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Part 1: Supporting the Reduction of Suicide in the General Population of Wales via the use of Structured Professional Judgement

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Part 2: Identifying the Factors Moderating Suicidal Thoughts and Suicide Attempts During the COVID-19 Pandemic

by

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Swansea University

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Abstract

Part 1

Early identification of individuals at risk of suicide represents a crucial component of effective suicide prevention. However, many of the current suicide risk assessment procedures are limited in their ability to identify and prevent future suicide attempts. This thesis aimed to investigate whether the structured professional judgement approach was an effective method of suicide risk assessment within an accident and emergency department. Chapter 1 outlined the major challenges facing the field of suicide risk assessment and introduced the structured professional judgement approach to risk assessment. Chapter 2 reviewed the various methods used to assess the risk of suicide within accident and emergency services, evaluated the efficacy of the structured professional judgement approach and outlined the new structured professional judgement scheme, the Risk of Suicide Protocol, that was investigated in this thesis. Chapter 3 compared the Risk of Suicide Protocol and assessment as usual in their ability to identify future suicide attempts in 107 participants referred for a suicide risk assessment with the accident and emergency-based Psychiatric Liaison Team. Chapter 3 also evaluated the inter-rater reliability of the Risk of Suicide Protocol, with two independent assessors completing assessments on the same 12 patients. Chapter 7 reviewed the research relating to the RoSP and discussed the wider meaning and clinical implications of the findings. The findings demonstrated that risk judgements made using the Risk of Suicide Protocol were significantly better at identifying future suicide attempts compared to assessment as usual. Additionally, the risk judgements made using the Risk of Suicide Protocol demonstrated excellent inter-rater reliability. These results indicate that the Risk of Suicide Protocol is a valid and reliable assessment for the structured clinical evaluation of suicide risk within an accident and emergency department. Overall, this thesis demonstrates that the Risk of Suicide Protocol represents a valuable method for the evaluation of suicide risk and may offer an important solution to some of the challenges facing the field of suicide risk assessment.

Part 2

The COVID-19 pandemic resulted in a wide range of difficulties for populations across the world, with research indicating that the pandemic had negatively impacted population mental health. This thesis aimed to identify and understand the factors influencing suicidal thoughts and attempts during the COVID-19 pandemic. Chapters 1 and 4 reviewed how the COVID-19 pandemic affected population mental health and suicidality and explored the rationale for this research. Chapters 5 and 6 reported the results of an online survey administered to a large sample of adults (N > 13,000) living in Wales between the 18th of January 2021 to the 7th of March 2021. Chapter 5 aimed firstly, to identify the demographic groups most vulnerable to suicidal thoughts and attempts and secondly, to examine whether various pandemic related stressors (e.g., social isolation, food insecurity) were associated with suicidal thoughts and attempts. Chapter 6 investigated whether hope, social connectedness, resilience or pandemic acceptance could protect against the presence of suicidal thoughts during the COVID-19 pandemic. Chapter 7 reviewed the research and considered the wider implications of the findings. The findings from chapter 5 revealed that men, younger adults and socioeconomically deprived individuals were more likely to experience suicidal thoughts during the pandemic, with younger adults also more likely to attempt suicide. Chapter 5 also found that domestic abuse, food insecurity, difficulty accessing healthcare, social isolation, relationship problems, financial problems and being made redundant were the pandemic related stressors most strongly related to suicidal thoughts and attempts. Chapter 6 found that hope, resilience and pandemic acceptance all protected against suicidal thoughts during the pandemic, with higher levels of hope, resilience and pandemic acceptance weakening the relationship between pandemic stress and suicidal thoughts. Overall, this thesis has enhanced our understanding of the factors influencing suicidal thoughts and attempts during the COVID-19 pandemic. The findings provide valuable insights that can be used to inform outreach and support structures in their efforts to prevent suicide.

Declarations and Statements

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Abbreviations

Abbreviation	Meaning
AAA	Abdominal Aortic Aneurysm
AAU	Assessment as Usual
AUC	Area Under the Curve
BAME	Black, Asian and Minority Ethnic
CDC	Centers for Disease Control and Prevention
CI	Confidence Interval
COVID-19	Coronavirus Disease 2019
DF	Degrees of Freedom
ESRC	Economic and Social Research Council
GP	General Practitioner
HCR-20	Historic Clinical and Risk Management – 20
HPA	Hypothalamic–Pituitary–Adrenal
HRA	Health Research Authority
HTT	Home Treatment Team
ICC	Intraclass Correlation Coefficient
IQ	Intelligence Quotient
IQR	Interquartile Range
M	Mean
MSHR	Manchester Self-Harm Rule
MSPS	Modified SAD PERSONS Scale
NICE	National Institute for Health and Care Excellence
NSSI	Nonsuicidal Self-Injury
ONS	Office for National Statistics
OR	Odds Ratio
PTSD	Post-Traumatic Stress Disorder
RCT	Randomised Control Trial
ReACT	ReACT Self-Harm Rule
REC	Research Ethics Committee
ROC	Receiver Operating Characteristic
RoSP	Risk of Suicide Protocol

SARA	Spousal Assault Risk Assessment
SARS	Severe Acute Respiratory Syndrome
SD	Standard Deviation
SE	Standard Error
SIS	Suicide Intent Scale
SITBI	Self-Injurious Thoughts and Behaviours Interview
SMS	Short Messaging Service
SPJ	Structured Professional Judgement
SPS	SAD PERSONS Scale
S-RAMM	Suicide Risk Assessment and Management Manual
SSI	Scale for Suicide Ideation
START	Short Term Assessment of Risk and Treatability
SVR-20	Sexual Violence Risk – 20
URL	Uniform Resource Locator
VIF	Variance Inflation Factor
WHO	World Health Organisation
WIMD	Welsh Index of Multiple Deprivation
β	Beta Coefficient

Glossary of Key Terms

Term	Definition
Accident and emergency department	A medical treatment facility within a hospital that specialises in emergency medicine and the acute care of patients who present without prior appointment.
Actuarial assessment	A purely statistical method of predicting the risk of a future event. They use fixed, explicit algorithms developed from previous data on risk factors, to estimate the likelihood of a future risk event.
COVID-19 pandemic	The spread of the SARS-CoV-2 virus across the world.
Negative predictive value	The probability that an individual who was identified as low risk would not go on to engage in the risk behaviour (e.g., suicide attempt or self-harm).
Nonsuicidal self-injury	The deliberate damaging of one's own body tissue in the absence of any intent to die.
Pandemic related stressor	A stressor that was caused or exacerbated by the COVID-19 pandemic (e.g., social isolation or food insecurity).
Positive predictive value	The probability that an individual who was identified as high risk would go on to engage in the risk behaviour (e.g., suicide attempt or self-harm).
Psychiatric Liaison Team	The team that provided mental health assessment and treatment for individuals attending the accident and emergency department.
Self-harm	Any deliberate act of harm to the self (e.g., cutting, poisoning, all other injuries) irrespective of the purpose of the act. This broad definition includes self-harm with and without suicidal intent and self-harm with unclear intent.
Sensitivity	The “true positive rate”. The proportion of individuals who go on to engage in the risk behaviour (e.g.,

	suicide attempt or self-harm), that were identified as high risk in the assessment.
Specificity	The “true negative rate”. The proportion of individuals who do not go on to engage in the risk behaviour (e.g., suicide attempt or self-harm), that were identified as low risk in the assessment.
Structured professional judgement	An approach to risk assessment that combines the actuarial and unstructured clinical judgement methods. It systematically guides the clinician through key, evidenced-based factors influencing risk and helps the clinician to construct an individualised risk management plan.
Suicidal behaviour	Includes suicide, suicide attempts and preparatory acts.
Suicidal thoughts & suicidal ideation (used interchangeably)	Thoughts about wanting to be dead or active thoughts about ending one’s life.
Suicidality	The overall risk of suicide, usually indicated by suicidal ideation or engagement with suicidal behaviours.
Suicide	Death caused by self-harming behaviour with any intent to die as a result of the behaviour.
Suicide attempt	A self-directed, potentially harmful act with any intent to die as a result of the behaviour. A suicide attempt may or may not result in injury.
Suicide risk assessment	The process of evaluating an individual’s risk of attempting or dying from suicide in the future.
Unstructured clinical judgement	A risk assessment process that imposes no constraints or guidelines on the clinician. The clinician uses their clinical experience, their understanding of the patient and their knowledge of existing risk factors to understand the individual’s risk of suicide and decide what needs to be done to keep them safe.

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COVID-19 Context Statement

The paragraphs below outline how the COVID-19 pandemic impacted this thesis.

Originally, this thesis aimed to investigate the validity, reliability and palatability of a new suicide risk assessment tool, the Risk of Suicide Protocol (RoSP), implemented within an accident and emergency department-based Psychiatric Liaison Team. The initial research plan was split into two stages. The first stage aimed to have the researcher completing RoSP assessments in the background of assessment as usual and analysing the efficacy of the RoSP compared to current practice. The second stage aimed to train the Psychiatric Liaison Team in using the RoSP and to evaluate the validity, reliability and palatability of the RoSP as it was implemented within their clinical practice.

However, 18 months into the thesis, the onset of the COVID-19 pandemic caused some major disruptions to the original research plans. By March 2020, I had completed the first stage of the research and had begun preparations for the second stage. At this point, the NHS in Wales suspended all non-essential research and I was not allowed to attend the Hospitals where the research was taking place. This meant we could not train staff in person, obtain consent from patients in person or monitor the use of the RoSP when implemented by staff. This meant that the second stage of research was no longer possible.

During the initial stages of the COVID-19 pandemic, I was involved in a separate research project, the Wales Wellbeing project. This was a collaborative research project between researchers in Swansea University, Cardiff University and the seven Health Boards in Wales that aimed to examine the wellbeing of the Welsh population throughout the COVID-19 pandemic. Over the following months, it gradually became clear that I would not be able to return to hospitals to complete the original plans for the thesis. After speaking to my PhD supervisors and representatives from Swansea University and the ESRC Doctoral Training Programme, we agreed that I would use the Wales Wellbeing research platform to conduct some research that could be presented within my thesis. During the remaining months of my PhD, I used the Wales Wellbeing research platform to conduct some research on the factors influencing suicidal thoughts and suicide

attempts during the COVID-19 pandemic. This research aligned with the broad aim of the original thesis, to improve the identification and prevention of suicide within the population but did represent a significant departure from the original research plans.

Therefore, the first part of this thesis focuses on assessing the efficacy of the RoSP and the second part focuses on identifying the factors influencing suicidal thoughts and suicide attempts during the COVID-19 pandemic. Whilst completing my thesis throughout the pandemic provided a serious challenge, I hope that both pieces of work can help inform methods of identifying and preventing suicide in the population.

Chapter 1: An Introduction

Background, Context and Aims

Suicide and attempted suicide are serious public health concerns. According to estimates from the World Health Organisation (WHO), over 700,000 people die from suicide every year (WHO, 2021a). In England and Wales, a 2019 review reported that 5,691 individuals died from suicide at a rate of 11 deaths per 100,000 population (Office for National Statistics [ONS], 2020). Suicide is the leading cause of death for individuals between the ages of 10-34, the fourth leading cause of death among 34-54 year olds and the fifth leading cause of death for individuals aged 45-54 (Centre for Disease Control [CDC], 2021). Furthermore, for every death from suicide there are many more people who attempt suicide. In Europe, it is estimated that for every death from suicide there are between 64 – 75 suicide attempts (Blasco-Fontecilla et al., 2018).

Suicide and suicide attempts have profound physical, emotional and economic consequences. Individuals who attempt suicide and survive, often experience severe injuries or organ damage that have adverse long term consequences on their physical health (CDC, 2021) and psychological wellbeing (Chapman & Dixon-Gordon, 2007). Suicide and suicide attempts can have far-reaching social effects with family members, friends, colleagues and members of the community experiencing an array of negative emotions such as shock, guilt, anger, depression and anxiety (CDC, 2021; Chapman & Dixon-Gordon 2007). Indeed, exposure to family members, friends or acquaintances that have died from suicide markedly increases the likelihood of an individual experiencing suicidal thoughts and engaging in suicidal behaviours (Hill et al., 2020).

The economic impact of suicide is also costly to society. In the USA, suicide and suicide attempts cost over $70 billion every year in work-loss and medical costs alone (CDC, 2021). Knapp et al. (2011) estimated that the average cost per death from suicide in England was £1.67 million, taking into account the pain and suffering of relatives, work-loss costs, medical costs, police time and funeral expenses. Suicide is a complex and devastating public health problem and research must play a role in developing and improving methods and practices that will lead to a reduction in suicide and suicide attempts.

Research into the prevention of suicide is multidimensional, with many disciplines investigating new and different methods of understanding and preventing suicide. Research into suicide prevention can range from investigating ways to reduce access to the means of suicide (e.g., pesticides, firearms, medications etc), developing psychological and pharmacological interventions designed to prevent suicide, developing community support structures for vulnerable individuals, examining psychological, social and biological predisposing factors for suicide, improving methods of identifying individuals at risk of suicide and studying and improving the reporting of suicide in the media. The causes of suicide are complex and multifaceted and whilst each individual research area is important, there is no single research topic or prevention approach that can lead to large scale reductions in suicide. Instead, collaboration and coordination across different disciplines and amongst various sectors within society are required for effective prevention efforts.

This thesis broadly aimed to improve methods of identifying and preventing suicide. As mentioned in the COVID-19 context statement, the research restrictions imposed by the pandemic disrupted the original plan for this thesis. Therefore, this thesis consists of two separate, but related pieces of research. The first part of this thesis looked at improving suicide risk identification and prevention procedures. This research aimed to examine the efficacy of a new approach to suicide risk assessment within a Psychiatric Liaison Team working in an accident and emergency department. The second part of this thesis aimed to develop an understanding of factors that could help improve the identification and prevention of suicide during the COVID-19 pandemic. Overall, this thesis implemented two separate pieces of research, that both aimed to improve the identification and prevention of suicide in the population. The first part of this chapter explores the background, objectives and rationale for the research looking at improving suicide risk identification procedures within an accident and emergency setting. The second part of this chapter describes the background, objectives and rationale for the research investigating the factors that could help improve the identification and prevention of suicide during the COVID-19 pandemic.

Part 1: Suicide Risk Assessment

The Problem

Early identification of individuals at risk of attempting suicide represents a crucial component of effective suicide prevention (WHO, 2021a). The notion that healthcare services could identify individuals at risk of suicide, before they engage in any suicidal behaviour, is extremely appealing. Early, accurate and reliable identification of individuals at risk of suicide would allow clinicians to engage such individuals in appropriate interventions that could prevent future death or injury from suicidal behaviour. This idea has given rise to the field of suicide risk assessment; an area of research focused on developing assessment procedures that help clinicians understand both the likelihood that an individual will attempt suicide, along with the treatable and modifiable risk and protective factors that can inform effective treatments (Simon, 2011; Perlman et al., 2011).

