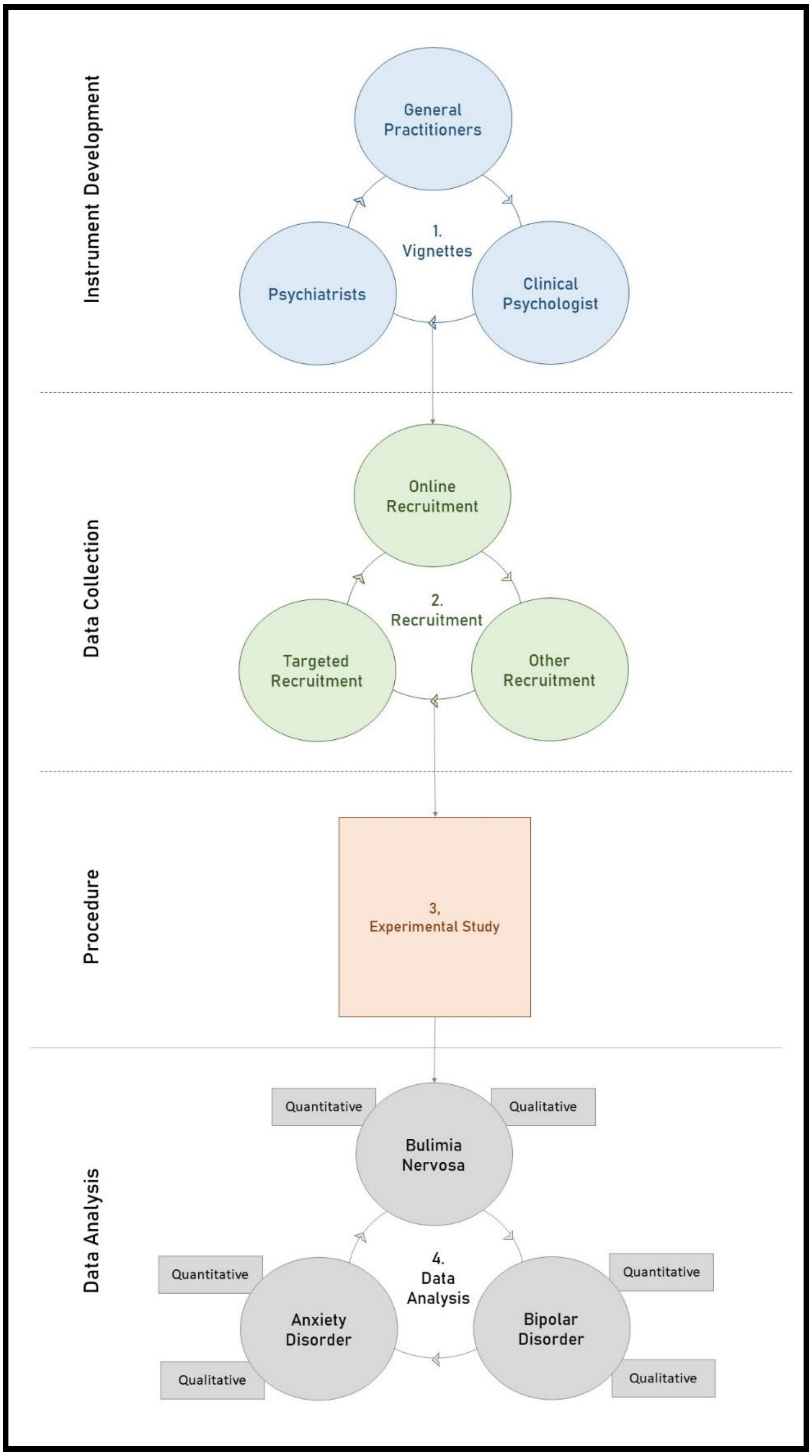


Figure 5.1: Study Temporal Sequence Flow Diagram

5.4.3.1. Instrument Development

Vignette Development

The aim of this project was to build upon the results of Chapter 4. To do this, three mental disorders that were associated with work (as a measure of SES), age and sex were chosen. Bulimia nervosa was paired with sex, anxiety disorder with age, and bipolar disorder with SES. There were three conditions per disorder; for bulimia nervosa the three conditions were male, female, and neutral (control). For anxiety disorder the conditions were young age reference, older age reference and no age reference (control). Finally, for bipolar disorder the conditions were high SES (a "lawyer"), low SES ("homeless") and one with no SES reference (control). Three mental health disorders were chosen to lessen the amount of time GPs had to commit to taking part.

A clinical vignette in this project refers to a brief case history of a fictitious patient. Vignettes were approximately 100 words and created based on clinical signs and symptoms taken from sources of information commonly used as reference points by clinicians in the United Kingdom, specifically, ICD-10 Guidelines, BMJ Best Practice, UpToDate and NICE Guidelines.

A graduate-entry medical student was brought in to assist with the vignette development as part of their developing professional practice (DPP) project for their degree in Medicine. They created three examples of vignettes per disorder (nine vignettes in total) and returned them for comment to the primary researcher (LB). This went through a few drafts, to ensure the NCpF were isolated per disorder i.e. 'bulimia' only had signs of gender, not SES or age, or give reference to other factors not being examined, such as ethnicity. The DPP student also assisted with GP recruitment for the participatory design stage during their GP placements as part of their course.

Once written, the nine completed vignettes were sent to clinicians for feedback on the vignettes themselves, the questions asked, the overall study, and to decide which of the three vignettes was the best exemplar of each disorder to be included in the study. Convenience sampling was used to identify clinicians to provide feedback, specifically the clinicians work closely with Swansea University. The aim was to receive feedback from two GPs and two Psychiatrist, however three GPs, two psychiatrists and one clinical psychologist provided feedback. The GPs provided feedback on the applicability of the vignette to the primary care setting, reliability of the information provided to reflect the patient-practitioner interaction during consultation, as well as any additional information they would expect to find during the consultancy. The psychiatrists gave feedback relating to the symptoms, how the symptoms present, as well as accuracy for the disorder. The clinical psychologist provided alternative insight on the disorder presentation and study design.

Participatory Design Feedback

Participatory design feedback on the vignettes was provided online via email and compiled. Table 5.1 provides information on the clinicians', occupation, location, preferred vignette option and general comments.

Table 5.1: Basic information on clinicians who provided feedback and their chosen vignette option (Bulimia Nervosa = BN, Anxiety Disorder = AD, Bipolar Disorder = BD)

Expert	Position	Form of Feedback	Location	Vignette Option	Notes
GP Expert 1	GP	Email	Tumble Surgery, Llanelli	BN: 1 AD: 2 BD: 1	All accurate Questions amended
GP Expert 2	GP	Email	Neyland Health Centre, Pembrokeshire	BN: 2 AD: 2 BD: 1	BN: 3 also accurate BD: 3 also liked
GP Expert 3	GP	Email	Swansea University, Swansea	BN: 3 AD: 2 BD: 3	No other comments
Psychiatry Expert 1	Psychiatrist	Email	Specialist Trainee 5, Aneurin Bevan University Health Board	BN: 2 AD: 1 BD: 1	AD: 2 is also accurate BD: 2 is also liked
Psychiatry Expert 2	Psychiatrist	Email	Specialist Trainee 5, Cardiff & Vale University Health Board	BN: 1 AD: 2 BD: 2	BN: All accurate BD: 1 also accurate of mania – could add reading rather than sleeping
Clinical Psychology Expert 1	Clinical Psychologist	Email	Cardiff CAMHS, St David's Hospital Cardiff	-	Disorder should be more obvious to ensure you measure the NCpF

Following feedback from the Clinical Psychologist, it was decided to check that the vignettes were not too obvious that a lay person could understand (thus too straight forward so no effect is shown), and not too vague or difficult for a clinician to identify. Therefore, the diagnosis was trialled with a GP who specialises in mental health and two lay people. The GP was accurate in diagnosing while the two lay people were not. The finalised vignettes can be seen in textboxes 1 to 3.

Textbox 1: Bulimia

A patient, Charlie, collapsed while shopping in town last week. You notice some redness on the knuckles but examination is otherwise unremarkable. Charlie admits to feeling self-conscious about her/his/their *body image.* She/he/they *denies any anxiety, low mood or depressive symptoms.* She/he/they *admits having occasional cheat days from* her/his/their *diet where they just keep eating to cope with general stress, but* she/he/they *make up for it by exercising at the gym. Charlie seems frustrated that* she/he/they *fainted and reports general feelings of tiredness and dehydration. ECG and blood tests reveal nothing untoward.*

Textbox 2: Anxiety

A twenty five/seventy six/patient *year old presents to your surgery after attending A&E at 6 am a couple of days ago with palpitations, chest pain, dizziness and a persistent feeling of choking. This is their third episode in 4 months and they were encouraged by a friend to call an ambulance. An ECG reveals the patient is in sinus tachycardia. The chest pain was resolved after 20 minutes of onset. You take a full history, but no specific trigger seems to bring on these episodes. They confide they are worried they are seriously ill and that the doctors are missing something serious, if it is not found they will die. They disclose they have stopped taking the bus to avoid catching something. They are feeling otherwise well and had no past medical history of mental illness.*

Textbox 3: Bipolar

A new patient has been brought to your surgery by their best friend. During the consultation, the patient discloses that they work as a lawyer/are homeless/no reference*, and they do not understand why their friend is concerned as they feel fantastic. The patient's mum recently passed away but they say they are coping well, despite being the only sibling organising the funeral arrangements. They spend most of their days and all nights reading, though the books read are nothing compared to the amazing pieces of literature they have written. The friend reported that this behaviour has been present for about eight days. You notice they talk rapidly, which has not been recorded in previous medical encounters. Medical history does include; appendicitis, cholecystectomy, three episodes of depression, and eczema.*

Other Materials

This was an online study therefore participants completed it in their own time. Being online, it allowed the study to be disseminated wider and ensure a double-blind method of randomisation. Therefore, once the three vignettes were finalised, they were input onto an online research and data collection platform, called ‘Gorilla’. The link to the study can be seen below:

https://research.sc/participant/login/dynamic/00D51085-AEA6-488F-AAE0-C75E97196AD1

5.4.3.2. Data Collection

This study utilised a multi-modal recruitment strategy, using a combination of online, traditional and targeted recruitment (McRobert, Hill, Smale, Hay, & Van der Windt, 2018).

Online Recruitment

Social media is an increasingly common recruitment tool for research (Gelinas et al., 2017; Reuter, 2020). It can assist with recruiting hard-to-reach populations (Kayrouz, Dear, Karin, & Titov, 2016), recruitment can be supported by participants sharing the research online (Reuter, 2020) and be done with little to no cost (Arigo, Pagoto, Carter-Harris, Lillie, & Nebeker, 2018). Social media has been used for health research (Arigo et al., 2018; Christensen et al., 2017), to explore the mental health of both young people (Grové, 2019; Wilson & Usher, 2017) and adults (Kayrouz et al., 2016). It can also be used to recruit clinicians (McRobert et al., 2018). Therefore, this was chosen to be one form of recruitment. Platforms targeted were LinkedIn, Facebook and Twitter.

Another common recruitment method is emailing known contacts. This is more challenging in that there is less spread than on social media and potentially exposed to recruitment bias. Nevertheless, this is still a useful recruitment tool as participants may be interested in the research topic and can also easily be shared. As such, internal University email lists were used to recruit participants; specifically, GPs associated with Swansea University Medical School, from the graduate entry medicine teaching course, as well as part-time GP staff at Swansea University.

Targeted Recruitment

There were several derivatives of targeted recruitment conducted in this study. At the time of recruitment, 574 practices on the Royal College of GP's website were listed as 'Research Ready' (see https://www.rcgp.org.uk/researchready). Of these, 461 were contacted to take part in this research, the rest were from Scotland (n=8) or no email was found on the practice website (n=105) Practices that are 'Research Ready' are interested in taking part in research. After NHS ethical approval was sought, an email was sent to each of the research leads at the various practices asking for collaboration in recruiting by forwarding the study information to the GP staff associated with the practice.

I was invited to recruit at two GP training days, where the intention was to present in person and distribute the Quick Response (QR) code business cards for the GPs to take away with them. One was a training day for Neath Port Talbot GPs on 11 March 2020, with approximately 75 GPs due to attend. However, it was cancelled as the Coronavirus 2020 pandemic was on the rise in March. Therefore, it was not possible to recruit at this event. The other was a Graduate Entry Medicine (GEM) GP Tutor Workshop on 17 June 2020, which was postponed until 14 October 2020. This event went ahead virtually and approximately 40 GPs attended, as such it was possible to recruit at this event.

The study was advertised in the monthly Clinical Innovation and Research Group newsletter. The Involving People Network were also contacted requesting advertising the study as was the Primary Care Research Team, however this did not come to fruition.

Other Recruitment Techniques

Typical recruitment techniques such as in-person and snowball sampling were utilised. To achieve this, business cards for the study was created with QR codes that had a link to the study. QR codes are often used in management research such as in print media for advertisements (Pandya & Galiyawala, 2008; Probst & Brokaw, 2012; Shin, Jung, & Chang, 2012) but have been used in research to explore services (Pulliam & Landry, 2011) and consumer communication (Dou & Li, 2008). QR code postcards showed potential in recruitment of adolescents to online health research (Gu, Skierkowski, Florin, Friend, & Yi, 2016). QR codes had the highest response percentage and lowest cost per recruited participant compared to Twitter and Facebook. It was also the most equal gender spread 45% female, 55% male (as opposed to Facebook 61% and 39%; Twitter 78% and 22%). There is little research on the efficacy of using QR codes for participant recruitment purposes, however it was decided to trial this as an element of recruitment for this study.

5.4.3.3. Procedure

This study used an experimental design, whereby participants were licensed GPs, Figure 5.2 outlines a flow diagram of the procedure. If the participants chose to access the study, either via the link or the QR code, they first came to the information sheet (Appendix 9), which provides the background, rationale and objectives as well as details about how to withdraw from the study. Participants were also required to tick a box stating that they were current general practitioners, then they must type 'I consent' and provide a code they should retain in the boxes allocated in case they wish to withdraw. If they did not consent, the participants were not able to continue onto the study. Contact details for the researchers were also provided in the information sheet, should the participant have any questions. Participants were blinded as to whether the vignettes would display mental health conditions or physical health conditions. Participants could exit the survey and re-enter however they would lose their progress. But, if they had a query, they were able to leave the site and re-join later once their question was answered.

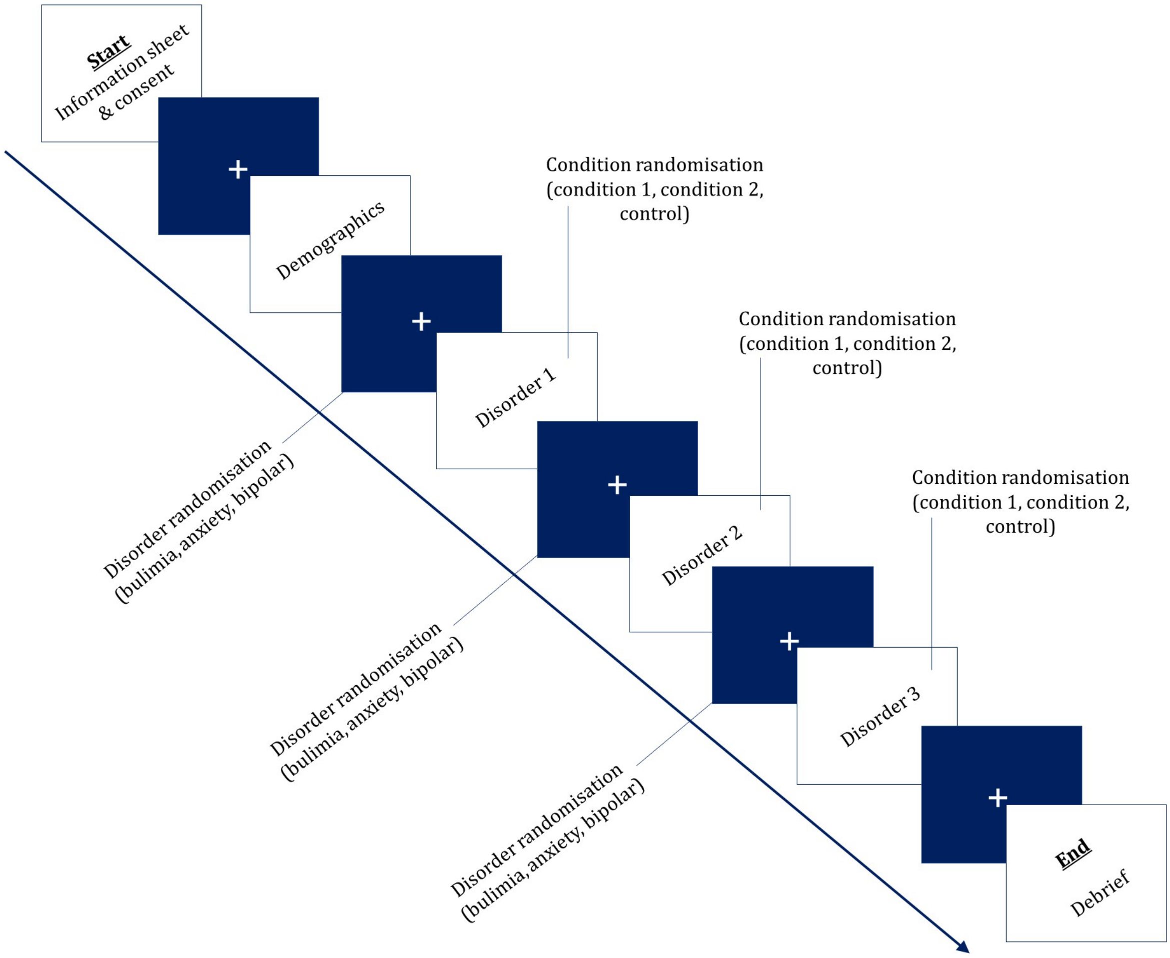


Figure 5.2: Procedure Flow Diagram

Participants then reach the demographics sheet which asked for age, gender, ethnicity and number of years practicing. No other identifiable information was requested to give clinicians the freedom to respond without fear of identification or concerns about judgement for incorrect responses and to encourage genuine responses. Location of GP practice was not sought for this reason, i.e. if any research leads in the practice get in contact, it may be easy to identify the GP.

Following this, participants were randomly allocated (in a double-blinded fashion) to one of the disorders and one of the conditions, a diagram depicting the randomisation process can be seen in Figure 5.3. These were counterbalanced to limit order effects. Therefore, one participant may read the bulimia case first, while the next may read it last, but all participants read one bulimia case. The difference between participants was the exposure condition, meaning one may be exposed to the ‘male’ bulimia case, but another only read the 'female' case. The cases, as shown in textbox 1-3, were identical apart from the pronoun used.

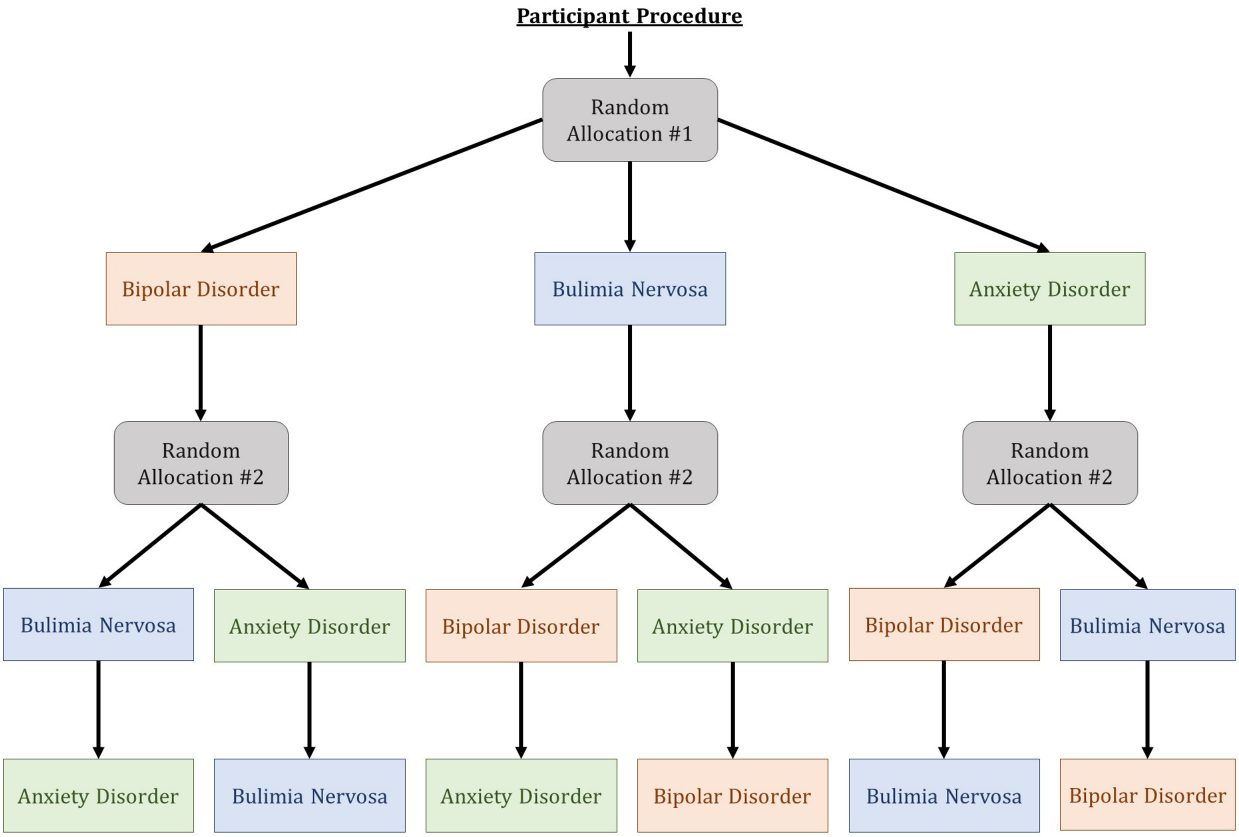


Figure 5.3: Participant Randomisation Process

After each vignette, participants were asked six open-ended questions enquiring as to the clinical decision they would take. The questions can be seen in textbox 4. This was repeated for the second and third vignettes. Finally, a debrief form was presented with an overview of the study and contact details of the ethics committee as well as researchers (Appendix 10). This process took approximately 15 minutes to complete, depending on how much detail the practitioner wished to provide.

Textbox 4: Six questions for participants

1) What would your next course of action be if presented with the patient and why?
2) If you had to diagnose the patient, what would it be and why?
3) If you were to try treatment with the patient, what would you suggest and why?
4) What are your thoughts on referring the patient?
5) Did you have any concerns, or other thoughts/comments regarding the patient?
6) Did you have any other comments?

5.4.3.4. Data Analysis

Design

GPs have limited time, high workload and pressures, therefore a between-subjects design was chosen so the GPs only read and answer questions about three disorders, saving their time, limiting boredom effects, while still answering the research question. A matched pairs design was not chosen to gain the best chance at reaching the desired sample size. An a-priori effect size calculation from G-Power identified that 115 GPs would be needed to reach a medium effect size.

This was an experimental study collecting qualitative and quantitative data. Quantitative aspects include basic descriptive statistics and quantifying the accuracy of the diagnosis, variation in treatment and referral. SPSS was used to analyse this data. The outputs were between groups, with categorical/continuous independent variables and a categorical dependent variable. For parametric testing to be appropriate, continuous variables were needed as well as a large sample size, therefore Pearson Chi-Squared tests for independence were used instead of ANOVAs. These are less sensitive so may not detect differences that parametric testing would have.

Open-ended qualitative responses were analysed using NVivo by LB, with updates and quality checking by supervisors, ADS and AJ. Braum and Clarke's (2006) thematic analysis was used as a basis for the qualitative analyses.

Statistical Analysis

The descriptive statistics for each disorder are outlined in Section 5.5. There were unequal group sizes (small number of other/Asian), therefore it would be inappropriate to use an ANOVA to compare groups. Further, as the outputs were between groups; only one independent variable with a categorical dependent variable that has two or more categories in each (i.e. gender = 3, diagnosis = 4). Therefore, as parametric testing requires continuous variables, as well as greater samples, a Pearson Chi^2 test for independence was used. However, non-parametric testing is less sensitive so may not detect differences between groups that parametric testing would. There is an assumption with a Chi^2 test for independence, which is the minimum expected cell frequency should be five or greater. As this was not found with the original un-grouped results, thus violating the assumption, the results were grouped. Doing so increases the reliability of the test, as such the grouped results are highlighted in Section 5.3, with Appendix 11 outlining the un-grouped results. Results were grouped as follows (Table 5.2):

Table 5.2: Original and Grouped Results

Diagnosis		Treatment		Referral	
Original	Grouped	Original	Grouped	Original	Grouped
Yes **Close** **No** **None**	**Yes** Yes + Close **No** No + None	**Medication** **Therapy** **Combination** **None** **SDM** **Depends** **Refer** **Other**	**Yes** Medication + Therapy + Combination **No** None **Other** SDM + Depends + Refer + Other	**Yes** **No** **Depends** **SDM**	**Yes** Yes **No** No **Other** SDM + Depends

5.4.4. Quality Measure

To ensure this research was of high quality, multiple steps were taken to strengthen the validity, reliability and generalisability during all possible stages. Established theory was used to create the vignette and questions, further validated by the involvement of clinicians to ensure both the vignettes and questions measured what they set out to measure. Vignette development was a dynamic process, through the process the vignettes were continually monitored to ensure no other non-clinical patient factors were used to ensure content validity. The questions were open-ended and covered the concept measured also achieving content validity. The method employed was targeted, researched and based on sound theory to ensure the internal validity of the study was high. External validity was sought by employing appropriate sampling methods to select subjects; by using the pool of ‘Research Ready’ practices on the RCGP website which spans across the various counties in England and Wales, to increase the study's generalisability. Participant allocation was double-blinded to the different conditions and blinded to the medical condition observed as the information sheet did not explicitly outline that vignettes will depict 'mental health' to prevent leading, ensuring the validity of the study. Finally, results were co-produced and the comments provided by the participants suggested that some presentations were common can further enhance the conclusion that the vignettes were valid.

All methods were used consistently within the study and between participants. The research was conducted using an online platform; therefore all participants received a controlled research experience ensuring reliability. All questions used identical wording, therefore internal consistency of the experiment was achieved. The conditions were standardized across participants and all participants viewed the exact vignette, with only the non-clinical patient factor amended (i.e. all those who saw the 'control' condition for bulimia read the same vignette), therefore held high reliability.

5.4.5. Ethical Approval

Swansea University Medical School Ethical Sub-committee provided ethical approval to recruit for this study (project number: 2019-0024A; Appendix 12). This project did not require any further ethical approval from bodies such as the NHS REC as it did not involve using NHS organisations to access patients. This study only required IRAS Health Research Authority approval to contact the GP practices via the Research Ready list supplied on the Royal College of General Practitioners website (IRAS project ID: 280969; protocol number: RIO-007-20; Appendix 13).

5.5. Results

A total of 115 GPs participated in the study, of these seven only partially completed the survey (only one of the three vignettes). The demographics are shown in Table 5.3.

Table 5.3: Overall Participant Demographics

Completion	Age	Sex	Ethnicity	No. Years Practicing
100% (n = 108)	M = 45.4 SD = 9.4 Max = 77 Min = 25	F = 56 M = 52	Asian = 8 Black = 2 Mixed = 1 White = 95 Other* = 2	M = 15.1 SD = 9.4 Max = 44 Min = 1
33% (n = 7)	M = 39.6 SD = 5.4 Max = 51 Min = 33	F = 6 M = 1	Asian = 2 White = 5	M = 7.9 SD = 7.3 Max = 25 Min = 1

* Other described in free-text box as ‘Arab’ and ‘Chinese’

5.5.1. Bulimia

An overview of the variables and hypotheses for the bulimia condition can be seen in Table 5.4:

Table 5.4: Overview of Research Question - Bulimia

Disorder	Bulimia
Independent Variables (Gender)	- Female - Male - Control
Dependent Variables (Clinical Decision)	- Diagnosis - Treatment - Referral
Hypotheses	- Females more likely to receive a diagnosis than either condition - Females less likely to receive treatment or referral than either condition

5.5.1.1. Descriptives

The descriptive statistics for the participants who completed the bulimia conditions are outlined in Table 5.5, Table 5.6 and Table 5.7.

Table 5.5: Gender and Ethnicity Descriptive Statistics for Bulimia Nervosa

Demographic	Category	Number	Percentage
Gender	Female	58	52.3
	Male	53	47.7
Ethnicity	Asian	9	8.1
	Black	2	1.8
	Mixed	1	0.9
	White	97	87.4
	Other	2	1.8
Total amount per demographic		111	100

Table 5.6: Age and Number of Years Working as GP Descriptive Statistics for Bulimia Nervosa

Demographic	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
Age	25	77	45.3	9.4	0.4	-0.3
Years as GP	1	44	14.9	9.4	0.4	-0.6

Skewness here highlights a positive skew (i.e. scores clustered to the left at low values). Negative kurtosis indicates the distribution is rather flat (i.e. too many cases in the extremes). With reasonably large sample sizes skewness will not make a substantive difference in the analysis (Pallant, 2013; Tabachnick & Fidell, 2013). Kurtosis can result in an underestimate of the variance, but this risk is lessened with larger sample sizes.

Table 5.7: Condition and Order Descriptive Statistics for Bulimia Nervosa

Demographic	**Category**	**Number**	**Percentage**
Condition	Female	38	34.2
	Male	36	32.4
	Control	37	33.3
Presentation Order	First	39	35.1
	Second	34	30.6
	Third	38	34.2
Total amount per demographic		109	100

5.5.1.2. Bulimia Condition with Diagnosis

Following a Pearson Chi^2 test for independence, no cells (0.0%) had an expected count less than five which covers the 80% required. Therefore, there was a significant difference between gender and diagnosis of bulimia nervosa (X2(2, N=111) = 10.1, p<0.01). Specifically, the diagnosis was more likely to be identified correctly in the control condition, while the presence of the gender variable made an accurate diagnosis less likely (Figure 5.4).

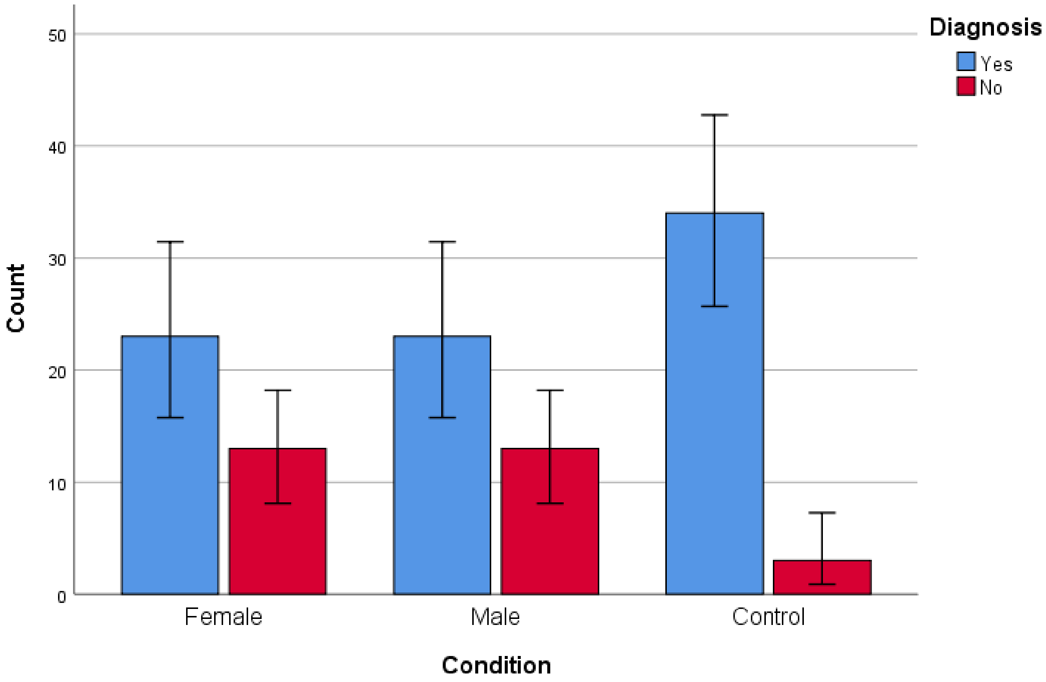


Figure 5.4: Graph to show the accuracy of participant’s diagnostic decisions for Bulimia Nervosa

5.5.1.3. Qualitative response to “if you had to diagnose, what with and why?”

When asked the question “if you had to diagnose, what with and why”, a variety of responses were given. The table below provides the number of times these conditions were mentioned in the original thematic analysis coding and grouped for the quantitative results (Table 5.8). Some participants identified multiple:

Table 5.8: Between-groups Comparison for Bulimia Nervosa Question 2 Responses

Theme	Number of references and codes present								
	Men			Women			Control		
	Theme Present	Amount	Grouped	Theme Present	Amount	Grouped	Theme Present	Amount	Grouped
Yes Bulimia		6	**20**		6	**28**		12	**34**
Close		14			22			22	
Anorexia	✓						✓		
Eating disorder	✓			✓			✓		
Induced vomiting	✓								
Restrictive eating							✓		
Disordered eating							✓		
Starving self							✓		
No		8	**14**	**No**	9	12	**No**	3	3
Body dysmorphia	✓						✓		
Dermatomyositis	✓								
Anxiety	✓			✓					
Vaso vagal syncope	✓			✓					
OCD	✓								
Depression				✓					
Gastric problem				✓					
Adjustment disorder				✓					
Stress				✓					
Self-harm				✓					
Syncope				✓					
Malnutrition				✓					
None		6		**None**	3		**None**	0	

In the quantitative analysis, the “yes” and “close” responses were merged as were the “no” and “none”. From this table and reflecting on the results of the quantitative analysis, the control had significantly far fewer incorrect responses and far more correct responses. Though the male condition had slightly more incorrect responses than the female, it seems the female condition had a wider variety of incorrect responses.