However, the field of suicide risk assessment is not without controversy. Whilst many proponents of suicide risk assessments maintain that they represent a crucial first step in suicide prevention (Ryan & Oquendo, 2020; Silverman & Berman, 2014; Gray et al., 2021), there are a variety of authors that argue there is no evidence that current risk assessment procedures lead to suicide prevention (Large & Ryan, 2014; Wand, 2011; Mulder et al., 2016; Chan et al., 2016), with a recent meta-analysis concluding that a strong, accurate and reliable method of identifying future suicide risk still remains elusive (Large et al., 2016).

Many of the criticisms levelled at previous risk assessments have shaped the development of the new suicide risk assessment procedure evaluated in this thesis; the Risk of Suicide Protocol (RoSP). Therefore, the following section explores and evaluates some of the core criticisms levelled at previous suicide risk assessment procedures. Whilst there are a range of different methods and processes for suicide risk identification, ranging from brief screening questionnaires to comprehensive interview assessment procedures, this section serves to examine the key criticisms and difficulties associated with the range of techniques used for the purpose of suicide risk assessment. After considering the limitations of previous suicide risk assessment procedures, the chapter outlines how the RoSP attempts to address and overcome these challenges.

Problem 1: Poor Prediction

One of the core criticisms levelled at suicide risk assessment procedures is simply that they are unable to accurately identify future suicide. Traditionally, the two most common forms of suicide risk assessment include suicide risk prediction tools (instruments that aim to classify suicide risk based on the presence or absence of a specified set of risk factors) and unstructured clinical judgement (the use of clinical experience and knowledge of a patient to assess suicide risk). Both of these methods have failed to demonstrate their ability to accurately identify future suicide and suicide attempts.

Risk Prediction Tools

Regarding risk prediction tools, Large et al. (2016) conducted a meta-analysis of longitudinal studies that had used various suicide risk prediction tools to stratify psychiatric patients into high and low risk groups, with suicide mortality as the outcome variable. They found that the meta-analytically derived sensitivity and specificity of a high-risk categorisation were 56% and 79% respectively. Large et al. (2016) noted that about half of all suicides occurred in individuals that were classified as “low risk” and that 95% of individuals categorised as “high risk” would not go on to die from suicide. They concluded that the current risk prediction scales were not capable of accurately identifying individuals at risk of suicide. Chan et al. (2016) also conducted a systematic review of suicide risk scales used on individuals receiving specialist mental healthcare. They concluded that no risk scales demonstrated sufficient evidence of predictive accuracy to justify their use in healthcare settings. Additionally, Steeg et al. (2018) examined the predictive accuracy of four popular suicide risk prediction scales (the Manchester Self-Harm Rule, the ReACT Self-Harm rule, the SAD PERSONS Scale and the Modified SAD PERSONS Scale) over a six-month follow-up period in a sample of patients attending hospital following self-harm (defined as a deliberate act of harm to the self with or without suicidal intent). Whilst some of these scales demonstrated an above chance ability to predict future suicide attempts, the authors concluded that such instruments were not accurate enough to be suitable for the purpose of suicide risk identification and prevention (Steeg et al., 2018).

It is important to acknowledge the role of the studied population when reviewing the accuracy of suicide risk prediction tools. It is possible that the

accuracy of suicide prediction tools may vary depending on the patient population. For example, Beck et al. (1999) and Nimeus et al. (1997) both investigated the same risk assessment scale (the Beck Hopelessness Scale; BHS; Beck et al., 1974), in different populations. Beck et al. (1999) examined the ability of the BHS to predict future suicide within out-patients seeking psychiatric treatment and Nimeus et al. (1997) studied the BHS in a sample of patients who presented to hospital after a suicide attempt. Whilst specificity rates were similar in both studies, the sensitivity of the BHS was slightly higher in Beck et al. (1999) compared to Nimeus et al. (1997). This meant that the probability that a patient identified as "high risk" by the BHS would die from suicide was slightly improved when it was used in a sample of out-patients seeking psychiatric treatment, compared to a sample of patients presenting to hospital after a suicide attempt.

Similarly, Harriss & Hawton (2005) and Nimeus et al. (1997) both investigated the same suicide risk prediction scale (the Suicide Intent Scale; SIS; Beck et al., 1974) in different populations. Harriss & Hawton (2005) used a population of patients who had presented to hospital after an episode of self-harm (defined by Harriss & Hawton (2005) as intentional self-poisoning or self-injury, irrespective of motivation), whereas Nimeus et al. (1997) studied the SIS in a population of patients who had presented to hospital after a suicide attempt (defined by Nimeus et al. (1997) as life-threatening behavior with the intent of jeopardising one's life, or to give the appearance of such an intent, but which has not resulted in death). The SIS had slightly higher sensitivity in Harriss & Hawton (2005) but higher specificity in Nimeus et al. (1997). This meant that the probability that a patient identified as "high risk" by the SIS would die from suicide was slightly better in the sample of patients who had presented to a hospital after self-harm. However, the probability that a patient identified as "low risk" by the SIS would not go on to die from suicide was slightly better within the sample of patients who had presented to hospital after a suicide attempt.

Both these examples demonstrate how the population under investigation can affect the ability of the risk prediction tools to identify future suicide. It is therefore important to be aware of the population under investigation, and not to generalise findings from one population to another. However, large-scale studies have examined the accuracy of many different suicide risk prediction scales across a

variety of samples including psychiatric in-patients (Pokorny, 1993; Goldstein et al., 1991), psychiatric out-patients (Beck et al., 1999; Brown et al., 2000) individuals who attended hospital after a non-fatal suicide attempt (Stefansson et al., 2015; Stefansson et al., 2012) and individuals who attended hospital after an episode of self-harm (with or without suicidal intent; Steeg et al., 2018; Harriss & Hawton, 2005) and have consistently found that suicide risk prediction scales fall short of the high levels of accuracy required to inform clinical decision making (Large et al., 2016; Chan et al., 2016). A more complete review of the most frequently employed suicide risk prediction scales is presented in chapter 2,

Unstructured Clinical Judgement

There are also concerns about the accuracy of unstructured clinical judgements of future suicide risk. Kapur et al. (2005) asked emergency department staff and psychiatric staff to predict the risk of repeated self-harm after an assessment interview with the patient, in over 7,000 patients who presented to hospital after self-harm (defined by Kapur et al. (2005) as an act of intentional self-poisoning or injury irrespective of the apparent purpose of the act). Kapur et al. (2005) concluded that the predictive value of the assessments made by emergency department staff and psychiatric staff was low and questioned whether the use of such assessments to guide treatment and intervention was worthwhile. Lindh et al. (2020) also evaluated the ability of unstructured clinical assessments to predict future suicide over a one year follow-up period in 479 patients attending a psychiatric emergency department after an episode of self-harm (defined by Lindh et al. (2020) as self-injurious behaviour with or without suicidal intent). Lindh et al. (2020) reported that the positive predictive value for clinician prediction was 6% and concluded that this was insufficient to guide future treatment and intervention recommendations. Further research has also highlighted the inconsistencies and poor reliability of unstructured clinical suicide risk assessment and prediction (Paterson et al., 2008). More details on the difficulties associated with the use of unstructured clinical judgement and risk prediction scales are explored in chapter 2.

Again, it is also important to consider the populations in which evaluations of unstructured clinical judgements have taken place. Most studies into the accuracy of unstructured suicide risk assessments have taken place in patients presenting to accident and emergency departments for self-harm (with or without suicidal intent;

Kapur et al., 2005; Lindh et al., 2020; Murphy et al., 2010; Cooper et al., 2007; Woodford et al., 2017) and have all concluded that unstructured clinical predictions of suicide have poor predictive value. We should be cautious before generalising these findings to other populations such as psychiatric in-patients, psychiatric out-patients or patients presenting to hospital after a suicide attempt. However, one study looking at the accuracy of unstructured clinical judgement for suicide risk in other populations such as psychiatric in-patients (Lemerond, 1977) reported similarly low levels of predictive value. So far, no empirical research has demonstrated that unstructured clinical classification of suicide risk is accurate and reliable enough to be clinically useful (Woodford et al., 2017).

In summary, several key studies have highlighted how traditional methods of suicide risk assessments struggle to accurately identify future suicide and suicide attempts. This has caused some authors to claim that suicide risk assessments should not be used to guide clinical decision-making (Mulder et al., 2016; Chan et al., 2016; Large & Ryan, 2014). However, before arriving at the conclusion that suicide risk assessment is a futile endeavour, it is important to consider the reasons why research has struggled to develop accurate and reliable methods of identifying future suicide risk and to reflect on whether accurate risk prediction is necessary for effective suicide risk assessment procedures.

Assessment Influences Intervention

One reason why research has struggled to develop accurate suicide risk identification procedures is because risk assessments often influence future treatment and intervention strategies. Given that patients perceived to be “high risk” are more likely to receive subsequent treatment and intervention, it is possible that many “high risk” individuals do not go on to engage in future suicide attempts because of successful interventions. Indeed, Steeg et al. (2018) acknowledged that the clinical management of patients perceived to be at heightened risk of future suicide, may have led to an underestimation in their measurement of the predictive accuracy of suicide risk assessment scales.

On the other hand, Kapur et al. (2005) argued that subsequent clinical management of patients was unlikely to have affected their findings for two reasons. Firstly, because very few patients tend to receive specialist follow-up or care after

hospital attendance for self-harm and secondly, because the effect of even the most intense interventions for repeated self-harm are relatively small (Kapur et al., 2005). Overall, whilst unlikely to completely explain the limited accuracy of suicide risk prediction procedures, it is possible that the subsequent clinical intervention for individuals perceived to be at heightened risk of future suicide, leads to an underestimation in the accuracy of some suicide risk identification procedures.

Statistical Challenges

Another reason why the development of an accurate and reliable method of suicide risk assessment is so challenging, is the combination of (1) the low base-rate of suicide in the general population, (2) the fact that many risk factors used to predict suicide risk are relatively common in the population and, (3) the weak to moderate association between most risk factors and suicide. These three points are outlined in more detail below.

The low base-rate issue is not a problem specifically related to suicide, rather it is a statistical issue that arises when trying to predict the occurrence of a rare event within a large population (Murphy, 1984). Whilst suicide is a large public health problem and any death from suicide is a death too many, the rate of deaths from suicide per person per annum is, relatively speaking, very rare (a rate of roughly ten deaths per 100,000 population or 0.01%; ONS, 2020). This means that within a population of 100,000 individuals, over the course of one year, ten will die from suicide and 99,990 people will not. Even with the use of highly accurate prediction tools, the low base-rate of suicide means that such prediction tools will always produce a large number of false positives relative to the number of true positives (Lewinsohn et al., 1989). For example, if one employed a method of predicting suicide that could correctly classify suicide risk 90% of the time, nine out of the ten suicides mentioned above would have been correctly predicted. However, of the 99,990 individuals who did not go on to die from suicide, the assessment tool would have incorrectly predicted that 9,999 of this group would also have died from suicide. Hence, the fairly accurate prediction tool would produce far more false positives relative to the number of true positives because of the low base-rate of suicide.

In clinical reality, the low base-rate issue is not as severe a problem as it originally seems. Clinicians are rarely asked to assess the risk of suicide within random members of the population. Instead, assessments typically take place in populations where there is a reason for concern (e.g., after an individual has attempted suicide). The base-rate of suicide within a population of individuals that have previously attempted suicide is much higher than in the general population, with approximately one in 100 individuals dying from suicide within one year of attending hospital after a suicide attempt (Hawton & Fagg, 1988). Nonetheless, a base-rate of one in 100 is still low and is likely to lead to high rates of false positives (Mitchell et al., 2021).

In addition to the low base-rate of suicide, the relatively high prevalence of most risk factors for suicide is also problematic for accurate risk prediction. Many of the risk prediction scales designed to identify future suicide and suicide attempts, ask clinicians to assess the presence of various factors that are known to be associated with suicide. If individuals possess many of these risk factors, then the assessment procedure will deem them to be "high risk". However, most of the risk factors associated with suicide such as previous self-harm, presence of suicidal thoughts, physical health problems and unemployment are relatively common within the general population (Mulder et al., 2016; Chan et al., 2016). The problem with using relatively common risk factors to predict a rare event, is that there will be many individuals within a population that will be exposed to these risk factors, that never attempt suicide. This again, can result in a high false positive rate. For example, in the previously mentioned population of 100,000 people, there are likely to be between 500 – 1000 people with a history of self-harm, suicidal ideation, physical health problems and employment difficulties, yet only ten of these 500 – 1000 people will die from suicide. Whilst it is certainly more likely that the individuals exposed to these risk factors will die from suicide (Large et al., 2016), using these risk factors as a means to predict future suicide is a process that will result in many individuals being incorrectly classified as "high risk".

Furthermore, many of the risk factors used to predict suicide are only weakly or moderately associated with suicide (Mulder et al., 2016). There is no "smoking gun" risk factor that is present in every individual that dies from suicide. Not all individuals who die from suicide have physical health problems, employment issues

or a history of self-harm (Victor & Klonsky, 2014). The nature of the weak to moderate correlations between risk factors and suicide means that not all individuals who die from suicide will be exposed to these risk factors. Therefore, suicide prediction scales that use these risk factors to classify suicide risk, will sometimes classify someone who will die from suicide as low risk, resulting in a false negative.

The low base-rate of suicide, combined with the relatively high prevalence of most risk factors for suicide, means that suicide risk prediction tools often have high false positive rates. Additionally, the weak or moderate association between most suicide risk factors and suicide, means that some individuals who die from suicide, are not identified by risk prediction methods, resulting in false negatives. Altogether, these statistical issues provide some insight into why suicide risk assessment methods struggle to accurately detect future suicide and suggest that such risk identification procedures on their own, may never be able to predict future suicide, with a high degree of accuracy.

Inadequate Training

Inadequate training could also explain why some risk assessments struggle to accurately identify future suicide. The field of implementation science has identified that high quality training along with continual monitoring and supervision is crucial for the successful implementation of any evidence-based practice (Tansella & Thornicroft, 2009; Bauer & Kirchner, 2020). Indeed, when Jeandarme et al. (2017) found a decline in the accuracy of an evidence-based risk assessment for violent behaviour after the assessment was implemented within a clinical setting, the authors cited poor or insufficient training of staff as a possible explanation for the decreased efficacy of the assessment.

Training has also been shown to improve an assessor's ability to identify important risk factors for suicide. McNiel et al. (2008) delivered a training workshop for suicide risk assessment and found that psychiatry residents improved their ability to recognise significant risk and protective factors for suicide after the workshop. Ensuring that staff are well trained in a good evidence-based suicide risk assessment may improve their ability to accurately identify and prevent future suicidal behaviour.

However, current evidence indicates that staff are not appropriately trained in the use of suicide risk assessment procedures. A review by Schmitz et al. (2012) reported that training of mental health professionals in the assessment and management of suicidal patients was limited. Additionally, Graney et al. (2020) investigated the suicide risk assessment tools currently in use across mental health services in the UK. They conducted an online survey of clinicians that assessed their opinions and experiences of using various suicide risk assessment procedures. Graney et al. (2020) found that one third of clinicians reported that they had not received training for the suicide risk assessment procedure they were currently using. High quality training in the use of suicide risk assessment procedures, along with ongoing supervision and quality assurance, is vital in ensuring that clinicians develop the knowledge, skills and confidence that allows them to accurately assess and manage an individual's risk of suicide.

Unpredictable Elements

Another reason why suicide risk assessments struggle to accurately identify future suicide is because many of the factors that contribute to an individual attempting suicide are often not possible to predict at the time of the assessment. For example, past research has demonstrated that factors such as the death of a friend, family member or a significant loved one (Powell et al., 2000), financial problems (Coope et al., 2015), the loss of one's job or business (Lester & Yang, 1997), the breakup of a relationship (Appleby et al., 1999; Blackmore et al., 2008) or the onset of a severe physical health problem (Goodwin et al., 2003; Legarreta et al., 2018) are all associated with an increased risk of suicide. Whilst a clinician can enquire about these factors during the assessment process, each of these issues can occur suddenly or with little warning. Unforeseen and tragic events do happen, and a clinician cannot be expected to anticipate the occurrence of such occurrences. Whilst this is not really a flaw of suicide risk assessments, as these events are not possible to predict, the inability to anticipate the occurrence of future events that may precipitate suicide is also part of the reason why suicide risk prediction tools are unable to accurately identify future suicide (Large et al., 2016).

In summary, the low base-rate of suicide, the high prevalence of suicide risk factors in the population, the low or weak association between risk factors and suicide and the unpredictable elements that are often involved in suicide, are some of

the key reasons why developing accurate and reliable methods of suicide risk identification is so difficult. These difficulties have led many authors to suggest that current suicide risk identification procedures lack clinical utility and have warned against their use in guiding clinical decision-making (Mulder et al., 2016; Chan et al., 2016; Large & Ryan, 2014). These difficulties pose a major problem for the field of suicide risk assessment. If suicide risk assessment procedures are unable to accurately identify individuals at risk of suicide, is there any value in such assessments? This is cause for researchers within the field to carefully reflect on the primary purpose of suicide risk assessment procedures, and an important distinction must be made between suicide *prediction* and suicide *prevention*. The section below reflects on the role and purpose of suicide risk assessments and how this has shaped the development of the new suicide risk assessment procedure (RoSP) evaluated within this thesis.

Overcoming Poor Prediction: Considering the Purpose of Suicide Risk Assessment

As outlined in the previous section, many current suicide risk assessment procedures have struggled to accurately identify future suicide. This has caused many individuals within the field of suicide risk assessment to reflect on the purpose of risk assessment procedures. The overarching purpose of suicide risk assessment is not to develop perfectly accurate methods of predicting future suicide, rather they aim to enhance the understanding of the patient, the factors influencing their risk of suicide and facilitate the development of an effective suicide prevention strategy for that individual (Large, 2018; National Institute for Health and Care Excellence [NICE], 2004; NICE, 2011; Simon, 2011). The ability to accurately identify individuals at risk of future suicide only has utility in its ability to inform prevention procedures. However, some authors have argued that this historical focus on developing accurate methods of detecting future suicide has detracted from the true purpose of suicide risk assessment: preventing suicide (Large, 2018; Chan et al., 2016; Mulder et al., 2016). These concerns are outlined below.

Firstly, an overreliance on suicide risk prediction may be in danger of providing false reassurance to clinicians. Suicide risk assessment is a highly pressurised, complex and uncertain process and the prospect of a patient dying from suicide after an assessment is a major source of stress and anxiety for clinicians

(Morrissey & Higgins, 2018). The notion that a risk prediction scale could simply total up the risk factors present in the individual and calculate an accurate risk score would provide immense reassurance to the clinician, taking the pressure and responsibility away from the clinician and placing it on the risk assessment tool. However, given the poor accuracy of such tools, there are concerns that they are providing clinicians with a false sense of confidence and reducing anxiety rather than improving the understanding of the patient and what needs to be done to keep them safe (Undrill, 2007; Chan et al., 2016).

Secondly, a focus on *predicting* risk ahead of *understanding* risk, can lead to attention being given to the presence or absence of various risk factors, instead of an understanding of the causal aspects driving the risk of suicide for that specific individual (Mulder et al., 2016; Chan et al., 2016). An understanding of the causal aspects of suicide risk for the individual is much more likely to inform ways in which the risk can be ameliorated (Large, 2018) and the use of prediction tools can neglect this. Many services have used risk stratification instruments to allocate individuals into certain interventions; with higher risk individuals receiving more intensive, expensive interventions and lower risk individuals receiving no or very limited interventions (Carter & Spittal, 2018). Even if such risk prediction scales were sufficiently accurate, the severity of an individual's suicide risk should not be the main determinant of the level of intervention that is provided. Factors such as the underlying cause of the patient's suicide risk, their preference for restrictive hospitalised care vs community support, their level of engagement with treatment plans and their beliefs about the help they need, should all factor into the decisions around effective treatment and intervention.

For these reasons, current NICE (2011) guidance standards explicitly state: "do not use risk assessment tools and scales to predict future suicide or repetition of self-harm" (p. 21) and "do not use risk assessment tools and scales to determine who should and should not be offered treatment or who should be discharged" (p. 21).Therefore, moving forward, it is important that suicide risk assessment procedures focus on developing an understanding of the individual, their needs, the causal factors related to their suicide risk and the most effective ways in which to keep them safe (NICE, 2011).

Building from this, this thesis explored the use of the structured professional judgement approach to suicide risk assessment. Structured professional judgements (SPJs) are an approach to risk assessment rather than a specific instrument (Bouch & Marshall, 2005) and SPJ schemes are commonly used in the assessment of many different risk behaviours such as violence (Douglas & Webster, 1999), sexual offending (Rettenberger et al., 2011) or stalking (Kropp, et al., 2011). The SPJ approach systematically guides clinicians through the key, evidenced-based factors influencing risk and provides clinicians with the structure in which to build a comprehensive understanding of the individual, their risks and the factors influencing their risks, to help them construct a patient-specific treatment and risk management plan (Douglas, 2019; Logan, 2016).

The SPJ approach to suicide risk assessment investigated within this research is different to previous risk assessment scales and adheres closely to current NICE guidelines (2011). Importantly, the SPJ approach places major focus on risk management and risk reduction ahead of risk prediction (Douglas, 2019). The SPJ approach does not use a risk score to determine treatment pathways, instead it helps the clinician attain an understanding of the factors driving an individual's risk of suicide, which is then used to construct an individualised treatment and risk management plan.

The SPJ approach is also much more dynamic compared to risk scales such as the SAD PERSONS Scale (SPS; Patterson et al., 1983) that consists primarily of static demographic and historical factors. SPJs acknowledge that suicide risk is changeable, and the assessment can be continually updated to reflect changes with the patient over time. Furthermore, the SPJ investigated within this thesis was designed specifically to be consistent with NICE (2004) guidelines that recommend that individuals should be offered an "evaluation of the social, psychological and motivational factors specific to the act of self-harm, current suicidal intent and hopelessness, as well as a full mental health and social needs assessment" (NICE, 2004, p. 6). For these reasons, the SPJ approach is sufficiently different from past suicide risk assessment scales and is consistent with current NICE guidelines.

Problem 2: Flaws with Human Judgement and Information Processing

A further difficulty with the current suicide risk assessment processes is the sheer volume of information that must be considered by the clinician. Current clinical best practice guidelines (NICE, 2011) advise clinicians to take into account the following factors when considering the risk of repeated self-harm or suicide: the methods and frequency of previous self-harm, current and past suicide attempts, depressive symptoms, other psychiatric illnesses, social difficulties, psychological difficulties, pharmacological problems, motivational challenges, types of coping strategies implemented by the individual, significant protective or damaging relationships that the individual may have and any other significant problems or stressors held by the individual.

This is a vast amount of information for one individual to process, especially under the time pressures typically experienced by mental health professionals (Jeandarme et al., 2017). The literature on how humans process information, form judgements and make decisions outlines many of the challenges involved when attempting to integrate lots of relevant information into a single judgement or decision. Kleinmuntz (1990) theorised that problems develop when humans attempt to incorporate multiple factors into a single judgement or decision because the cognitive demands of integrating multiple streams of information exceeds the limits of human processing capacity. Indeed, previous research has demonstrated that humans are incapable of integrating and differentially weighting large amounts of information into a coherent judgement (Faust 1986; Bell & Mellor, 2009).

Seminal research by Oskamp (1965) asked psychologists to predict an individual's behaviour at four intervals, with psychologists being provided with additional, relevant information at each interval. Oskamp (1965) found no relationship between the amount of available information and the accuracy of judgements, although there was a positive association between confidence in one's judgement and the amount of information available. These findings have been replicated on many occasions (Faust, 1984; Golden, 1964), with Sawyer (1966) concluding that humans do not have the cognitive capacity to integrate large amounts of useful information, into sensible and coherent judgements. Indeed, there have even been some findings where additional information has led to decreased predictive accuracy (Faust, 1986; Sawyer, 1966). The authors claimed that this was

caused by humans applying more weight to new information over previously available information, regardless of whether it had any predictive power (Faust, 1986; Sawyer, 1966). The difficulties humans have in organising and combining information into a coherent judgement have been documented across a variety of contexts and disciplines, ranging from assessments of medical disorders, future offending behaviour, job performance and future suicide, giving rise to concerns about the use of unstructured clinical judgement in the context of suicide risk assessment (Grove et al., 2000; Dawes, et al., 1989).

Further research has found that humans rarely make judgements through an organised, balanced weighing up of probability and statistics. Instead, Tversky & Kahneman, 1974 theorised that people use cognitive shortcuts or heuristics to reduce the time and cognitive effort involved in such complex judgements. Whilst these heuristics are economical, sometimes accurate and help humans avoid being bogged down by the hundreds of judgements and decisions made on a daily basis, they are particularly susceptible to biases and errors in judgement (Bell & Mellor, 2009). A full review of the variety of cognitive heuristics and biases involved in human judgement and decision-making is beyond the scope of this thesis and covered in detail elsewhere (Kahneman & Tversky, 1974). However, one pertinent example of how a cognitive heuristic can lead to poor assessment of suicide risk is the representativeness heuristic (Tversky & Kahneman, 1974). The representative heuristic refers to when an individual makes a judgement of the likelihood of an event, by comparing it to a prototype that already exists in their mind.

Applied to a clinical context, a clinician may estimate the likelihood of an individual attempting suicide in the future, by judging how similar the individual is to the “prototypical suicidal person” they have constructed in their minds (Hadlaczky, 2016). If a patient is similar to this prototype, the clinician may regard them as a high risk of suicide, and if they are very different from this prototype, the clinician may regard them as a lower risk. This is problematic because a clinician’s self-constructed “prototypical suicidal person” is entirely subjective and will differ from clinician to clinician. Furthermore, the population of individuals who attempt suicide is highly heterogenous and are unlikely to fit into any specific prototype (Hadlaczky, 2016). Human judgement is susceptible to a range of cognitive biases and heuristics when attempting to process complex information to inform a

judgement or decision. Given the large volume of information that is factored into suicide risk assessment procedures, there are concerns that unstructured human judgement alone is unable to build a coherent and complete understanding of the risk.

In summary, humans are unable to weigh, organise and integrate more than a small amount of information into a coherent and effective judgement or decision and this can cause unreliable and inaccurate judgements (Faust, 1996). Given the sizeable amount of information that clinicians must process during the suicide risk assessment process, it is unlikely that unaided human judgement will result in an optimal understanding of suicide risk. In an attempt to combat many of the problems encountered with unaided human judgement, many risk assessment procedures have attempted to side-step the need for human information processing, utilising an actuarial approach whereby they estimate an individual's risk of suicide by totalling up the number of risk factors present for that individual (e.g. the SAD PERSONS scale; Patterson et al., 1983). This eliminates the need for humans to organise, weight and integrate the information. However, in order to compute risk in this manner, one must classify each suicide risk factor, (e.g., depression, alcohol or drug misuse, unemployment, relationship breakup) as either present or absent. Such binary classification of each risk factor is problematic because it overlooks the depth of information that lies behind each risk factor.

Simply being unemployed, using illicit substances or getting a divorce does not uniformly increase suicide risk in all individuals in the same manner. Many of the risk factors for suicide are different for different individuals. For example, let us consider the risk factor of losing one's job. For some people, losing their job can mean the loss of their identity, the loss of financial security and it can become a source of immense anguish and psychological suffering, whereas for others, losing their job can be an opportunity to explore a new career path or a small bump in the road before another opportunity comes along. The point here is that many of the risk factors included in risk prediction scales do not affect all individuals in the same way and when processed in a binary manner (e.g., present or absent), lots of the important nuance and depth of information is lost. When risk factors such as alcohol misuse are reduced to being present or absent, important information such as why the person consumes alcohol, what happens when they drink alcohol, how much alcohol they

consume, what causes them to increase their alcohol consumption and how do they feel when they drink alcohol, are overlooked. Whilst these suicide screening tools can help organise and integrate information and create a more reliable judgement of risk, their binary classification of risk factors loses much of the depth and richness of information that is required in order to form a comprehensive and effective understanding of an individual's suicide risk.

This issue, combined with the difficulties humans have with organising and integrating information creates a type of catch-22 situation. Humans on their own, are capable of recruiting and understanding the depth of information necessary for a comprehensive and effective suicide risk assessment, however they are unable to organise and process the information into a coherent, reliable and accurate judgement. On the other hand, risk prediction or actuarial type tools are capable of organising and combining lots of information into a coherent and reliable judgement, but they cannot capture the depth of information associated with each risk factor.

Overcoming The Problem with Human Judgement: Structure and Nuance

As outlined above, humans struggle to organise and integrate lots of important information into a coherent judgement, and many of the actuarial tools developed to overcome this difficulty, neglect the depth and richness of information needed for an effective risk assessment. This problem is not unique to the field of suicide risk assessment, with the field of violence risk assessment (Hart et al., 2016) and sexual offending risk assessment (Rettenberger et al., 2011) reporting similar challenges. These difficulties with human judgement in risk assessments have caused government committees to state that unaided clinical judgement cannot continue to be supported and that they are unsustainable in risk assessment (Scottish Executive, 2000; Bouch & Marshall, 2005).