Women were recognised slightly more readily as having an eating disorder than the males (though not significant).

5.5.1.4. Bulimia Condition with Treatment

The results of the Pearson Chi^2 showed significance. No cells (0.0%) had a count less than five, therefore, there was a significant difference between gender and treatment for bulimia (X2(4, N=111) = 10.9, p<0.05). Specifically, the control group had a greater number of treatment decisions than either of the two gender options, and females had more recorded 'no treatment' (Figure 5.5).

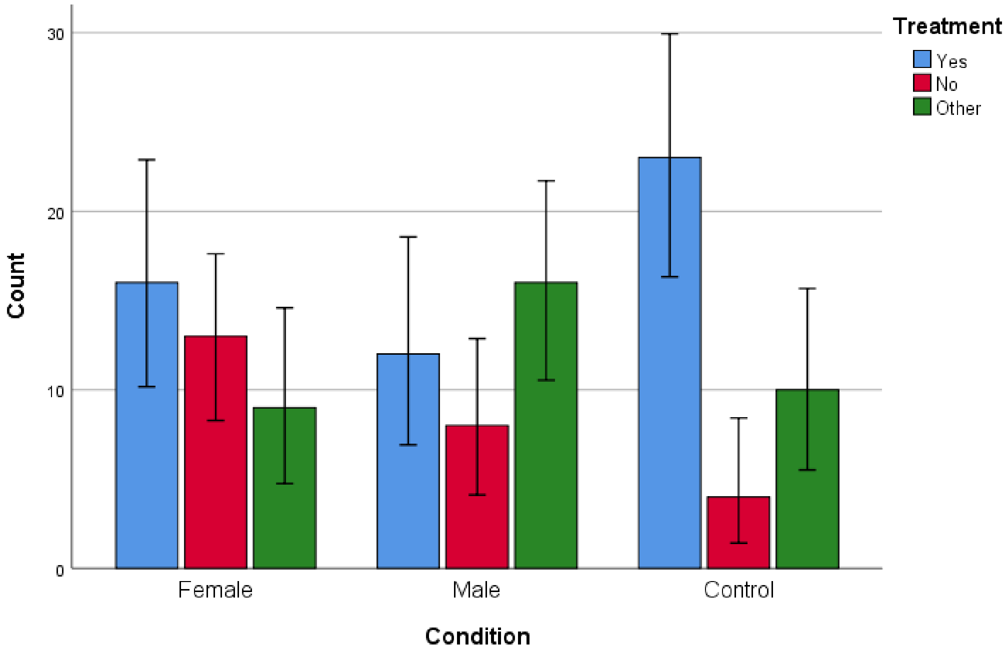


Figure 5.5: Graph to show the participant's treatment decisions for Bulimia Nervosa

5.5.1.5. Qualitative response to "if you were to treat, what would you suggest and why?"

When asked about treating the patient, several treatment options were highlighted. The table below provides the themes and number of times these themes were mentioned in the original coding of the thematic analysis and grouped for the quantitative results (Table 5.9). Some participants identified multiple themes:

Table 5.9: Between-groups Comparison for Bulimia Nervosa Question 3 Responses

Theme	Men		Women		Control	
	Amount	Grouped	Amount	Grouped	Amount	Grouped
Yes		11		11		21
Medication	1		0		2	
Therapy	7		7		8	
Combination	3		4		11	
None		8		15		4
Other		15		14		11
SDM	0		4		2	
Depends	6		2		1	
Refer	7		2		8	
Other	2		6		0	
Total n of references per case		34		40		36

Number of references and codes present (spanning header over Men, Women, Control)

In the quantitative analysis, the original treatment options were merged to become three groups. From Table 5.9 and reflecting on the results of the quantitative analysis, the control condition had far more instances of treatment options than men or women. Women had the highest reported 'no treatment' decision, while no differences can be seen with the 'other' treatment options.

Medication was scarcely provided as a treatment option. Those that did identify medication to assist the patient, all identified Selective Serotonin Reuptake Inhibitors (SSRIs) to 'increase mood'. Therapy was consistently identified as a course of treatment across all conditions. "Cognitive Behavioural Therapy (CBT)", "psychological therapy", "counselling", "talking therapy" were terms used under this theme. There were a limited number of responses for a combination of therapy for the male and female conditions, however it was often suggested for the control condition. Therapy in combination with a prescription of SSRIs were the most common, however treatment decisions could also include referral to a specialist service, GP intervention, and self-help solutions.

The female condition received the greatest number of no-treatment responses, followed by males with approximately half the number of the female condition, then control with half the amount reported in the male condition. The “no treatment” responses varied from “wouldn’t treat” to discussions about the dangers of excessive exercise and regular eating patterns, providing follow-up appointments or reassurance, and waiting for other results to come through to establishing a diagnosis. As one participant reported in the female condition:

> Regular review and time as a treatment.

Other forms of treatment were identified including various forms of self-help (e.g. food diaries, increase fluids) and sign-posting to online sources. There were more instances of these alternative help resources in women than men and controls. This may be due to women being the most common seen. An example of one participant’s treatment recommendation is reported below:

> Increase fluids, balanced diet, sensible exercise regime, websites such as Living life to the full & Foundation for positive mental health.

Some responses to the treatment request included referrals. Women were the least likely to receive referrals than men and controls. Referrals include other areas of health (such as rheumatology) as well as psychological services. One participant highlighted the necessity for referrals in patients with an eating disorder:

> There are red flag levels for urgent referral to an eating disorder clinic. Eating disorders are specialist and beyond what GPs have the time and expertise to deal with. They need lots of psych input as well as the physical monitoring which is complex and protocol driven.

The male condition held slightly more uncertainty, with more ‘depends’ responses, perhaps given the atypicality of a male with an eating disorder presenting, which required “more information before deciding on treatment”. Only one response in the control condition fitted this theme, where the treatment decision was dependant on the patient’s locality and service access.

The female and control conditions both reported incidences of SDM whereas there was no such mention for the male condition. Such instances were where the participant would “ask if they wanted help, and what type of help they would like”, requesting guidance from the patient about what support they would like to receive.

Though these four subthemes were combined to become “other” in the quantitative analysis, knowing how the actual responses reflect this is important to improve understanding as there appears to be differences between the male, female and control conditions in their qualitative responses, however the quantitative alone would miss these.

5.5.1.6. Bulimia Condition with Referral

This Chi^2 test of independence also gave an output of no cells (0.0%) cells with an expected count less than five, therefore the lack of significance is reliable (X2(4, N=111) = 7.8, $p>0.05$). Therefore, there were no significant differences between referral decisions for any gender condition with bulimia. Figure 5.6 below shows that men had less referral counts than the women and controls and more ‘depends’ counts for men than either of the other conditions. As non-parametric testing is conservative, there may be an association here that could be further explored in future research. The results of the thematic analysis may provide better insight as to why this may be the case.

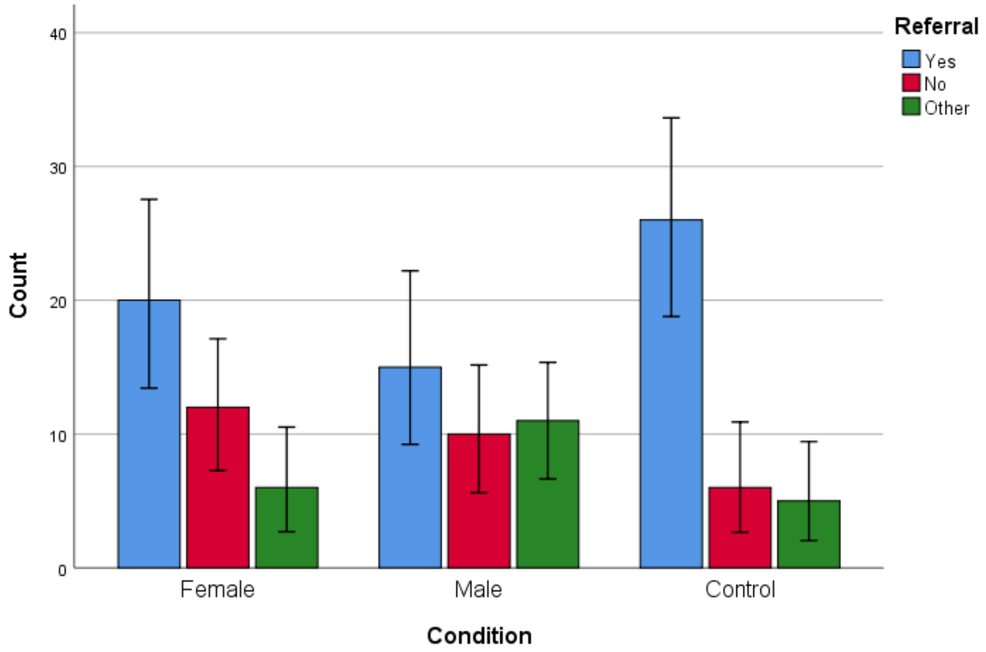


Figure 5.6: Graph to show the participant's referral decisions for Bulimia Nervosa

5.5.1.7. Qualitative response to "what are your thoughts on referring the patient?"

When questioned about referring, certain themes were highlighted. Table 5.10 below provides the number of times these were mentioned, some participants identified multiple:

Table 5.10: Between-groups Comparison for Bulimia Nervosa Question 4 Responses

	Number of reference and codes present					
Theme	Men		Women		Control	
	Amount	Grouped	Amount	Grouped	Amount	Grouped
Yes		15		20		26
No		10		12		6
Other		9		8		5
Depends	8		5		3	
SDM	1		3		2	
Total n of references per case		34		40		37

In the quantitative analysis, the “SDM” and “Depends” options were merged. From Table 5.10 and reflecting on the results of the quantitative analysis, the control had more instances of referral options being provided than men or women, and women had the highest reported ‘no referral’ decisions.

All conditions suggested patients should be referred. Males had the least number of referral comments, followed by females and controls had the greater number. Referrals were to neurology, rheumatology or cardiovascular as there was uncertainty around the diagnosis, as well as for specialist management as “there is little the GP can offer in terms of medication and management given the complexity of the intervention required to overcome an eating disorder”.

Both male and female conditions had higher occurrences of no referral than the control. In the male condition, some participants did not provide a reason for not referring, some felt it was “not required at the moment”, interestingly a small number of participants reported “not sure where to and why”. However, there was a significant number of participants that highlighted the reason for lack of referral was a lack of, or delays to access, eating disorder services, or the insight from the patient I:

> He may well not want to engage with referral as he might see himself as coping with his problems. I would have to point out that his body is seemingly telling him otherwise.

Women had the greatest number of no-referral responses. Answers provided were mostly short - “not required”, “I would not–, “no” - without justification. The control condition had the least number of no-referral responses, the reasons for lack of referral were because “things may improve with initial discussion and education”, not having enough information, ineligibility for eating disorder services, and wishing to build a rapport before referring.

The male condition had the greatest number of uncertain responses, under “depends”. Participants sought more information before deciding whether to refer, gathering information such as a more detailed history, blood test results, body mass index (BMI), weight, risk assessment, patients’ thoughts and willingness to engage. It was again mentioned that the psychosocial impact would have to be accounted for, as it may influence the response by secondary care services:

> If the person was coping largely with work and family life, I would expect that the response of any secondary care service may be limited due to resource prioritisation. I do not personally see this as fair.

A small number of participants identified elements of SDM across their referral responses. These involve the patient's opinions and agreeableness to the prospect of referral, but also involving other medical professionals in decisions.

5.5.1.8. Further Insight from Text Comments

Participants across all three conditions referenced the commonality of the presentation in primary care services, for the female and control conditions it was identified as being 'common', while participants felt the male condition was uncommon:

> Eating disorders may be less easily spotted in male patients because it's more unusual, but of course do still occur.

Age was also often requested in all conditions, and gender requested in the control condition, one participant highlighted:

> Age is the most important piece of clinical information that any doctor can have.

Age would impact how the doctor responds, as if the patient was young then they may respond differently to a patient who is an adult:

> How old is she? I would refer urgently if she was under 18.

Participants also wanted other information as there may be other factors that are missing that may point to other physical rather than mental causes. Information such as social health, work and life stressors were also called for.

Participants expressed desires to discuss the patient's feelings and attitudes in all conditions. Particularly with regards to their body image, stress, why they decided to start dieting, discussing possibility around issues of food,

> I would explore a bit more with them why they had concerns about body image, why they were frustrated with themself for fainting, and what their level of insight into the problems was.

Building trust, rapport, providing reassurance and talking to the patient “sensitively” were also across all conditions:

> Long chat with patient to try and establish rapport and explore the ‘general stress'.

Continuity of care was briefly mentioned in the male and control conditions, as one GP wrote:

> This is the sort of patient where it is really helpful to have some background knowledge of the patient and their family circumstances too. I have a few patients like this where, when the family background is already known, such problems can almost be anticipated. This is again a value of continuity of care and true family practice.

Safeguarding was mentioned twice in the male condition which referenced self-harm and medication abuse. These were also identified in the female and control condition along with other concerns such as suicide, domestic abuse, and ability to drive.

5.5.2. Anxiety

An overview of the variables and hypotheses for the anxiety condition can be seen in Table 5.11:

Table 5.11: Overview of Research Question - Anxiety

Disorder	Anxiety
Independent Variables	- Young
Age	- Old
	- Control
Dependent Variables	- Diagnosis
Clinical Decision	- Treatment
	- Referral
Hypotheses	- Younger adults are more likely to receive a diagnosis, treatment, and referral than either other condition.

5.5.2.1. Descriptives

The descriptive statistics for the participants who completed the bulimia conditions are outlined in Table 5.12, Table 5.13 and Table 5.14.

Table 5.12: Gender and Ethnicity Descriptive Statistics for Anxiety

Demographic	**Category**	**Number**	**Percentage**
Gender	Female	57	52.3
	Male	52	47.7
Ethnicity	Asian	8	7.4
	Black	2	1.8
	Mixed	1	0.9
	White	96	88.1
	Other	2	1.8
Total amount per demographic		109	100

Table 5.13: Age and Number of Years Working as GP Descriptive Statistics for Anxiety

Demographic	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
Age	25	77	45.5	9.4	0.3	-0.3
Years as GP	1	44	15.2	9.5	0.4	-0.6

Table 5.14: Condition and Order Descriptive Statistics for Anxiety

Demographic	Category	Number	Percentage
Condition	Young	38	34.9
	Old	36	33.0
	Control	35	32.1
Presentation Order	First	38	34.9
	Second	42	38.5
	Third	29	26.6
Total amount per demographic		109	100

5.5.2.2. Anxiety Condition with Diagnosis

The Pearson Chi^2 for anxiety and diagnosis found no cells had an expected count of less than five (0.0%), which was significant (X2(2, N=109) = 9.0, p=0.01). Therefore, there a significant difference was seen between age ranges and the diagnostic decisions made. Specifically, as shown in Figure 5.7, younger people were more likely to have an accurate diagnosis than the older adult and control condition.

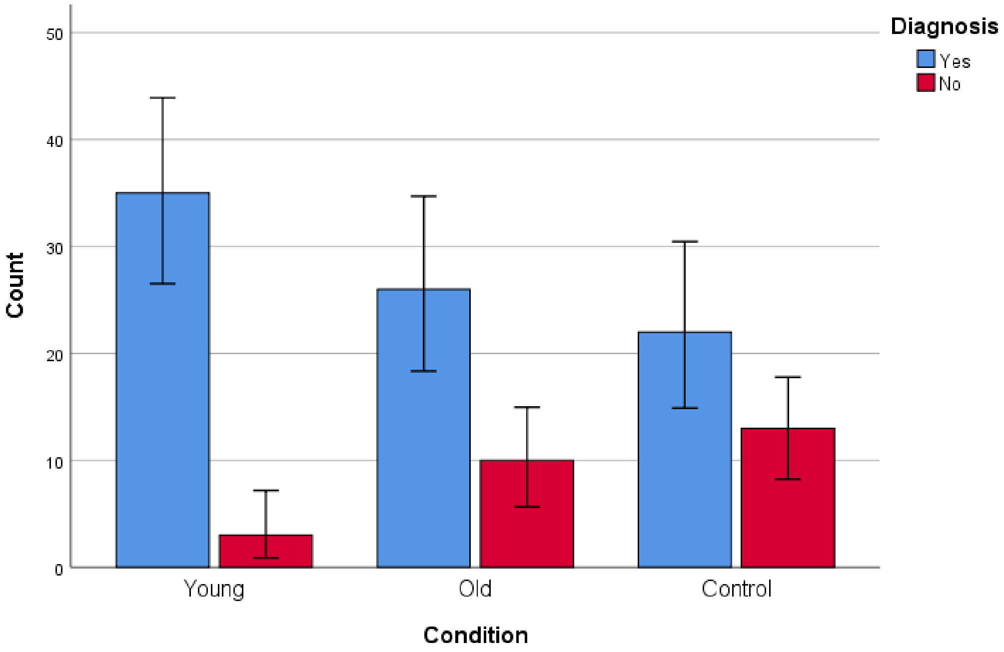


Figure 5.7: Graph to show the accuracy of participant's diagnostic decisions for Anxiety

5.5.2.3. Qualitative response to "if you had to diagnose, what with and why?"

When participants were asked what they would diagnose there were a range of responses. The table below provides the number of times conditions were mentioned in the original thematic analysis coding and grouped for the quantitative results (Table 5.15). Some participants identified multiple, for these conditions the more accurate case was scored:

Table 5.15: Between-groups Comparison for Anxiety Question 2 Responses

Theme	**Number of references and codes present**								
	Young			Old			Control		
	Theme present	Amount	Grouped	Theme present	Amount	Grouped	Theme present	Amount	Grouped
Yes		29	35		20	26		16	22
Close		6			6			6	
Panic attack	✓			✓			✓		
No		2	3	**No**	8	11	**No**	7	12
Arrythmia				✓			✓		
Angina pectorus	✓			✓					
Supraventricular tachycardia							✓		
Stress	✓								
Somatisation	✓								
Cardiac				✓					
Myocardial Infarction				✓					
Acute coronary syndrome	✓								
Globus	✓								
Sinus tachycardia				✓					
Coronary ischaemia				✓					
None		1		**None**	3		**None**	5	
Total n of references per case			38			37			27

In the quantitative analysis, the “yes” and “close” were merged as were the “no” and “none”. From Table 5.15 above and reflecting on the quantitative results, the young condition had fewer incorrect responses and more correct responses than the other two conditions. The older condition had slightly more correct responses than the grouped. This is a reverse of what was seen with the bulimia condition, as the lack of any age reference hindered the accuracy of the diagnosis.

5.5.2.4. Anxiety Condition with Treatment

The Chi^2 test for treatment decisions and age resulted in three cells (33.3%) having a count less than five. No significant difference between age and treatment decisions for anxiety were seen (X2(4, N=109) = 5.4, p>0.05). Figure 5.8 shows the array of responses.

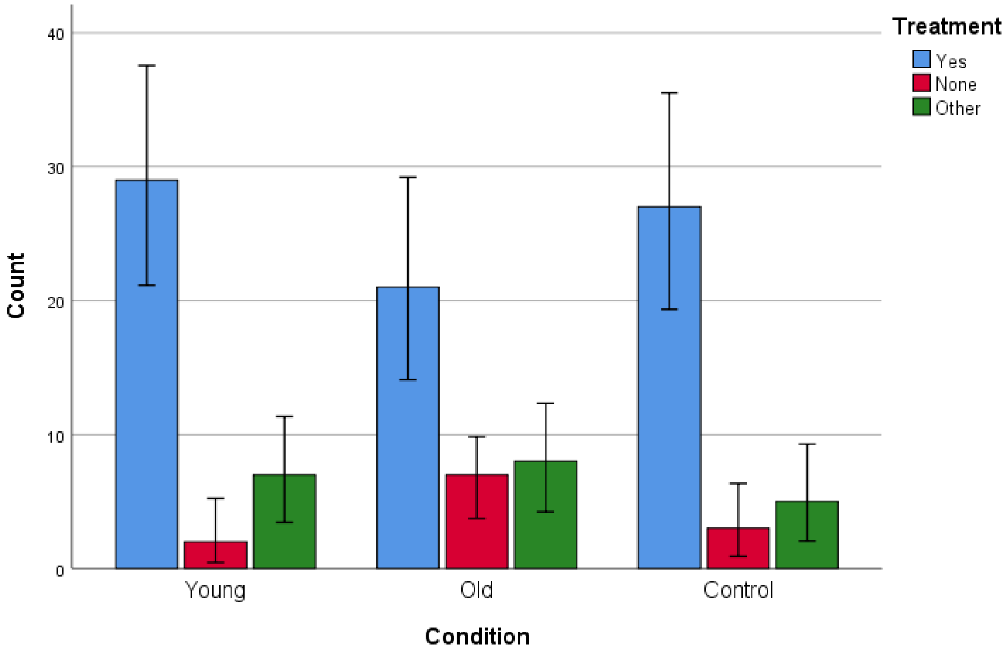


Figure 5.8: Graph to show the participant's treatment decisions for Anxiety

5.5.2.5. Qualitative response to "if you were to treat, what would you suggest and why?"

When asked about treatment, different options were provided. Table 5.16 shows the themes and number of times these themes were mentioned in the original coding and grouped for the quantitative results. Some participants identified multiple themes:

Table 5.16: Between-groups Comparison for Anxiety Question 3 Responses

Theme	**Number of references and codes present**					
	Young		Old		Control	
	Amount	Grouped	Amount	Grouped	Amount	Grouped
Yes		**28**		**21**		**24**
Medication	7		14		15	
Therapy	5		2		1	
Combination	16		5		8	
None		**2**		**7**		**3**
Other		**8**		**9**		**7**
SDM	1		1		2	
Depends	3		3		3	
Refer	-		3		1	
Other	4		2		1	
Total n of references per case		38		37		34

In the quantitative analysis, the original treatment options were merged. Though the quantitative results showed no difference between age and treatment decisions for anxiety, there appears to be slightly less grouped ‘yes’ responses to treatment and slightly more no treatment options (‘none’) for the older condition (Table 5.16).

Medication alone was mentioned twice as often for the older and control conditions than the young condition. Medications highlighted vary from beta blockers, aspirin, glyceryl trinitrate (GTN) spray, statin, bisoprolol, SSRI, and proton pump inhibitors (PPI).

Therapeutic treatments were not as common for anxiety than bulimia. The therapeutic solutions were more frequently found in the younger rather than older or control conditions.

> I would discuss cognitive behavioural therapy in the first instance as I would want to avoid drug treatment if not necessary.

Though identified in all, more so than the bulimia vignette, the younger condition had the greatest number of treatment suggestions that used a combination of techniques. SSRI with some form of psychological therapy appeared to be the most common combination. Medications included diazepam, propranolol, citalopram, sertraline or betablockers. While self-help techniques, social prescribing, anxiety management strategies, CBT or "other" psychological therapy were suggested in conjunction with the medication.

Older adults had the greatest number of "No Treatment" responses. Responses varied from "no treatment", "not at this time", to "can't at this point". Though many did not expand on their responses, those that did sought more information and highlighted other aims during the clinical interaction:

> I think the main priority is to build trust and rapport, so the patient doesn't feel "dismissed by another doctor". This will take some time. I would aim to get them to have an understanding of panic disorder and make it clear we acknowledge the reality of the physical symptoms (not "in their head").

The 'Other' theme for anxiety included various forms of self-help, stress management classes, mindfulness strategies, information leaflets, removing alcohol and caffeine from their diet and sign-posting to online sources:

> I would also offer the patient bibliotherapy and suggest some online websites such as Glasgow steps and Mood Gym.

Though a separate question asked about referrals, some participants mentioned referring in their answer about treatment decisions. This was only seen in the older adults and control condition. The referral options identified here were a mix between cardiology and psychological services:

> Anxiety vs cardiac diagnosis. At 76 years old, I'd refer to cardiology before starting treatment.

There was an element of uncertainty about treatment across all conditions, which was grouped under a 'Depends' theme. Decisions mostly depended on patient history, examination, resources, whether patients require reassurance, test results, and the likely diagnosis. All conditions briefly mentioned elements of SDM:

> I cannot answer that. There is nothing fixed, it would depend on a shared decision. Current access to psychological therapies may affect decision to use these if felt appropriate.

5.5.2.6. Anxiety Condition with Referral

This also gave an output of no cells (0.0%) with an expected count less than five. The results remained not significant (X2(4, N=109) = 0.9, p>0.05). Therefore, no significant difference can be seen with age and referral decisions for anxiety (see Figure 5.9).

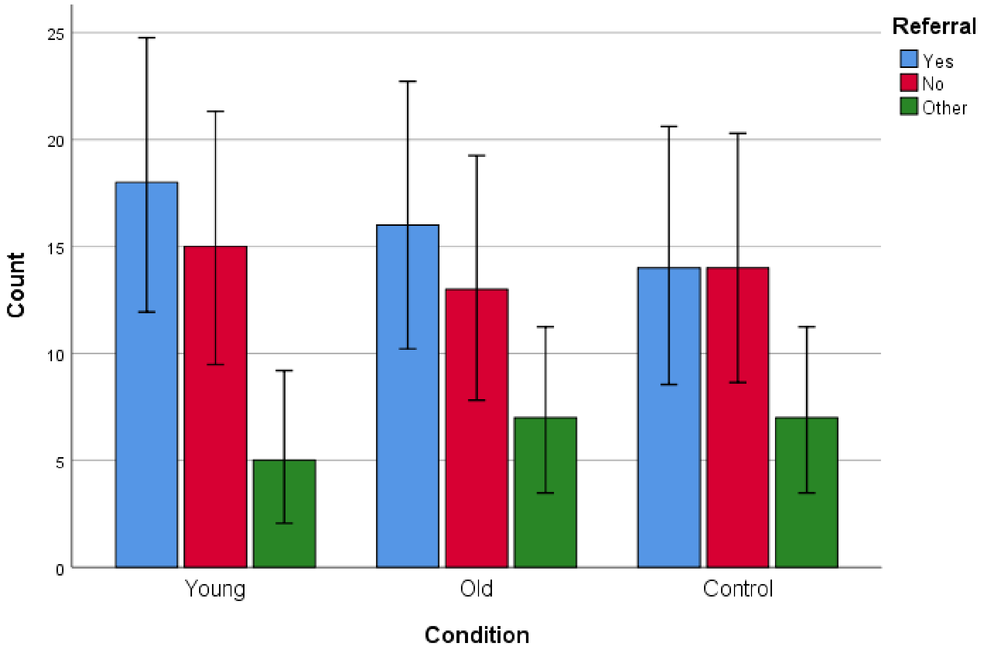


Figure 5.9: Graph to show the participant's referral decisions for Anxiety

5.5.2.7. Qualitative response to "what are your thoughts on referring the patient?"

When asked about referring the patient, responses were mixed. Table 5.17 below provides the number of times responses occured, some participants identified multiple:

Table 5.17: Between-groups Comparison for Anxiety Question 4 Responses

Theme	**Number of reference and codes present**					
	Young		Old		Control	
	Amount	Grouped	Amount	Grouped	Amount	Grouped
Yes		14		17		17
No		14		13		15
Other		5		7		4
Depends	4		5		3	
SDM	1		2		1	
Total n of references per case		23		37		36

In the quantitative analysis, the "SDM" and "Depends" options were merged. From this table and reflecting on the results of the quantitative analysis, the young condition had slightly less 'yes' responses than the older or control condition. Very little difference was seen between the other scores. The older and control condition had referrals for psychological therapies as well as physical clinics such as cardiology or rapid access chest pain clinic:

> Referral to a cardiologist as age suggests an organic issue needs to be investigated.

While the younger condition only saw referrals for psychological therapies such as IAPT, CBT and counselling:

All conditions had a similar number of 'No Referral' comments. The responses appear balanced across all conditions; a combination of short responses ("would probably not refer on at this stage"), some reasoned responses ("I don't think all possibilities have been considered"), self-referrals ("I would suggest they self-refer to IAPT"), or self-help only ("self-help in our area is the only pathway").

Uncertainty around referral decisions were also grouped under one 'Depends' theme, which was equally present across all conditions. It was dependant on the results of tests or the physical exam, the urgency of the symptom presentation, and the local pathways available.

> This depends on local pathways- it is likely that I would not have anyone who would see them in a timely manner unless perhaps the practice employs an in-house mental health practitioner.

A small number of participants identified elements of SDM across their referral responses. The ‘SDM’ comments were similar across all age conditions, clinicians would “take patient preference” to make the decision.

5.5.2.8. Further Insight from Text Comments

As with bulimia, GPs desired more information however to a lesser extent. Younger and control conditions had the most comments requesting more information, with older adults having the least number of comments under this theme. For the control condition only, information about the age and sex was requested, stating that they “need to know age” and are “missing the visual cues of seeing a patient”, stating openly that it would influence the decisions made:

> Not enough info in scenario to make a clinical decision- things like age, sex… Would all influence my management.

More information relating to family history, lifestyle, about the symptom presentation itself, and the use of alcohol, illicit drugs, cigarettes and caffeine was also requested. The latter was identified briefly in the control and older conditions though was mostly desired for the younger adults:

> Specifically ask if they are taking any illicit drugs, as this could explain the symptoms in a young adult.

There was a request for further physical examination in all conditions. Examples included: general physical examinations (such as observations and auscultation of the heart and chest), organising blood tests, electrocardiogram (ECG) and thyroid function tests. Conditions thought to identify include: anaemia, hyperthyroidism, cardiovascular and respiratory problems. It was deemed important to examine physical causes and anxiety “would be a diagnosis of exclusion”, especially in the older condition:

> I think in this age group and with such symptoms, they need a more full physical examination before resting on a mental health problem as the diagnosis.

This theme identifies the participants’ desire to discuss the patients’ concerns, to understand the symptoms, to explain anxiety or the procedures, provide reassurance and gain an understanding of their perspective, this was most prominent in the younger condition. Some participants highlighted they would “finish every step with the patient”, while others reported the older adult condition as “the GP clinic from hell” as “this group of patients will not be as reassured by telephone consultations”.

All anxiety vignettes were seen as a “common scenario” where GPs “often see patients like this”, however some reported negativity associated with these presentations, which may come from the amount of time taken to console the individual:

> This is far from an infrequent presentation to general practice that takes a significant amount of time to manage properly.

Such service concerns were only identified in the aged conditions, whereby long waiting lists, limited and over-stretched medical resources, and lack of funding were identified as challenges for this population:

> The mental health services are woefully underfunded and my concern would be that he would not be able to access the modalities that would arrest, subdue and improve his clinical presentation.

That said, some (more often in the control condition) reported exploring why the patient is fearful, listening to the patient, understanding their concerns.

> I would want to acknowledge that and not dismiss those concerns while also exploring the possibility of panic attacks with them.

Safeguarding concerns were identified in the young and control conditions, suicidal ideation, prohibiting driving until further assessments, domestic abuse and wider social situation were all highlighted:

> Again, look for suicidal thoughts or ideas, any safeguarding issues, domestic abuse, think of the family, are children affected, exploring social situation is vital.

5.5.3. Bipolar

An overview of the variables and hypotheses for the bipolar condition can be seen in Table 5.18:

Table 5.18: Overview of Research Question - Bipolar

Disorder	- Bipolar
Independent Variables Socioeconomic Status	- High (Lawyer) - Low (Homeless) - Control
Dependent Variables Clinical Decision	- Diagnosis - Treatment - Referral
Hypotheses	- Patients with a high SES are less likely to receive a diagnosis that the other conditions. - Patients with a high SES are more likely to receive treatment and be referred than the other conditions.

5.5.3.1. Descriptives

The descriptive statistics for the participants who completed the bulimia conditions are outlined in Table 5.19, Table 5.20 and Table 5.21.