However, the difficulties associated with human judgement are not insurmountable. Whilst humans are vulnerable to neglecting important information or placing too much weight on less valuable information (Grove et al., 2000), there are ways in which these problems can be overcome. Applying the SPJ approach to the assessment of suicide risk offers a potential solution to this challenge. SPJs provide the clinician with a list of the evidenced-based risk and protective factors for the relevant risk behaviour (e.g., suicide), a space to consider the presence and

relevance of each risk/protective factor and a structure in which they can combine all the relevant information into a comprehensive understanding of the individual, their risks and what can be done to keep them safe (Hart et al., 2016).

This approach bridges the gap between unstructured clinical judgement and actuarial methods, ensuring that the clinician recruits the depth of information necessary for a comprehensive risk assessment, whilst also providing a structure that enables clinicians to organise information effectively, preventing key factors from being under- or over-weighted, neglected or forgotten (Hart & Logan, 2011). SPJs also provide clinicians with the evidence base for each risk factor, describing how and why it is related to suicide risk, saving the clinician the time and effort from having to do this work themselves (Hart et al., 2016). Through providing a structure and method for obtaining, organising and integrating the information, the SPJ approach helps clinicians overcome many of the cognitive challenges involved in using multiple sources of information to make complex judgements and decisions. This balance between recruiting in-depth information in a structured and organised manner makes the SPJ approach a promising solution to some of the difficulties associated with human judgement in the field of risk assessment.

Summary of Key Issues

Problem

Suicide risk assessment procedures that can identify individuals at risk of suicide and inform effective intervention strategies are a vital component of a wider population approach to suicide prevention (WHO, 2021a). However, attempts at developing accurate and reliable methods of predicting future suicide have been largely unsuccessful (Chan et al., 2016; Large et al., 2016). This is partially due to the low base-rate of suicide in the population (Murphy, 1984), the high prevalence of suicide risk factors in the population (Mulder et al., 2016), the weak to moderate association between suicide risk factors and suicide (Victor & Klonsky, 2014) and the unpredictable elements that often precipitate suicide and suicide attempts. These difficulties in suicide risk prediction have prompted a reflection about the overarching purpose of suicide risk assessments. Many authors have made an important distinction between suicide *prediction* and suicide *prevention* and have argued that suicide risk assessments must prioritise an understanding of the modifiable risk and protective factors that inform the necessary treatment and

prevention strategies, ahead of a quantification of risk (Simon, 2011; NICE, 2011). Furthermore, the difficulties associated with the way humans organise and integrate the large volumes of information typically encountered during suicide risk assessments, has cast doubts on the efficacy of unaided clinical judgement. This has prompted a reflection on how to structure risk assessment processes in a way that helps clinicians process the vast amount of information and build an organised and comprehensive understanding of the patient, their risks and how to manage them.

Solution

The SPJ approach to risk assessment can offer a potential solution to these key challenges in the field of suicide risk assessment. The ultimate goal of the SPJ approach is to facilitate the clinician in developing an individualised risk reduction plan that targets the key factors driving their risk (Douglas, 2019), ensuring that understanding and preventing risk is prioritised ahead of predicting risk. Furthermore, the SPJ approach guides the clinician through important, evidence-based risk factors and helps them organise and combine the information in a structured manner that protects against many of the difficulties encountered with unstructured clinical judgement (Hart & Logan, 2011). The SPJ approach has been used to successfully overcome similar challenges within the fields of violence risk assessment (Douglas & Webster, 1999) and sexual offending risk assessment (De Vogel et al., 2004) and are regarded as the gold-standard within these fields (Morrissey et al., 2013; Gray et al., 2021). The first part of this thesis aimed to evaluate the use of the SPJ approach to the risk assessment of suicide.

Proposed Research

Broad Outline

In summary, the SPJ approach represents a potentially useful method that can overcome some of the major challenges associated with current suicide risk assessment procedures. The initial aim of this thesis was to evaluate whether the RoSP (Snowden & Gray, 2022), a SPJ designed to assess suicide risk, represented a promising method of assessing the risk of future suicide in a Psychiatric Liaison Team operating within an accident and emergency setting.

Location

This PhD studentship was funded in partnership with the Aneurin Bevan University Health Board (ABUHB). The funding was provided with the stipulation that the research take place within a Psychiatric Liaison Team based in an accident and emergency department.

Most accident and emergency services across the UK have an on-site Psychiatric Liaison Team comprised of skilled mental health professionals that provide assessments and safety planning for individuals experiencing psychiatric emergencies. As outlined by the National Institute for Health and Care Excellence (2022), patients should be referred for an assessment with the Psychiatric Liaison Team when they attend the accident and emergency department after a non-fatal suicide attempt, non-suicidal self-harm, suicidal thoughts or requests for urgent psychiatric help (NHS, 2021). This represented a good location for this research because each of these reasons for a Psychiatric Liaison Team referral have strong associations with future suicide.

There is compelling evidence to suggest that hospital attendance for either a non-fatal suicide attempt or non-suicidal self-harm is perhaps the strongest single risk factor for future suicide. A meta-analysis by Carroll et al. (2014) reviewed 177 research papers that investigated individuals who presented to health care services for self-harm. Importantly Carroll et al. (2014) defined self-harm as a deliberate act of harm to the self with or without suicidal intent. This conflation of suicidal self-harm and non-suicidal self-harm within the literature can be problematic and is explored more in chapter 2. Carroll et al. (2014) found that one in 25 patients that presented to health care services for self-harm (with or without suicidal intent) died from suicide within the following 5 years.

Similar findings from Owens et al. (2002) reported that approximately one in 50 patients who attended hospital after self-harm (with or without suicidal intent) died from suicide within one year. Considering that the rate of suicide within the general UK population is approximately one in 10,000 (ONS, 2020), individuals who attend hospital for self-harm (with or without suicidal intent) represent a very high risk of future suicide. Indeed, many authors (Geulayov et al., 2019; Bennardi et al.,

2016; Knipe et al., 2019) have claimed that hospital attendance for self-harm (with or without suicidal intent) represents the single strongest risk factor for future suicide.

There is also evidence that presenting to hospital with suicidal thoughts is an important risk factor for future suicide. Maguire et al. (2019) examined electronic records of all presentations to accident and emergency departments in Northern Ireland over a four year period. They found that one in 88 individuals who presented to hospital with suicidal thoughts died from suicide within four years. They also reported that individuals who presented to hospital with suicidal thoughts were 4.5 times more likely to die from suicide compared to individuals in the electronic records who did not present to hospital with suicidal thoughts. Additionally, research from Morgan & Stanton, (1997) found that 75% of patients that died from suicide within two months of being discharged from hospital, had reported experiencing suicidal thoughts upon admission. These studies indicate that individuals who present to hospital with suicidal thoughts are at heightened risk of future suicide.

Da Cruz et al. (2010) also highlighted the important role that Psychiatric Liaison Teams within accident and emergency departments can play in preventing suicide. They reviewed 286 cases of individuals that died from suicide in North West England and found that 43% of individuals who died from suicide, attended accident and emergency services in the year before they died. Da Cruz et al. (2010) reported that the most common reasons for their final attendance at accident and emergency departments were self-harm (including both non-fatal suicide attempts and non-suicidal self-harm) and requests for psychiatric help. Given that these reasons would typically result in a referral for a Psychiatric Liaison Team assessment, this location represents a crucial place for the identification and prevention of future suicide. For these reasons, recent national guidelines have started to advocate for improved suicide risk assessment and safety planning processes within mental health teams based in accident and emergency departments (National Action Alliance for Suicide Prevention, 2018; The Joint Commission, 2019; Laliberte et al., 2021).

In order to achieve the statistical power necessary to evaluate the ability of the RoSP to identify future suicide attempts, this research needed to take place in a setting where the outcome of attempted suicide was relatively common. Considering the high risk of future suicide in individuals referred for an assessment with the

accident and emergency department-based Psychiatric Liaison Team, this location represented an ideal location for this research.

Methodology

This thesis aimed to assess the validity, reliability and palatability of the RoSP within a Psychiatric Liaison Team setting. The research consisted of two major stages. The first stage of the research aimed to evaluate the validity and reliability of the RoSP. To investigate the validity of the RoSP, a researcher conducted RoSP assessments on patients referred for an assessment with the Psychiatric Liaison service and examined whether risk judgements made using the RoSP could accurately identify future suicide attempts over the following three months. These risk judgements were compared to risk judgements made by the Psychiatric Liaison Team to evaluate how the RoSP compared to assessment as usual[1]. The inter-rater reliability of the RoSP was examined through independent RoSP assessors completing RoSP assessments on the same set of patients and analysing the similarity of their risk judgements.

The second stage of this research aimed to evaluate the validity, reliability and palatability of the RoSP as it was implemented within the Psychiatric Liaison Team. Originally, it was planned for the Psychiatric Liaison Team to be trained in using the RoSP and to implement it within their clinical practice. As the Psychiatric Liaison Team used the RoSP, the research aimed to measure their ability to identify future suicide attempts over a three-month period, along with the inter-rater reliability of judgements made by different staff members independently assessing the same patient. To assess the palatability of the RoSP, this research aimed to conduct a series of qualitative interviews with both staff and patients, that evaluated whether the RoSP was a palatable assessment procedure within their service.

However, the COVID-19 pandemic and associated research restrictions meant that this hospital-based research was no longer possible. The research limiting restrictions came into place during March 2020, prior to the second phase of the research. Therefore, only the first stage of research is reported within this thesis.

[1] Importantly, this examination of the RoSPs ability to identify future suicide attempts was not an attempt to endorse the RoSP as a risk prediction tool, rather it was an attempt to investigate whether the RoSP could provide clinicians with an enhanced understanding of the patient's future risk of suicide compared to current assessment methods.

Research Questions

This thesis aimed to evaluate the efficacy of the RoSP as a suicide risk assessment procedure within a Psychiatric Liaison Team operating in an accident and emergency department. In order to evaluate the efficacy of the RoSP as a suicide risk assessment procedure this research asked three questions:

1. Were risk evaluations made using the RoSP better at identifying future suicide attempts relative to current assessment procedures used by the Psychiatric Liaison Team?

2. Were risk evaluations made using the RoSP reliable, i.e., could independent assessors complete a RoSP assessment on the same patient and arrive at the same understanding of risk?

3. Was the RoSP a valid, reliable and palatable suicide risk assessment procedure when implemented within a Psychiatric Liaison Team?

As outlined above, the COVID-19 pandemic disrupted the completion of this research. Therefore, only the first two questions are answered within this thesis. In response to the COVID-19 pandemic disrupting the original plans for this research, the second half of the thesis shifted focus away from the RoSP, towards developing an understanding of factors that could help improve the identification and prevention of suicide during the COVID-19 pandemic. The research questions relating to the RoSP are presented within chapters 2 and 3.

Part 2: Identifying Factors Moderating Suicidal Thoughts and Suicide Attempts During the COVID-19 Pandemic

The Problem

COVID-19 is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first known case of COVID-19 was identified in Wuhan, China in December 2019 and since then the disease has spread across the world. On the 11th of March 2020, the WHO declared the COVID-19 outbreak a global pandemic and by the end of 2021, there were approximately 360 million confirmed COVID-19 cases and 5.5 million COVID-19 related deaths (WHO, 2021b). The COVID-19 pandemic and associated restrictions have had

profound social and economic impacts across the globe (Nicola et al., 2020). Almost every facet of modern life has faced a range of challenges and it is important to consider how the COVID-19 pandemic and associated restrictions has impacted suicide risk identification and prevention procedures. The paragraphs below explore some of the ways in which suicide risk identification and prevention procedures have been affected by the COVID-19 pandemic.

Barriers to Mental Health Services

The large rise in hospital admissions due to COVID-19, combined with the strict infection control measures made to almost every service, have caused the NHS to become overwhelmed (Sokol, 2021). Many of the locations in which suicide risk identification procedures take place have undergone significant changes over the course of the pandemic. GP practices have resorted to conducting most of their consultations over the phone (Murphy et al., 2021), many mental health services have also transitioned to using online and telephone consultations (Pereira-Sanchez, 2020) and psychiatric emergency departments have observed large decreases in attendances (Hernandez-Calle et al., 2020) because of the strict infection control restrictions in place (Senedd Research, 2021). The act of moving many physical and mental healthcare services online during the COVID-19 pandemic has created concerns about the accessibility of services that play a vital role in the identification and prevention of future suicide.

Whilst the partial transition to telemedical services has the potential to increase accessibility to mental health services in the longer term (Bashshur et al., 2000), the recent and rapid transition to online or telephone formats has created barriers for individuals who lack trust in the safety and confidentiality of telemedical services (Kauer et al., 2014), those who lack belief in the efficacy of such services (Almathami et al., 2020), individuals with limited access to the technology required to use such services (Seifert, 2020; Aragona et al., 2020) and individuals with limited expertise and confidence with such technology (Seifert, 2020). Indeed, research published by the Royal College of Psychiatrists (2021) found that 45% of psychiatrists had observed a fall in their routine appointments since the onset of lockdown restrictions. Additionally, Chen et al. (2020), found that referrals and presentations to nearly all mental health services within the UK dropped in the months after the onset of the COVID-19 pandemic. This has led to concerns that

individuals who would normally access mental health services for routine appointments, are not seeking help until they reach a crisis point (Royal College of Psychiatrists, 2021; Chen et al., 2020). This barrier to accessing GP or mental health services is likely to make it more difficult to identify individuals at risk of suicide and provide them with the necessary help and support.

The Introduction and Exacerbation of Stressors

In addition to the barriers to accessing services, the COVID-19 pandemic and the associated restrictions have also resulted in the introduction or exacerbation of an array of stressors across the population. Research has indicated that the pandemic and associated restrictions have resulted in increased health anxiety for oneself and one's loved ones (Asmundson & Taylor, 2020), job insecurity and financial difficulties (Prime, et al., 2020), increased bereavement (Verdery, et al., 2020), school closures (Van Lancker & Parolin, 2020), food insecurity (Van Lancker & Parolin, 2020), social isolation (Groarke et al., 2020) and a host of other stressors that will be explored in greater depth later in this thesis.

Along with the introduction or exacerbations of numerous stressors, the pandemic has also resulted in the withdrawal of many protective factors. Lockdown restrictions have resulted in people being unable to see family members or close friends (Hiremath et al., 2020), people have been unable to attend community groups, clubs and societies such as sports clubs, musical groups, theatre societies and religious groups (Evans et al., 2020) and many people have had to cancel or postpone important upcoming events such as weddings, holidays and christenings (Imber-Black, 2020). The simultaneous introduction and exacerbation of stressors and withdrawal of important protective factors due to the COVID-19 pandemic has given rise to concerns about increased mental health difficulties and suicidality within the population (Sher, 2020; Gray et al., 2020; Pierce et al., 2020). Indeed, initial evidence during the early stages of the pandemic indicated that populations experiencing lockdown restrictions experienced increased rates of suicidal thoughts (Killgore et al., 2020; O'Connor et al., 2020).