Table 5.19: Age and Number of Years Working as GP Descriptive Statistics for Bipolar

Demographic	Category	Number	Percentage
Gender	Female	59	53.2
	Male	52	46.8
Ethnicity	Asian	9	8.1
	Black	2	1.8
	Mixed	1	0.9
	White	97	87.4
	Other	2	1.8
Total amount per demographic		111	100

Table 5.20: Age and Number of Years Working as GP Descriptive Statistics for Bipolar

Demographic	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
Age	25	77	45.2	9.5	0.4	-0.3
Years as GP	1	44	14.8	9.5	0.4	-0.6

Table 5.21: Condition and Order Descriptive Statistics for Bipolar

Demographic	Category	Number	Percentage
Condition	Low	42	36.9
	High	33	30.6
	Control	36	32.4
Presentation Order	First	41	36.9
	Second	33	29.7
	Third	37	33.3
Total amount per demographic		111	100

5.5.3.2. Bipolar Condition with Diagnosis

No significant difference was seen between socioeconomic status (work) and accuracy for diagnosing bipolar disorder (X2(2, N=111) = 2.2, p>0.05). No cells (0.0%) had an expected count of less than five. Figure 5.10 demonstrates the diagnostic accuracy across conditions.

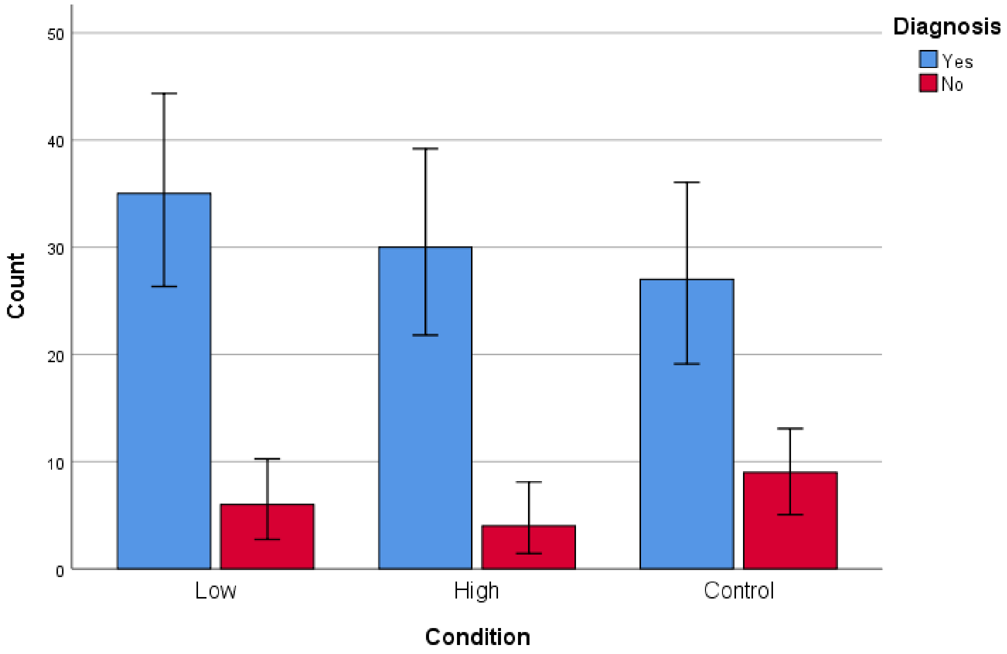


Figure 5.10: Graph to show the accuracy of participant's diagnostic decisions for Bipolar

5.5.3.3. Qualitative response to "if you had to diagnose, what with and why?"

When asked the above question, various conditions were provided. Table 5.22 below shows the number of times these were mentioned in the original coding and grouped for the quantitative results. Some participants identified multiple:

Table 5.22: Between-groups Comparison for Bipolar Disorder Question 2 Responses

Theme	Number of references and codes present								
	Low				High			Control	
		Amount	Grouped	Theme	Amount	Grouped	Theme	Amount	Grouped
Yes		22	36		17	29		17	27
Close		14			12			10	
Mania	✓			✓			✓		
Hypomania	✓			✓			✓		
No		6	6		4	4		8	9
Grief reaction	✓						✓		
Stress	✓						✓		
Psychosis	✓			✓			✓		
Depression				✓			✓		
Reactive depression							✓		
Mental health				✓					
Physical				✓					
Substance misuse							✓		
None		0			0			1	
Total n of references per case			42			33			37

In the quantitative analysis, the "yes" and "close" were merged as were the "no" and "none", but no significant difference was seen. However, from this table and reflecting on the results of the quantitative analysis, the control group have slightly less correct diagnoses than the high SES condition, which in turn has less correct responses than the low condition. The control also had a marginally wider spread of misdiagnoses than the other two conditions.

5.5.3.4. Bipolar Condition with Treatment

For treatment, no cells (0.0%) had an expected count of less than five, though still no significant difference between treatment of bipolar disorder and SES was seen (X2(4, N=111) = 5.6, p>0.05). Participant's treatment decisions can be seen in Figure 5.11.

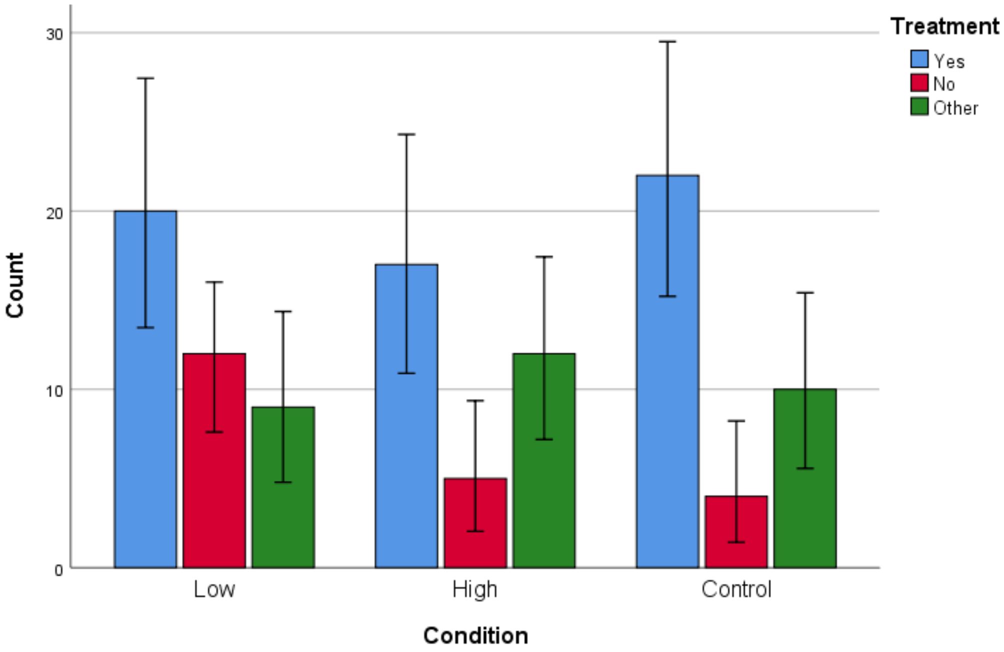


Figure 5.11: Graph to show the participant's treatment decisions for Bipolar

5.5.3.5. Qualitative response to "if you were to treat, what would you suggest and why?"

When asked about treatment, various options were highlighted. Table 5.23 provides the themes and number of times these themes were mentioned in the original thematic analysis and grouped for the quantitative results. Some participants identified multiple:

Table 5.23: Between-groups Comparison for Bipolar Disorder Question 3 Responses

Theme	**Number of references and codes present**					
	Low		High		Control	
	Amount	Grouped	Amount	Grouped	Amount	Grouped
Yes		12		13		16
Medication	10		10		14	
Therapy	2		2		1	
Combination	-		1		1	
None	13	13	4	4	4	4
Other		17		16		14
SDM	8		3		6	
Depends	-		3		1	
Refer	9		8		8	
Other	-		-		1	
Total n of references per case		42		33		34

In the quantitative analysis the original treatment options were merged. No significant difference could be seen between treatment decisions for bipolar. However, as shown in Figure 5.11, the low condition had far more ‘no treatment’ options than the high or control conditions.

Medication alone was mentioned as a treatment option in all conditions, with slightly more for the control. Medication was the most common treatment method, more so than either therapy alone or treatment combination. The type of medication advised was similar in the high SES and control condition, whereby medication to help with sleep (such as “Diazepam”, “Lorazepam”, “Zimovane”/“Zopiclone” or “other sedative”/“hypnotic”) were the most common recommendations, followed by antipsychotics (such as “Olanzapine” or “Quetiapine”) then mood stabilisers (such as “Lithium” or “Valproate”). For the low SES condition, antipsychotics were the more prominent medication, followed by sleeping tablets, then mood stabilisers.

> Probably some diazepam to aid sleep and only other meds if they refuse the psychiatry team as they probably need an antipsychotic

This is also dependant on the patient adhering to medication:

> Possibly short course of diazepam or sleeping tablets- acute only but patient may not accept this as appears no insight currently.

Psychological treatment techniques were seldom reported in all conditions and unlike the other disorders, there were very few combined treatment suggestions for bipolar disorder. Only one for the high SES conditionand one for the control condition:

> Bereavement support? Sleeping [tablets], follow up within 2 [weeks].

There were a greater number of 'no treatment' for the low SES condition than the high and control conditions. Some did not provide an explanation for their lack of treatment, however reasons appeared to be similar across all conditions; not enough information, observation to see whether it is a grief reaction, and a desire to confirm the diagnosis before treating. Additional justifications for the lack of treatment in the low SES condition include a desire to delay treatment until the mental health team saw the patient and to give time to build trust and rapport:

> Probably arrange follow up soon once they trust me / rapport.

Referral was mentioned in response to this question more so in bipolar than either of the other diagnoses. It was suggested an equal amount across all conditions. Though most participants did not outline why they would refer over treatment, considering what was highlighted in the 'Medication' subtheme and the following quote, it may be reasonable to extrapolate this response is due to the complex nature of supporting individuals with bipolar disorder and being unequipped to do so primary care:

> Beyond my scope of practice- would refer urgently to mental health team, may need sectioning for assessment & treatment.

A small number of participants in the high SES and control conditions suggested their treatment decision was dependant on other factors, specifically on gaining more information about the individual, a detailed history, as well as risks and insight:

> First try talking and finding out more information. Depending on impact and risks and insight may be enough to take time out and provide support but if more risk and no insight may need to involve mental health team.

SDM was highest for the low and control conditions, with at least double the amount of the high condition. The majority of participants who record a shared decision, identified the decision being shared between primary and secondary health care, seeking "advice first", "psychiatric advice", "with specialist guidance" or with "help from CMHT" as opposed to the individual themselves.

5.5.3.6. Bipolar Condition with Referral

For referral, the Chi^2 demonstrated a significant difference between SES and referral for bipolar disorder (X2(4, N=111) = 12.9, p=0.01), however three cells (33.3%) had an expected count of less than five, therefore this significance cannot be said with upmost certainty. Nevertheless, this does highlight a trend that those with low SES are more likely to be referred than those with high SES (see Figure 5.12). The reasons for these findings may be better understood following the thematic analysis aspect of this study.

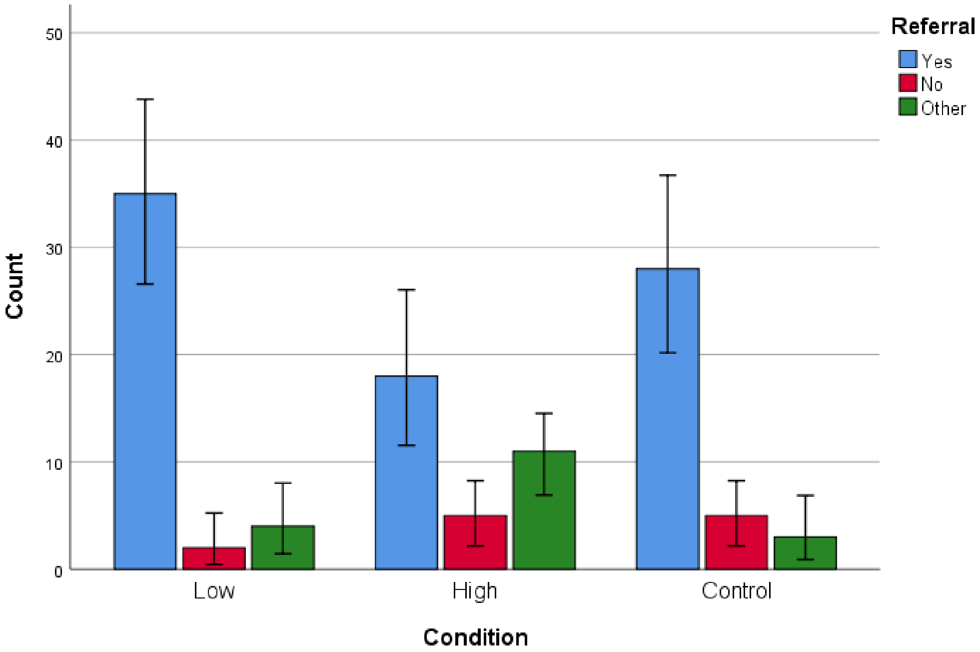


Figure 5.12: Graph to show the participant's referral decisions for Bipolar

5.5.3.7. Qualitative response to "what are your thoughts on referring the patient?"

Table 5.24: Between-groups Comparison for Bipolar Disorder Question 4 Responses

Theme	**Number of reference and codes present**					
	Low		High		Control	
	Amount	Grouped	Amount	Grouped	Amount	Grouped
Yes		36		19		26
No		2		5		5
Other		4		11		3
Depends	2		7		3	
SDM	2		4		0	
Total n of references per case		42		35		34

In the quantitative analysis, the "SDM" and "Depends" options were merged to become "Other". From Table 5.24 and reflecting on the results of the quantitative analysis, the low SES condition had more instances of referral than the control condition, which in turn had far more than the high SES condition. The high SES and control conditions had slightly more 'no referral' decisions than the low SES condition. The high SES condition had more 'other' responses than the low SES and control conditions.

Referrals were to psychiatry or other specialist mental health care such as the early intervention team and the crisis team, bereavement counselling. The urgency of this referral was also often highlighted in the high and low conditions, more frequently in the former than the latter, stating the patient needs "referral same day". The urgency in the low SES was a result of their homelessness as they are "vulnerable" and "likely to engage in risky behaviour". While the urgency in the high SES appeared to be a result of the mental state worsening:

> Their mental health could deteriorate rapidly if not acted upon immediately.

Decisions to not refer were slightly less in the low SES, with an equal amount in the control and high conditions. Referral would either take place later, in a second follow-up appointment, or because the patient does not currently suggest any harm to self or others:

> There is nothing to suggest patient at immediate risk of harm to self or others but I would want to arrange a follow up shortly (e.g. within the week) to monitor situation - this may be challenging dependent upon agreement of patient who apparently thinks all is ok.

The high SES condition had the greatest number of uncertain responses. Participants sought more information before deciding whether to refer, gathering information such as a more detailed history, level of insight, and the outcome of any risk assessments:

> If needed depending on insight and impact on day-to-day activities I may suggest referral to mental health team. May also get support from Cruse for bereavement. If no insight and more acute concerns could need to look at sectioning.

A shared decision for referral was scarcely mentioned but the greatest number of occurrences were in the high SES condition, followed by the low SES condition. This decision was made with both the patient ("I will seek their consent to refer") and the mental health team as "they are likely to benefit from more specialist expertise". Though there may be uncertainty regarding this for the high SES condition:

> May consider referral to the mental health team but not sure the lawyer will agree.

5.5.3.8. Further Insight from Text Comments

Participants desired more information for the bipolar vignettes. Specific information requested included the patient's relationship with the mother and friend, age of the patient, further symptoms, understanding spending habits, body language and speech (control only), nutrition (low SES only) as well as alcohol and drug use (illicit and prescribed).

> It would be helpful to know how old they are. Also, alcohol and street drug taking.

This was to eradicate alternative causes that may have resulted in the episode, including drug-induced, grief-induced and organically caused.

In all conditions a medical history was requested by participants. The type of history was varied, from personal physical and psychiatric history, social history, family history, medication/illicit drug history, as well as a history from the “friend” that brought the patient to the clinic to “corroborate the patient’s account”.

Talking to the patient about their concerns, feelings, expressing empathy, was considered in all conditions. However, the frequency was much less in the low SES condition. Unlike the other vignettes, the inclusion of a friend altered the pattern of this section, as GPs tended to engage with the patient’s friend either in addition to or instead of the patient.

> I would want to hear the friend's concerns, and then question the patient about them. I would want to know what the friend has noticed regarding behaviour changes in the past 8 days. How is this different to his/her normal personality/behaviour?

For the high and control conditions, it was thought to check the accuracy of whether the patient’s mum had died and their literacy skills, either through “Google” to check whether “they are an author” or request an example to determine authenticity:

Commonality was also commented on, though only in the low SES condition. Specifically that it is a rare presentation in general practice:

> It is a very rare presentation to general practice for someone in acute mania, often they present to the A&E dept or through police, I have only seen acute mania as a junior doctor in an inpatient settling.

All conditions referred to safeguarding patients, the frequency was lowest for the high SES condition, then the control condition, and highest for the low SES. Safeguarding and risk assessments, specifically explored suicidal ideation, thoughts of harming self or others, grandiose ideas or delusions, overspending, as well as other risky behaviours. The low SES condition appears to have the most safeguarding concerns as a result of their ‘homeless’ status, which means they “may be vulnerable” and are “likely to make poor, life damaging decisions”. Two participants considered sectioning for the low SES condition, to protect from harm:

> They may need sectioning as they are homeless and may be at risk from others.

Follow-up was often commented on in the control condition, specifying that the follow-up should occur shortly after the presentation to the practice:

> I'm concerned that they have an emerging a cute psychosis and would follow up by phone in 24-48 hours.

Several concerns were highlighted by participants, most occurred in the 'control' condition, followed by the 'high', then the 'low' condition. A lack of insight was seen as a "red flag" for participants, leaving them concerned regarding "personal safety":

> Getting hypomanic patients to acknowledge the condition and accept help is one of the more tricky situations in general practice. It often comes to a crisis before we can act.

The other consideration highlighted by all conditions was support, for the high and control conditions, support was mentioned in an explorative capacity:

> I would want to know much more about their social circumstances to help formulate a management plan.

However, for the low condition, it was about practical considerations such as:

> They are homeless and vulnerable, could they stay with friend or anyone else, do they need help with funeral arrangements, did they need help with any drug problem.

Social considerations were reported mostly in the high SES condition, the social considerations identified all related to work – how their condition may impact their judgement and whether they should be off work for a while:

> Would be concerned about work as if not well, behaving abnormally at work could have life changing consequences for their clients.

Some participants commented on the complexity of the case, this level would mean the interaction with the patient would "be very time consuming":

> Complex patient. Needs thorough history and focussed examination. Can't be done in a 10-minute consultation – important to spend longer and get it right.

Service concerns were identified in the low SES condition only, specifically the "shockingly low level of resources" secondary psychiatry care have at their disposal, the “delay in treating new patients” as a result from delays in accessing notes from the previous GP, as well as the homeless person being “at risk of being lost to services” due to the patient disengaging from the services.

5.5.4. Non-Clinical Patient Factors

Even though a great deal of effort was applied to isolate the non-clinical patient factors, there were instances across all three mental health disorders where assumptions about other patient factors occurred, either in the control or other conditions.

5.5.4.1. Bulimia

In the control condition for the bulimia vignette, three participants used female pronouns when writing their responses, even though no female pronouns were used in the vignette:

> As above, sounds like she would need to be managed by a specialist service.

In the female condition, one participant reported along with requiring age, that the patient seems young:

> No age for Charlie – it sounds like she is young?

5.5.4.2. Anxiety

Though the anxiety vignette appeared to provoke less requests for information regarding the patient’s sex, four people used male pronouns when writing their responses (one in the control condition, two in the old condition and one young condition):

> The patient has been assessed appropriately in the departments he has attended, ruling out physical/ pathological cause of his clinical syndrome is highest priority.

The young condition also showed two presentations of female pronouns:

> Is there any specific condition she is worried about? What does she hope we will do?

5.5.4.3. Bipolar

For bipolar disorder, in the high SES condition one participant made an age-related comment ("childbearing age"), which could also be interpreted as gender assumption. This included, seven used female pronouns (five for the high SES condition, one for low SES condition, and one in the control condition).

> Ask more detail about her previous mental health problems.

It appears that across all conditions, assumptions about NCpF were made, despite every effort being made to isolate these conditions. Though gender appeared to be the most prevalent assumption, gender is more easily identified passively in language. It is important to note that female pronouns were used more readily than males. Age was mentioned a couple of times across conditions, more assumptions may have been made though perhaps not apparent given the questions asked and would be worth exploring in future research.

5.5.5. Result Co-production

Following the analysis, the results were shared with GPs to sense-check the conclusions made. These conversations have been used to shape the discussion and interpretation of the qualitative and quantitative results, which will be outlined in the final 'Discussion' section of this chapter.

5.6. Discussion

This section will first outline the main findings, then discuss the findings in relation to the wider literature. The strengths and limitations of the research will follow, as well as implications for research and practice.

5.6.1. Summary of Key Findings

5.6.1.1. Gender Impact on Bulimia Nervosa Diagnostic, Treatment and Referral Decisions

A significant difference was found in the diagnostic decisions for bulimia ($X2(2, N=111) = 10.1, p<0.01$) with the control condition having more correct diagnoses than either gendered condition.

From the text comments, the control had more correct diagnoses with only one response categorised as incorrect as opposed to five for males and nine for females. This rejects the null hypothesis, though in a different direction than predicted. This supports our analysis and confirms that, in our study, gender had a negative impact on the diagnosis of bulimia nervosa. It appears that even though, more information about the gender was sought, the lack of information appeared to benefit the practitioner in terms of accuracy. What this may be showing is that by omitting the patient factor, when GPs read the clinical vignettes it puts them in the context of their clinical training, which may increase their accuracy.

A significant difference was also seen between gender and treatment decisions ($X2(4, N=111) = 10.9, p<0.05$). The control group received more treatment-related decisions than either of the two gender options.

Therefore, we can reject the null hypothesis but in an alternate direction than predicted. Females had the greatest amount of no-treatment. This may suggest the lack of information benefited the practitioner to make a treatment decision, but potentially the commonality of female presentations hindered the treatment for them, which resulted in a greater 'wait and see' approach. The reverse of this is that given it is an unusual presentation for men, the GP may believe it is a more serious presentation, or require specialist help sooner.

No significant difference was seen between gender and referral decisions ($X2(4, N=111) = 7.8, p>0.05$).

Though not significant (therefore the null hypothesis was not rejected), men and women both appeared to have less 'yes' referral counts and more 'no' referral counts than the controls. As the control condition in this instance as well as treatment also had the greatest number of referral/treatment options, this supports the idea that for bulimia, the presence of gender may in some way hinder the clinical decision.

5.6.1.2. Age Impact on Anxiety Diagnostic, Treatment and Referral Decisions

A significant difference was seen in the diagnostic decisions for anxiety (X2(2, N=109) = 9.0, p=0.01), whereby younger people were more likely to have an accurate diagnosis than older adults, followed by the control condition.

Therefore, the directional hypothesis for the anxiety condition can be accepted. From the text comments, the young condition had fewer incorrect responses and more correct responses than the other two conditions. The older condition had slightly more correct responses than the grouped. This pattern was the reverse of what was seen with the bulimia case. This supports our analysis and confirms that, in our study, age impacts diagnostic decisions for anxiety.

No significant difference was seen in the treatment decisions for anxiety (X2(4, N=109) = 5.4, p>0.05).

Though not significant, there are slight differences between the treatment responses for anxiety. Older adults had the least number of ‘yes’ responses to treatment than either of the other conditions, with younger adults with the greatest amount. This could reflect requiring excluding physical aspects first, in order to find the best treatment for older adults. Equally, on the whole GPs may feel more confident with younger adults that it is a mental health episode therefore be more inclined to provide the treatment they require.

No significant difference was seen in the referral decisions for anxiety (X2(4, N=109) = 5.4, p>0.05).

No difference could be seen with referral decisions for the anxiety diagnosis, therefore the null hypothesis must be accepted. Comparing the bulimia with the anxiety results, it may show that for anxiety, the presence of age is only beneficial when it is a younger adult, however the reasoning behind this is because missing a physical aspect is more dangerous than the alternative. Therefore, what may be concluded is different mental health conditions may use differing logic – perhaps dependant on the commonality or severity of the condition in question. This will be analysed further in Section 5.6.2.

5.6.1.3. Socioeconomic Status Impact on Bulimia Nervosa Diagnostic, Treatment and Referral Decisions

No significant difference could be seen with SES and the diagnostic decisions made for bipolar disorder (X2(2, N=111) = 2.2, p>0.05), nor were there differences with the treatment decisions made (X2(4, N=111) = 5.6, p>0.05).

No significant difference could be seen with bipolar and the diagnostic decisions, therefore the null hypothesis cannot be rejected. However, a slight trend can be seen whereby those who were labelled as 'homeless' (low SES) had slightly more accurate diagnoses than the 'lawyer' (high SES) and control conditions. Equally, no significant difference could be seen with treatment for the bipolar condition, however there appeared to be more 'no treatment' responses for the 'homeless' condition than the control or the 'lawyer' condition.

A significant difference was seen between SES and referral decisions for bipolar disorder (X2(4, N=111) = 12.9, p=0.01). Those with a lower socioeconomic status were more likely to be referred than control or higher socioeconomic status individuals.

A significant difference between SES and referral was found for bipolar. Though the quantitative results may not be reliable given the non-parametric testing used, there does appear to be a trend that those who were labelled as 'homeless' were more likely to be referred than those who were working as lawyers, which rejects the null hypothesis but in an alternate direction as predicted. From the text comments, sex of the patient was assumed in the bipolar vignettes.

5.6.2. Discussion of Findings

This thesis aimed to explore the impact of NCpF on mental health-related clinical decisions, specifically diagnosis, treatment, and referral decisions. This section will discuss the findings of this vignette study in relation to the wider literature and outline some explanations as to the part NCpF influence mental health decision-making, incorporating the thoughts of the GPs involved in the co-production of this study.

Diagnosis

Both bulimia and anxiety were associated with significant differences in diagnosis (X2(2, N=111) = 10.1, p<0.01; X2(4, N=111) = 10.9, p<0.05). The presentation of the impact of the NCpF was different across the two disorders. For bulimia, the presence of the NCpF made the diagnostic accuracy decrease, while for anxiety, it increased it for one condition, younger adults, and decreased it for older adults. The trend found with anxiety was also found with bipolar, however to a lesser extent. The presence of a NCpF may either help or hinder the decision-making process depending on the context, the symptoms presenting, and the NCpF present. What may be happening is that the GPs may be reading the vignettes and succumbing to availability bias (as highlighted in Chapter 2), whereby the easier it is to recall relevant examples, the greater the likelihood is of assuming that is the correct response (Magnavita, 2016; Mamede et al., 2010). Further, in the bulimia vignettes, as there is a definite contrast between the control and the gendered condition, whereby the only difference is the presence of gendered terms, the GPs may be succumbing to anchoring bias – whereby too much weight is placed onto one aspect, resulting in a distorted view of the subsequent knowledge gained (Richards & Wierzbicki, 1990). It may be the case that removing a gender reduces the cognitive load thus increasing accuracy (Burgess, 2010) however, this pattern was not seen with the other NCpF therefore this seems unlikely. Perhaps the lack of gender allowed the GPs to reflect on their past cases, and, being unbiased by the addition of patient factors, may pick the cases that most accurately reflect the control vignette, which may explain why in the control condition, gendered terms are still being used. In the gendered condition, the GPs may have this same thought process i.e. reflecting onto past cases, however the addition of the gender may suggest the patient they are picturing may be categorised by a certain gender, making an accurate diagnosis less likely. For example, the last female they saw with similar traits may have had anxiety or depression. Therefore, may be subject to an anchoring bias whereby a greater emphasis is being placed on the gender and less on the clinical signs and symptoms, hindering accuracy in this context.

If these biases are present, the NCpF itself or the symptoms presented, or an interaction between the two, may be influencing the GPs decision. Though gender was requested in the bulimia control condition, it was scarcely mentioned in the anxiety and bipolar conditions. Though gendered pronouns were assumed across all conditions, it may be the case that these GPs assumed the gender therefore did not request it in the text comments. Typically, the feminine pronoun was used. It was only in the anxiety condition that male pronouns were used, which may actually be the societal use of the word ‘he’ meaning ‘one’. This pattern of thinking may help the decision-making process in some contexts, depending on the NCpF and disorder presented. Some age assumptions were made about the bulimia case, though less so than the gender which could reflect a stereotype, or sheer frequency of exposure.

Age was deemed important as it was requested more frequently across all conditions, perhaps age provides more clinical information or gender is more often assumed than age. For bulimia, gender inhibited the accuracy, however for anxiety, age was beneficial for young adults but detrimental for older adults. Though this seemed to be an active choice by GPs for fear of missing a physical cause that could have negative effects. For bipolar disorder, the person with lower SES had slightly greater accuracy in the diagnostic decision than the high SES condition (though this difference was not significant). This may be showing an interesting interaction occurring for each condition individually, though there may be similarities, some motivations may be different – either intentionally such as seen with anxiety, or unintentionally as seen with bulimia and bipolar.

For bulimia, the results found here about diagnosis contrast with the findings of a similar study whereby female cases were more likely to receive an eating disorder diagnosis than men (Currin, Schmidt, & Waller, 2007), however, this study did not have a control condition, it only had responses from 82 GPs and the study design itself was prone to bias as the vignettes were different (one was an underweight patient and one overweight) therefore there could be other confounding variables, further this study provided options for diagnosis and treatment whereas our research allowed for free-response.

The difficulty with anxiety, as mentioned, is that it often presents as a physical complaint, has highlighted in the text comments may explain why the GPs in this study sought to rule-out the physical symptoms first. This has also been reflected in the literature (Locke et al., 2015). This presentation is even more complex as older adults are less accurate in identifying anxiety symptoms, therefore may be more reliant on the GP to identify it for them, whereas in the consultation, younger adults may be more able to provide that insight (Wetherell et al., 2009).

Bipolar is also difficult in this context as it is often misdiagnosed and it is rare to see a manic episode in GP, as one clinician here highlighted, it is usually A&E these patients present, therefore GPs and patients may not recognise these manic phases as part of their disease (Hughes et al., 2016), even though NICE guidelines recommend enquiring about manic episodes in all adults which present to primary care with symptoms of depression (NICE, 2020a). The development of diagnostic practices have been used to explain the association with SES and bipolar disorder (Eid et al., 2013). However, those with a lower SES were more likely to receive a diagnosis than those with a higher SES, this was found in another study where income was the SES marker of choice. Those with an annual income of <$10,000 were less likely to receive a diagnostic test than those who earned over $30,000 (Scott et al., 1996).

Treatment

For bulimia, the control group had the greatest amount of treatment, suggesting in this context, the attributional bias may be a positive one, resulting in a more accurate diagnosis. However, as it is rare to have males present with an eating disorder in general practice, or perhaps an assumption is being made about the severity of the eating disorder, this may result in a positive bias when it comes to treatment which could explain why they had a greater amount of treatment than women. That said, males tended to have more “depends” responses, suggesting uncertainty, perhaps due to the rarity of the presentation. Equally, as women are more commonly seen in general practice, a negative bias may be being observed given they are more likely to receive the ‘wait-and-see’ approach. Or, differences seen may be due to gender references leading the participant away from uncertainty and towards the ‘by the book’ way they were taught to treat patients with bulimia. Further adding gender or age references may mean it is more likely the participant uses these to recall similar patients while the control may be closer to the ‘exemplar’ response in GP training, therefore reverting to how they were taught to treat such cases in medical school.

Older adults were less likely to receive treatment than either of the other conditions, this appeared to reflect a desire to excluding the physical aspects first, given the potential life-threatening nature of the physical cause. Younger adults are less likely to have heart conditions than the older adults, however even in these cases the clinician still sought to rule this out. Other research has highlighted the under-recognition of mental health problems for older adults at primary care level. This includes fewer decisions to treat or refer older patients, with GPs tending to prefer monitoring the presentation, or defer decisions (Watts et al., 2002).

With bipolar disorder, though no significant difference could be seen statistically, there appeared to be more ‘no treatment’ responses for the homeless condition than the control or lawyer condition. GPs may tend to prescribe to assist with the lack of sleep for the high and control condition, it was antipsychotics that were more often prescribed for the homeless condition. This may reflect an active decision based on practical or patient-guided decisions – i.e. if they are a lawyer, lack of sleep may negatively impact their career and clients. It could however reflect an assumed preference of the ‘lawyer’, not wishing to have antipsychotics on their medical records, whereas sleep medication may be more likely, further there may be fears of litigation if a ‘lawyer’ wished to have treatment but none was made available. This is different to other research, which found that those who had an annual income of less than $15,000 were three times more likely to be prescribed medication compared to those on a higher income (Scott, et al., 1996). However, it has been suggested that health practitioners are uncomfortable advising patients from higher social status groups as they are similar to themselves (Lock & Kaner, 2004). Further, in a study whereby 50% of physicians believed they had met the criteria for mental illness but did not seek treatment, and some of the reasons were relating to reporting to a medical licensing board and a belief that the diagnosis was shameful (Gold, Andrew, Goldman, & Schwenk, 2016). This may explain the results seen here, whereby practitioners could be reflecting their own preferences onto the lawyer.