Summary of Key Issues

The Problem

The combination of the NHS being overwhelmed, many services undergoing a challenging transition to telemedical services that creates service accessibility difficulties, the introduction and exacerbation of many stressors across the population and the simultaneous withdrawal of protective factors have added layers of complexity to the process of early identification and intervention for individuals at risk of suicide. Leading experts have voiced concerns that the profound psychological, social and economic consequences of the COVID-19 pandemic will have a long-lasting negative impact on the rates of suicide within the population (Sher, 2020; Gunnell et al., 2020; Sheffler et al., 2020) and have called for vigilance in understanding population suicidality during these uncertain and changing times (John et al., 2021; Appleby, 2021; Pirkis et al., 2021), along with highlighting the need for active outreach and support structures for individuals who have been more adversely impacted by the pandemic (Sher, 2020; Sheffler et al., 2020).

This research aimed to develop an understanding of factors that could help facilitate the development of effective outreach and support structures for individuals who may be at risk of suicide during the COVID-19 pandemic. The following section outlines some of the key areas of research that will aid the development of effective outreach to vulnerable individuals.

Proposed Solutions

Identifying Individuals in Need of Outreach

To ensure that outreach structures provide effective support throughout the pandemic, it is important to identify the individuals who have been adversely affected by the pandemic and are most in need of help. Research into population recovery during and after large-scale disasters, conducted by The King's Fund, concluded that assessing and identifying the individuals most at risk of psychological suffering is an essential part of an effective community recovery process (Cream et al., 2021). The introduction and exacerbation of so many psychological, social and economic difficulties at once is unprecedented in recent history and it is hard to know which individuals have been most negatively impacted and are most in need of help.

Whilst almost every individual has experienced some adverse effects from the pandemic, there is an immense degree of variation in the way each individual has been impacted. For example, initial findings during the pandemic indicated that different demographic subgroups within the population were affected by different stressors. Older individuals experienced more health anxiety and fear of the physical consequences of the coronavirus (Bergman et al., 2020), whereas younger individuals were more vulnerable to the financial insecurities and social restrictions brought on by the COVID-19 pandemic and associated infection control measures (Beam & Kim, 2020). Those living alone experienced a sense of loneliness and detachment from their communities (Bu et al., 2020), whereas individuals sharing a house with many other people experienced difficulties with overcrowded conditions (Dickerson et al., 2020).

Given that different demographic groups and sectors within the population have experienced a range of different stressful experiences, it is not obvious which groups of individuals are most vulnerable to suicide during the pandemic and in need of outreach and support. Therefore, this research aimed to improve our understanding of the demographic groups most vulnerable to suicide over the course of the COVID-19 pandemic.

Identifying Causes of Distress

Exposure to stress and adversity plays a key role in many theoretical models of suicide. For example, the Integrated Motivational-Volitional (IMV) model of suicidal behaviour (O'Connor, 2011) suggests that an individual's motivation to engage in suicidal acts can be caused by feelings of entrapment, and these feelings often arise after defeat or humiliation appraisals that occur after experiencing an acute or chronic stressor (O'Connor & Kirtley, 2018). Cognitive models of suicide (Wenzel & Beck, 2008) posit that pre-existing cognitive vulnerabilities interact with life stressors to cause psychiatric problems and suicidal thoughts to arise, and the Cubic model of suicide (Shneidman, 2015) argues that it is the combination of stress, pain and perturbation that results in suicide risk. There are also many biological theories that propose suicidal behaviour results from the dual presence of biologically-based vulnerabilities (e.g., dysregulation of the serotonergic system in the ventromedial prefrontal cortex or an over-active hypothalamic-pituitary-adrenal axis) and a psychosocial stressor (Mann, 2003; Van Orden et al. 2010). These

theoretical models of suicide highlight how exposure to stressors can play a pivotal role in the pathway towards suicidal thoughts and behaviours. Considering that the COVID-19 pandemic resulted in the introduction or exacerbation of a number of stressors across the population, many authors have speculated that this might lead to increased suicidality within the general population (Sher, 2020; Gunnel et al., 2020).

Developing an understanding of the specific stressors driving suicidal thoughts and suicide attempts during the pandemic is a vital part of effective community recovery (Cream et al., 2021). Establishing whether exposure to certain pandemic related stressors (e.g., food insecurity or social isolation) are linked to increased suicidal thoughts and suicide attempts will help governments and community leaders (1) identify individuals exposed to the stressors and provide them with outreach and support and, (2) work to prevent or lessen the severity of the stressors within that community.

There are many consequences of the COVID-19 pandemic that have been cited as potential contributing factors toward worsening mental health and increased suicidality, such as the increases in job insecurity (Sher, 2020), people experiencing bereavement (Verdery et al., 2020), financial difficulties (Prime et al., 2020), school closures and home-schooling (Van Lancker & Parolin, 2020), food insecurity (Van Lancker & Parolin, 2020), domestic abuse (Mahase, 2020), worsening physical health (Bo et al., 2020) and social isolation (Groarke et al., 2020). In order to develop and deliver interventions that can ameliorate the deleterious impact of the COVID-19 pandemic, it is vital that research develops an improved understanding of the specific factors linked to an increased risk of suicidal thoughts and suicide attempts. Therefore, this research aimed to identify some of the key stressors associated with suicidal thoughts and suicide attempts during the COVID-19 pandemic.

Identifying Protective Factors

Whilst identifying the aspects of the pandemic related to increased suicidal thoughts and suicide attempts is an important part of an effective recovery strategy, it is not possible to eliminate all sources of distress during a global pandemic. Having large portions of the population experience adversity is an unfortunate reality of the COVID-19 pandemic. However, not all individuals who undergo adversity experience mental health difficulties or increased suicidality. Indeed, past research

has highlighted the immense human capacity to withstand great adversity and still retain a desire to live.

For example, a study of prisoners subjected to torture in Sri Lanka found that the majority (62%) of prisoners exposed to the torture did not experience suicidal thoughts (Somasundaram, 1993). Similarly, Ferrada-Noli et al. (1998) investigated the prevalence of suicide attempts in refugees exposed to severe traumas (e.g., witnessing combat atrocities, imprisonment, sexual violence) and found that over half of the refugees did not attempt suicide. Furthermore, Ackard and Neumark-Sztainer (2002) investigated the prevalence of sexual abuse and suicidal thoughts in a sample of American schoolchildren and reported that the majority (69%) of sexual abuse survivors had not experienced lifetime suicidal thoughts. These studies draw attention to the remarkable human capacity to maintain a desire to live in the face of great suffering. This has inspired researchers to investigate the social and psychological factors that help individuals withstand such adversity.

Through furthering our understanding of the factors that help individuals maintain their desire to live during adversity, we can help inform intervention strategies that enable communities to withstand and bounce back from the challenging circumstances brought on by the pandemic. Therefore, a final aim of this research was to identify key psychological and social factors that protected individuals during the pandemic. More specifically, this research aimed to investigate whether hope, social connectedness, resilience and reality acceptance could protect against suicidal thoughts during the COVID-19 pandemic. The choice of these factors was influenced by theoretical accounts that outlined the protective value of hope, social connectedness, resilience and reality acceptance.

Hope

The construct of hope, broadly defined as the belief that things will improve in the future, plays a protective role in many theoretical models of suicide. For example, Klonsky and May (2015), in their Three-Step Theory of suicide, posit that great pain or suffering alone is not sufficient to produce suicidal thoughts if an individual has hope that their situation will eventually improve. Suicidal thoughts will only arise when great pain or suffering is combined with a sense of hopelessness about the future. Similarly, the Interpersonal Theory of Suicide (Van Orden et al.,

2010) proposes that thwarted feelings of belonging and burdensomeness are proximal and sufficient causes of suicidal desire, only when an individual has no hope that these states will improve. In summary, multiple theoretical models of suicide suggest that suicidal thoughts are unlikely to occur if an individual has hope that their situation will improve.

Social Connectedness

Social connectedness is the sense of belongingness and the feeling of being close and connected to others. Social connectedness plays a central role in many theoretical models of suicidality. Durkheim (1897) first proposed that the likelihood of suicide was influenced by one's degree of social integration and connection within society. Baumeister and Leary (1995) also argued that the human need to belong and feel socially connected to others is such a fundamental need, that when it is thwarted, a desire for death develops. In a similar vein, the Interpersonal Theory of Suicide (Van Orden et al., 2010) suggests that the absence of a sense of belongingness (a sense of connection to others), alongside feelings of burdensomeness and a sense of hopelessness about these states, provides the conditions necessary for suicidal desire to arise. Overall multiple theoretical accounts acknowledge that the human need to feel socially connected plays a crucial role in protecting against the development of suicidal thoughts.

Resilience

Resilience, defined here as the ability to "bounce back" and maintain or regain good psychological outcomes and quality of life after experiencing adversity (Guihard et al., 2018) is emerging as an important construct within the suicide literature. The meta-theory of resilience and resiliency (Richardson, 2002) claims that individuals typically exist in a state of biopsychospiritual homeostasis. This state of homeostasis is continually hit with potential disruptions such as stressors, life events or traumatic experiences. Disruption to this state of homeostasis occurs when an individual does not have the sufficient resources to buffer against the stressors they are exposed to. After such a disruption, the individual is forced to undergo a reintegration process where they attempt to recover and attain a new level of homeostasis. After this process, an individual may return to an improved, the same or a lower level of homeostasis, depending on their levels of resilience (Richardson, 2002). This ability to bounce back stronger from disruptions may protect individuals

exposed to adversity from developing suicidal thoughts and attempting suicide. Indeed, many authors have theorised that resilience may represent an important intermediate layer between risk factors for suicide and suicidality (Wang et al., 2022; Chang et al., 2021; Chen et al., 2021).

Acceptance

Acceptance is an individual's capacity to recognise the reality of a set of circumstances and acknowledge them for what they are, without an attempt to alter or protest them (Viane et al., 2004). Hayes et al. (1996) provided a compelling theoretical account of how acceptance of reality can help protect individuals from negative mental health outcomes under conditions of high stress. Hayes et al. (1996) proposed that through accepting the reality of negative experiences or events, individuals do not expend precious emotional and attentional resources on trying to avoid, change or control these circumstances. If an individual accepts their reality, they can divert their energy towards observing their environment, reflecting, deciding and completing the course of action required to achieve their valued goals in a way that integrates their negative circumstances (Hayes et al., 1996; Bond & Bunce, 2003).

This idea that acceptance of negative experiences can lead to improved mental and physical functioning by diverting attention away from aversive experiences and allowing energy to be dedicated to goal-directed tasks, was developed within the chronic pain literature (Hayes et al., 1996; McCracken, 1998). However, many authors have proposed that acceptance can help individuals maintain healthy psychological functioning after exposure to a range of stressful or aversive experiences such as negative work events (Kuba & Schiebe, 2017), frontline work during a disease outbreak (Wu et al., 2009) and serious physical illness (Poppe et al., 2012). This research aimed to investigate whether acceptance could help protect against suicidal thoughts during the COVID-19 pandemic.

Summary

In addition to these theoretical accounts, empirical research has highlighted how hope for the future (Abramson et al., 2002), social connectedness (Kelley et al., 2019), resilience (Min et al., 2015) and acceptance of reality (Wu et al., 2009), can provide protection from a range of mental health difficulties in individuals exposed

to significant adversity. A more in depth exploration of the theoretical and empirical rationale for the selection of these protective factors is presented in chapter 6. Overall, hope, social connectedness, resilience and acceptance each have strong theoretical and empirical research outlining their ability to protect against suicidality and negative mental health outcomes in individuals exposed to adversity. Therefore, this research aimed to investigate whether these factors could provide protection against suicidal thoughts during the COVID-19 pandemic.

Proposed Research

Broad Outline

The many challenges and changes brought on by the COVID-19 pandemic have added layers of complexity to the process of identifying and preventing suicide within the population. Widespread calls have been made for active outreach programmes to provide help and support to those who are particularly vulnerable to suicide during the pandemic (Sher, 2020; Vigo et al., 2020; Moreno et al., 2020). The second part of this thesis aimed to build an understanding of (1) the demographic groups most vulnerable to suicidal thoughts and suicide attempts during the pandemic, (2) the factors driving suicidal thoughts and suicide attempts during the pandemic, (3) the factors protecting against the development of suicidal thoughts during the pandemic. Improving our understanding of these areas can help facilitate the development of effective outreach and support structures for individuals vulnerable to suicide during the COVID-19 pandemic.

Location

As outlined in the COVID-19 context statement, this research was part of a wider project, in partnership with the NHS in Wales, that aimed to examine the mental health and wellbeing of the Welsh population over the course of the COVID-19 pandemic. Due to the COVID-19 research restrictions limiting face to face contact, combined with a desire to sample a large number of participants within a short time frame, this research was carried out via an online survey. Online surveys represent an effective method for obtaining and processing data from a wide audience within a short time-frame (Wright, 2005) whilst adhering to the COVID-19 infection control restrictions in place (Torrentira, 2020). Data collection for this research consisted of one online survey administered to the Welsh adult (16+)

population between the 18th of January 2021 to the 7th of March 2021 (4-11 weeks into the second Welsh lockdown).

Research Questions

This research aimed to address three key questions that would enhance our understanding of the factors influencing suicidal thoughts and suicide attempts during the COVID-19 pandemic and help facilitate the development of effective outreach support structures. The three questions were:

1. Which demographic groups (age, gender, socioeconomic status) were most vulnerable to suicidal thoughts and suicide attempts during the COVID-19 pandemic?

2. Which specific aspects of the COVID-19 pandemic were associated with suicidal thoughts and suicide attempts?

3. Which factors protected against the development of suicidal thoughts during the COVID-19 pandemic?

These research questions are addressed within chapter 4 and chapter 5 of this thesis.

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Chapter 2: Literature Review

Introduction

This chapter aims to review and critically evaluate the relevant literature that helped shape the design of this research. This chapter reviews previously used methods of suicide risk assessment within an accident and emergency setting, introduces the structured professional judgement (SPJ) approach to risk assessment, evaluates the SPJ schemes that have been developed within the field of suicide risk assessment, explores some of the major methodological challenges within the field of suicide risk assessment and describes how these challenges influenced the design of this research.

Self-Harm and Suicide Risk Assessment in Accident and Emergency Services: A Review

Unstructured Clinical Judgement

What is Unstructured Clinical Judgement?

Unstructured clinical judgement is a risk assessment process that imposes no constraints or guidelines on the assessor (Douglas & Kropp, 2002). The clinician uses their clinical experience, their understanding of the patient and their knowledge of existing risk factors to decide the individual's risk of suicide and what needs to be done to keep them safe (Douglas & Kropp, 2002). This approach relies entirely upon clinician discretion in relation to the selection and synthesis of risk factors and the interpretation of risk. Unstructured clinical judgement is the oldest model of risk assessment (Grove et al., 2000) and it is still sometimes employed as a method of assessing suicide risk (Whiting & Fazel, 2019; Fazel et al., 2019). The section below reviews the core studies that have examined the efficacy of unstructured clinical judgement within the accident and emergency department setting.