Referral

The only significant result for referral was seen with the bipolar diagnosis (X2(4, N=111) = 12.9, p=0.01). This may be a result of the homeless individual being more vulnerable, therefore requiring referral more urgently. However, following discussions from the GPs they felt it may reflect the lawyer not wanting this evidence on their medical record, given their insight into how medical records are used in legal cases or a concern from the GP deciding a course of action and leaving themselves vulnerable to litigation. Those with the lower SES were more likely to be referred than those with the higher SES. Though not significant, men and women both had less ‘yes referral’ counts and more ‘no referral’ counts than the controls, which may be for the same reasons as outlined for diagnosis and treatment. No difference could be seen with referral decisions for the anxiety diagnosis. This is different to the results reflected with diagnosis and treatment, which may suggest a difference between the decision-making process behind referring than choosing to diagnose or treat, potentially because there are other factors at play such as accounting for various service concerns and practical concerns for patients. Raine et al. (2000) found that GPs recognised the presence of mental ill-health in 259 patients, but only one-third of these were referred on. More information is needed to understand the process behind referral decisions.

5.6.3. Strengths and Limitations

This study had several strengths. This research was built upon past research, focus groups, population health data research and was co-produced with various stakeholders, giving it a strong theoretical foundation. It also collected qualitative and quantitative data which overcomes the challenges that accompany either quantitative and qualitative research independently. Further, this study was created with the aim to maximise convenience for the participants, minimising fatigue and other elements. The vignettes themselves were created to minimise the effect of confounding variables, which was not done in other studies (Currin et al., 2007; Feldman & Gutheil, 1997; McKinlay et al., 1997; McKinlay, Potter, & Feldman, 1996). Further, the presentation of the vignettes was double-blinded randomisation and completed online, limiting the impact of researcher bias. This study utilised multiple recruitment methods to have the widest reach, and QR codes were used which was a novel recruitment method in this form of research. This study found several significant findings, creating a strong discussion point.

As with all research, there were some drawbacks, such as the relatively small sample size and seven participants did not fully complete the study, potentially because of the impact of COVID-19. Some significant results were seen despite this, and should this study, or another similar study, be repeated attempting to access a larger participant pool may be of benefit.

It is necessary to note, these significant results are trends so do not imply causations. Therefore, the results found here could reflect the impact of NCpF, or something unaccounted for, even perhaps a reflection of using vignettes as a method of assessing quality of care. It is not true to daily practice as doctors are able to gain much more information, however what is interesting about this is that all vignettes were identical, bar a presentation of a NCpF. Therefore, it is a useful way of demonstrating that a trend has occurred and driven by the NCpF in some form.

There is always an element of sample bias, as those who are interested in research or this topic are more likely to take part or be involved by forwarding on to colleagues. However, bias was minimised in other areas to make it as reliable as possible. Finally, location was not accounted for, this was a decision made to promote honest responses and lessen the likelihood of discovering who the participant was as this study was promoted as being completely anonymous.

5.6.4. Implications for Research

Research Implications

This study could be repeated with other NCpF such as ethnicity, or alternative forms of SES, such as educational attainment or income, or perhaps appearance descriptors. Other disorders could be researched with the same NCpF, such as substance or alcohol abuse and gender, as men are more likely to be identified as having alcohol or substance abuse than women (Astbury, 2001; Berner et al., 2007; Kaner et al., 2001; Lock & Kaner, 2004; Rosenfield & Mouzon, 2013). As it was highlighted here that age and gender were unintentionally reported across all conditions in the free-text comments, perhaps the same diagnoses could be used but swapping the NCpF in each vignette, such as age for bulimia, sex for anxiety and sex for bipolar as an example.

‘Male’ and ‘female’ were used as the gender conditions for this study, however repeating the study but exploring other genders would be more representative of other members of the LGBTQ+ community as well as useful to understand the clinical biases experienced by these individuals (Nordell, 2021).

As highlighted in the qualitative aspect of the bipolar vignette, these episodes may be more common in another clinical setting, such as the emergency department. Therefore, this same study could be repeated but targeting participants who are clinicians in another clinical setting to determine what differences in clinical decision-making seen in that context. This was also mentioned by the GPs approached when discussing the findings of the study.

Further, this style of research could be used to unravel whether complex disorders that are often misdiagnosed, such as bipolar disorder, borderline personality disorder, and complex post-traumatic stress disorder, may be influenced by the presence of the NCpF.

5.7. Conclusion

This chapter sought to determine the impact of NCpF on mental health clinical decision-making as well as the feasibility of utilising clinical vignettes in an experimental survey. This was achieved by creating fictitious clinical vignettes that depicted three disorders; bulimia, anxiety and bipolar, and alternating the NCpF presented with each disorder. Differences in clinical decision-making were found between these disorders. The final ‘Discussion’ Chapter will explore in greater detail the theoretical findings outlined here in a wider context and bring together the chapters that preceded it.

Chapter 6: Discussion

This chapter provides a summary of the main findings of the three studies. It is a joint discussion of the entirety of the PhD work combining, comparing, and contrasting the findings of previous studies within the literature.

As highlighted in Chapters 1 and 2, clinical decisions are prone to bias and may unknowingly contribute to health inequity and inequality. Though most common mental disorders can be successfully managed in primary care, many individuals do not receive the treatment they require, experience diagnostic and referral delays and errors. Understanding the extent of which clinician bias impacts clinical decisions can help reduce unnecessary errors. The aim of this PhD project was to understand the impact of NCpF on mental health clinical decision-making, utilising a combination of social science and health data science methodologies.

This aim was accomplished by achieving the following three thesis objectives:

1. To understand patients with mental ill-health's clinical decision-making experiences. This was achieved by completing a focus-group study (Chapter 3). The subsidiary objectives of this chapter were as follows:

    a. To gain the patient perspective of SDM in mental healthcare by conducting qualitative research with people with lived experiences of mental ill-health.

    b. To use the qualitative research to understand: a) What are patients' experiences of SDM throughout their healthcare journey? b) Do patients desire involvement in the decision-making process regarding their mental health? c) Where along the patients' healthcare journey should SDM lie?

    c. To determine whether people with lived experience identified any NCpF as influential on their mental health care, to guide later Chapters.

    d. To discuss the findings of the qualitative research in relation to the existing SDM and mental health literature, while making recommendations to research, policy, and practice.

2. To identify whether NCpF are associated with clinical decisions in treatment, diagnosis, and referral of people with mental ill-health. This was achieved by completing health data science study (Chapter 4). The subsidiary objectives of this chapter were as follows:

    a. To utilise data science, specifically a correlational (observational) research design, to explore clinical decision-making.

    b. To determine the association, and direction of association, between NCpF and receiving a mental health diagnosis and receiving treatment for mental ill-health.

    c. To determine whether NCpF are associated with the amount of time between gaining a referral and being seen by a mental health specialist.

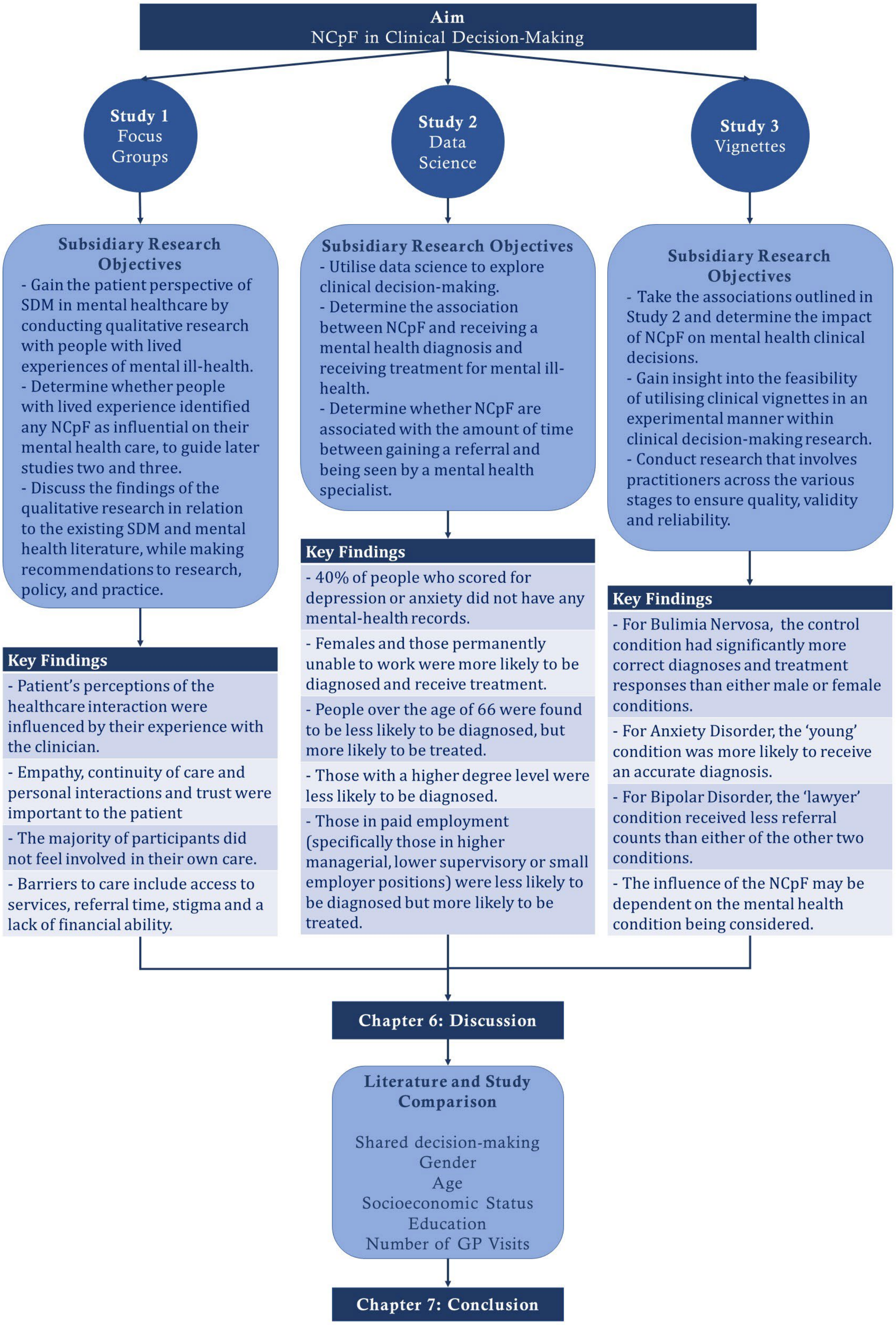
3. To determine whether specific NCpF can lead to differences in treatment, diagnostic or referral decisions regarding patients with mental ill-health. This was achieved by completing the clinical vignette study (Chapter 5). The subsidiary objectives of this chapter were as follows:

    a. To take the NCpF associated with clinical decisions outlined in Chapter 4 to determine whether the presences of such factors lead to differences in treatment, diagnosis or referral of mental health conditions.

    b. To gain insight into the feasibility of utilising clinical vignettes in an experimental manner within clinical decision-making research.

    c. To conduct research that involves practitioners across the various stages to ensure quality, validity, and reliability.

This Discussion chapter has provided the aims and objectives, it will outline each of the projects (focus groups, data science and clinical vignettes) and discuss them in relation with past research. The following flow-diagram provides the layout of this chapter:



Aim
NCpF in Clinical Decision-Making

Study 1
Focus Groups

Subsidiary Research Objectives

- Gain the patient perspective of SDM in mental healthcare by conducting qualitative research with people with lived experiences of mental ill-health.
- Determine whether people with lived experience identified any NCpF as influential on their mental health care, to guide later studies two and three.
- Discuss the findings of the qualitative research in relation to the existing SDM and mental health literature, while making recommendations to research, policy, and practice.

Key Findings

- Patient's perceptions of the healthcare interaction were influenced by their experience with the clinician.
- Empathy, continuity of care and personal interactions and trust were important to the patient
- The majority of participants did not feel involved in their own care.
- Barriers to care include access to services, referral time, stigma and a lack of financial ability.

Study 2
Data Science

Subsidiary Research Objectives

- Utilise data science to explore clinical decision-making.
- Determine the association between NCpF and receiving a mental health diagnosis and receiving treatment for mental ill-health.
- Determine whether NCpF are associated with the amount of time between gaining a referral and being seen by a mental health specialist.

Key Findings

- 40% of people who scored for depression or anxiety did not have any mental-health records.
- Females and those permanently unable to work were more likely to be diagnosed and receive treatment.
- People over the age of 66 were found to be less likely to be diagnosed, but more likely to be treated.
- Those with a higher degree level were less likely to be diagnosed.
- Those in paid employment (specifically those in higher managerial, lower supervisory or small employer positions) were less likely to be diagnosed but more likely to be treated.

Study 3
Vignettes

Subsidiary Research Objectives

- Take the associations outlined in Study 2 and determine the impact of NCpF on mental health clinical decisions.
- Gain insight into the feasibility of utilising clinical vignettes in an experimental manner within clinical decision-making research.
- Conduct research that involves practitioners across the various stages to ensure quality, validity and reliability.

Key Findings

- For Bulimia Nervosa, the control condition had significantly more correct diagnoses and treatment responses than either male or female conditions.
- For Anxiety Disorder, the 'young' condition was more likely to receive an accurate diagnosis.
- For Bipolar Disorder, the 'lawyer' condition received less referral counts than either of the other two conditions.
- The influence of the NCpF may be dependent on the mental health condition being considered.

Chapter 6: Discussion

Literature and Study Comparison

Shared decision-making
Gender
Age
Socioeconomic Status
Education
Number of GP Visits

Chapter 7: Conclusion

Figure 6.1: Chapter 6 Flow Diagram

6.1. Summary of Findings

6.1.1. Focus Groups

These focus groups aimed to gain the perspective of people with lived experience about their involvement in mental health care, to understand whether they wish to be involved in decisions, their experiences and where along the healthcare journey should decisions lie. It was also set out to determine whether service users identified any NCpF as influential in their mental health care.

Two focus groups took place with eleven participants in total. Braun and Clarke's thematic analysis was used to code the results (Braun & Clarke, 2006), which highlighted three themes; 'doctor-patient relationship', 'doctor-patient communication' and 'ending the cycle'. The first theme was split into three subthemes; 'positive relationships', 'negative relationships' and 'trust in the doctor'. When discussing the medical encounter participants' perceptions appeared to be influenced by their experience with the medical clinician. Positive relationships were highlighted when clinicians talked with the service user, when they specialise in mental health, and when they assist with treatment or referrals. Negative relationships were reported based on a lack of empathy, a lack of continuity of care, and feeling the interaction was impersonal. The service user had a positive relationship with the clinician then the participants tended to trust the doctor, even if service users disagree with the decision the clinician proposes.

The second theme identified by participants was the communication between doctor and patient. This was split into four subthemes; 'no discussion, no choice', 'included in care', 'referral', and 'patient knowledge'. Approximately half of the participants freely relayed instances where they felt a decision was made for them, but when prompted, about a quarter reported instances when they were involved in their own care. The referral process seemed to vary greatly between participants, with some being referred when desiring it while others were not. It was noticed that service users held a lot of knowledge about the medication they had taken and were taking as well as a desire to learn more about the diagnosis and treatment options.

The final theme outlined the continual 'treatment cycle', of initiating, changing and stopping medication. Participants aimed to find the 'right care', which looks different to everyone. Barriers to care that may hinder the cycle ending were identified including access to services, referral times, stigma and a lack of funding.

It was concluded that SDM can lie across the healthcare journey, though does not always in mental health. The experience of the patient is influenced by how they perceive they are treated by the clinician and shared decisions assists patients with feeling ‘talked with’ as opposed to ‘talked to’ during the consultation. The patient-clinician relationship should be built upon these grounds of empathy, trust and SDM, that way given the fluidity of mental health, even if there are concerns about the ability of a patient to make a sound decision, the patient still has a pleasant perspective of the interaction.

One participant identified age as a potential factor that may influence decisions, specifically that young people are disregarded when seeking mental health care because they are “attention seeking”. However, this was already identified as a NCpF in past research. Therefore, only the NCpF highlighted in past literature were used in the next aspect of this research.

6.1.2. Data Science

Administrative and health data were linked to determine whether there is an association between NCpF and mental ill-health. This was achieved by using the Short Form 36, which contains a mental health summary score that can be used as a standardised indicator of mental ill-health. According to this measure, 2,770 unique individuals were found that had a mental health score as less than 50 (i.e., classified as having a common mental health disorder). Approximately 40% of these who had mental ill-health had no mental health records. Therefore, the gender, age, SES, and education were compared between these two groups.

In the multivariate analysis exploring NCpF and diagnosis, females and those permanently unable to work were more likely to be diagnosed, while people over the age of 66 years and those in paid employment were less likely to be diagnosed. Of those employed, people who were working as a higher manager, lower supervisory or small employer were less likely to be diagnosed.

The multivariate analysis for treatment also found females were more likely to receive treatment, those in paid employment saw the reverse with treatment whereby they were more likely to receive treatment as are those who are permanently unable to work. Those who working in a higher managerial position, intermediate occupations and in a lower supervisory role, were also more likely to be treated, which is again the reverse that is seen with diagnosis. Those over 66 years old are less likely to receive treatment, those with a higher degree level were also less likely to receive treatment. The greater the number of visits to the GP, the greater the likelihood of both treatment and diagnosis.

The results of the time-to-referral analysis were not significant, potentially because of the 2,770 cohort, only 300 were recorded as being referred, which is a very small cohort for this type of analysis, and any significant results could be due to sampling bias. Nonetheless, some univariate regressions showed significance, such as those who are 56-60 are seen approximately 40% quicker than the other age bands. Work and time-to-referral also showed significance, with those who are doing unpaid work for a relative experiencing 25 times longer waiting times (note, only a small number of participants were identified under this label and as such it is highly likely these results are skewed), and those who are temporarily unable to work due to sickness or injury experience 2.5 times longer waiting times. The multivariate model showed significance, with those between the ages of 51 and 60 are seen approximately 50% quicker than their counterparts, and those who are doing unpaid work for a relative have over 20 times longer waiting times.

From these results, three NCpF to be explored experimentally were chosen. Only three were chosen to lessen the amount of time that GPs had to commit to taking part, increasing the likelihood of participation. The three NCpF chosen were taken from the diagnostic and treatment results given the larger participant numbers and thus has greater reliability. From this, gender, age and work (as a reflection of socioeconomic status) were strongly associated with differences in clinical decision-making. Therefore, these were explored in Chapter 5.

6.1.3. Clinical Vignettes

This study aimed to determine the impact of NCpF on mental health clinical decision-making as well as honing the method of utilising clinical vignettes in an experimental survey to explore patient factors. This was achieved by selecting three mental health conditions that are stereotypically associated with socioeconomic status, age and gender, specifically; bipolar disorder, anxiety disorder and bulimia nervosa respectively. Fictitious clinical vignettes were co-produced with six clinicians in order to create clinically accurate presentations of the disorders and the patient-clinician interaction. One hundred and fifteen GPs from across England and Wales took part in this online study.

Using a Pearson Chi^2 analysis significant results were seen. The control condition had more correct diagnosis than either of the gendered condition in the bulimia case, the control group also had a greater number of treatment responses than either of the two gendered conditions. The 'young' condition was more likely to receive an accurate diagnosis, more so than controls or older adults. Finally, the 'lawyer' condition received less referral counts than either of the other two conditions.

The analysis of the free-text comments within this study also highlighted some key points, such as the weight of importance of NCpF may be dependent on the mental health condition being considered; for example, gender was seen as important for the bulimia case but was scarcely mentioned in the anxiety and bipolar condition, where age was more frequently requested.

These results will be further explored by tying together all the key findings for each study as well as what those means in the context of the wider literature.

6.2. Literature and Study Comparison

6.2.1. SDM

Shared decision-making can occur in any clinical decision, however from the focus groups (Chapter 3) it was seen that participants were most concerned about treatment decisions and reported cycles of taking, changing, and stopping treatment. Other clinical decisions such as diagnostic, referral and hospital admission decisions were also mentioned in the focus groups and reflected in the wider literature (Hill & Laugharne, 2006; Klausen et al., 2016; Mahone et al., 2011). Age UK and NHS England have called on GPs to spot warning signs for common mental illnesses in older adults (Age UK, 2017; NHS England, 2017) as half of adults aged 55 and over have experienced mental ill-health. Though older adults wish to be involved in mental health clinical decisions, as highlighted in the systematic review outlined in Chapter 2 by the author of this thesis (Burns et al., 2020), research suggests they are less able to identify anxiety and depression than younger adults which increases the pressure on clinicians to identify mental health conditions (Adams et al., 2007; Wetherell et al., 2009; Coffey et al., 2016; Stacey et al., 2015; Todd, Solis-Trapala, Jones, & Lobban, 2012b). It is also why the results seen from the anxiety vignettes (Chapter 5) is so vital, whereby the GPs were more accurate in their diagnosing of anxiety disorder in younger adults than older adults as a result of GPs desiring to rule-out physical disorders first.

Disorder type or severity could influence the patient's preference for involvement in decision-making, as those with serious illnesses may have a greater desire to receive information (De las Cuevas & Peñate, 2014; De las Cuevas, Peñate, & de Rivera, 2014; Paillaud et al., 2017). For example, though Lechner et al.'s (2016) study found that individuals with clinical depression preferred involvement, this may not be the case with illnesses such as schizophrenia (Park et al. 2014; De las Cuevas & Peñate, 2014), potentially due to the severity of the disorder or degree of individual or public knowledge surrounding the health problem (Thompson et al., 1993). Participants in the focus groups (Chapter 3) had a variety of conditions, including schizophrenia, psychosis, intermittent explosive disorder as well as OCD, alcohol dependency, autism, depression, and anxiety. This supports the notion of patient-centred care as even those with severe disorders may wish to be involved and there are ways to adapt SDM to be suitable even if there are concerns about patient insight and cognitive capacity (Hamann & Heres, 2014).

Disorder type or severity may also explain the differences seen between Chapter 5 and Chapter 4, as well as within Chapter 5. The data science study (Chapter 4) found females had more treatment than their male counterparts, while the vignette study (Chapter 5) found males had more treatment responses and less 'no treatment' responses than females, however the control condition had the greatest amount of treatment responses. This may reflect perceived severity of males presenting with bulimia (Chapter 5), as opposed to anxiety and depression (Chapter 4). Severity could also explain the differences between treatment responses for anxiety disorder versus bulimia or bipolar disorder (Chapter 5). Otherwise, it could be a result of the control condition being more consistent with how the general practitioners learnt about the typical presentations of conditions.

Decisions to undertake surgery and changing medication supposedly have the greatest levels of participation for older adults (Bynum et al., 2014), which was reflected in the focus groups (Chapter 3). Whereas decisions to have diagnostic procedures such as advanced imaging, blood tests, EKGs, x-rays or cancer screening were perceived as required therefore patients may not engage in decision-making (Bynum, et al., 2014). Therefore, decision type may impact the likelihood of patients seeking involvement in mental health clinical decisions. This builds on a wider contextual understanding, as mentioned in Chapter 5, it was reported that it is unusual for a GP to be presented with a manic bipolar episode, whereas it is more likely for these individuals to present to A&E, so the GPs may seek a shared decision from both the patient and specialised mental health services due to the complex nature.

The results from the focus groups outlined in Chapter 3 show that patients have mixed experiences of SDM throughout their healthcare journey. Some have little to no involvement in their decisions, while others are included. It was found that patients being involved in their own care is associated with having a positive experience and relationship with their clinician's, which meant that even if they disagreed with an outcome they trusted the doctor enough to believe it was for the best, something which is very important especially in mental health clinical decision-making as GPs are doctors may be concerned about patient insight or understanding as a result of the mental disorder. These findings are not new, patients often report on the importance of trust and respect and should these traits be lacking then it can hinder the patient-practitioner relationship, reduce medication adherence and desire for involvement (Castillo & Ramon, 2017; Farrelly et al., 2015; Kaminskiy et al., 2013; McCloughen et al., 2011; Rise et al., 2011; Roe et al., 2009). This is crucial as it can feed into the power imbalance between patients and clinicians, as being valued can empower participants to be a driver in their own care (Mahone et al., 2011). As shown by Stacey and colleagues, the power constructs influenced whether service users, carers and clinicians felt they should be included in the decision-making process (Stacey et al., 2016). Further, the 'right' care looks different to every patient, as every person's presentation is a unique combination of symptoms, beliefs, values and goals. Therefore, as highlighted in the systematic review conducting by Burns et al. (2020), the focus groups identified here as well as other research (Laitila et al., 2018; Simon et al., 2006), involving the patient can ensure that treatment is patient-centred and can help counteract any influences of patient, clinician, familial or societal stigma, stereotyping (Eliacin, Salyers, Kukla, & Matthias, 2014; Roe et al., 2009; Stacey et al., 2015; Todd et al., 2012b) as well as help toward the prevention of systemic biases (MBRRACE-UK, 2020). SDM can ensure care reflects the differences between generations currently and in the future, to reflect the dynamic nature of societal beliefs and values. It can also have an important role in preventing clinical biases by adding another layer to the "Swiss cheese" model of defence (Reason, 1997).

Finally, there is a scarcity of research that looks at the effects of SDM on clinician's cognitive processes or clinical judgements made. Most research on clinical judgement and decision-making to date, as stated before, focuses on the clinicians making an individual decision in isolation based on acquired knowledge, reasoning patterns and available information. However, greater knowledge is required to understand how having to communicate with other people who are not clinical 'data source' but have an equal power in the decision-making process affects this dyad. The present PhD starts to highlight the importance of the interaction between these SDM and clinical decision-making, that seem separate in their research agendas but overlap every day in clinical practice. This thesis attempts to bridge these two fields, but it is beyond the scope of the project to explore it further.

6.2.2. Gender

The results of this thesis show that NCpF impact mental health clinical decision-making. Specifically, it was found that gender influenced the diagnostic decisions, which has also been shown in previous research (Berner et al 2007; Redfors et al., 2015; Alabas, et al., 2017). For example, in a video vignette study, gender was the only patient factor out of four (gender, age, class and race) that influenced the diagnostic and management activities; women were asked fewer question, received fewer examinations and had fewer diagnostic tests ordered (Arber et al., 2006; Bönte et al., 2008). The data science research (Chapter 4) found that females were more likely to be diagnosed with a mental health disorder, but from the vignette research (Chapter 5) the bulimia case control condition had more of the correct diagnosis responses than either of the gendered condition. The difference seen between these two chapters may be explained in a number of ways.

First, it may be that these results reflect the disorder type presented. The data linkage seen in Chapter 4 uses the SF-36 which is a gold-standard identifier of depression and anxiety, whereas the vignettes in Chapter 5 look at gender with bulimia. Perhaps different conditions are impacted by NCpF in different ways, as there is a broad spectrum of mental ill-health, different severities, commonalities, presentations and with varying levels of social understanding and acceptance, a sentiment which was approached in Chapter 3. There is limited research exploring mental health clinical decision-making and gender, those that exist tend to explore mood disorders and problem drinking. For example, men are more likely to have problem drinking detected than women (Berner, et al., 2007). Further, there is evidence to suggest that women are more likely to be diagnosed as depressed and less likely to be diagnosed as having alcohol problems (Astbury, 2001; Lock, & Kaner, 2004a; Afifi, 2007). Finally, in a study of eating disorders, it was found that female cases were more likely to receive the eating disorder diagnosis than men (Currin, et al., 2007), though this study did not have a control condition, it had less responses from GPs and the study design itself did not account for confounding variables. Nonetheless, these three studies highlight the variety of ways mental health disorders may be impacted by NCpF.

Second, the difference in results seen between Chapter 4 and 5 could reflect the study type. Chapter 4 uses survey data and health data; however there is a greater survey engagement rate for women and men are less likely to attend primary care. However, more than this, the experimental design of Chapter 5 allowed an addition of a control condition by removing the 'gender' which is not possible in the health data research. There were more accurate diagnosis responses for the female than male condition, and more incorrect diagnoses in the male than female, therefore this supports the idea that the results in Chapter 5 may be reflecting what is seen in Chapter 4, however the addition of the control variable provides deeper insight.

Third, this difference may be due to differences in the research question behind the two chapters. Chapter 4 sought to understand what 'was' done, whereas Chapter 5 is explores what ‘would be’ done, the latter being theoretical and though this involves open-ended questions to understand the rationale, it still may not match the decision made, as highlighted by the quantity of ‘dependant’ responses.

It was also found that gender influenced treatment decisions. In the vignette study (Chapter 5), for the bulimia case, the control group also had a greater number of treatment responses than either of the two gendered conditions. This was also different to what was reflected in Chapter 4 whereby females have more treatment than their male counterparts. Like the diagnostic differences in bulimia, this difference in results could reflect the disorder type presented or the study question for the same reasons as highlighted with the diagnostic decisions above. The treatment, diagnosis and referral of females is less accurate in coronary heart disease (Aggarwal et al., 2018), myocardial infarction (Lawesson et al., 2018), acute coronary syndrome (Redfors, 2017), and coronary deaths (Tunstall-Pedoe et al., 1996). It may also reflect the study design but to a limited extent, such as the issues that accompany survey and health data, however unlike the diagnostic decision, men had more treatment responses and less ‘no treatment’ decision responses than the women. It may also suggest disorder type may influence the decision seen here. Men being more likely to receive treatment for bulimia could be due to clinicians assuming the severity of the disorder is greater in men, given the pattern of males presenting to primary care. Disorder severity was also highlighted in Chapter 3 as something that may impact SDM. Past research suggests that physicians perceive women’s complaints as being influenced by emotional factors and are more likely to be identified as being psychosomatic than men (Bernstein & Kane, 1981; Hajjaj et al., 2010).

No significant difference was seen in the bulimia condition for gender and referral. This was the same as the time-to-referral pattern highlighted in Chapter 4, whereby no significant difference was seen with gender. Though not significant, the results of the vignette study (Chapter 5) found women had a greater number of referrals than men, and the control condition had even more referrals again. As can be seen in all three clinical decisions with bulimia is that the control condition was more likely to have the right diagnosis, some form of treatment, and to be referred. One reason identified for this in Chapter 5 was that the presence of gender hindered the decision-making, potentially as a result of availability or anchoring biases in the decision-making process

(Magnavita, 2016; Richards & Wierzbicki, 1990). A video vignette study used older adult actors to explore depression-related clinical decisions in men and women. It was concluded that no difference was seen, but age or other visual cues may have influenced the decision made (Frayne et al., 2004). However, an alternate justification for this finding could be that control cases in vignette form are more similar to traditional cases in medical textbooks than a gendered case, therefore making the diagnosis and treatment closer to how they were taught to identify.

Gender was deemed important in the bulimia condition whereas it was not often requested in the anxiety and bipolar conditions. However, subconsciously the gender of the individual was identified in all three conditions (in the control condition with the bulimia case). In the bulimia and bipolar condition all comments used female pronouns, and a mix of male and female pronouns were used in the anxiety case. This supports the idea that there may be an availability bias present in that GPs may be picturing the most recent case, or they may be making more NCpF assumptions on the case based on the disorder which may lead to, or result from, stereotyping. If this is the case, then it demonstrates the difficulty and complexity of researching clinical decision-making given the strength of the internal biases one has and understanding the impact of NCpF as the gender assumption is strongly ingrained into the decision-making process. All vignette conditions presented were the same apart from the gender, similarly in the data analysis the SF-36 threshold saw no difference between genders. Future research could repeat the same vignettes but using different NCpF, to better understand this association.

6.2.3. Age

Moving onto age, across this thesis it has been demonstrated how age may influence diagnostic decisions. Chapter 3 highlighted how age influenced assumptions about whether or not to involve adults in clinical decisions. From the focus groups in Chapter 3, age was the only NCpF referred to when one participant referred to their experiences as a young adult seeking help for their mental health. Finally, Chapter 4 and 5 also relayed ways in which age influences diagnostic, treatment and referral decisions. For diagnosis, both data science (Chapter 4) and the clinical vignettes (Chapter 5) studies demonstrated that older adults were less likely to receive a diagnosis (or an accurate diagnosis for the latter chapter) than the other age groups, which is also found in other research (Raine et al., 2000). In Chapter 5, the control condition had the least number of correct diagnoses, which suggest the age references appeared to help the diagnostic process rather than hinder it. The qualitative aspects of this Chapter highlighted that the rationale behind the diagnostic decisions were consciously relating to age, in that the presentations of anxiety were mainly physical, and these physical conditions should be assumed first given the grave consequences should these be missed. This has been identified before in the wider literature (Adams et al., 2006).

For treatment, in the data science study (Chapter 4) adults over the age of 66 were less likely to receive treatment than the younger age bands. This pattern was reflected in Chapter 5 however the results were not significant. However, it was seen that young adults had more responses that suggested a combination of treatment while older adults and controls had more responses of only medication. It was also highlighted that older adults had more 'no treatment' responses than younger adults or controls. This has been reflected in the literature, whereby older adults are less likely to receive counselling than younger adults (Goldberg et al., 2019), some physicians are less likely than younger adults to be prescribed potentially beneficial treatments (Protière, Viens, Rousseau, & Moatti, 2009). Another study also demonstrated that GPs tend to prefer monitoring the presentation and deferring treatment decisions of older adults (Watts et al., 2002). Interestingly, here shared treatment decisions were mentioned more often in the older adult condition, though marginally. This contrasts with perceptions in the literature about involving older adults as highlighted in Burns et al. (2020). This contrast may be a result of cultural norms and assumptions in different countries.

The research in Chapter 4 and 5 ask two slightly different questions yet show similar responses. The data science study in Chapter 4 sought to understand whether certain NCpF influenced the amount of time between referral and being seen for their first appointment, it was found that those who were 56-60 were seen 40% quicker than their younger counterparts. Whereas the vignette study (Chapter 5) on the other hand asked the GPs thoughts on referring the patients and found more referral counts for older adults (the same amount as controls) than younger adults, though not significant. According to NHS England, older people are a fifth as likely as younger age groups to have access to talking therapies but six times as likely to be on medication (Burns, 2015), which is the reverse of both the pattern of treatment and referral seen in Chapter 5. The former chapter had a relatively small number of participants for the analysis used, therefore results cannot be entirely confident. The latter chapter also highlighted that the referral was for psychological and physical conditions, therefore if it was a targeted question about referral to mental health services, then the responses may have been different. Nonetheless, it creates an interesting discussion for future research.

Unlike gender, information relating to age was requested in all cases (including the control condition for anxiety). Further, in the bulimia and bipolar cases an assumption about age was mentioned briefly. However, assumptions about age are more difficult to see in these responses – as gender pronouns occur more commonly in speech than references to age. Future research could explore this using similar experimental methods as outlined in Chapter 5, given the success seen with this study. An assumption about age is interesting in the bulimia case as bulimia was recognised in its current form in the DSM-IV in 1994, though it was identified more prominently in young people, those who were young in 1994 would be young to middle aged adults in 2020. There is still an assumption that it only occurs in young people, however those who were young in 1994 may still be struggling with their eating disorder and those adults may be missed based on an outdated assumption. This belief may be being passed along to future medics through medical education (Byrne & Tanesini, 2015; Capers, 2020; Sukhera & Watling, 2017).

6.2.4. Socioeconomic Status

There are different measures for socioeconomic status which make it an interesting NCpF but one that is difficult to research consistently. As seen in Chapter 4, those who were permanently unable to work were more likely to be diagnosed, those in paid employment were less likely to be diagnosed, with specifically those working as a higher manager, lower supervisory or small employer being the least likely to be diagnosed. In Chapter 5, these results were tested in that a 'homeless' person and someone who was employed as a 'lawyer' were used as cases in the vignettes. Though not significant, there were more accurate diagnoses with the 'homeless' condition than the 'lawyer' condition, which was more than the control condition. This trend is in alignment with the results in Chapter 4 as well as a study where women of lower SES were more likely to be given the correct diagnosis of breast cancer than those in higher SES (McKinlay et al., 1997). Findings are mixed across the literature, as another identified that those who earn less than $10,000 were less likely to receive a diagnostic test than those who earn over $30,000 (Scott, et al., 1996), possibly as a result of the differences in observing SES. The pattern seems to reflect the diagnostic pattern seen in the anxiety condition, which suggests the SES reference in bipolar helps the diagnostic process, especially as there were more incorrect diagnoses in the control condition, however, this would have to repeated with more participants to determine whether this is a significant difference.

Though not significant, there appeared to be slightly more 'no treatment' responses for the 'homeless' condition than the control or 'lawyer' condition while there were no differences between 'yes treatment' responses. In other words, GPs usually said 'yes' to treatment for bipolar regardless of SES, however 'no' responses were more prominent in the low SES individuals. This finding contrasts with past literature (Scott et al., 1996) and contrasts with the pattern of treating highlighted in the results of Chapter 4, whereby those in paid employment and those who are permanently unable to work are both more likely to receive treatment than the other variables. This also differs from some past research, whereby not owning a property is a predictor of receiving intervention (Raine et al., 2000), however another study also found that social class does not influence the likelihood that an intervention is given, but what can be found is that health clinicians are more uncomfortable advising patients from similar social classes to themselves (Lock & Kaner, 2004). Those classified as having low SES having less treatment reflects the care disparity as outlined by the Inverse Care Law (Cookson, Doran, Asaria, Gupta, & Mujica, 2021; Hart, 1971) whereby those who are advantaged have a greater amount of resource input while those who are less advantaged have less resource input which leads to an excessive availability in the former and unmet need in the latter. The pattern seen with the bulimia vignette was similar in this regard, but contrasts with the anxiety case, as the control condition had the greatest number of treatment recommendations. Reflecting on the pattern emerging from across the conditions and NCpF, it may be the case that each NCpF may impact each mental health case in a different way, or that the mental health condition will be influenced differently by the NCpF presented. The reasons for this contrast may also be due to the differences in classification of SES, such as income in Scott et al.'s (1996) study, whereby those who earn under $15,000 are more likely to be prescribed medication than those on a higher income. It may also reflect study design, study question, and severity, commonality and presentation of the disorder itself. However, the vignette study here gave us greater insight as the free-text analysis showed there were differences in treatment choices – 'homeless' condition being prescribed antipsychotics while the 'lawyer' and control conditions being prescribed sleep medication. This is an important finding and requires further research.

Finally, the data science study in Chapter 4 found that the relationship between work status and time-to-referral was significant, with those doing unpaid work for a relative and those who were temporarily unable to work due to sickness or injury experiencing longer waiting times between gaining a referral and being seen. The clinical vignette study (Chapter 5) on the other hand found those who were 'homeless' had significantly higher referral counts than the control condition, and even more than the 'lawyer' condition. Though these are asking two slightly different questions, it does show that referral decisions are impacted in some conditions, or by some SES related information. It may also suggest that referral decisions may be different to treatment or diagnostic decisions, as also highlighted in Chapter 3, and this could be a confounding factor. The reasons for the differences in these decisions could reflect the service concerns with referral and these are weighted against the severity of the disorder, therefore only those conditions (such as bipolar) whereby specialist input is essential, may be referred, otherwise there may be a preference for GPs to ensure the patient's care is left with them. This possible explanation is supported by the results of Raine et al.'s (2000) study, whereby patients who had referrals to psychiatric inpatient or outpatient care, and thus perhaps more 'severe cases,' were more likely to receive alternate interventions.

Reflecting on the three clinical decisions and their NCpF, different clinical decisions were impacted in different ways for the mental health disorders outlined. It could be the case that the presence of a NCpF can help or hinder depending on the MH condition, or it could be that the MH condition may be susceptible to different levels of NCpF influences, or a combination of the two. It may also show that SES may be too broad a category given the variance with how it is portrayed in research. For example, if the presence of gender hinders clinical decisions for bulimia, would this be the same if the NCpF was changed to SES for bulimia? Or would pairing bipolar disorder with gender see the same effect as bulimia with gender? What if work such as 'lawyer' was swapped with some financial indicator? Such questions would be beneficial to explore in the future.

6.2.5. Education

Education was highlighted in past research as a NCpF that impacts clinical decisions. In the data science study (Chapter 4), it was found that those with a higher degree level are less likely to receive treatment, however this was not explored in the vignette study as the impact of education was not found with diagnosis, and to minimise the amount of time GPs need to sacrifice to complete the survey. The research on mental health clinical decision-making and the influence of education is scarce, though there are a few studies that highlight the impact on physical health. One study found that those with a higher education level received more aggressive treatment than those with less education (Kane et al., 2003). Another study explored prescriptions of GPs and found that independent of health status, those who left school before they were 15 were more likely to be prescribed medication than those who left after the age of 15 (Scott et al., 1996), this latter study supports what was found in the data science study (Chapter 4), however more research should be done to explore this in greater detail, and with mental health specifically.

There are other biases surrounding education, such as some accents are associated with being less educated or having a lower SES (Shah, 2019). Accent has been associated with personality traits as well such as friendliness, agreeableness and arrogance (Giles, Wilson, & Conway, 1981; Shah, 2019), and in some situations can be more influential on judgements than race or ethnicity (Dovidio & Gluszek, 2012; Kinzler, Shutts, Dejesus, & Spelke, 2009; Rakić, Steffens, & Mummendey, 2011), though a combination of non-native accent in conjunction with ethnicity can have increased negative attributions than either alone (Segrest, Perrewe, Gillespie, Mayes, & Ferris, 2006). This would be an interesting phenomenon to explore further in the context of clinical decision-making specifically, as well as a further example of the importance for controlling such potentially confounding variables as shown in Chapter 5, especially in video vignettes as done in some decision-making research (Arber et al., 2006; Markus Bönte et al., 2008; Frayne et al., 2004).

6.2.6. Number of GP Visits

From Chapter 4, we saw that the more visits to the GP the greater the likelihood of diagnosis and treatment. This could reflect physical health status (Raine et al., 2000; Berner, et al., 2007), a result of the 'wait and see' method, which was identified frequently in the free-text analysis in Chapter 5, or may be a result of the patient being 'well-known' in the department. Frequent visits to the GP are associated with increased probability of detection of problem drinking (Berner, et al. 2007). Previous history of mental ill-health symptoms (Raine, et al., 2000) and prior mental health service use (Rushton et al., 2002) are associated with a greater likelihood of one's mental ill-health being acknowledged and increased likelihood of referral. Further, patients who were seen by the clinician before were more likely to receive diet, nutrition and exercise counselling (Goldberg et al., 2019). Like educational attainment, it would be useful to conduct a similar experimental vignette study to better explore number of GP visits and outcome to isolate this from other NCpF and better understand how the decision-making process is influenced by number of GP visits.

6.3. Conclusion

From this PhD project, it has been found that NCpF impact mental health clinical decision-making, however the level of impact is variable depending on the NCpF itself and in conjunction with the decision type, and the mental health condition itself. These findings suggest that demographic factors such as work, age, education, and gender impact not only access to health care but the quality of care and type that is being received by the patients. Therefore, in order to fully achieve health equity and a positive improvement in health outcomes, it is necessary to look beyond access and possibly develop more targeted interventions.

Throughout this thesis, a number of suggestions for future research, practice and education have been highlighted. These will be outlined in Chapter 7 in addition to the strengths and limitations of the research, final remarks and thesis conclusion.

Chapter 7: Conclusion and Future Research

This thesis has identified NCpF that influence clinical decision-making. This final chapter will provide a summary of the key conclusions of this research, provide an overview of the areas of future research should examine further, the strengths and limitations of the various elements of this thesis, which will ultimately lead to the final remarks (see Figure 7.1).

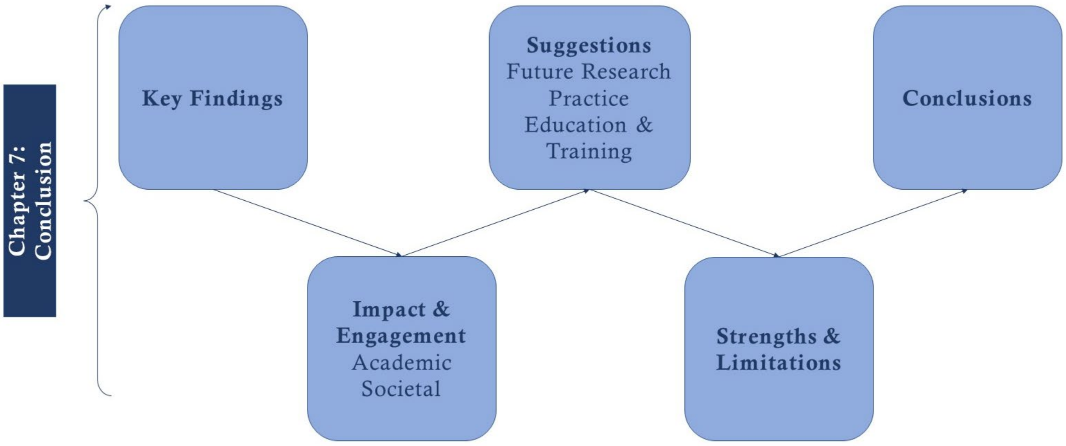


Figure 7.1: Chapter 7 Flow Diagram

7.1. Key Findings of this Research

- This thesis demonstrated the feasibility of using administrative and health care records to study mental health-related clinical decision-making.

- This was one of the first studies using patient data in conjunction with other complementary methods to investigate CDM in this manner, thus demonstrating the impact of a combined methodological approach.

- Using this innovative design, the current research found that gender, age, and socioeconomic status impact the clinical decision-making process. This research also found that the effect of this influence varies depending on the clinical decision and disorder type.

- Training should be provided for staff to ensure decisions are truly shared and thus strengthening preventative measures towards systemic error. Further, there is room for improvement within medical education to ensure that biases associated with NCpF are acknowledged during the clinical interaction and not passed to the new generations of doctors.

7.2. Suggestions for Future Research, Practice, and Education

7.2.1. Future Research

As identified in Chapter 2 and 3, there is a need to better understand whether the type of treatment influences preferences for SDM, for example, there may be differences in preferences for SDM when presented with options to start, stop or change psychiatric drug treatment as opposed to talking therapy. There is also uncertainty around how disorder type or severity, or patient's and clinician's familiarity of the disorder, may impact the patients' preference for involvement or influence on the decision made, which could be better understood with further research.

It may be the case that those who seek involvement are more likely to engage in research (Castillo & Ramon, 2017). Therefore, future studies should continually seek to engage populations that are less involved in research at all stages of the research process, such as patients as shown in Chapter 3, or clinicians as in Chapter 5. Further, accountability and legal aspects were not voiced in the focus groups. Past articles have indicated that accountability and legality hinder clinicians' desires to involve patients, therefore it would be beneficial to understand the patients' views of accountability and legality when making a clinical decision (Brooks et al., 2017; Castillo & Ramon, 2017).

Chapter 4 highlighted 2,770 patients, all of which reached the clinical threshold for depression or anxiety, but only approximately 60% of these individuals had clinical records, therefore research is needed to understand why these individuals did not help-seek, or if they did, what came of it. This study could be repeated at a larger scale, however this would be difficult to replicate with the adjournment of the WHS. The NSW only uses the WEMHWBS, which does not have the same standing as the SF-36 for mental health diagnoses or identification. However, other methods of exploring this on a national scale may arise, or research can be done to fill this gap regardless of the lack of this resource.

Given the versatility of clinical vignettes and the success of using them in an experimental fashion, other variations of the study in Chapter 5 could be conducted. For example, using the same mental health disorders but paired with other NCpF such as ethnicity or alternative forms of SES, such as educational attainment or income, or perhaps appearance descriptors. Alternatively, other disorders could be researched using the same NCpF, such as substance or alcohol abuse paired with gender, as men are more likely to be identified as having alcohol or substance abuse than women (Astbury, 2001; Berner et al., 2007; Kaner et al., 2001; Lock & Kaner, 2004; Rosenfield & Mouzon, 2013). As highlighted in Chapter 5, age and gender were unintentionally reported across all conditions. Perhaps the same diagnoses could be used but switching the NCpF, such as coupling age with bulimia, sex with anxiety or sex with bipolar. It must also be noted that using ‘male’ and ‘female’ as the conditions for gender in this study neglects members of the LGBTQ+ community, the clinical biases experienced by these individuals is an important subject in clinical decision-making currently, as highlighted by a recent article in The Guardian (Nordell, 2021). Therefore, using clinical vignettes to explore the differences one’s sex and gender has on their clinical decisions would be important to the wider clinical decision research, this sentiment was echoed within the discussions from the GPs involved following this study. Further, research by Linden and Redpath (2011) exploring attitudes of nurses towards survivors of brain injuries found more negative attitudes towards individuals seen as contributing to their own injury. This study however solely explored young males, therefore such attitudes may not be consistent across women or older gentlemen (Linden & Redpath, 2011), therefore a similar vignette methodology may help clarify. Exploring these areas further would be beneficial to continue untangling the complex impact of NCpF on mental health related clinical decisions (Redpath et al., 2010).

It could be prudent to repeat this study with a different population, such as A&E staff, as individuals with mental ill-health make up approximately 20% of emergency admissions (Dorning, Davies, & Blunt, 2021). This was highlighted within the free-text analyses for the bipolar condition in the clinical vignette study as well as the GP workshop following this study. Therefore, repeating this study but targeting participants who are clinicians in another clinical setting may be beneficial to determine what differences in clinical decision-making are seen in various contexts. Furthermore, this style of research could be used to unravel whether complex disorders that are often misdiagnosed, such as bipolar disorder, borderline personality disorder, and complex post-traumatic stress disorder, may be influenced by the presence of the NCpF.

Finally, this research could be explored further by expanding on the experimental design. For example, if participants read the vignette, then were provided open-ended questions regarding the age of the patient, the gender of the patient, as well as their responses to the clinical decisions on a separate screen without the ability to check back to the vignette, this would be a method of determining whether other assumptions were made about the patient.

7.2.2. Practice

As highlighted in Chapter 3, healthcare professionals should seek to involve adults in clinical decision-making regarding their mental health. Further, in practice there should be a continual, evolving mission to improve trust between patients and practioner, respecting the patient as an “expert by experience” and understanding what the individual patient would like to see in their care (Chapter 3). There has been some suggestion that a specialised older-adult service should be implemented (Abdul-Hamid, et al., 2015; Royal College of Psychiatrists, 2018), which would maintain a consistent clinician to build trust (Zisman-Ilani, Roe, Scholl, Härter, & Karnieli-Miller, 2017), incorporate SDM and other elements such as engaging patients in shared care planning, patient motivation and empowerment. Even if these specialised services are not possible, continuity of care is important to people with mental ill-health, as identified in the focus groups (Chapter 3) and in previous research (Brooks et al., 2018). Further, as seen in the vignette study (Chapter 5) when enforcing the ‘wait and see’ approach, clinicians mentioned keeping the patient in their care for the bulimia and anxiety cases but were more likely to refer the bipolar cases. This may show that GPs understand the importance of continuity of care, however given the specialist care required with bipolar disorder this becomes less possible to ensure continuity of care and must therefore be strived for in other areas such as psychiatry.

Better recording of patient health outpatient data is required, especially regarding mental health referral, given the challenges with this data. The clinical codes were not ideal for mental health research given how generalised they are. Improving clinical recording to be more suitable to research in order to make the most of secondary data analysis ensures it to be as cost and time effective as possible.

Finally, as seen in Chapter 4, that of the 2,770 patients, all of which reach the clinical threshold for depression or anxiety, but only approximately 60% of these individuals had clinical records, showing that more can still be done to improve the identification of individuals with poor mental health, either in practice or through outreach.

7.2.3. Education and Training

As identified in Chapter 3, Burns et al. (2020) as well as the feedback of the stakeholder events, it can be argued that clinicians require more training about shared decision-making, the forms it takes and how to involve the patient in decisions, which can be achieved without increasing consultation time while increasing patient satisfaction (Kiselev, et al. 2018; Loh et al., 2007). This is necessary as some clinicians may believe they are already involving patients in decisions however patients do not always agree this is the case (Farrelly et al., 2015). More training about how to teach medical school students without sharing their biases is also required (Stone & Moskowitz, 2011), as seen in Chapter 5, the biases clinicians have may be being taught to the students. During these times of training and greater implementation of SDM, patients and healthcare staff alike should be supported to ensure shared decisions can be made and thus preventing errors caused from these biases.

7.3. Research Impact and Engagement

Impact is an important part of any research and was at the core of this PhD project. It is essential to involve patients, stakeholders, other relevant groups including the wider public to increase the societal impact and ensure this research reaches those it affects. The sections below summarise the academic and societal impact that has been achieved throughout the various stages of this PhD.

7.3.1. Academic Impact

The academic impact of this project can be divided into: publications, conferences and wider academic engagement.

7.3.1.1. Publication

The systematic review discussed in Chapter 2 was published in the Journal of Mental Health, entitled 'shared decision-making preferences in mental health: does age matter? A systematic review' (Burns, et al., 2020). The Journal of Mental Health has an international scope, employs a strict peer-review process and supports work that is of high-quality that impacts both clinical practice and service provision. Publications are a vital aspect of a PhD journey as it opens up the research to critique and opportunities to defend the research. It also ensures the research is of high quality and demonstrates its value.

7.3.1.2. Conferences

Several conferences have been attended throughout the duration of this degree. In doing so, the findings were continually shared with and challenged by colleagues across a variety of academic fields. This allowed for continual academic feedback. The following conferences were attended:

- Swansea University Medical School Postgraduate Research Conference (2018, 2019). A poster and flash-presentation were presented in 2018 and 2019 respectively, at the latter I was awarded the Chair's Prize.
- Wales Institute of Social and Economic Research and Data Conference (2018). Engaged with the Three-Minute Engagement Competition.
- Bevan Commission International Conference (2018).
- Administrative Data Research Conference (2019). Conducted a flash presentation at this international event.
- Society to Improve Diagnosis in Medicine Conference (2020). Presented a poster at this virtual, international event.

- Royal College of General Practitioners: A Fresh Approach to General Practice conference (2021). Presented a poster at this virtual, international event.
- The 34th Annual Conference of the European Health Psychology Society (2021). Conducted an oral presentation at this European conference.

7.3.1.3. Academic Engagement

As the results of this research highlight potential areas for future training and education, the target audience also includes the academic and educator field. As such, the following events were attended with this in mind:

- Presented at the Issues in Social Sciences Event, Swansea University (2018).
- Three-Minute Thesis (3MT) Competition (2018, 2019).
- PGR Poster Showcase, Swansea University Final, PGR Showcase (2019), competition finalist.
- Presentation with question and answer at the Medical Education Research Group, Swansea University (2021).

7.3.2. Societal Impact

The societal impact of this project can be divided into: involvement with Swansea Mind, communication with stakeholders and wider public engagement.

7.3.2.1. Involvement with Swansea Mind

Focus groups were run at the beginning of the project to engage people with mental ill-health, providing them with the ability to talk about their mental health experiences and start guiding the research. The service users at Swansea Mind were kept up to date on the developments of the project to discuss the findings while sharing their thoughts and opinions in an informal manner. Finally, a short report was sent to Swansea Mind outlining the key findings, targeted at the staff and service user, written in an accessible manner for their information and comment.

7.3.2.2. Communication with Stakeholders

This research, with a specific emphasis on the vignette study, was presented at a GP workshop with approximately 40 GPs in attendance to spread awareness of the impact of these biases, provide considerations for GPs and used as an opportunity for feedback on the study. Further, I was approached by the Directorate of Strategy from the Swansea Bay Health Board to share this research at clinical workshops and assist in the development of the Transforming Mental Health programme, as part of their wider Addressing Health Inequalities initiative. By sharing this research in this manner, greater awareness about the impact of NCpF will be provided, with the aim to reinforce the shift towards better patient-centred care. This research has also been presented at the following events with various stakeholders:

- Poster Presentation at the RCPsych in Wales & Welsh Psychiatric Society spring meeting (2019, 2020). The audience was primarily psychiatrists and those in positions relating to psychiatry, including research.
- Education Research Group meeting (2021). The audience was those who are on a teaching career pathway in SUMS education strands for undergraduate and postgraduate academic staff. There were approximately 30 attendees at the meeting.
- Engagement workshop and discussion at SAIL Consumer Panel (2021). The audience was a group of members of the public, aimed at providing lay-person opinions on research. Twelve panellists attended the engagement workshop.

7.3.2.3. Wider Public Engagement

Given the fluidity of mental health, it is vital for the wider public to be aware of the potential impact of factors such as age, gender and socioeconomic status. Especially with conditions such as anxiety-related and eating disorders, that are very common in the younger population. As such, younger audiences were targeted to share the research and lessen the stigma around communicating about mental ill-health. The following events were attended:

- I'm A Scientist, Get Me Out of Here! MRC Festival UK (2018)
- Pint of Science (2019)
- Swansea Science Festival (2018, 2019)
- FameLab Competition, Welsh Final (2018, 2020)

7.4. Strengths and Limitations

This thesis highlights the importance of using multiple study designs to gain a better understanding of a research question, as seen by the varying results between the data science (Chapter 4) and clinical vignette (Chapter 5) studies. The problem we sought to understand was a complex one, therefore a complex approach was required. The different methodologies used were the most appropriate to answer the research questions given the alternative natures of the various questions.

The focus groups in Chapter 3 were beneficial to this thesis as they provided a patient-based foundation to the research. The questions asked were open enough so that the patient guided the responses surrounding SDM and it identified the aspects of the healthcare journey patients felt were important to SDM. However, this was a small population, recruited from one charity located South Wales, therefore using other charities and organisations would make the results more generalisable. Nonetheless, this population still provided an important introduction to this research, identified aspects important to patients and highlighted key areas for future research.

This thesis utilised methods that are seldom used in decision-making research, such as through health and administrative data linkage, which shows potential for future research. However, the SF-36 is no longer distributed on a national scale, and instead was replaced by the WEMHWS, which means these records are approximately six years old and would be difficult to repeat in the same manner in the future, however this method can be applied in other ways. Further, even though the data stems from 2015, the research and findings are still applicable to date and provide a corner stone for similar methods in the future of clinical decision-making research.

There are other challenges with health data such as the reliance on survey and self-report measures. There are risks of completion bias as a number of participants did not respond to the survey questions, potentially skewing results. However, this is the case with all survey and self-report research and still identifies key trends that should be explored in greater detail. Further, surveys (such as in Chapter 4 and 5) are open to sampling bias, this can be seen in Chapter 4 as the majority of participants who completed the WHS are middle to older adults, women (though there was no difference in severity between men and women), from higher managerial, semi-routine occupations or long-term unemployed. However, this study still highlighted novel findings and was used to build a broad picture of clinical decision-making and mental health. Sampling bias was also seen in Chapter 5 whereby most people who completed it were Caucasian. Though reasonable measures were taken to lessen the risk of sampling bias by sharing the research across GP research ready practices in England as well as Wales as opposed to recruitment occurring from one county or region. The results of Chapter 4 may not be reliable for the time-to-referral analyses given the small cohort. The final caution when attempting to understand these results is that these associations do not imply causation. This research highlighted the association between certain NCpF and likelihood of diagnosis, treatment or referral, such as age, work, gender, and educational attainment, across a variety of mental illnesses and to varying degrees of depth.

The final part of this research, the clinical vignette study (Chapter 5), was built upon the two previous projects and was co-produced with stakeholders in the creation, conduction, and conclusion of the results, therefore it held a strong theoretical foundation. The research design allowed for a more in depth understanding of the results seen than either qualitative or quantitative research alone. The research was conducted in a manner that minimised the fatigue and maximised convenience for the participants. The vignettes were created in a way that minimised the effect of confounding variables, this is often not done in other clinical decision-making studies, therefore has greater reliability (Currin et al., 2007; Feldman & Gutheil, 1997; McKinlay et al., 1997; McKinlay et al., 1996). The vignettes were also presented in a double-blinded randomisation fashion and completed online, limiting the impact of researcher bias. This study utilised multiple recruitment methods to have a wide reach and minimise recruitment bias, also QR codes were used which is a novel recruitment method in this form of research. This study found several findings, some of which complement previous research, while some findings contradict or provide a greater insight into past research, creating a strong discussion point. There were some drawbacks, such as the impact of COVID-19, which may have influenced which GP practices had the time and resources to complete the study. Some significant results were seen despite this. As aforementioned, sampling bias is present in any study as those who are interested in research or this topic will be more likely to take part or be involved by forwarding on to colleagues. However, bias was minimised in other areas to make it as reliable as possible. Finally, location was not accounted for, linking responses to a location to determine how location influences the results would be interesting for future research, however in this research this was a decision made to promote honest responses and lessen the likelihood of discovering who the participant was as this study was promoted as being completely anonymous.

Perhaps the greatest challenge of this thesis was the ability to explore ethnicity. Though ethnicity was sought in the data science study, it was not granted due to the additional permissions required and the potential for identification. Therefore, it could not be explored and brought into the vignette study in Chapter 5. Further, the focus group and vignette participants were not diverse in this regard, only around 10% of the participants in both studies were not Caucasian, therefore differences in their responses would not be generalisable. There were mixed results about whether implicit biases exist surrounding ethnicity and race in Fitzgerald and Hurst's systematic review (Fitzgerald & Hurst, 2017), therefore it would be useful to explore this in a similar capacity as in Chapter 5 in future research. Nonetheless, this PhD project has confirmed previous findings about the impact of various NCpF, highlighted the importance of decision context when exploring bias, and provided new knowledge such as unexpected differences in diagnostic and treatment decisions seen between men, women and control conditions for bulimia as well as the wider extent to which NCpF, specifically age, gender and socioeconomic status, impact mental health clinical decision-making, which is beneficial for practice, research and clinical education, as highlighted above.

7.5. Author Final Remarks

7.5.1. Impact of COVID

COVID-19 had a massive global impact. ‘Build Back Fairer: The Covid-19 Marmot Review’ published by the Health Foundation and the Institute of Health Equity highlighted the inequalities faced by people with mental ill-health and the lack of appropriate services for those who were impacted most since the start of the pandemic; young people, those with higher educational attainment and women experienced the most pronounced increase in psychological distress (Marmot et al., 2020). This continues to demonstrate the importance of combating inequality and inequity faced by people with mental health.

COVID-19 fell during the last section of this thesis, which meant the final research element, the clinical vignettes (Chapter 5) suffered the greatest impact. Delays in the NHS Ethical submission and sign-off due to increased demand and being given a lower priority than time-restricted COVID-19 research being pushed through NHS Ethics. Once the ethical approval was received, the workload of the GPs increased as highlighted by the responses (either automated or direct) from the practices contacted for recruitment; they were unable to partake in the research due to the resources being finely stretched. Stakeholder groups that were planned during data collection as well as to share the research were delayed or in some instances cancelled as well other conferences that were hoped to attend. Finally, a domino-effect of research team members resources became spread thin, resulting in work delays. This resulted in general mental wellbeing strains throughout the pandemic, an experience shared by many individuals across the world. That said, completing this degree despite the challenges outlined above has made this an even more rewarding submission.

7.5.2. PhD Journey

When starting this PhD, I saw it as an opportunity to develop new skills and expand on those I held already. My past research experience primarily entailed experimental psychology, with elements of qualitative research. As such, this degree was an opportunity to further my qualitative research knowledge, develop skills in computer coding, data linkage and regressional analyses, as well as take my prior experimental knowledge and utilise it in the clinical decision-making setting. More than this, I sought to learn and hone my teaching skills, gain confidence presenting research, and take part in various public engagement initiatives. I feel these personal targets were accomplished and am proud of the work done.

7.5.3. Final Remarks

This thesis has demonstrated the impact of NCpF on mental health clinical decision-making, filled gaps in clinical decision-making research, as well as highlighted suggestions for future research, practice, and education in order to continue working towards truly equal and equitable care.

Appendices

Appendix 1: Systematic Review Publication

https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:f51174ef-109b-457b-ae2f-1fd48db60d0f

Appendix 2: Author Declaration

One chapter in this thesis was associated with a published paper. The systematic review of the literature, as discussed in Chapter 2, was associated with a published paper (Burns et al., 2020). The following people and institutions contributed to the publication of work undertaken as part of this thesis:

Candidate (Author 1)	Lauren Burns Swansea University Medical School
Author 2	Ana da Silva Swansea University Medical School
Author 3	Ann John Swansea University Medical school

Author Details and their Roles

Paper: Burns, L., da Silva, A., and John, A. (2020). Shared decision-making preferences in mental health: does age matter? A systematic review. *Journal of Mental Health, 30*(5), 634-645. Doi: 10.1080/09638237.2020.1793124.

Located in: Appendix 1 (contributed to Chapter Two)

Candidate contributed to: Conceiving of study design; conducted electronic search; assessment of studies for inclusion; extraction and analysis of data; producing of first draft of paper; commented meaningfully to draft and agreement of final version.

Author 2 (Ana da Silva) contributed to: Conceiving of study design; assessment of studies for inclusion; extraction of data; producing of first draft of paper; commented meaningfully to draft and agreement of final version.

Author 3 (Ann John) contributed to: Conceiving of study design; assessment of studies for inclusion; commented meaningfully to draft and agreement of final version.