Efficacy of Unstructured Clinical Judgement

This section reviews the key peer-reviewed studies that have evaluated the reliability, validity and clinical utility of the unstructured clinical judgement approach to suicide risk assessment within accident and emergency departments.

Kapur et al. (2005) conducted one of the first, large-scale examinations of unstructured clinical judgement for repeat self-harm within an accident and

emergency department. They collected data from four hospitals in the northwest of England on adults that presented to the emergency department with self-harm between 1997 and 2001. All patients received an assessment with either emergency department staff or mental health staff and the assessor was asked to provide a global risk evaluation regarding whether the risk of future self-harm was low, moderate or high (low and moderate risk categories were collapsed into one for the analysis). Kapur et al. (2005) used a database shared between the four hospitals to determine whether patients re-attended hospital for self-harm within 12 months of their first presentation. In total, emergency department staff carried out 4,879 assessments and mental health staff completed 3,828 assessments. Global risk evaluations made by emergency department staff had 32.0% sensitivity, 82.0% specificity and a positive predictive value of 21.3%. Global risk evaluations made by mental health staff had 21.3% sensitivity, 91.6% specificity and a positive predictive value of 25.7%. Definitions of all statistical terms are provided in Table 2.1.

Table 2.1

Definition of Diagnostic Accuracy Terminology

Statistical term	Definition
Sensitivity	The "true positive rate". The proportion of individuals who go on to engage in the risk behaviour (e.g., suicide attempt or self-harm), that were identified as high risk in the assessment.
Specificity	The "true negative rate". The proportion of individuals who do not go on to engage in the risk behaviour (e.g., suicide attempt or self-harm), that were identified as low risk in the assessment.
Positive predictive value	The probability that an individual who was identified as high risk would go on to engage in the risk behaviour (e.g., suicide attempt or self-harm).
Positive likelihood ratio	The probability that an individual who was identified as low risk would not go on to engage in the risk behaviour (e.g., suicide attempt or self-harm).

Receiver operating characteristic (ROC) curve	A graphical representation of the overall discrimination ability of a risk assessment scale to identify whether an individual did or did not go onto engage in the risk behaviour (e.g., suicide attempt or self-harm) at various cut-off points. It is plotted as sensitivity versus 1-specificity. The performance of the risk assessment scale is indicated by the calculation of the area under the curve (AUC). An AUC of 0.5 means the scale has no better discriminatory power than chance and an AUC of 1.0 indicates that the scale has perfect discriminatory power. In general, an AUC value of 0.5 suggests no discriminatory ability, a value between 0.7 – 0.8 is considered fair or acceptable, a value between 0.8 – 0.9 is considered excellent and more than 0.9 is considered outstanding (Mandrekar, 2010).

The low positive predictive value found by Kapur et al. (2005) meant that only one in five (emergency department staff) or one in four (mental health staff) of the individuals identified as high risk, went on to repeat self-harm within 12 months. Furthermore, the low rates of sensitivity in the predictions from both emergency department and mental health staff meant that a large proportion of the individuals who went on to repeat self-harm, were not identified as high risk in the original assessment. Even assuming that interventions were effective in preventing suicide, the administration of interventions to high risk individuals would only prevent one fifth of repeat self-harm episodes. Overall, Kapur et al. (2005) concluded that the predictive value of these unstructured clinical assessments was low and unlikely to be a useful guide to future intervention.

However, it is important to consider some methodological limitations when interpreting these findings. One consideration is that the risk evaluations may have influenced subsequent intervention plans. Individuals identified as high risk may have received higher levels of intervention, causing an underestimation of the predictive value of the clinician's judgement. However, very few patients received specialist follow-up treatment (Kapur et al., 2005) and the effect of such treatment on self-harm repetition has previously been shown to be very small (Kapur et al., 2003).

Therefore, Kapur et al. (2005) judged that intervention efforts were unlikely to have caused an underestimation of the ability of unstructured clinical judgements to identify future self-harm.

Cooper et al. (2007) conducted further research into unstructured clinical evaluations of future self-harm. Patients who attended the emergency department after self-harm received a clinical assessment. After the assessment, clinicians rated the risk of future self-harm as either low, moderate, or high risk (moderate and high risk were collapsed into one category for the analysis) and the outcome measure was whether patients attended hospital for self-harm within the following six months. Clinicians completed global risk evaluations on 8,722 episodes of self-harm and their risk judgements had 85.0% sensitivity, 38.0% specificity and a positive predictive value of 22.0%.

Compared to Kapur et al. (2005), Cooper et al. (2007) reported higher sensitivity, but lower specificity in global clinical judgements of future self-harm risk. This meant that a large proportion (85%) of individuals who went on to repeat self-harm were originally identified as high risk, however many (62%) of the individuals who did not repeat self-harm, were also identified as high risk. These differences likely reflect the fact that Kapur et al. (2005) collapsed low risk and moderate risk ratings into the same category (vs high risk) whereas Cooper et al. (2007) collapsed moderate risk and high risk ratings into the same category (vs low risk). The more conservative classification of future risk by Cooper et al. (2007) likely resulted in higher sensitivity and lower specificity. The positive predictive value in Cooper et al. (2007) is very similar to that found in Kapur et al. (2005), with just over one in five individuals identified as high risk repeating self-harm within six months. This reinforces the idea that unstructured clinical judgements of suicide risk have a limited ability to identify future self-harm and suggests that employing a strategy whereby interventions are reserved for those judged (via unstructured clinical judgement) to be high risk, is unlikely to be beneficial in reducing repeat self-harm and attempted suicide.

Murphy et al. (2010) also examined the efficacy of unstructured clinical assessments used on patients who presented to hospital after self-harm. In total, 3,491 individuals presented with self-harm to three hospitals in England. A

psychiatrist or psychiatric nurse completed a review of the individual's demographic and clinical information and subsequently rated their risk of future self-harm as low, moderate or high (low and moderate risk categories were collapsed into one category). Re-attendance to hospital with self-harm to any of the three emergency department sites served as the outcome measure. The risk ratings made by psychiatrists had 12.0% sensitivity, 93.0% specificity and a positive predictive value of 23.0%. Risk ratings made by the psychiatric nurses had 18.0% sensitivity, 90.0% specificity and a positive predictive value of 25.0%.

Similar to the findings from Kapur et al. (2005) and Cooper et al. (2007), the risk evaluations made by both psychiatrists and psychiatric nurses were low in predictive value. The low sensitivity of the evaluations made by both psychiatrists and psychiatric nurses indicated that unstructured clinical judgements are not able to accurately identify individuals that will repeat self-harm behaviours. This supports the notion that unstructured clinical judgements are limited in their ability to successfully guide future intervention strategies. It is important to consider that Kapur et al. (2005), Cooper et al. (2007) and Murphy et al. (2010) all used presentation at hospital for self-harm as the major outcome variable. Therefore, any self-harm behaviours that occurred without hospital attendance would not have been recorded, leading to a possible underestimation of the outcome measure. Given that most self-harm behaviours do not involve hospital attendance (Jollant et al., 2020; Hawton et al., 2009), this is an important limitation to consider. Whilst this limitation must be considered, hospital presentation for self-harm is often used as an outcome measure in this type of research because of its impact on resource use (Murphy et al., 2010), the fact that hospital attendance for self-harm is one of the biggest risk factors for future attempted suicide (Chan et al., 2016) and because of its objectivity and freedom from reliance on self-report (Nock et al., 2010).

Lindh et al. (2020) examined the ability of unstructured clinical judgement to predict death from suicide within a one-year follow-up period. In a prospective cohort design, clinicians conducted their routine assessment on 479 patients who attended a psychiatric emergency department in Sweden after self-harm and provided a judgement of suicide risk on a scale from 1 (low risk) to 4 (high risk). Within the follow-up period, 14 individuals died from suicide. Using a risk rating of ≥3 as a cut-off, the clinical assessment of risk had 71.4% sensitivity, 62.3% specificity and a

positive predictive value of 6.1%. Of the 14 people who died from suicide, ten were identified as high risk and four were identified as low risk.

Additionally, Conlon et al. (2007) measured the ability of unstructured clinical judgement to accurately distinguish between 39 psychiatric patients that died from suicide and 39 matched controls. Two fully trained psychiatrists were asked to assign patients to high- or low-suicide risk groups based on the patients blindly abstracted records. Conlon et al. (2007) found that the raters assigned patients to the high- and low-risk groups with 41.0% sensitivity and a 90.0% sensitivity, with only 16 of the 39 patients that died from suicide being correctly identified as high-risk. Whilst it is harder to build a complete understanding of a patient from retrospective case records, this study highlights the difficulty in using unstructured clinical judgement to identify future deaths from suicide.

Furthermore, Randall et al. (2018) analysed the predictive accuracy of unstructured assessments of suicide risk from psychiatric emergency department consults that took place in two main hospitals in Winnipeg, Canada. As part of the psychiatric assessment, the clinicians were asked to rate the risk of future suicide for that patient on a scale of 1-10. The study collected data on over 2,643 patients and followed them up. Twelve months after their initial presentation to hospital, 20 patients had died from suicide. The findings showed that the clinician's ratings could not significantly predict suicide over a 12-month follow up period (AUC = 0.54) and the authors concluded that the unstructured clinician assessment of suicide was not effective at predicting deaths from suicide.

Importantly, when comparing the findings from Lindh et al. (2020), Conlon et al. (2007) and Randall et al. (2018), with Kapur et al. (2005), Cooper et al. (2007) and Murphy et al. (2010), it must be acknowledged that death from suicide, rather than hospital attendance for self-harm was the outcome measure. The use of an outcome measure with a much lower base rate is likely to result in a higher number of false positives (Murphy, 1984). This explains why the positive predictive value in Lindh et al. (2020) was substantially lower than previous studies. Whilst the ability of clinicians to identify future suicide exceeded chance levels, Lindh et al. (2020) concluded that the low positive predictive value, the high number of false positives and the fact that four of the 14 individuals who died from suicide were classified as

low risk, meant that unstructured clinical judgements of suicide risk cannot be relied upon to inform decisions around treatment and risk management (Lindh et al., 2020). The findings from Conlon et al. (2007) and Randall et al. (2018) align with Lindh et al. (2020) and further highlight the difficulties in using unstructured clinical judgement of future suicide risk.

Distinguishing Between Self-Harm and Suicide Attempts

In the research outlined above, studies have examined the ability of unstructured clinical judgements to identify both future self-harm and future suicide or suicide attempts. It is important to establish the distinction between self-harm and suicide attempts, and to understand why some studies have used self-harm instead of suicide attempts as an outcome measure.

In the theoretical clinical literature, a suicide attempt is defined as a self-directed potentially injurious behaviour with any intent to die as a result of the behaviour (O'Connor et al., 2013). According to the clinical guidelines outlined by the National Institute for Health and Care Excellence (2022), self-harm is defined as any act of intentional self-poisoning or injury, irrespective of the apparent purpose of the act. This includes both acts of self-harm with and without the intention to end life. Indeed, many acts of self-harm are done without any intent to end life (termed here as non-suicidal self-harm).

Klonsky (2007) conducted a review of the theoretical literature for non-suicidal self-harm and identified seven core theoretical models designed to explain the motivation and functions for engagement in non-suicidal self-harm. The affect-regulation model (Favazza, 1992) posits that non-suicidal self-harm is a strategy to alleviate negative emotions or painful affective arousal. The interpersonal-influence model (Chowanec et al. 1991) suggests that non-suicidal self-harm can be done to communicate the degree of one's suffering, to elicit help from others, or to manipulate others. The self-punishment model (Klonsky et al., 2003) suggests that it can serve the purpose of punishing oneself and expressing anger or derogation towards oneself. The anti-dissociation model (Edmondson et al., 2016) stipulates that non-suicidal self-harm can help to end periods of dissociation or depersonalisation. The sensation-seeking model (Nixon et al., 2002) considers that non-suicidal self-harm can be done in order to generate exhilaration or excitement. The anti-suicide

model (Suyemoto, 1998) proposes that the act of harming oneself can help an individual resist the urge to attempt suicide. There is also the interpersonal boundaries model (Carroll et al., 1980) that suggests self-harm without suicidal intent may be done to affirm the boundaries of the self and assert the distinction between the self and others. This is thought to occur in individuals that lack a normal sense of self.

As outlined in the review by Klonsky (2007) there are a variety of motivations for self-harm, many of which do not involve suicidal intent. Clearly, self-harming with the intention to regulate emotions, elicit care from others or to generate excitement is different from self-harming with the intention to end life (a suicide attempt). Therefore, it seems problematic that some of the empirical research presented in this chapter has employed self-harm as an outcome measure without distinguishing between non-suicidal self-harm and suicide attempts. Whilst this is certainly questionable, there are some reasons why self-harm is used as an outcome measure in research into suicide risk assessments.

Firstly, self-harm in clinical populations is much more common relative to suicide attempts (Woodford et al., 2017), which helps overcome some of the problems associated with predicting an outcome with a low base-rate (see chapter 1). Secondly, there is a substantial degree of overlap between suicide attempts and self-harm in both the risk factors related to such behaviours (Mars et al., 2014) and the association between such behaviour and future suicide risk (Chan et al., 2016). Considering the substantial overlap between self-harm and suicide attempts, some authors believe that the early identification and prevention of self-harm is likely to result in the prevention of suicide (Woodford et al., 2017). For these reasons NICE (2022) clinical guidelines recommend that a psychosocial assessment should be carried out at the earliest opportunity after an episode of self-harm.

Thirdly, from a research perspective, it is often difficult to determine which acts of self-harm would be classified as a suicide attempt. This is because the distinction relies on uncovering the intent behind the behaviour, which is often difficult to ascertain due to issues with individuals misremembering (Blanchard & Farber, 2018), misclassifying (Hom et al., 2016) or lying about (Rumschik & Appel, 2019) their motivations for self-harm. Finally, some research includes self-harm as

an outcome measure because self-harm, even without suicidal intent, can cause death. Previous studies into acts of self-harm have found the relationship between medical lethality and suicidal intent to be very weak (Brown et al., 2004; Gjelsvik et al., 2016). Therefore, only including suicide attempts as an outcome measure can overlook acts of self-harm that seriously endanger life, which is something many risk assessments would hope to identify and protect against.