We, the undersigned, agree with the above stated "proportion of work undertaken" for the published peer-reviewed manuscripts contributing to this thesis:

Signed Candidate [redacted]

Author 2 (Ana da Silva) ____________________

Author 3 (Ann John) _ [redacted]

Appendix 3: Focus Groups Ethical Application Approval

Ethics Committee Use Only

Principal Investigator	Lauren BURNS
Title of Proposed Research	The Impact of 'Non-Clinical' Patient Factors' (NCpF) in Clinical Decision-Making: Uncovering Impact on Mental Health.
RESC Project reference number	**2018-0032**

Application approved	**Yes**	X	**No**			
Conflict of interest	**Yes**		**No**	X	▨	▨
If yes, please supply details						

Chair of SUMS RESC	Deya Gonzalez Associate Professor of Molecular Medicine CNH, ILS2 building, room 018 Swansea University Medical School Singleton Park, Swansea, SA2 8PP, UK. Email [redacted] Tel [redacted]
Date 26.06.18	Signature [redacted]

This application **has been granted ethical approval** via Chair's Action in its current form.

Please ensure that you quote project reference number **2018-0032** in any correspondence with the SUMS RESC

Time limit for applicant to respond	(two months from receipt of email from ethics panel)

Appendix 4: Focus Groups Ethics Application

https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:5d44fb85-897f-4f24-8c48-73eee6a82410

Appendix 5: Data Science IGRP Approval

https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:2073fd3f-c4b6-46bd-abd2-4a94d7d9cf92

Appendix 6: Data Science Read Codes

Anxiety Diagnosis Read Codes

READ_CODE	ANXIETY	Cornish 2016	John2015	DESCRIPTION
1B12.	1	1	1	nerves - nervousness
1B13.	1	1	1	anxiousness
1B1V.	1	1	1	c/o - panic attack
2258.	1	1	1	o/e - anxious
2259.	1	1	1	o/e - nervous
225J.	1	1	1	o/e - panic attack
8G52.	0	0	0	antiphobic therapy
8G94.	0	0	0	anxiety management training
8HHp.	0	0	0	referral for guided self-help for anxiety
E200.	1	1	1	anxiety states
E2000	1	1	1	anxiety state unspecified
E2001	1	1	1	panic disorder
E2002	1	1	1	generalised anxiety disorder
E2003	1	1	1	anxiety with depression
E2004	1	1	1	chronic anxiety
E2005	1	1	1	recurrent anxiety
E200z	1	1	1	anxiety state nos
E202.	1	1	0	phobic disorders
E2020	1	0	0	phobia unspecified
E2021	1	0	0	agoraphobia with panic attacks
E2022	1	0	0	agoraphobia without mention of panic attacks
E2023	1	0	0	social phobia-eating in public
E2024	1	0	0	social phobia-public speaking
E2025	1	0	0	social phobia-public washing
E2026	1	0	0	acrophobia
E2027	1	0	0	animal phobia
E2028	1	0	0	claustrophobia
E2029	1	0	0	fear of crowds
E202A	1	0	0	fear of flying
E202B	1	0	0	cancer phobia
E202C	1	0	0	dental phobia
E202D	1	0	0	fear of death
E202E	1	0	0	fear of pregnancy
E202z	1	0	0	phobic disorder nos
E203.	0	0	0	obsessive-compulsive disorders
E2030	0	0	0	compulsive neurosis
E2031	0	0	0	obsessional neurosis
E203z	0	0	0	obsessive-compulsive dis nos
E28z.	0	0	0	acute stress reaction nos
E2920	0	0	0	separation anxiety disorder

E2D0.	1	1	1	disturbance of anxiety and fearfulness childhood/adolescent
E2D00	1	1	1	childhood and adolescent overanxiousness disturbance
E2D01	1	1	0	childhood and adolescent fearfulness disturbance
E2D0z	1	1	1	disturbance anxiety and fearfulness childhood / adolescent nos
Eu40.	1	1	0	phobic anxiety disorders
Eu400	1	0	0	agoraphobia
Eu401	1	0	0	social phobias
Eu402	1	0	0	specific (isolated) phobia
Eu403	1	0	0	needle phobia
Eu40y	1	0	0	other phobic anxiety disorder
Eu40z	1	0	0	phobic anxiety disorder, unspecified
Eu41.	1	1	1	other anxiety disorders
Eu410	1	1	1	panic disorder [episodic paroxysmal anxiety]
Eu411	1	1	1	generalized anxiety disorder
Eu412	1	1	1	mixed anxiety and depressive disorder
Eu413	1	1	1	other mixed anxiety disorders
Eu41y	1	1	1	other specified anxiety disorders
Eu41z	1	1	1	anxiety disorder, unspecified
Eu42.	0	0	0	obsessive - compulsive disorder
Eu420	0	0	0	predominantly obsessional thoughts or ruminations
Eu421	0	0	0	predominantly compulsive acts [obsessional rituals]
Eu422	0	0	0	mixed obsessional thoughts and acts
Eu42y	0	0	0	other obsessive-compulsive disorders
Eu42z	0	0	0	obsessive-compulsive disorder, unspecified
Eu930	1	1	1	separation anxiety disorder of childhood
Eu931	1	1	1	phobic anxiety disorder of childhood
Eu932	1	1	1	social anxiety disorder of childhood
R2y2.	1	1	1	nervousness

Depression Diagnosis Read Codes

READ_CODE	CORNISH 2016	DEPRESS	DESCRIPTION
1B17.	1	1	depressed
1B1U.	1	1	symptoms of depression
1BP..	0	1	loss of interest
1BP0.	0	1	loss of interest in previously enjoyable activity
1BQ..	1	1	loss of capacity for enjoyment
1BT..	1	1	depressed mood
1BU..	1	1	loss of hope for the future
2257.	1	1	o/e - depressed
E112.	1	1	single major depressive episode
E1120	1	1	single major depressive episode, unspecified
E1121	1	1	single major depressive episode, mild
E1122	1	1	single major depressive episode, moderate
E1123	1	1	single major depressive episode, severe, without mention of psychosis
E1124	0	0	single major depressive episode, severe, with psychosis
E1125	1	1	single major depressive episode, in partial or unspecified remission
E1126	1	1	single major depressive episode, in full remission
E112z	1	1	single major depressive episode nos
E113.	1	1	recurrent major depressive episode
E1130	1	1	recurrent major depressive episodes, unspecified
E1131	1	1	recurrent major depressive episodes, mild
E1132	1	1	recurrent major depressive episodes, moderate
E1133	1	1	recurrent major depressive episodes, severe, without mention of psychosis
E1134	0	0	recurrent major depressive episodes, severe, with psychosis
E1135	1	1	recurrent major depressive episodes, in partial or unspecified remission
E1136	1	1	recurrent major depressive episodes, in full remission
E1137	1	1	recurrent depression
E113z	1	1	recurrent major depressive episode nos
E118.	1	1	seasonal affective disorder
E135.	1	1	agitated depression
E2003	1	1	anxiety with depression
E204.	1	1	neurotic depression reactive type
E291.	1	1	prolonged depressive reaction
E2B..	1	1	depressive disorder nec
E2B0.	1	1	postviral depression
E2B1.	1	1	chronic depression
Eu32.	1	1	depressive episode
Eu320	1	1	mild depressive episode
Eu321	1	1	moderate depressive episode

Eu322	1	1	severe depressive episode without psychotic symptoms
Eu323	0	0	severe depressive episode with psychotic symptoms
Eu324	1	1	mild depression
Eu325	0	1	major depression, mild
Eu326	0	1	major depression, moderately severe
Eu327	0	1	major depression, severe without psychotic symptoms
Eu328	0	0	major depression, severe with psychotic symptoms
Eu329	0	0	single major depressive episode, severe, with psychosis, psychosis in remission
Eu32A	0	0	recurrent major depressive episodes, severe, with psychosis, psychosis in remission
Eu32B	0	1	antenatal depression
Eu32y	1	1	other depressive episodes
Eu32z	1	1	depressive episode, unspecified
Eu33.	1	1	recurrent depressive disorder
Eu330	1	1	recurrent depressive disorder, current episode mild
Eu331	1	1	recurrent depressive disorder, current episode moderate
Eu332	1	1	recurrent depressive disorder, current episode severe without psychotic symptoms
Eu333	0	0	recurrent depressive disorder, current episode severe with psychotic symptoms
Eu334	1	1	recurrent depressive disorder, currently in remission
Eu33y	1	1	other recurrent depressive disorders
Eu33z	1	1	recurrent depressive disorder, unspecified
Eu341	1	1	dysthymia
Eu412	1	1	mixed anxiety and depressive disorder

Treatment Read Codes

READ_CODE	ANTIDEP.PPSI	ANXIOLITICS.PPSI	HYPNOTICS.PPSI	DESCRIPTION
d1...	0	0	1	hypnotics
d11..	0	0	1	chloral hydrate
d111.	0	0	1	chloral 500mg/5ml mixture
d112.	0	0	1	chloral paediatric 200mg/5ml elixir
d113.	0	0	1	noctec 500mg capsules
d114.	0	0	1	chloral hydrate 500mg capsules
d115.	0	0	1	welldorm 143mg/5ml elixir
d115.	0	0	1	welldorm 143mg/5ml elixir
d116.	0	0	1	welldorm tablets
d116.	0	0	1	welldorm tablets
d117.	0	0	1	chloral hydrate 414mg tablets
d118.	0	0	1	chloral hydrate 143mg/5ml elixir
d119.	0	0	1	chloral hydrate 500mg/5ml syrup
d11A.	0	0	1	somnwell 707mg tablets
d12..	0	0	1	clomethiazole edisylate [hypnotic]
d121.	0	0	1	heminevrin 192mg capsules
d122.	0	0	1	heminevrin 250mg/5ml syrup
d123.	0	0	1	heminevrin 8mg/ml infusion
d12v.	0	0	1	clomethiazole(base) 192mg capsules
d12v.	0	0	1	clomethiazole(base) 192mg capsules
d12w.	0	0	1	clomethiazole edisilate 250mg/5ml syrup
d12w.	0	0	1	clomethiazole edisilate 250mg/5ml syrup
d12z.	0	0	1	chlormethiazole edisylate 8mg/ml infusion
d13..	0	0	1	dichloralphenazone
d131.	0	0	1	welldorm 650mg tablets
d132.	0	0	1	welldorm 225mg/5ml elixir
d13y.	0	0	1	dichloralphenazone 650mg tablets
d13z.	0	0	1	dichloralphenazone 225mg/5ml elixir
d14..	0	0	1	flunitrazepam
d141.	0	0	1	rohypnol 1mg tablets
d14z.	0	0	1	flunitrazepam 1mg tablets
d15..	0	0	1	flurazepam
d151.	0	0	1	dalmane 15mg capsules
d152.	0	0	1	dalmane 30mg capsules
d153.	0	0	1	paxane 15mg capsules
d154.	0	0	1	paxane 30mg capsules
d15y.	0	0	1	flurazepam 15mg capsules
d15z.	0	0	1	flurazepam 30mg capsules
d16..	0	0	1	loprazolam
d161.	0	0	1	loprazolam 1mg tablets
d162.	0	0	1	dormonoct 1mg tablets
d17..	0	0	1	lormetazepam

d171.	0	0	1	lormetazepam 500micrograms tablets
d172.	0	0	1	lormetazepam 1mg tablets
d173.	0	0	1	noctamid 500micrograms tablets
d174.	0	0	1	noctamid 1mg tablets
d18..	0	0	1	nitrazepam
d181.	0	0	1	nitrazepam 5mg capsules
d182.	0	0	1	nitrazepam 5mg tablets
d183.	0	0	1	nitrazepam 10mg tablets
d184.	0	0	1	nitrazepam 2.5mg/5ml mixture
d185.	0	0	1	mogadon 5mg capsules
d186.	0	0	1	mogadon 5mg tablets
d187.	0	0	1	nitrados 5mg tablets
d188.	0	0	1	noctesed 5mg tablets
d189.	0	0	1	remnos 5mg tablets
d18a.	0	0	1	remnos 10mg tablets
d18b.	0	0	1	somnite 5mg tablets
d18c.	0	0	1	somnite 2.5mg/5ml mixture
d18c.	0	0	1	somnite 2.5mg/5ml mixture
d18d.	0	0	1	surem 5mg capsules
d18e.	0	0	1	unisomnia 5mg tablets
d18f.	0	0	1	nitrazepam 5mg/5ml suspension
d19..	0	0	1	promethazine hcl [hypnotic] see section c8i..
d1a..	0	0	1	temazepam [hypnotic]
d1a1.	0	0	1	temazepam 10mg capsules
d1a2.	0	0	1	temazepam 15mg capsules
d1a3.	0	0	1	temazepam 20mg capsules
d1a4.	0	0	1	temazepam 30mg capsules
d1a5.	0	0	1	temazepam 10mg/5ml elixir
d1a6.	0	0	1	normison 10mg capsules
d1a7.	0	0	1	normison 20mg capsules
d1a8.	0	0	1	temazepam planpak capsules
d1a9.	0	0	1	temazepam 10mg tablets
d1aa.	0	0	1	temazepam 20mg tablets
d1ab.	0	0	1	temazepam gelthix 10mg capsules
d1ac.	0	0	1	temazepam gelthix 20mg capsules
d1ad.	0	0	1	temazepam gelthix 15mg capsules
d1ae.	0	0	1	temazepam gelthix 30mg capsules
d1af.	0	0	1	temazepam gel filled 10mg capsules
d1ag.	0	0	1	temazepam gel filled 20mg capsules
d1ah.	0	0	1	temazepam gel filled 15mg capsules
d1ai.	0	0	1	temazepam gel filled 30mg capsules
d1aj.	0	0	1	temazepam 10mg/sachet oral solution
d1ak.	0	0	1	temazepam 20mg/sachet oral solution
d1al.	0	0	1	euhypnos 10mg/sachet oral solution
d1am.	0	0	1	euhypnos 20mg/sachet oral solution
d1an.	0	0	1	euhypnos 10mg/5ml oral solution

d1ao.	0	0	1	temazepam 10mg/5ml sugar free oral solution
d1b..	0	0	1	triazolam
d1b1.	0	0	1	triazolam 125microgram tablets
d1b2.	0	0	1	triazolam 250microgram tablets
d1b3.	0	0	1	halcion 125microgram tablets
d1b4.	0	0	1	halcion 250microgram tablets
d1c..	0	0	1	triclofos sodium
d1c1.	0	0	1	triclofos 500mg/5ml liquid
d1d..	0	0	1	zopiclone
d1d1.	0	0	1	zopiclone 7.5mg tablets
d1d2.	0	0	1	zimovane 7.5mg tablets
d1d3.	0	0	1	zopiclone 3.75mg tablets
d1d4.	0	0	1	zimovane ls 3.75mg tablets
d1d5.	0	0	1	zileze 7.5 tablets
d1d6.	0	0	1	zileze 3.75 tablets
d1e..	0	0	0	glutethimide [no drugs here]
d1f..	0	0	1	zolpidem
d1f1.	0	0	1	stilnoct 5mg tablets
d1f2.	0	0	1	zolpidem tartrate 5mg tablets
d1f3.	0	0	1	zolpidem tartrate 10mg tablets
d1f4.	0	0	1	stilnoct 10mg tablets
d1g..	0	0	1	zaleplon
d1g1.	0	0	1	sonata 5mg capsules
d1g2.	0	0	1	sonata 10mg capsules
d1gy.	0	0	1	zaleplon 5mg capsules
d1gz.	0	0	1	zaleplon 10mg capsules
d1h..	0	0	1	melatonin
d1h1.	0	0	1	circadin 2mg m/r tablets
d1hz.	0	0	1	melatonin 2mg m/r tablets
d1i..	0	0	1	dexmedetomidine
d1i1.	0	0	1	dexdor 200micrograms/2ml concentrate for soln for infusion
d1i2.	0	0	1	dexmedetomidine 200micrograms/2ml conc for soln for inj
d1i3.	0	0	1	dexdor 400micrograms/4ml concentrate for soln for infusion
d1i4.	0	0	1	dexmedetomidine 400micrograms/4ml conc for soln for inj
d1i5.	0	0	1	dexdor 1mg/10ml concentrate for solution for infusion
d1i6.	0	0	1	dexmedetomidine 1mg/10ml concentrate for soln for injection
d2...	0	1	0	anxiolytics
d21..	0	1	0	diazepam [anxiolytic]
d211.	0	1	0	diazepam 2mg capsules
d212.	0	1	0	diazepam 5mg capsules
d213.	0	1	0	diazepam 2mg tablets

d214.	0	1	0	diazepam 5mg tablets
d215.	0	1	0	diazepam 10mg tablets
d216.	0	1	0	diazepam 2mg/5ml elixir
d217.	0	1	0	alupram 2mg tablets
d218.	0	1	0	alupram 5mg tablets
d219.	0	1	0	alupram 10mg tablets
d21a.	0	1	0	atensine 2mg tablets
d21A.	0	1	0	diazepam 5mg/5ml oral solution
d21b.	0	1	0	atensine 5mg tablets
d21B.	0	1	0	rimapam 2mg tablets
d21c.	0	1	0	atensine 10mg tablets
d21C.	0	1	0	rimapam 5mg tablets
d21d.	0	1	0	diazemuls 10mg/2ml ampoules
d21D.	0	1	0	rimapam 10mg tablets
d21e.	0	1	0	evacalm 2mg tablets
d21E.	0	1	0	dialar 2mg/5ml syrup
d21f.	0	1	0	evacalm 5mg tablets
d21F.	0	1	0	dialar 5mg/5ml syrup
d21g.	0	1	0	solis 2mg capsules
d21G.	0	1	0	valclair 10mg suppositories
d21h.	0	1	0	solis 5mg capsules
d21i.	0	1	0	stesolid 10mg/2ml injection
d21j.	0	1	0	stesolid 20mg/4ml injection
d21J.	0	1	0	diazepam 10mg/5ml suspension
d21k.	0	1	0	stesolid 5mg rectal solution
d21l.	0	1	0	stesolid 10mg rectal solution
d21m.	0	1	0	tensium 2mg tablets
d21n.	0	1	0	tensium 5mg tablets
d21o.	0	1	0	tensium 10mg tablets
d21p.	0	1	0	valium 2mg capsules
d21q.	0	1	0	valium 5mg capsules
d21r.	0	1	0	valium 2mg tablets
d21s.	0	1	0	valium 5mg tablets
d21t.	0	1	0	valium 10mg tablets
d21u.	0	1	0	valium 2mg/5ml syrup
d21v.	0	1	0	valium [anxiol] 10mg/2ml injection
d21w.	0	1	0	valium dup del injection
d21x.	0	1	0	valium 5mg suppositories
d21y.	0	1	0	valium 10mg suppositories
d21z.	0	1	0	diazepam 10mg suppositories
d22..	0	1	0	alprazolam
d221.	0	1	0	xanax 250micrograms tablets
d222.	0	1	0	xanax 500micrograms tablets
d22y.	0	1	0	alprazolam 250microgram tablets
d22z.	0	1	0	alprazolam 500microgram tablets
d23..	0	1	0	bromazepam

d231.	0	1	0	lexotan 1.5mg tablets
d232.	0	1	0	lexotan 3mg tablets
d23y.	0	1	0	bromazepam 1.5mg tablets
d23z.	0	1	0	bromazepam 3mg tablets
d24..	0	1	0	chlordiazepoxide
d241.	0	1	0	chlordiazepoxide 5mg capsules
d242.	0	1	0	chlordiazepoxide 10mg capsules
d243.	0	1	0	chlordiazepoxide hydrochloride 5mg tablets
d244.	0	1	0	chlordiazepoxide hydrochloride 10mg tablets
d245.	0	1	0	chlordiazepoxide hydrochloride 25mg tablets
d246.	0	1	0	chlordiazepoxide 5mg tablets
d247.	0	1	0	chlordiazepoxide 10mg tablets
d248.	0	1	0	chlordiazepoxide 25mg tablets
d249.	0	1	0	librium 5mg capsules
d24a.	0	1	0	librium 10mg capsules
d24b.	0	1	0	librium 5mg tablets
d24c.	0	1	0	librium 10mg tablets
d24d.	0	1	0	librium 25mg tablets
d24e.	0	1	0	librium 100mg injection
d24f.	0	1	0	tropium 5mg capsules
d24g.	0	1	0	tropium 10mg capsules
d24h.	0	1	0	tropium 5mg tablets
d24i.	0	1	0	tropium 10mg tablets
d24j.	0	1	0	tropium 25mg tablets
d25..	0	1	0	chlormezanone
d251.	0	1	0	trancopal 200mg tablets
d25z.	0	1	0	chlormezanone 200mg tablets
d26..	0	1	0	clobazam
d261.	0	1	0	clobazam 10mg capsules
d262.	0	1	0	frisium 10mg capsules
d263.	0	1	0	clobazam 10mg tablets
d264.	0	1	0	frisium 10mg tablets
d265.	0	1	0	tapclob 5mg/5ml oral susp | tapclob 5mg/5ml oral suspension
d266.	0	1	0	clobazam 5mg/5ml oral suspension
d267.	0	1	0	tapclob 10mg/5ml oral suspension
d268.	0	1	0	clobazam 10mg/5ml oral suspension
d269.	0	1	0	perizam 1mg/ml oral suspension
d26A.	0	1	0	perizam 2mg/ml oral suspension
d27..	0	1	0	clorazepate dipotassium
d271.	0	1	0	tranxene 7.5mg capsules
d272.	0	1	0	tranxene 15mg capsules
d27y.	0	1	0	clorazepate dipotassium 7.5mg capsules
d27z.	0	1	0	clorazepate dipotassium 15mg capsules
d28..	0	1	0	hydroxyzine hcl [anxiolytic]
d281.	0	1	0	atarax 10mg tablets

d282.	0	1	0	atarax 25mg tablets
d283.	0	1	0	atarax 10mg/5ml syrup
d284.	0	1	0	ucerax 25mg tablets
d285.	0	1	0	ucerax 10mg/5ml syrup
d28x.	0	1	0	hydroxyzine hcl 10mg tablets
d28y.	0	1	0	hydroxyzine hcl 25mg tablets
d28z.	0	1	0	hydroxyzine hcl 10mg/5ml syrup
d29..	0	1	0	ketazolam
d291.	0	1	0	anxon 15mg capsules
d292.	0	1	0	anxon 30mg capsules
d29y.	0	1	0	ketazolam 15mg capsules
d29z.	0	1	0	ketazolam 30mg capsules
d2a..	0	1	0	lorazepam [anxiolytic]
d2a1.	0	1	0	lorazepam 1mg tablets
d2a2.	0	1	0	lorazepam 2.5mg tablets
d2a3.	0	1	0	almazine 1mg tablets
d2a4.	0	1	0	almazine 2.5mg tablets
d2a5.	0	1	0	ativan 1mg tablets
d2a6.	0	1	0	ativan 2.5mg tablets
d2a7.	0	1	0	ativan 4mg/1ml injection
d2ax.	0	1	0	ativan 4mg/ml injection
d2az.	0	1	0	lorazepam 4mg/1ml injection
d2b..	0	1	0	medazepam
d2b1.	0	1	0	nobrium 5mg capsules
d2b2.	0	1	0	nobrium 10mg capsules
d2by.	0	1	0	medazepam 5mg capsules
d2bz.	0	1	0	medazepam 10mg capsules
d2c..	0	1	0	meprobamate
d2c1.	0	1	0	meprobamate 200mg tablets
d2c2.	0	1	0	meprobamate 400mg tablets
d2c3.	0	1	0	equanil 200mg tablets
d2c4.	0	1	0	equanil 400mg tablets
d2c5.	0	1	0	meprate 400mg tablets
d2c6.	0	1	0	tenavoid tablets
d2d..	0	1	0	oxazepam
d2d1.	0	1	0	oxazepam 30mg capsules
d2d2.	0	1	0	oxazepam 10mg tablets
d2d3.	0	1	0	oxazepam 15mg tablets
d2d4.	0	1	0	oxazepam 30mg tablets
d2d5.	0	1	0	oxanid 10mg tablets
d2d6.	0	1	0	oxanid 15mg tablets
d2d7.	0	1	0	oxanid 30mg tablets
d2e..	0	1	0	prazepam
d2e1.	0	1	0	centrax 10mg tablets
d2ez.	0	1	0	prazepam 10mg tablets
d2f..	0	1	0	buspirone hydrochloride

d2f1.	0	1	0	buspirone 5mg tablets
d2f2.	0	1	0	buspar 5mg tablets
d2f3.	0	1	0	buspar 5mg tablets x126
d2f4.	0	1	0	buspar 10mg tablets
d2f5.	0	1	0	buspirone 10mg tablets
d2g..	0	1	0	flumazenil
d2g1.	0	1	0	flumazenil 500microgram/5ml injection
d2g2.	0	1	0	anexate 500micrograms/5ml injection
d2g2.	0	1	0	anexate 500micrograms/5ml injection
d7...	1	0	0	tricyclic antidepressants
d71..	1	0	0	amitriptyline hydrochloride [antidepressant]
d711.	1	0	0	amitriptyline 10mg tablets
d712.	1	0	0	amitriptyline 25mg tablets
d713.	1	0	0	amitriptyline 50mg tablets
d714.	1	0	0	domical 10mg tablets
d715.	1	0	0	domical 25mg tablets
d716.	1	0	0	domical 50mg tablets
d717.	1	0	0	elavil 10mg tablets
d718.	1	0	0	elavil 25mg tablets
d719.	1	0	0	lentizol 25mg m/r capsules
d71a.	1	0	0	lentizol 50mg m/r capsules
d71b.	1	0	0	tryptizol 75mg m/r capsules
d71c.	1	0	0	tryptizol 10mg tablets
d71d.	1	0	0	tryptizol 25mg tablets
d71e.	1	0	0	tryptizol 50mg tablets
d71f.	1	0	0	tryptizol 10mg/5ml syrup
d71g.	1	0	0	tryptizol 100mg/10ml injection
d71h.	1	0	0	amitriptyline 25mg/5ml sugar free solution
d71i.	1	0	0	amitriptyline 50mg/5ml sugar free solution
d71j.	1	0	0	amitriptyline 10mg/5ml sugar free oral solution
d71u.	1	0	0	amitriptyline 25mg m/r capsules
d71v.	1	0	0	amitriptyline 50mg m/r capsules
d71w.	1	0	0	amitriptyline 75mg m/r capsules
d71y.	1	0	0	amitriptyline 10mg/5ml syrup
d71z.	1	0	0	amitriptyline hydrochloride 100mg/10ml injection
d72..	1	0	0	butriptyline
d721.	1	0	0	evadyne 25mg tablets
d722.	1	0	0	evadyne 50mg tablets
d72y.	1	0	0	butriptyline 25mg tablets
d72z.	1	0	0	butriptyline 50mg tablets
d73..	1	0	0	clomipramine hydrochloride
d731.	1	0	0	anafranil 10mg capsules
d731.	1	0	0	anafranil 10mg capsules
d732.	1	0	0	anafranil 25mg capsules
d732.	1	0	0	anafranil 25mg capsules

d733.	1	0	0	anafranil 50mg capsules
d733.	1	0	0	anafranil 50mg capsules
d734.	1	0	0	anafranil 25mg/5ml syrup
d735.	1	0	0	anafranil 25mg/2ml injection
d736.	1	0	0	anafranil sr 75mg m/r tablets
d736.	1	0	0	anafranil sr 75mg m/r tablets
d737.	1	0	0	tranquax 10mg capsules
d738.	1	0	0	tranquax 25mg capsules
d739.	1	0	0	tranquax 50mg capsules
d73r.	1	0	0	clomipramine hcl 50mg tablets
d73s.	1	0	0	clomipramine hcl 10mg tablets
d73t.	1	0	0	clomipramine hcl 25mg tablets
d73u.	1	0	0	clomipramine hcl 10mg capsules
d73v.	1	0	0	clomipramine hcl 25mg capsules
d73w.	1	0	0	clomipramine hcl 50mg capsules
d73x.	1	0	0	clomipramine hydrochloride 25mg/5ml syrup
d73y.	1	0	0	clomipramine hcl 25mg/2ml injection
d73z.	1	0	0	clomipramine hcl 75mg m/r tabs
d74..	1	0	0	desipramine hydrochloride
d741.	1	0	0	pertofran 25mg tablets
d74z.	1	0	0	desipramine hydrochloride 25mg tablets
d75..	1	0	0	dosulepin hydrochloride
d751.	1	0	0	prothiaden 25mg capsules
d752.	1	0	0	prothiaden 75mg tablets
d753.	1	0	0	prepadine 25mg capsules
d754.	1	0	0	prepadine 75mg tablets
d755.	1	0	0	dothapax 25mg capsules
d756.	1	0	0	dothapax 75mg tablets
d759.	1	0	0	thaden 25mg capsules
d75A.	1	0	0	thaden 75mg tablets
d75y.	1	0	0	dosulepin hydrochloride 25mg capsules
d75z.	1	0	0	dosulepin hydrochloride 75mg tablets
d76..	1	0	0	doxepin
d761.	1	0	0	sinequan 10mg capsules x56cp
d762.	1	0	0	sinequan 25mg capsules x28cp
d763.	1	0	0	sinequan 50mg capsules x28cp
d764.	1	0	0	sinequan 75mg capsules x28cp
d765.	1	0	0	sinepin 25mg capsules
d765.	1	0	0	sinepin 25mg capsules
d766.	1	0	0	sinepin 50mg capsules
d766.	1	0	0	sinepin 50mg capsules
d76w.	1	0	0	doxepin 10mg capsules
d76x.	1	0	0	doxepin 25mg capsules
d76y.	1	0	0	doxepin 50mg capsules
d76z.	1	0	0	doxepin 75mg capsules
d77..	1	0	0	imipramine hydrochloride [antidepressant]

d771.	1	0	0	imipramine 10mg tabs
d772.	1	0	0	imipramine 25mg tablets
d773.	1	0	0	praminil 10mg tablets
d774.	1	0	0	praminil 25mg tablets
d775.	1	0	0	tofranil 10mg tablets
d776.	1	0	0	tofranil 25mg tablets
d777.	1	0	0	tofranil 25mg/5ml syrup
d77w.	1	0	0	imipramine hydrochloride 25mg/5ml oral solution
d77x.	1	0	0	imipramine hydrochloride 10mg tablets
d77y.	1	0	0	imipramine hydrochloride 25mg tablets
d77z.	1	0	0	imipramine hydrochloride 25mg/5ml syrup
d78..	1	0	0	iprindole
d781.	1	0	0	prondol 15mg tablets
d782.	1	0	0	prondol 30mg tablets
d78y.	1	0	0	iprindole 15mg tablets
d78z.	1	0	0	iprindole 30mg tablets
d79..	1	0	0	lofepramine
d791.	1	0	0	gamanil 70mg tablets x56cp
d792.	1	0	0	lomont 70mg/5ml sugar free suspension
d793.	1	0	0	feprapax 70mg tablets
d794.	1	0	0	gamanil 70mg tablets
d79y.	1	0	0	lofepramine 70mg/5ml sugar free suspension
d79z.	1	0	0	lofepramine 70mg tablets
d7a..	1	0	0	maprotiline hydrochloride
d7a1.	1	0	0	ludiomil 10mg tablets
d7a2.	1	0	0	ludiomil 25mg tablets
d7a3.	1	0	0	ludiomil 50mg tablets
d7a4.	1	0	0	ludiomil 75mg tablets x28cp
d7aw.	1	0	0	maprotiline hydrochloride 10mg tablets
d7ax.	1	0	0	maprotiline hydrochloride 25mg tablets
d7ay.	1	0	0	maprotiline hydrochloride 50mg tablets
d7az.	1	0	0	maprotiline hydrochloride 75mg tablets
d7b..	1	0	0	mianserin hydrochloride
d7b1.	1	0	0	mianserin 10mg tablets
d7b2.	1	0	0	mianserin 20mg tablets
d7b3.	1	0	0	mianserin 30mg tablets
d7b4.	1	0	0	bolvidon 10mg tablets
d7b5.	1	0	0	bolvidon 20mg tablets
d7b6.	1	0	0	bolvidon 30mg tablets
d7b7.	1	0	0	norval 10mg tablets
d7b8.	1	0	0	norval 20mg tablets
d7b9.	1	0	0	norval 30mg tablets
d7c..	1	0	0	nortriptyline
d7c1.	1	0	0	allegron 10mg tablets
d7c2.	1	0	0	allegron 25mg tablets

d7c3.	1	0	0	aventyl 10mg capsules
d7c4.	1	0	0	aventyl 25mg capsules
d7c5.	1	0	0	aventyl 10mg/5ml liquid
d7c6.	1	0	0	nortriptyline 10mg tablets
d7c7.	1	0	0	nortriptyline 10mg/5ml liquid
d7c8.	1	0	0	nortriptyline 25mg tablets
d7c9.	1	0	0	nortriptyline 10mg capsules
d7cy.	1	0	0	nortriptyline 25mg capsules
d7d..	1	0	0	protriptyline hydrochloride
d7d1.	1	0	0	concordin 5mg tablets
d7d2.	1	0	0	concordin 10mg tablets
d7d3.	1	0	0	protriptyline hydrochloride 5mg tablets
d7d4.	1	0	0	protriptyline hydrochloride 10mg tablets
d7e..	1	0	0	trazodone hydrochloride
d7e1.	1	0	0	molipaxin 50mg capsules x84cp
d7e2.	1	0	0	molipaxin 100mg capsules x56cp
d7e3.	1	0	0	molipaxin 50mg/5ml liquid
d7e4.	1	0	0	molipaxin 150mg tablets x28cp
d7e5.	1	0	0	trazodone hydrochloride 150mg tablets
d7e6.	1	0	0	molipaxin cr 150mg m/r tablets x28
d7e7.	1	0	0	trazodone hydrochloride 150mg m/r tablets
d7ew.	1	0	0	trazodone hydrochloride 100mg capsules
d7ex.	1	0	0	trazodone hydrochloride 50mg capsules
d7ez.	1	0	0	trazodone hydrochloride 50mg/5ml liquid
d7f..	1	0	0	trimipramine
d7f1.	1	0	0	surmontil 50mg capsules x28cp
d7f1.	1	0	0	surmontil 50mg capsules x28cp
d7f2.	1	0	0	surmontil 10mg tablets
d7f2.	1	0	0	surmontil 10mg tablets
d7f3.	1	0	0	surmontil 25mg tablets
d7f3.	1	0	0	surmontil 25mg tablets
d7fx.	1	0	0	trimipramine 50mg capsules
d7fy.	1	0	0	trimipramine 10mg tablets
d7fz.	1	0	0	trimipramine 25mg tablets
d7g..	1	0	0	viloxazine hydrochloride
d7g1.	1	0	0	vivalan 50mg tablets
d7gz.	1	0	0	viloxazine 50mg tablets
d7h..	1	0	0	amoxapine
d7h1.	1	0	0	amoxapine 25mg tablets
d7h2.	1	0	0	amoxapine 50mg tablets
d7h3.	1	0	0	amoxapine 100mg tablets
d7h4.	1	0	0	amoxapine 150mg tablets
d7h5.	1	0	0	asendis 25mg tablets
d7h6.	1	0	0	asendis 50mg tablets
d7h7.	1	0	0	asendis 100mg tablets
d7h8.	1	0	0	asendis 150mg tablets

d8...	1	0	0	monoamine-oxidase inhibitors
d81..	1	0	0	phenelzine
d811.	1	0	0	nardil 15mg tablets
d81z.	1	0	0	phenelzine 15mg tablets
d82..	1	0	0	iproniazid
d821.	1	0	0	marsilid 25mg tablets
d822.	1	0	0	marsilid 50mg tablets
d82y.	1	0	0	iproniazid 25mg tablets
d82z.	1	0	0	iproniazid 50mg tablets
d83..	1	0	0	isocarboxazid
d831.	1	0	0	marplan 10mg tablets
d83z.	1	0	0	isocarboxazid 10mg tablets
d84..	1	0	0	tranylcypromine
d841.	1	0	0	parnate 10mg tablets
d84z.	1	0	0	tranylcypromine 10mg tablets
d85..	1	0	0	moclobemide
d851.	1	0	0	manerix 150mg tablets
d852.	1	0	0	moclobemide 150mg tablets
d853.	1	0	0	manerix 300mg tablets
d854.	1	0	0	moclobemide 300mg tablets
d9...	1	0	0	compound antidepressant drugs
d91..	1	0	0	compound antidepressants a-z
d911.	1	0	0	limbitrol 5 capsules
d912.	1	0	0	limbitrol 10 capsules
d913.	1	0	0	motipress tablets x28cp
d914.	1	0	0	motival tablets
d915.	1	0	0	parstelin tablets
d916.	1	0	0	triptafen tablets
d917.	1	0	0	triptafen-m tablets
da...	1	0	0	other antidepressant drugs
da1..	1	0	0	flupentixol [antidepressant]
da11.	1	0	0	fluanxol 500micrograms tablets
da12.	1	0	0	fluanxol 1mg tablets
da1y.	1	0	0	flupentixol 500micrograms tablets
da1z.	1	0	0	flupentixol 1mg tablets
da2..	1	0	0	tryptophan
da21.	1	0	0	optimax 500mg tablets
da21.	1	0	0	optimax 500mg tablets
da22.	1	0	0	optimax 1g/6g powder
da23.	1	0	0	optimax wv 500mg tablets
da24.	1	0	0	pacitron 500mg tablets
da2y.	1	0	0	tryptophan 500mg tablets
da2y.	1	0	0	tryptophan 500mg tablets
da2z.	1	0	0	tryptophan 1g/6g powder
da3..	1	0	0	fluvoxamine maleate
da31.	1	0	0	faverin 50mg tablets

da32.	1	0	0	fluvoxamine maleate 50mg tablets
da33.	1	0	0	faverin 100mg tablets
da34.	1	0	0	fluvoxamine maleate 100mg tablets
da4..	1	0	0	fluoxetine hydrochloride
da41.	1	0	0	fluoxetine 20mg capsules
da42.	1	0	0	prozac 20mg capsules x30
da43.	1	0	0	fluoxetine 20mg/5ml oral liquid
da44.	1	0	0	prozac 20mg/5ml oral liquid
da45.	1	0	0	prozac 20mg capsules
da46.	1	0	0	fluoxetine 60mg capsules
da47.	1	0	0	prozac 60mg capsules
da48.	1	0	0	felicium 20mg capsules
da49.	1	0	0	oxactin 20mg capsules
da4A.	1	0	0	ranflutin 20mg capsules
da4B.	1	0	0	prozit 20mg/5ml oral solution
da4C.	1	0	0	prozep 20mg/5ml oral solution
da4D.	1	0	0	olena 20mg dispersible tablets
da4E.	1	0	0	fluoxetine 20mg dispersible tablets
da5..	1	0	0	sertraline hydrochloride
da51.	1	0	0	sertraline 50mg tablets
da52.	1	0	0	sertraline 100mg tablets
da53.	1	0	0	lustral 50mg tablets
da54.	1	0	0	lustral 100mg tablets
da6..	1	0	0	paroxetine hydrochloride
da61.	1	0	0	paroxetine 20mg tablets
da62.	1	0	0	seroxat 20mg tablets x30
da63.	1	0	0	paroxetine 30mg tablets
da64.	1	0	0	seroxat 30mg tablets x30
da65.	1	0	0	paroxetine 10mg/5ml sugar free liquid
da66.	1	0	0	seroxat 10mg/5ml sugar free liquid
da67.	1	0	0	paroxetine 10mg tablets
da68.	1	0	0	seroxat 10mg tablets
da7..	1	0	0	venlafaxine
da71.	1	0	0	venlafaxine 37.5mg tablets
da72.	1	0	0	venlafaxine 75mg tablets
da73.	1	0	0	efexor 37.5mg tablets
da74.	1	0	0	efexor 75mg tablets
da75.	1	0	0	venlafaxine 50mg tablets
da76.	1	0	0	efexor 50mg tablets
da77.	1	0	0	venlafaxine 75mg m/r capsules
da78.	1	0	0	efexor xl 75mg m/r capsules
da79.	1	0	0	venlafaxine 150mg m/r capsules
da7a.	1	0	0	venaxx xl 150mg m/r capsules
da7A.	1	0	0	efexor xl 150mg m/r capsules
da7b.	1	0	0	vaxalin xl 75mg m/r capsules
da7B.	1	0	0	rodomel xl 75mg m/r capsules

da7c.	1	0	0	vaxalin xl 150mg m/r capsules
da7C.	1	0	0	rodomel xl 150mg m/r capsules
da7d.	1	0	0	alventa xl 75mg m/r capsules
da7D.	1	0	0	winfex xl 75mg m/r capsules
da7e.	1	0	0	alventa xl 150mg m/r capsules
da7E.	1	0	0	winfex xl 150mg m/r capsules
da7f.	1	0	0	ranfaxine xl 150mg m/r capsules
da7F.	1	0	0	trixat xl 75mg m/r capsules
da7g.	1	0	0	ranfaxine xl 75mg m/r capsules
da7G.	1	0	0	trixat xl 150mg m/r capsules
da7h.	1	0	0	bonilux xl 75mg m/r capsules
da7H.	1	0	0	viepax xl 75mg m/r tablets
da7i.	1	0	0	bonilux xl 150mg m/r capsules
da7I.	1	0	0	venlafaxine 75mg m/r tablets
da7j.	1	0	0	tonpular xl 75mg m/r capsules
da7J.	1	0	0	viepax xl 150mg m/r tablets
da7k.	1	0	0	tonpular xl 150mg m/r capsules
da7K.	1	0	0	venlafaxine 150mg m/r tablets
da7l.	1	0	0	foraven xl 75mg m/r capsules
da7L.	1	0	0	tardcaps xl 75mg m/r capsules
da7m.	1	0	0	foraven xl 150mg m/r capsules
da7M.	1	0	0	tardcaps xl 150mg m/r capsule
da7n.	1	0	0	depefex xl 75mg m/r capsules
da7N.	1	0	0	viepax 37.5mg tablets
da7o.	1	0	0	depefex xl 150mg m/r capsules
da7O.	1	0	0	viepax 75mg tablets
da7p.	1	0	0	venlalic xl 37.5mg m/r tablets
da7P.	1	0	0	vensir xl 75mg m/r capsules
da7q.	1	0	0	venlafaxine 37.5mg m/r tablets
da7Q.	1	0	0	vensir xl 150mg m/r capsules
da7r.	1	0	0	sunveniz xl 75mg m/r tablets
da7R.	1	0	0	tifaxin xl 75mg m/r capsules
da7s.	1	0	0	sunveniz xl 150mg m/r tablets
da7S.	1	0	0	tifaxin xl 150mg m/r capsules
da7t.	1	0	0	venladex xl 75mg m/r tablets
da7T.	1	0	0	vexarin xl 75mg m/r capsules
da7u.	1	0	0	venladex xl 150mg m/r tablets
da7U.	1	0	0	vexarin xl 150mg m/r capsules
da7v.	1	0	0	efexor xl 225mg m/r capsules
da7V.	1	0	0	venlalic xl 75mg m/r tablets
da7w.	1	0	0	venlafaxine 225mg m/r capsules
da7W.	1	0	0	venlalic xl 150mg m/r tablets
da7X.	1	0	0	venlalic xl 225mg m/r tablets
da7Y.	1	0	0	venlafaxine 225mg m/r tablets
da7Z.	1	0	0	venaxx xl 75mg m/r capsules
da8..	1	0	0	nefazodone

da81.	1	0	0	nefazodone hydrochloride 100mg tablets
da82.	1	0	0	nefazodone hydrochloride 200mg tablets
da83.	1	0	0	dutonin 100mg tablets
da84.	1	0	0	dutonin 200mg tablets
da85.	1	0	0	nefazodone hydrochloride 50mg+100mg+200mg initiation tablets pack
da86.	1	0	0	dutonin 50mg+100mg+200mg treatment initiation tablets pack
da9..	1	0	0	citalopram
da91.	1	0	0	citalopram 20mg tablets
da92.	1	0	0	cipramil 20mg tablets
da93.	1	0	0	citalopram 10mg tablets
da94.	1	0	0	cipramil 10mg tablets
da94.	1	0	0	cipramil 10mg tablets
da95.	1	0	0	citalopram 40mg tablets
da96.	1	0	0	cipramil 40mg tablets
da96.	1	0	0	cipramil 40mg tablets
da97.	1	0	0	cipramil 40mg/ml oral drops 15ml
da98.	1	0	0	paxoran 10mg tablets
da99.	1	0	0	paxoran 20mg tablets
da9A.	1	0	0	paxoran 40mg tablets
da9z.	1	0	0	citalopram 40mg/ml oral drops
daA..	1	0	0	reboxetine
daA1.	1	0	0	reboxetine 4mg tablets
daA2.	1	0	0	edronax 4mg tablets
daB..	1	0	0	mirtazapine
daB1.	1	0	0	mirtazapine 30mg tablets
daB2.	1	0	0	zispin 30mg tablets
daB3.	1	0	0	mirtazapine 30mg oro-dispersible tablets
daB4.	1	0	0	zispin soltab 30mg oro-dispersible tablets
daB5.	1	0	0	mirtazapine 15mg oro-dispersible tablets
daB6.	1	0	0	zispin soltab 15mg oro-dispersible tablets
daB7.	1	0	0	mirtazapine 45mg oro-dispersible tablets
daB8.	1	0	0	zispin soltab 45mg oro-dispersible tablets
daBy.	1	0	0	mirtazapine 45mg tablets
daBz.	1	0	0	mirtazapine 15mg tablets
daC..	1	0	0	escitalopram
daC1.	1	0	0	escitalopram 10mg tablets
daC2.	1	0	0	cipralex 10mg tablets
daC3.	1	0	0	escitalopram 20mg tablets
daC4.	1	0	0	cipralex 20mg tablets
daC5.	1	0	0	escitalopram 5mg tablets
daC6.	1	0	0	cipralex 5mg tablets
daC7.	1	0	0	escitalopram 10mg/ml oral drops
daC8.	1	0	0	cipralex 10mg/ml oral drops
daC9.	1	0	0	cipralex 20mg/ml oral drops

daCA.	1	0	0	escitalopram 20mg/ml oral drops
daD..	1	0	0	agomelatine
daD1.	1	0	0	valdoxan 25mg tablets
daD2.	1	0	0	agomelatine 25mg tablets
daE..	1	0	0	vortioxetine
daE1.	1	0	0	brintellix 5mg tablets
daE2.	1	0	0	vortioxetine 5mg tablets
daE3.	1	0	0	brintellix 10mg tablets
daE4.	1	0	0	vortioxetine 10mg tablets
daE5.	1	0	0	brintellix 20mg tablets
daE6.	1	0	0	vortioxetine 20mg tablets
gde..	1	0	0	duloxetine
gde1.	1	0	0	yentreve 20mg gastro-resistant capsules
gde2.	1	0	0	yentreve 40mg gastro-resistant capsules
gde3.	1	0	0	cymbalta 30mg gastro-resistant capsules
gde4.	1	0	0	cymbalta 60mg gastro-resistant capsules
gdew.	1	0	0	duloxetine 60mg gastro-resistant capsules
gdex.	1	0	0	duloxetine 30mg gastro-resistant capsules
gdey.	1	0	0	duloxetine 20mg gastro-resistant capsules
gdez.	1	0	0	duloxetine 40mg gastro-resistant capsules

Appendix 7: Data Science Full Diagnostic Multinomial Model

		Univariate			Model 1			Model 2			Model 3			Model 4		
		OR	CI	*p*-value	OR	CI	*p*-value	OR	CI	*p*-value	OR	CI	*p*-value	OR	CI	*p*-value
Sex	Male (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Female (2)	1.76	1.50-2.06	0.00	1.74	1.48-2.04	0.00	1.81	1.53-2.14	0.00	1.83	1.55-2.16	0.00	1.75	1.44-2.12	0.00
Age	16-20 (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	21-25 (2)	1.50	0.89-2.56	0.13	1.50	0.88-2.57	0.14	1.00	0.55-1.83	1.00	1.03	0.57-1.89	0.92	1.00	0.52-1.92	0.99
	26-30 (3)	1.79	1.07-3.036	0.03	1.76	1.05-3.00	0.03	1.14	0.62-2.12	0.68	1.18	0.64-2.20	0.60	1.15	0.58-2.27	0.70
	31-35 (4)	1.85	1.12-3.13	0.02	1.81	1.08-3.07	0.03	1.19	0.64-2.24	0.58	1.25	0.66-2.35	0.49	1.20	0.60-2.42	0.61
	36-40 (5)	2.04	1.23-3.45	0.01	2.04	1.22-3.45	0.01	1.23	0.66-2.29	0.52	1.28	0.69-2.39	0.44	1.04	0.52-2.08	0.91
	41-45 (6)	1.82	1.12-3.00	0.02	1.93	1.18-3.20	0.01	1.23	0.67-2.27	0.50	1.28	0.70-2.35	0.43	1.13	0.58-2.23	0.72
	46-50 (7)	1.80	1.12-2.98	0.02	1.84	1.13-3.06	0.02	1.05	0.57-1.93	0.89	1.09	0.59-2.01	0.78	1.01	0.51-1.99	0.98
	51-55 (8)	1.44	0.88-2.40	0.15	1.52	0.93-2.54	0.10	0.83	0.45-1.54	0.55	0.88	0.48-1.65	0.69	0.74	0.37-1.47	0.38
	56-60 (9)	1.89	1.16-3.13	0.01	2.00	1.23-3.33	0.01	1.12	0.61-2.08	0.72	1.18	0.64-2.20	0.59	0.87	0.43-1.73	0.69
	61-65 (10)	1.97	1.21-3.52	0.01	2.17	1.32-3.61	0.00	1.01	0.54-1.89	0.97	1.09	0.58-2.05	0.78	0.71	0.35-1.44	0.35
	66-70 (11)	1.49	0.91-2.49	0.12	1.61	0.97-2.70	0.07	0.79	0.41-1.52	0.47	0.87	0.45-1.68	0.67	0.58	0.28-1.23	0.16
	71-75 (12)	1.37	0.81-2.35	0.25	1.42	0.83-2.45	0.20	0.67	0.34-1.33	0.25	0.75	0.378-1.488	0.41	0.47	0.216-1.017	0.06
	75+ (13)	0.71	0.43-1.19	0.19	0.77	0.47-1.29	0.31	0.38	0.20-0.74	0.00	0.43	0.22-0.84	0.01	0.26	0.12-0.55	0.000

	No response (-9)	-	-	-	-	-	-	–	-	-	-	-	-	-	-	-
Work	In paid employment (1)	0.46	0.26-0.80	0.01	-	-	-	0.39	0.20-0.74	0.00	0.36	0.18-0.71	0.00	0.33	0.15-0.70	0.00
	Looking for paid work or trianing (2)	0.76	0.50-1.16	0.20	-	-	-	0.68	0.44-1.05	0.08	0.64	0.39-1.04	0.07	0.68	0.39-1.18	0.17
	Waiting to paid up paid work already obtained 3)	1.52	0.63-3.74	0.35	-	-	-	1.11	0.44-2.82	0.83	1.08	0.42-2.79	0.88	1.65	0.55-5.13	0.38
	Full-time education (4)	1.20	0.38-3.73	0.75	-	-	-	1.44	0.44-4.79	0.54	1.32	0.39-4.47	0.65	1.55	0.40-6.09	0.53
	Doing unpaid work for a relative (5)	2.39	0.71-9.43	0.18	-	-	-	2.08	0.59-8.53	0.28	1.99	0.54-8.41	0.31	1.72	0.41-8.36	0.48
	On Government training scheme (6)	1.20	0.65-2.21	0.57	-	-	-	1.15	0.61-2.17	0.67	1.08	0.55-2.11	0.83	0.94	0.44-2.02	0.87
	Temporary sickness or injury - 28 days or less (7)	1.26	0.61-2.61	0.54	-	-	-	1.15	0.54-2.45	0.71	1.09	0.50-2.36	0.84	1.16	0.48-2.85	0.74
	Long-term sickness or	1.55	1.01-2.39	0.04	-	-	-	1.53	0.98-2.41	0.06	1.52	0.93-2.48	0.09	1.52	0.86-2.67	0.15

	energy (8)															
	Retired from paid work (9)	0.69	0.45-1.06	0.09	-	-	-	1.11	0.70-1.79	0.66	1.10	0.66-1.84	0.73	0.95	0.54-1.70	0.87
	Looking after the home or family (10)	0.96	0.60-1.52	0.85	-	-	-	0.78	0.48-1.27	0.32	0.76	0.45-1.28	0.30	0.73	0.40-1.31	0.29
	Doing something else (11)	1.06	0.60-1.90	0.84	-	-	-	0.97	0.53-1.77	0.92	0.93	0.50-1.75	0.82	0.97	0.47-2.00	0.94
NSSEC5	No response (-9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Higher managerial and professional occupations (1)	0.67	0.40-1.11	0.12	-	-	-	0.63	0.37-1.09	0.10	0.63	0.37-1.09	0.10	0.53	0.29-0.97	0.04
	Intermediate occupations (2)	0.89	0.51-1.56	0.69	-	-	-	0.79	0.44-1.44	0.44	0.76	0.42-1.38	0.37	0.55	0.28-1.08	0.09
	Small employers (3)	0.58	0.34-0.99	0.05	-	-	-	0.55	0.304-1.00	0.04	0.55	0.31-0.99	0.05	0.45	0.23-0.87	0.02
	Lower supervisory and technical	0.67	0.40-1.14	0.14	-	-	-	0.62	0.35-1.08	0.09	0.62	0.35-1.08	0.09	0.50	0.26-0.93	0.03

	occupations (4)															
	(Semi) Routine Occupations (5)	0.97	0.59-1.60	0.90	-	-	-	0.82	0.48-1..41	0.47	0.85	0.49-1.47	0.56	0.71	0.38-1.29	0.26
	Long-term unemployed (8)	1.66	0.89-3.13	0.11	-	-	-	1.03	0.53-2.02	0.93	1.08	0.55-2.11	0.83	0.96	0.44-2.07	0.91
ECSTAT3	No response (-9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	In employment (1)	0.78	0.52-1.18	0.24	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Unemployed (2)	1.32	0.74-2.37	0.35	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Economically inactive (3)	0.95	0.64-1.43	0.81	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA
QualHi	No response (-9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	None (1)	0.88	0.63-1.23	0.46	-	-	-	-	-	-	0.82	0.56-1.21	0.32	0.82	0.53-1.26	0.36
	Other (2)	1.12	0.82-1.53	0.50	-	-	-	-	-	-	1.19	0.82-1.73	0.36	1.35	0.89-2.06	0.16
	Degree (3)	0.76	0.52-1.10	0.14	-	-	-	-	-	-	0.92	0.59-1.43	0.71	0.91	0.56-1.50	0.72
NO. GP	0 events	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1-100 events (1)	2.89	1.73-4.74	0.000	-	-	-	-	-	-	-	-	-	3.06	1.80-5.13	0.00

101-500 events (2)	9.52	6.81-13.54	0.000	-	-	-	-	-	-	-	-	-	10.14	7.10-14.71	0.00
501-1000 events (3)	20.77	14.84-29.58	0.000	-	-	-	-	-	-	-	-	-	21.92	15.43-31.67	0.00
1001-2500 events (4)	23.39	16.93-32.91	0.000	-	-	-	-	-	-	-	-	-	27.98	19.91-40.06	0.00
2501-5000 events (5)	19.41	13.65-28.04	0.000	-	-	-	-	-	-	-	-	-	29.53	19.98-44.37	0.00
5000+ events (6)	35.75	19.22-69.62	0.000	-	-	-	-	-	-	-	-	-	52.83	26.86-108.41	0.00

Appendix 8: Data Science Full Treatment Multinomial Model

			Univariate			Model 1			Model 2			Model 3			Model 4		
			OR	CI	*p*-value	OR	CI	*p*-value	OR	CI	*p*-value	OR	CI	*p*-value	OR	CI	*p*-value
	Sex	Male (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Female (2)	1.49	1.28-1.74	0.00	1.56	1.33-1.82	0.00	1.64	1.39-1.93	0.00	1.63	1.39-1.93	0.00	1.70	1.34-2.16	0.00
Demographics	Age	16-20 (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		21-25 (2)	0.88	0.53–1.46	0.62	0.87	0.52–1.45	0.59	0.78	0.44–1.38	0.40	0.83	0.47-1.46	0.51	0.74	0.36-1.51	0.41
		26-30 (3)	1.04	0.63-1.71	0.87	1.02	0.62–1.69	0.93	0.90	0.49–1.62	0.72	0.93	0.51-1.69	0.82	0.87	0.40-1.86	0.72
		31-35 (4)	1.17	0.71–1.93	0.53	1.15	0.69–1.89	0.59	1.04	0.57–1.91	0.89	1.11	0.60-2.04	0.74	1.14	0.52-2.50	0.74
		36-40 (5)	1.25	0.76-2.06	0.37	1.24	0.75–2.05	0.39	1.01	0.55–1.84	0.97	1.07	0.59-1.96	0.82	0.78	0.36-1.69	0.53
		41-45 (6)	1.28	0.80–2.05	0.30	1.34	0.83–2.15	0.23	1.16	0.65–2.08	0.61	1.21	0.67-2.17	0.52	1.19	0.55-2.55	0.65
		46-50 (7)	1.45	0.90-2.32	0.13	1.47	0.91–2.36	0.11	1.15	0.64–2.06	0.65	1.19	0.66-2.14	0.56	1.40	0.64-3.02	0.40
		51-55 (8)	1.40	0.87–2.26	0.17	1.47	0.90–2.37	0.12	1.06	0.58–1.92	0.84	1.11	0.61-2.01	0.73	1.22	0.55-2.68	0.62
		56-60 (9)	1.40	0.87-2.25	0.17	1.46	0.90–2.36	0.12	1.10	0.61–2.00	0.74	1.13	0.62-	0.69	0.74	3.34-1.61	0.44

													2.04				
		61-65 (10)	1.76	1.09–2.85	0.02	1.89	1.17–3.08	0.01	1.13	0.61–2.07	0.69	1.16	0.63-2.13	0.63	0.63	0.28-1.42	0.27
		66-70 (11)	1.37	0.84- 2.22	0.21	1.48	0.89–2.36	0.13	0.85	0.45–1.61	0.63	0.88	0.46-1.65	0.68	0.41	0.17-0.97	0.04
		71-75 (12)	1.43	0.86–2.40	0.17	1.48	0.88–2.48	0.14	0.84	0.43–1.62	0.60	0.85	0.44-1.65	0.63	0.37	0.15-0.94	0.04
		75+ (13)	1.26	0.79-2.003	0.33	1.35	0.85–2.16	0.21	0.79	0.42–1.49	0.48	0.80	0.42-1.51	0.50	0.38	0.16-0.92	0.03
SES	Work	No response (-9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		In paid employment (1)	0.63	0.37–1.07	0.09	-	-	-	0.72	0.39-1.34	0.30	0.78	0.40-1.49	0.45	0.96	0.40-2.30	0.93
		Looking for paid work or trianing (2)	0.77	0.51–1.17	0.22	-	-	-	0.75	0.48-1.15	0.19	0.82	0.50-1.32	0.41	0.99	0.50-1.93	0.97
		Waiting to paid up paid work already obtained 3)	1.58	0.51–1.17	0.34	-	-	-	1.45	0.57-3.92	0.45	1.51	0.59-4.15	0.41	5.21	1.37-19.89	0.02
		Full-time education (4)	0.99	0.32–3.20	0.98	-	-	-	1.13	0.36-3.73	0.83	1.25	0.39-4.24	0.71	1.64	0.36-8.30	0.54

	Doing unpaid work for a relative (5)	1.48	0.44–5.85	0.54	-	-	-	1.38	0.40-5.53	0.63	1.59	0.45-6.53	0.49	1.25	0.25-7.89	0.80
	On Government training scheme (6)	1.11	0.60–2.08	0.74	-	-	-	1.20	0.63-2.28	0.58	1.28	0.65-2.51	0.48	1.22	0.49-3.05	0.67
	Temporary sickness or injury - 28 days or less (7)	2.02	0.93–4.63	0.08	-	-	-	1.99	0.90-4.63	0.10	2.05	0.91-4.86	0.09	4.82	1.46-1.65	0.01
	Long-term sickness or energy (8)	1.86	1.19–2.87	0.01	-	-	-	1.81	1.15-2.84	0.01	1.91	1.17-3.12	0.01	3.42	1.66-6.98	0.00
	Retired from paid work (9)	1.22	0.79–1.87	0.36	-	-	-	1.45	0.91-2.30	0.11	1.56	0.93-2.59	0.09	1.77	0.86-3.61	0.12
	Looking after the home or family (10)	1.00	0.63–1.60	0.98	-	-	-	0.89	0.55-1.43	0.63	0.94	0.56-1.58	0.83	0.99	0.48-2.03	0.99
	Doing something else (11)	1.29	0.72–2.35	0.40	-	-	-	1.30	0.71-2.39	0.39	1.37	0.72-2.59	0.34	2.23	0.90-5.56	0.08
NSSEC5	No response (-9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Higher managerial and profession	1.62	0.98-2.70	0.06	-	-	-	1.51	0.89-2.60	0.13	1.56	0.91-2.68	0.11	1.96	0.99–3.84	0.049

	al occupations (1)															
	Intermediate occupations (2)	2.35	1.33–4.17	0.00	-	-	-	1.96	1.08-3.58	0.03	1.94	1.07-3.54	0.03	1.98	0.91–4.30	0.08
	Small employers (3)	1.48	0.86–2.56	0.16	-	-	-	1.32	0.75-2.36	0.34	1.30	0.74-2.33	0.36	1.36	0.65–2.83	0.40
	Lower supervisory and technical occupations (4)	1.83	1.09–3.12	0.02	-	-	-	1.61	0.92-2.82	0.09	1.55	0.89-2.72	0.12	1.84	0.90–3.75	0.09
	(Semi) Routine Occupations (5)	2.06	1.25–3.43	0.00	-	-	-	1.69	0.99-2.90	0.05	1.63	0.95-2.80	0.08	1.64	0.83–3.21	0.15
	Long-term unemployed (8)	3.28	1.72–6.37	0.00	-	-	-	2.19	1.11-4.39	0.02	2.10	1.06-4.20	0.03	2.62	1.05-6.65	0.04
ECSTAT3	No response (-9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	In employment (1)	0.79	0.52-1.19	0.26	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Unemployed (2)	1.16	0.64-2.10	0.63	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Economica	1.29	0.85-1.93	0.22	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA

		lly inactive (3)															
Education	QualHi	No response (-9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		None (1)	1.70	0.76-1.50	0.70	-	-	-	-	-	-	0.93	0.63-1.36	0.71	1.01	0.56-1.77	0.98
		Other (2)	0.88	0.64-1.21	0.43	-	-	-	-	-	-	0.92	0.63-1.33	0.67	1.02	0.56-1.75	0.96
		Degree (3)	0.57	0.40-0.83	0.00	-	-	-	-	-	-	0.69	0.44-1.06	0.09	0.54	0.28-1.00	0.05
No. GP Visits	No. GP Visits	0 events	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		1-100 events (1)	3.38	2.02-9.18	0.00	-	-	-	-	-	-	-	-	-	4.05	2.36-6.90	0.00
		101-500 events (2)	22.41	15.87-32.36	0.00	-	-	-	-	-	-	-	-	-	32.97	22.26-49.91	0.00
		501-1000 events (3)	62.85	43.27-93.21	0.00	-	-	-	-	-	-	-	-	-	90.51	60.06-139.61	0.00
		1001-2500 events (4)	114.8	78.35-171.89	0.00	-	-	-	-	-	-	-	-	-	165.22	108.62-257.89	0.00
		2501-5000 events (5)	194.1	118.47-331.43	0.00	-	-	-	-	-	-	-	-	-	308.36	117.89-557.89	0.00
		5000+ events (6)	858.8	182.58-1535.17	0.00	-	-	-	-	-	-	-	-	-	1262	258.46-2280.12	0.00

Appendix 9: Clinical Vignette Information Sheet

Understanding Clinical Decision-Making

Thank you for your interest in our research!

We at the Swansea University Medical School would like to invite you to take part in our study. This study is being run as a PhD student project. Joining the study is entirely up to you, before you decide we would like you to understand why the research is being done and what it would involve for you. Please read this information sheet to help you decide whether or not you would like to take part. If you have any questions, please contact the lead researcher, Lauren Burns using the contact details below. This study should take approximately 15 minutes. Please feel free to talk to others about the study and share it if you wish. The first part of the Participant Information Sheet details why this study is being conducted, then specifies who is eligible. It then outlines what will happen should you wish to take part as well as any additional important information.

Why is this research being conducted?

There is an increased pressure on general practitioners to make swift yet accurate clinical decisions, especially within the mental health field. The difficulty with this research is that, though a decision may be made, we are yet to fully understand the rationale behind this decision for treatment, diagnostic and referral.

This study is part of a larger PhD project, and wishes to better understand the decision-making process of medical practitioners when diagnosing, treating and referring patients displaying mental-health related symptoms. Through this, we hope to:

- Gain a better understanding of decisions being made by medical practitioners, including the rationale behind the decision
- Identify areas where decision-making between medical practitioners are inconsistent
- Identify potential areas of improvement for mental health decision-making

Who can take part?

To take part in this research, you must be:

- A General Practitioner (last practised within the past 6 months)

Please tick the box below to confirm that you either are currently, or have been within the last 6 months, an acting general practitioner:

☐ I am a current GP, or was within the last 6 months.

What does the study involve?

You will first be asked to provide some basic demographic information (age, gender, ethnicity and number of years as a GP). Then, will need to read three fictitious clinical cases (no more than 100 words each), and answer some open-ended questions about them to better understand:

a) what decisions you would make, and

b) the rationale behind these.

In full, this should take between 10 and 15 minutes of your time to complete. Our aim is to recruit 115 GPs; however we will stop recruitment either when we reach our target number, or 31st December 2020.