These reasons provide some understanding as to why studies investigating suicide risk assessments use self-harm, rather than suicide attempts, as an outcome measure. However self-harm and suicide attempts are distinct constructs, and it is always important to acknowledge whether the outcome measure is self-harm or attempted suicide when interpreting the findings of research into the efficacy of suicide risk assessments. For these reasons, the research conducted within this thesis made an effort to distinguish between self-harm with intent to end life (a suicide attempt) and self-harm that caused major harm regardless of intent. This is explained in more detail in chapter 3.

An Evaluation of Unstructured Clinical Judgement

Upon reviewing the studies above (Kapur et al., 2005; Cooper et al., 2007; Murphy et al., 2010; Lindh et al., 2020; Conlon et al., 2007; Randall et al., 2018), the consistent finding was that unstructured clinical judgements were unable to identify the future risk of self-harm or suicide with the degree of accuracy necessary to inform decisions around intervention and treatment strategies. Whilst suicide risk assessment is about much more than accurate prediction of future risk, the consistently poor predictive value of such assessments questions whether unstructured assessment procedures are the best way to help clinicians build a comprehensive understanding of the patient, their risks and what needs to be done to prevent such risks. Indeed, a review of unstructured clinical judgements by Woodford et al. (2017) concluded that the clinical utility of a “high risk” clinical prediction was poor and unable to inform treatment decisions. This section aims to reflect on the strengths and weaknesses of the unstructured clinical approach to risk assessment, in the hope that this can inform ways in which suicide risk assessment processes can be improved.

Strengths

Whilst there are concerns about the use of unstructured clinical judgement (Kapur et al., 2005; Bouch & Marshall, 2005) it is important to consider the benefits of such an approach to ensure the baby is not thrown out with the bathwater. One advantage of the unstructured clinical judgement process is its ability to facilitate increased engagement with the patient. One of the current challenges with modern risk assessment processes is that many patients (35%) are aware that checklist or risk assessment tools are being administered throughout the assessment (Graney et al., 2020). This can cause clinicians to become more focused on completing the relevant checklist or risk assessment tool, rather than listening to the patient and developing a deeper understanding about their circumstances and their difficulties (Graney et al., 2020). The flexible and idiographic nature of the unstructured clinical assessment can increase engagement and strengthen the relationship and trust between the clinician and patient.

Another advantage of unstructured clinical judgement is its flexibility. Clinicians are not confined to a list of pre-specified risk factors, they can give attention and consideration to any topic that arises within the assessment. There are a limitless number of factors that can contribute to an individual having suicidal thoughts or urges (O'Connor & Nock, 2014) and the flexibility of the unstructured clinical assessment allows the clinician to spend time focusing on whichever factors are pertinent to each individual. This flexible approach to risk assessment also facilitates the tailoring of person and context specific treatment and intervention strategies (Douglas & Kropp, 2002). This is an important strength of unstructured risk assessment given the current emphasis on the idea that suicide risk assessment should focus on understanding the modifiable risk and protective factors that help inform the necessary treatment and prevention strategies, ahead of accurate prediction of risk (see chapter 1).

Weaknesses

One major difficulty with unstructured clinical judgement is the lack of standardisation and complete reliance on the clinician's discretion. Clinicians often have different training backgrounds, different experiences in their practice, different exposures to the literature and different styles of assessment. This can lead to poor reliability of judgements (Lamont & Brunero 2009). Research in the field of violence

risk assessment has highlighted the low levels of inter-rater reliability in unstructured clinical judgement (Doyle & Dolan, 2002). Research by Paterson et al. (2008) also found the agreement between different clinicians' judgements of future suicide risk to be poor (W = .41). Furthermore, Murphy et al. (2010) also highlighted that treatment decisions made after unstructured suicide risk assessments were often influenced by the characteristics of the assessor, rather than the characteristics of the patient. In summary, the lack of standardisation, the lack of structure and the total reliance on the clinician's discretion can lead to inconsistent evaluations of risk.

A second difficulty with unstructured clinical judgement is the overreliance on human cognition. As outlined in chapter 1, humans struggle to combine lots of information into a single coherent decision (see Faust, 1984 for full review). Difficulties with cognitive biases (Tversky & Kahneman, 1974) and the application of incorrect and inconsistent weights to certain pieces of information (Grove et al., 2000) mean that humans often struggle to combine lots of information into an accurate, well balanced judgement or decision. Considering the limitations in human cognition and the vast array of information and risk factors that clinicians are advised to consider (National Institute for Health and Care Excellence [NICE], 2011) it is unrealistic to expect clinicians to be able to process such large volumes of information in an unstructured manner and come to a coherent and comprehensive understanding of suicide risk.

A counter argument to the notion that unaided human judgement struggles to combine lots of information into a coherent judgement, comes from the field of intuitive expertise (Kahneman & Klein, 2009). This field has documented numerous occurrences where an expert's intuition or "gut feeling" about the occurrence of an event can accurately predict its occurrence. For example, senior fire-fighters can instinctively judge whether a house is about to collapse with a high degree of accuracy without considering a long list of pre-specified risk factors (Klein et al., 1986) and medical professionals can intuitively detect whether infants are developing life-threatening infections prior to considering blood test results and vital signs (Crandall & Getchell-Reiter, 1993). If experts in other fields can accurately predict the occurrence of adverse events without additional decision aids, then why is this not the case for suicide risk assessment? Importantly, the answer lies in the environment in which the risk assessment takes place. Kahneman and Klein (2009)

identified the conditions necessary for intuitive expertise to take place. Firstly, there needs to be a strong and consistent relationship between the risk factors (e.g., increased breathing rate) and the adverse event (e.g., infant sepsis). Secondly, the environment must provide rapid and unequivocal feedback on the judgement that was made. Given that the relationship between most risk factors for suicide are only weakly to moderately correlated with attempted suicide (Chan et al., 2016; Victor & Klonsky, 2014) and the fact that clinicians rarely receive feedback on their judgements made in assessments, we can conclude that suicide risk assessment is not an environment in which accurate expert intuition can develop.

Summary

In summary, the unstructured clinical judgement approach to suicide risk assessment is unable to identify future risk of self-harm or attempted suicide with the degree of accuracy necessary to inform decisions around intervention and treatment strategies. This is partially due to poor reliability amongst the different clinicians administering the assessment and the limitations on human cognition when processing large volumes of information. Whilst the problems with unstructured clinical judgement have led many authors to conclude that they are an unsuitable method for guiding future treatment and intervention strategies (Bouch & Marshall, 2005; Woodford et al., 2017), it is important to acknowledge that the flexible and idiographic nature of unstructured risk assessment can help in the design of person and context specific treatment and intervention plans.

Actuarial Tools

What Are Actuarial Tools?

The actuarial approach to risk assessment arose as a means of overcoming the problems associated with unstructured clinical judgement. Actuarial tools (also referred to as risk assessment scales, risk prediction tools or screening tools) are a purely statistical method of predicting the risk of a future event. They use fixed, explicit algorithms developed from previous data on risk factors, to estimate the likelihood of future risk behaviours (Hart et al., 2016). The fixed nature of the actuarial approach helps overcome the reliability issues associated with unstructured clinical judgement and their algorithmic nature surmounts the difficulties that humans have in organising and integrating large volumes of information (Grove et al., 2000). The actuarial approach to risk has been widely implemented in forensic

services to prevent future violence (Hart et al., 2016) and there have been numerous attempts to develop actuarial tools capable of identifying future self-harm and attempted suicide (Steeg et al., 2018). The section below reviews the use of actuarial tools to identify and prevent self-harm and attempted suicide in accident and emergency services.

Efficacy of Actuarial Tools

There have been many studies evaluating the ability of different actuarial tools to identify and prevent future self-harm and attempted suicide within accident and emergency departments. Whilst a comprehensive review of every actuarial tool used to identify future self-harm and attempted suicide is beyond the scope of this thesis, this section aims to review the key studies that have investigated some of the most widely used actuarial tools in accident and emergency departments. Table 2.2 below summarises some of the most popular actuarial tools used to assess future risk of self-harm and suicide.

Table 2.2

A Summary of the Actuarial Tools Used for Suicide Risk Assessment

Actuarial tool	Authors	Description
SAD PERSONS Scale (SPS)	Patterson et al. (1983)	The SPS includes ten items. Each item is scored as present (1) or absent (0) and the scores are totalled up out of ten and used to classify patients into low, medium and high risk categories. The ten risk factors are: male sex, age (<20 or >44), depression, previous suicide attempt, alcohol or substance abuse, loss of rational thinking, lack of social support, presence of an organised suicide plan, absence of spouse or partner, stated suicidal intent.
Modified SAD PERSONS Scale (MSPS)	Bolton et al. (2012)	The MSPS is the same as the SPS, except additional weights have been added to four of the items (depression, loss of rational thinking, organised suicide plan and stated suicidal intent). These items

		are scored as 2 if they are present rather than 1. As a result, the MSPS is scored out of 14 rather than 10.
Manchester Self-Harm Rule (MSHR)	Cooper et al. (2006)	The MSHR assesses the presence of four items: any history of self-harm, previous psychiatric treatment, benzodiazepine use in suicide attempt and any current psychiatric treatment. A “yes” to at least one of the items results in a high risk categorisation and a “no” to all items results in a low risk categorisation.
ReACT Self-Harm Rule (ReACT)	Steeg et al. (2012)	The ReACT Self-Harm rule assesses the presence of four items: recent self-harm (past year), living alone or homelessness, cutting, stabbing or piercing as a method of self-harm and treatment for a current psychiatric disorder. A “yes” to at least one of the items results in a high risk categorisation and a “no” to all items corresponds to a low risk categorisation.
Scale for Suicide Ideation (SSI)	Beck et al. (1979)	The SSI is a clinician rating scale consisting of 19 items that evaluate three dimensions of suicidal ideation: active suicidal desire, specific plans for suicide and passive suicidal desire. Each item is rated on a 3-point scale (0, 1, 2), scores range from 0 – 38 and higher scores indicate greater severity of suicidal ideation. Previous research has used a cut-off of 6 or more on the SSI to classify patients as high risk for future suicide (Holi et al., 2005).
Suicide Intent Scale (SIS)	Beck et al. (1974)	The SIS is a 15-item instrument designed to assess patients that survived a suicide attempt. The scale aims to understand the intent behind the suicide

	attempt and examines aspects of the suicide attempt such as whether the patient sought help after the attempt, whether anyone else was present during the attempt, the level of preparation done prior to the attempt and the person's expectations of fatality. Whilst not originally developed as an actuarial tool, many studies have used the SIS to predict the likelihood of future suicide.

Early Risk Assessment Scales

Some psychometric tools such as the Suicide Intent Scale (SIS; Beck, et al. 1974) and the Scale for Suicide Ideation (SSI; Beck et al., 1979) have been employed as suicide risk assessment scales in emergency departments (see Table 2.2). Whilst the original purpose of the SSI and the SIS was to quantify the nature and degree of an individual's suicidal thoughts (SSI) or suicidal intentions (SIS), over the past 30 years both scales have been used as a method of assessing and identifying risk of future suicide following hospital attendance for self-harm (Stefansson et al., 2012; Beck et al., 1999; Chan et al., 2016).

Chan et al. (2016) conducted a meta-analysis examining studies that used the SIS to assess and identify future death from suicide following hospital attendance for self-harm. Chan et al. (2016) pooled data from three studies on a combined 3,124 individuals and reported that the SIS had 73.0% sensitivity and 64.0% specificity, with a positive predictive value ranging between 4 – 16%. With regards to the SSI, Beck et al. (1999) assessed 3,701 outpatients seeking psychiatric treatment and examined whether patients' current levels of suicidal ideation (as indexed by the SSI) could predict future suicide. All patients were followed up for 15 years and death from suicide served as the outcome measure, with 30 patients dying from suicide within that period. Beck et al. (1999) found that SSI scores, using the optimal cut-off of >3, had 53.0% sensitivity and 83.0% specificity, with a positive predictive value of 2.4%. The low positive predictive values for both the SIS and the SSI indicate that only a very small proportion of the individuals identified as high risk went on to die from suicide, with Chan et al. (2016) concluding that there is not sufficient evidence to support the use of these tools in the risk assessment of suicide.

In summary, the SIS and SSI do not seem to offer much of an improvement in their ability to detect future suicide compared to unstructured clinical judgement. Whilst understanding the degree of suicidal intent behind a patient's self-harm (SIS) and the severity of suicidal thoughts they are currently experiencing (SSI) will certainly provide clinicians with important information that should form part of a wider conceptualisation of risk, the sensitivity, specificity and positive predictive value of both the SIS and SSI, mean that clinicians should not rely on them in isolation to assess suicide risk and guide subsequent prevention strategies (Chan et al., 2016).

SAD PERSONS Scale

Whilst the ability of the SIS and SSI failed to demonstrate accurate identification of future self-harm, suicide attempts and suicide over and above unstructured clinical judgement, it is important to acknowledge that this was not the original purpose of either measure. Researchers have since attempted to design risk assessment scales specifically for the prediction of future self-harm and attempted suicide. The SAD PERSONS Scale (SPS; Patterson et al., 1983) and the subsequent Modified SAD PERSONS Scale (MSPS; Bolton, et al., 2012) represent some of the earlier attempts to develop an actuarial tool specifically for suicide risk assessment. The SAD PERSONS Scale and the Modified SAD PERSONS Scale have been among the most frequently used actuarial tools in the assessment of future self-harm and suicide attempts (Bolton et al., 2012).

Steeg et al. (2018) examined the predictive accuracy of the SPS and MSPS in an unselected sample of patients attending three different hospitals. The SPS and MSPS were completed on 4,000 patients who attended hospital after self-harm. Repeat attendance to any of the three study hospitals after self-harm within six months served as the primary outcome measure and death from suicide within six months served as the secondary outcome measure. For self-harm, Steeg et al. (2018) found that the SPS had relatively low sensitivity (24 – 29%[1]), moderately high specificity (76 – 77%), a positive predictive value of 28 – 34% and an area under the curve (AUC) of 0.51. Similarly, the MSPS also had low sensitivity (9 – 12%), high specificity (90%), a positive predictive value of 26 – 32% and an AUC of 0.49. For

[1] The two values represent the values at different cut off points on the SPS or MSPS.

suicide, the findings were very similar, with the SPS demonstrating low sensitivity (25 – 33%), moderately high specificity (75 – 76%) with a positive predictive value of 0.5 – 0.7% (the lower positive predictive value a result of the much lower base-rate of suicide) and the MSPS also demonstrating low sensitivity (0 – 17%), high specificity (90 – 91%) with a positive predictive value of 0 – 0.8%. The AUC values were not calculated for the analysis with suicide as the outcome measure.

The low sensitivity rates meant that only a very small proportion of individuals who reattended hospital after self-harm or died from suicide were identified by the SPS or MSPS as high risk. Additionally, the positive predictive value suggested that just over one in four individuals identified as high risk by the SPS or MSPS, had a repeat self-harm episode and the AUC values indicated that the SPS and MSPS were no better than chance at identifying future self-harm. These rates do not offer much of an improvement compared to unstructured clinical judgement (Kapur et al., 2005; Lindh et al., 2020) and the authors concluded that both the SPS and MSPS failed to accurately identify both future self-harm and suicide and therefore should not be used to determine access to treatment.