Possible benefits for taking part:

- You will be contributing to research on clinical decision-making
- By helping with this study, it will provide us with a better understanding of clinical decision-making
- You will be assisting with identifying areas of improvement for clinical decision-making

There is very little risk when taking part in an anonymised online study. Though, we appreciate how much pressure clinicians are under, therefore have worked with GPs among other clinicians in the creation of the clinical cases and the study in order to keep this study as short as possible, while still gaining enough information to answer the research question.

Result Anonymisation and Withdrawal

This is an anonymised research study, so we do not ask for your name, contact details or practice. We ask you to provide a unique identifier, so should you wish to withdraw, we would be able to – at any time, without consequence and no reason is required. Please contact the lead researcher, Lauren Burns, quoting your unique identifier, to withdraw. Withdrawal would involve the lead researcher removing all responses you provided from the results, therefore will not be included in any stage of analysis, results, or discussion.

The study will close on the 31st September 2020, therefore after this date there will no-longer be guaranteed withdrawal as the analysis will be started. However, should you wish to withdraw after this date, please feel free to contact the lead researcher in the instance the analysis has not begun. The results of this research may be published; however results will not be identifiable. We will send the published article to the various practices we invited to take part.

☐ I understand that I am able to withdraw at any time by providing a unique identifier and contacting the lead researcher.

Please provide a unique identifier and make a note of this should you require it in the future:

How will we use information about you?

We will need to use information from you for this research project. This information will include your gender, age, ethnicity and number of years as a practicing GP, which will be held by the sponsor. People will use this information to do the research and answer the research question.

Only the researchers involved in this project will see the information you provide. People who do not need to see the raw data will not be able to see your personal information. Your data will have a code number instead. We will keep all information about you safe and secure. Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

What are your choices about how your information is used?

You can stop being part of the study at any time, without giving a reason. If after completing the survey you choose to stop taking part in the study, you can do so by contacting the researcher (LB) by the information below and quoting the unique identifier you provide. No data can or will be collected after taking part in the study. We need to manage your records in specific ways for the research to be reliable. This means that we won't be able to let you see or change the data we hold about you.

Where can you find out more about how your information is used?

You can find out more about how we use your information at www.hra.nhs.uk/information-about-patients/ or from the NHS HRA leaflet here www.hra.nhs.uk/patientdataandresearch. You can also contact the research team on the details below, or email Swansea University's Data Protection Officer directly by sending an email to dataprotection@swansea.ac.uk.

Who to complain to for data or management issues?

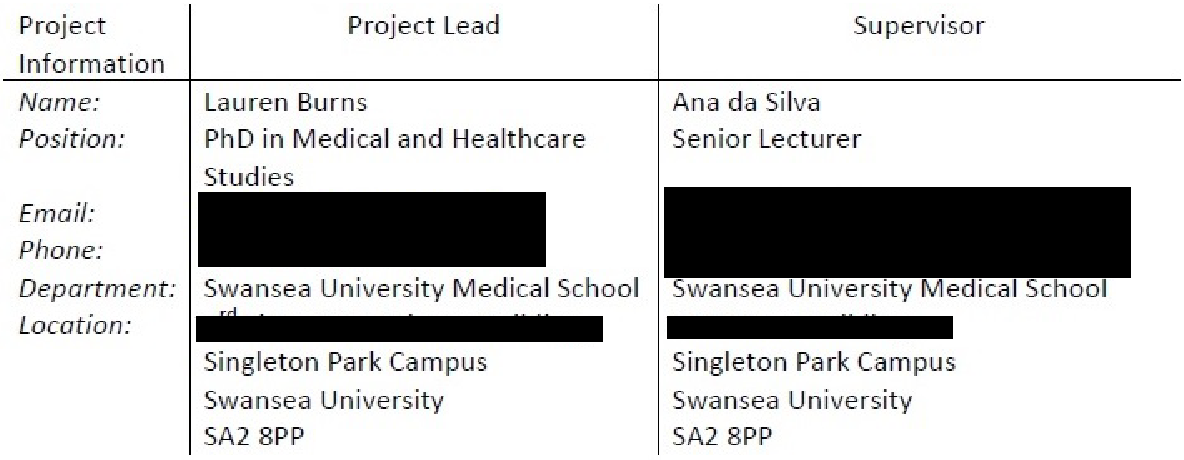
1. Data issues. The data controller for this project will be Swansea University. The University Data Protection Officer provides oversight of university activities involving the processing of personal data, and can be contacted at the Vice Chancellors Office: dataprotection@swansea.ac.uk. Your personal data will be processed for the purposes outlined in this information sheet
2. Management issues. This is being run as a PhD project in the Swansea University Medical School, you can contact the supervisors of this project (Dr Ana da Silva) via the details below, or the Head of College which is Professor Keith Lloyd by email k.r.lloyd@swansea.ac.uk.

Project Funding and Ethical Approval

This project is part of a PhD funded scholarship, granted by the Economic and Social Research Council. The grant number for this project is ES/P00069X/1. This study has been reviewed and granted approval by the Swansea University Medical School Research Ethics Sub-Committee (project number 2019-0024A).

Any Other Questions

If you have any questions regarding this study, please contact either Lauren Burns (project lead) or Dr Ana da Silva (supervisor) by the details below. If you have any other concerns, the details for the Chair of the SUMS RESC (Prof Deya Gonzalez) can also be found below.



Project Information	Project Lead	Supervisor
Name:	Lauren Burns	Ana da Silva
Position:	PhD in Medical and Healthcare Studies	Senior Lecturer
Email:	[redacted]	[redacted]
Phone:	[redacted]	[redacted]
Department:	Swansea University Medical School	Swansea University Medical School
Location:	[redacted] Singleton Park Campus Swansea University SA2 8PP	[redacted] Singleton Park Campus Swansea University SA2 8PP

If you are happy to take part in this study, please state ‘I consent’ in the box below:

Appendix 10: Clinical Vignette Debrief Sheet

Thank you for taking part in this research!

Research Aim

As mentioned prior, this research is part of a larger PhD project. The aim of this study is to gain a better understanding of decisions made by medical practitioners, within the mental health context. We hoped to identify areas where decision-making between medical practitioners are inconsistent, and finally potentially identify areas of improvement for mental health care.

Past research has shown that factors such as demographics (Feldman et al., 1997; Refors et al., 2015; Alabas et al., 2017), socioeconomic status (McKinlay et al., 1997; Hajjaj et al., 2010), and medical history (Raine et al., 2000) can unintentionally influence diagnostic and treatment decisions. It may be the case that other factors are coming into play when medical practitioners make their decisions and their past knowledge may override any 'internal' influences. Unless we are aware of the rationale behind decisions, then we are unable to be sure of the influence of patient, or any, factors on the decision.

The responses from this study will be used to better understand the decision-making process within mental health, and feed into a larger research project utilising already collected anonymous health data and Welsh Health Survey responses, to gain an inclusive view of mental health clinical decision-making.

Future Plans

This project will be published as a PhD thesis and may also be published as an independent research project. Once the report is finished, any outputs (e.g. results, reports, publications etc.) may also be accessed on the Economic and Social Research Council webpage (ESRC), as they are funding the PhD project.

Any Problems

Should you wish to withdraw your participation from the study, you are still able to do so. If you wish to withdraw, please email Lauren Burns on the information below, quoting your unique identifier. This study was approved by the Swansea Medical School Ethics Committee, if you wish to get in contact, their information is also provided. Finally, for any other queries or concerns, please contact either Lauren Burns or Dr Ana da Silva, via their contact information below. Only quote your unique identifier should you wish to withdraw, to maintain your autonomy from the responses. For general queries or questions, the unique identifier is not required.

Please make a note of the contact details below, should you require them for future reference:

Contact Details	Lauren Burns	Dr Ana da Silva	SUMS Research Ethics Sub-Committee
Email: *Phone:* *Location:*	[redacted] Singleton Park Campus, Swansea University, SA2 8PP	[redacted] Singleton Park Campus, Swansea University, SA2 8PP	[redacted] Institute of Life Sciences, Singleton Park Campus, Swansea University, SA2 8PP

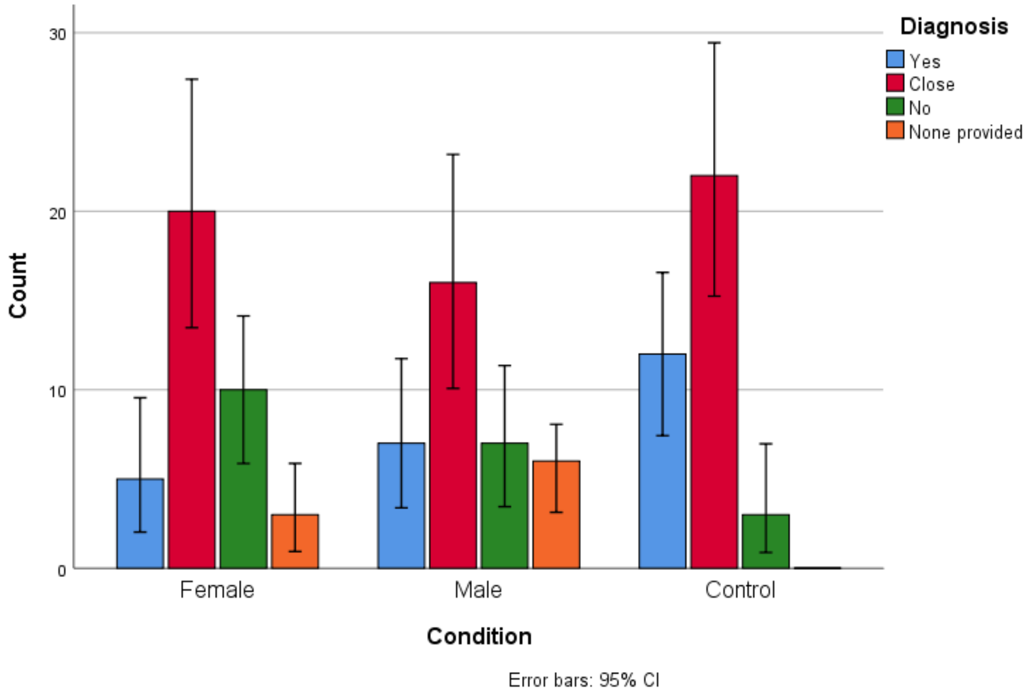
Thank you again for participating in this research.

Appendix 11: Clinical Vignettes Ungrouped Results

As highlighted in Chapter 5 (Section 5.4.3.4), one of the assumptions for the Chi^2 test for independence is that the minimum expected cell frequency should be five or greater (or at least 80% of the cells have a frequency of 5 or more). As the analysis displayed that the un-grouped results all violated this assumption, the results were grouped and these grouped results are highlighted in Section 5.5 of Chapter 5. However, the un-grouped results can be seen here.

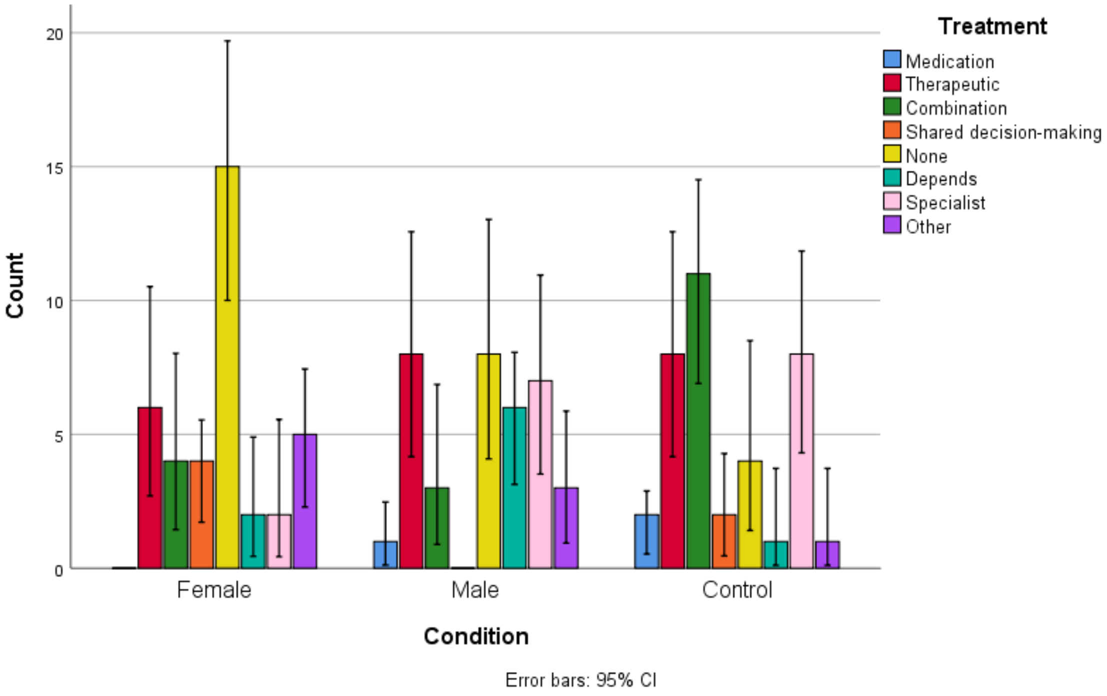
Bulimia: Condition with Diagnosis

When exploring the data in categories of four (Yes, No, Close, None), there are three cells (25.0%) that have a count of less than five, but this Pearson chi-square is significant ($X^2(6,N=111)=13.9$, $p<0.5$).



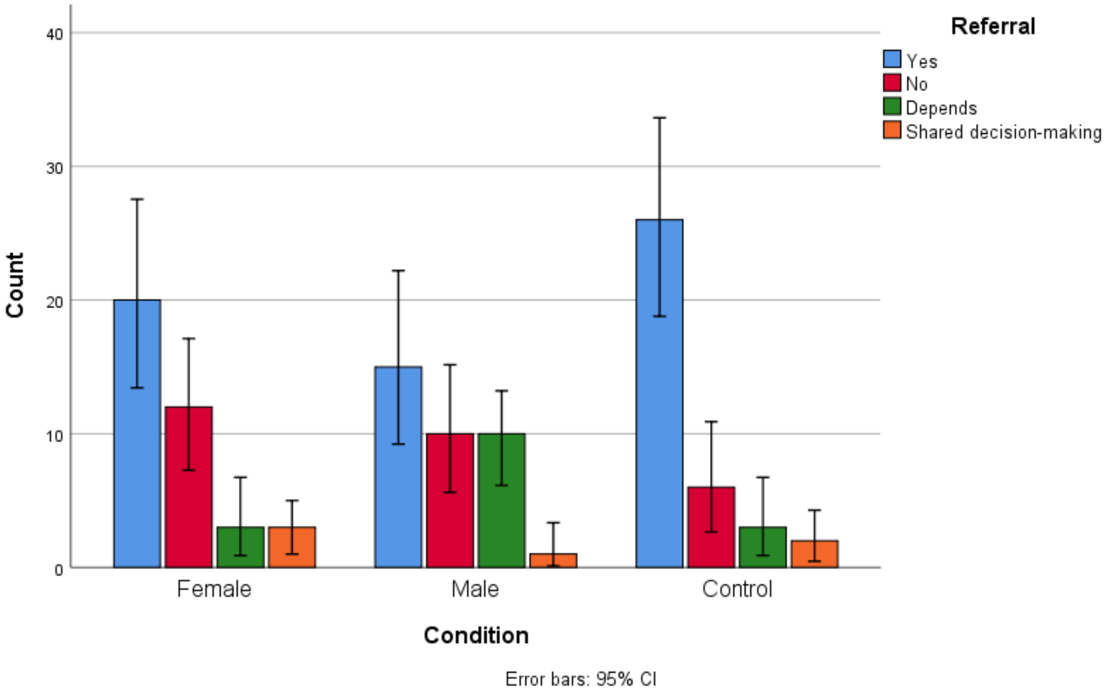
Bulimia: Condition with Treatment

When taking the original coding with 8 groups, this also violated the assumption (12 cells, [50%] had an expected count less than five). However, the results of the Pearson chi^2 showed significance (X^2 (14, N=111) = 30.4, $p<0.01$).



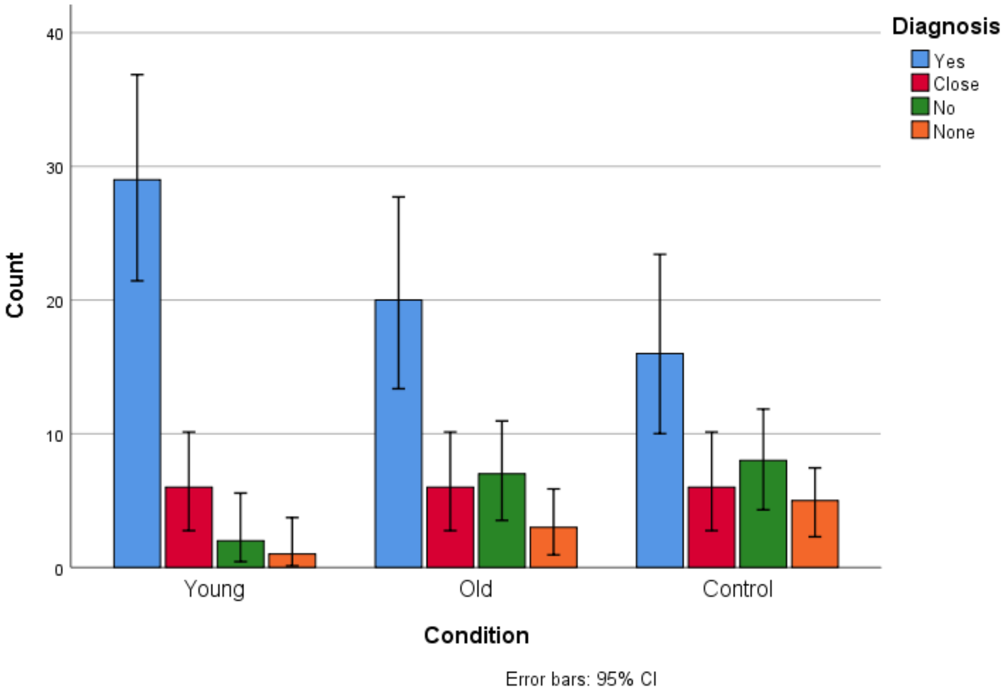
Bulimia: Condition with Referral

Using the original coding with four groups, violated the assumption (three cells, [25%] had an expected count less than five), and the results of the Pearson chi^2 did not show significance ($X^2(6, N=111) = 12.2, p=0.06$).



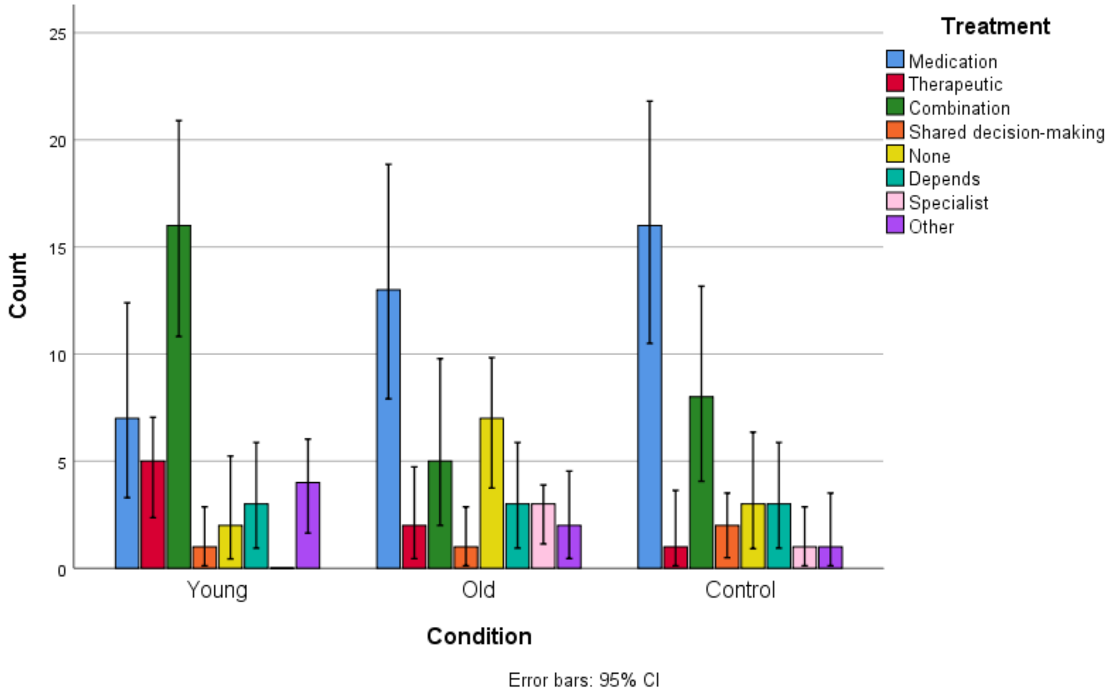
Anxiety: Condition with diagnosis

When exploring the data in categories of four as originally coded (“yes”, “no, “close”, “none”), there were three cells (25.0%) that had a count of less than five. This Pearson Chi^2 test was not significant (X^2(6, N=109) = 10.2, p>0.05).



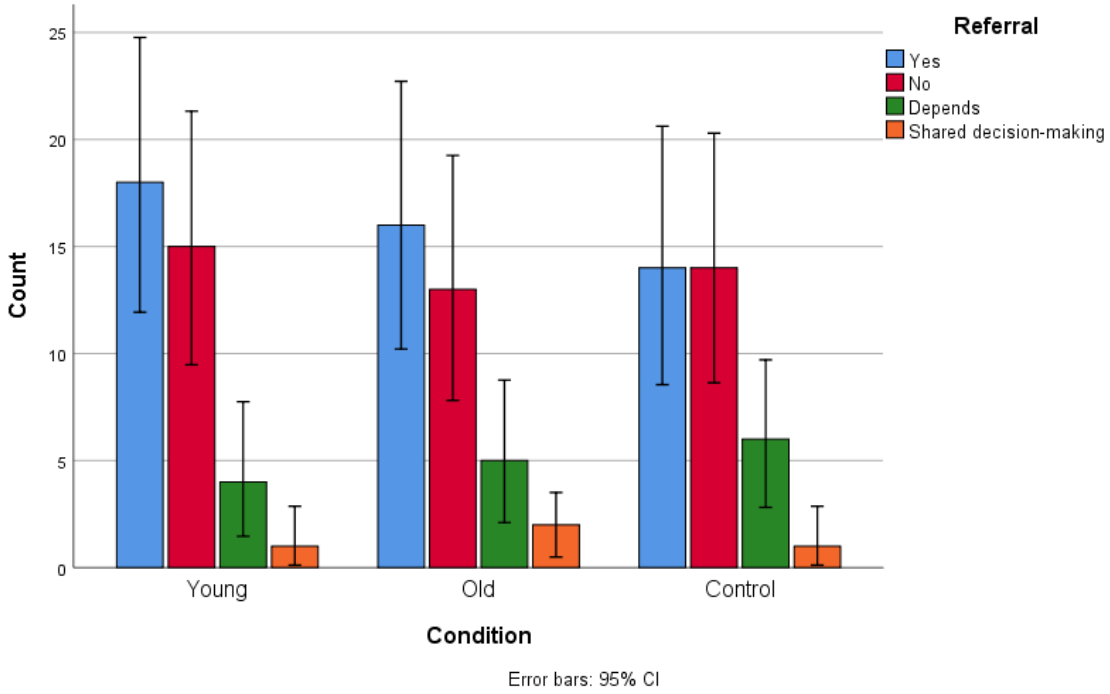
Anxiety: Condition with Treatment

Using the original eight coded groups, this also violated the assumption (18 cells, [75.0%] had an expected count less than 5) and did not show significance (X^2(14, N=109) = 22.5, p>0.05).



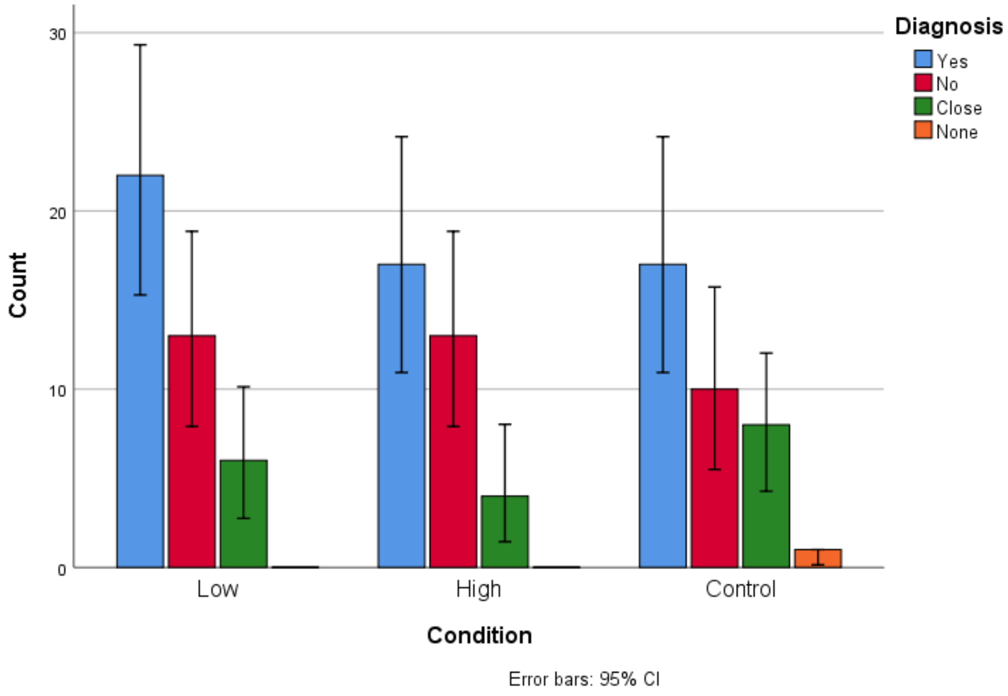
Treatment with Condition Referral:

Using the original coding with four groups violated the assumption (five cells, [41.7%] had an expected count less than 5), and the results of the Pearson Chi^2 did not showed significance ($X^2(6, N=109) = 1.4, p>0.05$).



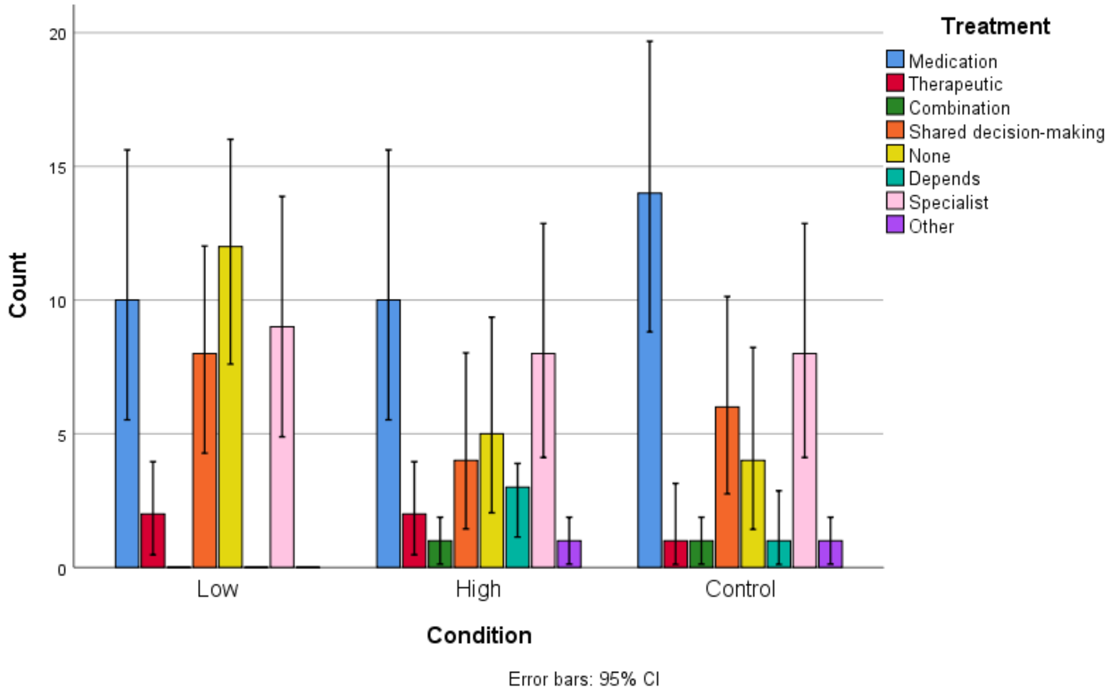
Bipolar: Condition with Diagnosis

When exploring the data in categories of four (“yes”, “no”, “close”, “none”), there were three cells (25.0%) that had a count of less than five. This Pearson Chi^2 was not significant ($X^2(6, N=111) = 4.1, p>0.05$).



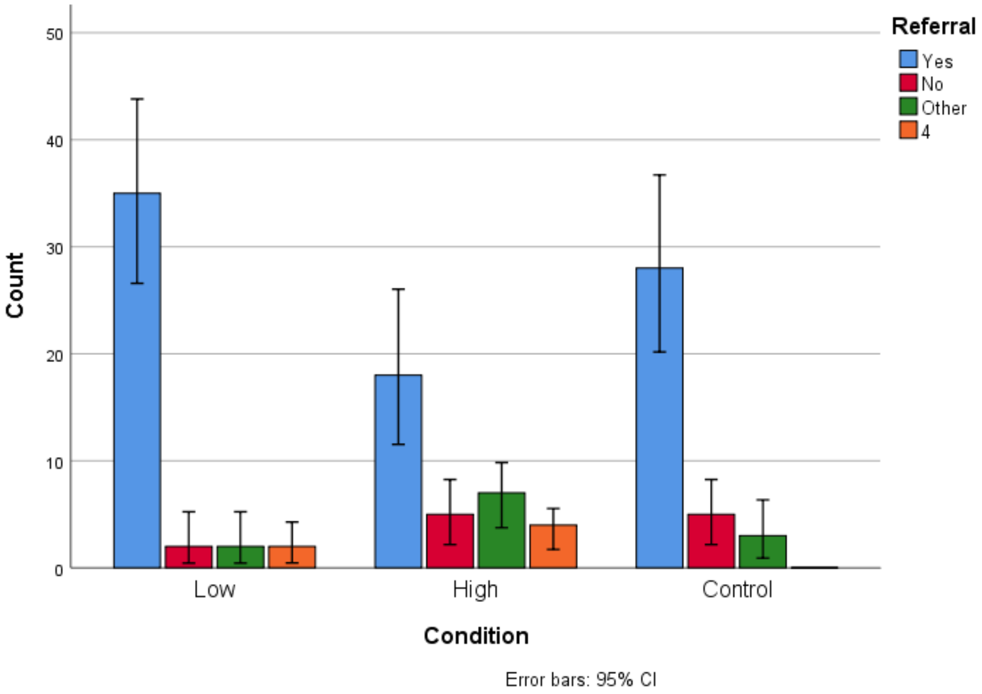
Bipolar: Condition with treatment

Taking the original coding with eight groups also violated the assumption with 12 cells [50%%] having an expected count less than 5 and no significant results seen ($X^2(14, N=111) = 12.7, p>0.05$).



Bipolar: Condition with Referral

Using the original coding with four groups violated the assumption (9 cells, [75.0%] had an expected count less than 5), and the results of the Pearson chi^2 did show significance ($X^2(6, N=111) = 14.0$, $p<0.05$).



Appendix 12: Clinical Vignettes Ethical Approval

https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:29fe478a-940b-45e1-a9a2-be825380cf59

Appendix 13: Clinical Vignettes HRA IRAS Approval

https://documentcloud.adobe.com/link/review?uri=urn:aaid:scds:US:eccdf4cd-b919-4033-b18c-a9a3d5e0105e

Glossary

Administrative data	Information collected by organizations (e.g., governments) for purposes not relating to research (e.g., record keeping).
Anonymised Linking Field (ALF)	A unique, non-identifiable encrypted code.
Clinical vignettes	A written case study; fictional in this context.
Deterministic matching	An exact way of matching using key variables that must be present in both data sets.
Electronic health record (EHR)	A patient's health data that is stored electronically.
Heuristics	Learnt rules that are simple, effective, and work in most circumstances.
Inequality	Social or economic disparity resulting in unequal opportunity or treatment.
Inequity	Uneven distribution of resources due to genetic or societal factors.
Non-clinical patient factors (NCpF)	Elements of the patient that are unrelated to clinical criteria.
Probabilistic matching	An alternative way of matching datasets, based on probability as opposed to exact variables.
Read codes	A widely used coded thesaurus of clinical terms.
Routinely collected health data	Patient information collected by healthcare organisations (e.g., accident and emergency) for purposes associated with the patient's health care.
Shared decision-making (SDM)	In healthcare, whereby the patient and practitioner exchange information, relay their preferences for action, discuss and reach an agreement.
Social determinants of health	Non-medical factors that influence health and healthcare outcomes.

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