A systematic review by Warden et al. (2014) evaluated three studies that used the SPS to predict suicide attempts and concluded that no study demonstrated any evidence that the SPS could accurately predict future suicide attempts. Further research by Katz et al. (2017) examined the ability of both the SPS and MSPS to identify future suicide in 5,462 patients seen by psychiatric staff in the emergency department. Death from suicide within 12 months of the original assessment was used as the outcome measure, with 41 of the 5,462 patients dying from suicide within the year. Katz et al. (2017) found that risk scores from both the SPS and the MSPS had low sensitivity (48.8% and 57.5%), moderate specificity (60.1% and 59.7%), very low positive predictive values (0.9% and 1.1%) and AUC values (0.56 and 0.59) that indicated that risk scores were no better than chance at identifying future suicide. Once again, these results led the authors to conclude that neither the SPS or MSPS should be used to predict suicide or guide treatment within accident and emergency services. Taken altogether, these findings indicate that both the SPS and MSPS offer very little predictive value or clinical utility in the identification and prevention of self-harm, suicide attempts and death from suicide.

Modern Actuarial Tools

More recently, screening tools such as the Manchester Self-Harm Rule (MSHR) and the ReACT Self-Harm Rule (ReACT) have been developed from databases containing multicentre prospective cohort data from thousands of individuals who attended hospital with self-harm (MSHR: N = 9,086; ReACT: N = 29,571). Both projects used their respective databases to distil a four-question actuarial tool designed to screen for risk of future suicide. In the same study mentioned above, Steeg et al. (2018) also examined the ability of the MSHR and ReACT to identify future self-harm and suicide. For self-harm, they found that the MSHR demonstrated high sensitivity (98%), low specificity (15%), a positive predictive value of 31% and an AUC value of 0.71 (a value typically considered to represent acceptable discriminatory ability; Mandrekar, 2010). In a similar vein, ReACT demonstrated high sensitivity (94%), low specificity (23%), a positive predictive value of 33% and an "acceptable" AUC value of 0.71.

For suicide, the MSHR demonstrated high sensitivity (89%) but low specificity (11%) with a positive predictive value of 0.5%. In a similar vein, ReACT demonstrated moderately high sensitivity (78%), low specificity (18%) with a positive predictive value of 0.4%. The AUC values were not calculated for the analysis with suicide as the outcome measure. Additional research investigating the ability of ReACT to predict future self-harm within an accident and emergency setting (Steeg et al., 2012) found very similar rates of sensitivity (95%), specificity (21%) and positive predictive value (30%). Similarly, a systematic review by Randall et al. (2011) reported that the MSHR demonstrated high sensitivity (94%) and low specificity (26%) in the prediction of future hospital attendance for self-harm.

Compared to unstructured clinical judgement and previous actuarial tools (SSI, SIS, SPS, MSPS), the MSHR and ReACT offered significant improvements in the identification of individuals at risk of future self-harm and suicide (Steeg et al., 2018). These studies indicated that both the MSHR and ReACT, were good at identifying individuals who went on to engage in self-harm or die from suicide as high risk (high sensitivity). However, this came at the cost of falsely identifying many individuals who did not go on to engage in self-harm or die from suicide, as high risk (low specificity). Numerous authors have argued that the poor specificity and low positive predictive value of these tools mean that these tools do not have

clinical utility in their ability to guide future treatment and intervention (Steeg et al., 2018; Randall et al., 2011). However, the high sensitivity rates have led to suggestions that such tools could provide a useful adjunct to clinicians. Tools such as the MSHR or ReACT may be able to help clinicians understand that individuals who fall into the low risk categorisation, have a very low chance of re-attending the hospital for future self-harm or dying from suicide.

An Evaluation of Actuarial Tools

Upon reviewing the studies that investigated the efficacy of actuarial tools in suicide risk assessment, it seems that some of the early risk prediction tools for self-harm and suicide (i.e., SIS, SSI, SPS & MSPS) offer little improvement over and above that offered by unstructured clinical judgement. Whilst more recent attempts to develop actuarial type screening tools (MSHR & ReACT) offer improved sensitivity and overall predictive accuracy (Steeg et al., 2018; Steeg et al., 2012; Cooper et al., 2006), they still fall short of the high levels of accuracy required to inform decisions around intervention and treatment strategies (Steeg et al., 2018). This section aims to reflect on the benefits and limitations of the actuarial approach to suicide risk assessment.

Strengths

One of the biggest strengths of actuarial assessments is the absence of subjective judgement and biases. As mentioned previously, unstructured clinical judgements struggle with poor reliability due to the reliance on subjective opinion (Lamont & Brunero, 2009). Given that actuarial measures pre-specify the risk factors to be considered and the weight assigned to each factor, there is little room for subjective opinions and beliefs to alter the outcome of actuarial assessments. As a result, clinicians can administer actuarial tools with high levels of inter-rater reliability (Hilton et al., 2004). High levels of reliability and consistency in such judgements lead to more accurate identification of risk (Grove et al., 2000) and increase the chances that treatment and intervention plans are based on the characteristics of the patient, rather than the characteristics of the assessor (Murphy et al., 2010).

Furthermore, the pre-determined structure of actuarial measures ensures that none of the key risk factors associated with suicide are missed out, ignored, or

undervalued. With unstructured clinical judgement, flaws in human cognition and information processing often lead to vital risk factors (e.g., previous self-harm or historical psychiatric issues) being forgotten about, glossed over, or underweighted in the risk assessment process (Grove et al., 2000). With actuarial measures such as the SPS, MSPS, MSHR and ReACT, all the risk factors deemed to be meaningfully associated with suicide are compiled in a pre-determined list for the clinician, ensuring that they are not overlooked. The structured nature of actuarial measures minimises the chances of important information being neglected.

Limitations

Despite these strengths, there are reasons to be cautious with actuarial tools in the risk assessment of suicide. Firstly, actuarial tools may only be relevant to the settings they were developed and validated within (Maden, 2003; Stein, 2007; Lamont & Brunero, 2009). If we consider the MSHR and the ReACT screening tools, they were both developed using data from self-harm presentations to emergency departments in hospitals based in England (Steeg et al., 2012; Cooper et al., 2006). Whilst these screening tools have high sensitivity when detecting repeat self-harm in patients attending emergency departments in England after self-harm, these high sensitivity rates may not transfer perfectly to other settings (e.g., GP practices, psychiatric hospitals) or to different countries and cultures. It is important to be aware that the ability of actuarial tools to accurately identify future self-harm and suicide may only apply to the specific context in which they were developed.

Secondly, the pre-determined structure of actuarial tools can limit the flexibility of the assessment process. There are almost a limitless number of factors that can contribute to an individual having suicidal thoughts or urges (O'Connor & Nock, 2014) and different risk factors are likely to differ in their importance and relevance to suicide for each individual. For example, if an individual had a strong and imminent desire and a clear plan to end their life because they wish to escape large gambling debts, but had no recent self-harm, lived with their family and were not currently receiving treatment for a psychiatric disorder, they would be perceived as low risk by the ReACT Self-Harm rule (Steeg et al., 2012). Actuarial measures do not cover all possible contributors to suicide risk and confining the assessment to a pre-specified list of risk factors can result in important patient-specific information being overlooked (Dawes et al., 1989).

Thirdly, the way in which actuarial measures score risk factors as present or absent, overlooks much of the depth and nuance that lies behind important risk factors. If we look at some of the risk factors for the SPS, simply consuming alcohol, separating from a partner, or having depression does not uniformly increase suicide risk in all individuals in the same manner. Consider the risk factor of alcohol misuse. If an individual was to consume over 50 units of alcohol per week, most clinicians using the SPS would mark the risk factor of alcohol misuse as present. For some individuals this may be accurate. Their regular consumption of alcohol could have a detrimental impact on their mental health, it could worsen their social and financial circumstances, lower their inhibitions and lead to increased suicidal thoughts. However, for other individuals, their alcohol use could have little to no impact on their suicide risk. Their use of alcohol may facilitate more social interactions with friends and family and could even lower their inhibitions and enable them to open up about difficult emotions they are experiencing and ask for help and support. Many of the risk factors included in risk prediction scales do not affect all individuals in the same way and when processed in a binary manner, the depth and nuance of the information is lost. When risk factors (e.g., alcohol misuse) are reduced to being simply present or absent, important information such as why the person drinks alcohol, what happens when they consume alcohol, how much alcohol they consume, what circumstances cause them to increase their alcohol consumption and how they feel when they drink alcohol, are all overlooked.

Finally, the most important concern with the use of actuarial tools is their ultimate inability to inform care and prevention procedures (Lamont & Brunero, 2009). Whilst some actuarial measures may be able to predict future risk with increased accuracy and reliability compared to unstructured clinical judgement (Grove et al., 2000), such prediction is of limited utility if it does not inform ways to mitigate and prevent the risk of suicide (Bouch & Marshall, 2005). Actuarial measures place focus on accurately classifying the risk of suicide, ahead of developing a causal understanding of the factors driving an individual's risk, the latter of which is needed to guide intervention and prevention strategies. Given that the purpose of suicide risk assessment is to build an understanding of the modifiable risk and protective factors that inform the necessary treatment and prevention strategies (Simon, 2011; NICE, 2011), it is widely thought that actuarial tools on

their own, are not suitable to guide and determine future treatment and prevention strategies for self-harm and suicide (NICE, 2011; Chan et al., 2016; Mulder et al., 2016).

Summary

In summary, some of the recently developed actuarial tools for suicide risk assessment in accident and emergency settings (MSHR & ReACT) offer a slight improvement over unstructured clinical judgement in their ability to identify individuals at risk of future self-harm and suicide. This is mainly down to the pre-specified structure of actuarial measures eliminating the inconsistencies and biases that arise in human judgement and ensuring that all key risk factors are considered when forming a judgement of suicide risk. However, the predictive accuracy of even the best actuarial tools still falls short of the levels needed to inform decisions around intervention strategies (Steeg et al., 2018). Actuarial assessment tools often overlook the depth behind many of the risk factors, they are limited to considering only pre-specified items and crucially, they do little to inform the most appropriate intervention and prevention procedures for the specific individual. Whilst some actuarial tools may offer a useful adjunct to clinicians, they should not be used in isolation to classify risk and determine intervention strategies (Steeg et al., 2018; NICE, 2011).

Current Suicide Risk Assessment Procedures in the UK

Given the well documented difficulties with the two major approaches to suicide risk assessment, many different mental health organisations have developed their own risk assessment procedures. Graney et al. (2020) conducted a thorough investigation into the suicide risk assessment tools currently being used in mental health services across the UK. In a mixed-methods study, Graney et al. (2020) identified and contacted all 85 NHS mental health trusts and health boards in the UK and requested details of their suicide risk assessment procedures. This was followed by an online survey of clinicians, carers and patients that assessed their opinions and experiences in using these assessment procedures. They found 156 suicide risk assessment tools and scales currently in use across the UK and some of the most frequently used procedures are described in Graney et al. (2020). A full review of each of these currently used suicide risk assessment measures is beyond the scope of this thesis due to the large number of different measures used and the lack of

information available for each measure. However, the section below reflects on and evaluates some of the key issues highlighted with many of the current suicide risk assessment procedures in Graney et al. (2020).

One of the main difficulties highlighted was the lack of consensus between the various risk assessment tools and scales that were used. There was great variation in the length, complexity, degree of structure and the way in which risk was categorised in the different suicide risk assessment procedures (Graney et al., 2020). With over 150 risk assessment tools being used across 85 mental health organisations, this creates difficulties when patients move between different mental health services. Clinicians must learn to interpret and understand a wide range of risk assessment tools to understand the risks of patients that have previously attended other mental health services. A commonly used and widely understood risk assessment procedure would facilitate a faster and easier communication and understanding of a patient's risk, as they move between different services.

Another problem with current suicide risk assessment procedures was the lack of adequate training. In the online survey, Graney et al. (2020) found that one third of clinicians reported that they had not received training for the suicide risk assessment procedure they were currently using. In response to questions about improving risk assessment procedures, clinicians highlighted the need for improved training in understanding and formulating risk (Graney et al., 2020). Initial training in the risk assessment procedure along with ongoing training, reflection and supervision is vital in ensuring that clinicians develop the knowledge, skills and confidence that allows them to assess and manage an individual's risk of suicide.

A further concern highlighted by Graney et al. (2020) was the lack of empirical validation for many of the risk assessment procedures currently in use. The majority (58%) of clinicians reported that the risk assessment procedures they were currently using had not been empirically validated. Whilst many of the current risk assessment procedures adhere to best practice guidelines (NICE, 2011) and bring the clinician's attention to empirically validated risk and protective factors, there is limited evidence to suggest these risk assessment tools improve the clinician's ability to understand risk and effectively prevent suicide (Graney et al., 2020). Building a robust evidence base for any risk assessment procedure is a complex but important

process. To have confidence that a suicide risk assessment procedure is suitable for implementation in clinical practice, research needs to demonstrate that the procedure can facilitate a good understanding of a patient's suicide risk, can lead to effective treatment and management of suicide risk and is palatable to clinicians, patients and carers.

Graney et al. (2020) also noted that many of the risk assessment procedures utilise some form of risk factor checklist. Amongst patients, 35% reported being aware that a checklist or risk assessment tool was being administered during the assessment and roughly half (47%) felt they were not listened to during the meeting. This highlights the need for clinicians to adopt a personalised approach to the assessment, drawing attention away from the completion of a checklist. Additionally, over one third (35%) of patients felt that a care plan had not been communicated to them and did not know what to do or who to contact in a crisis. It is vital that future suicide risk assessment procedures conclude with the communication of a clear care plan to the patient.

Regarding family members and carers of the patient, half (50%) of those surveyed reported that the care plan and safety needs of the person they were supporting was not explained to them and over half (55%) reported that they did not get the chance to discuss their own views on the person's safety (Graney et al., 2020). The lack of involvement and communication with carers and family members of patients has been outlined as a major area for improvement in the suicide risk assessment process (Graney et al., 2020). A final difficulty with current suicide risk assessment procedures is the lengthy and time consuming nature of assessments. The time consuming nature of many risk assessment procedures was a consistent source of negative feedback from clinicians (Graney et al., 2020). Given the immense time pressure clinicians face daily, risk assessment procedures that take many hours to complete are simply not palatable for clinicians.

What Next for the Field of Suicide Risk Assessment?

The first part of this chapter outlined and evaluated current methods of suicide risk assessment. Each method has important strengths and weaknesses that, when considered altogether, highlight ways in which the suicide risk assessment process can be improved. The flexible and idiographic nature of unstructured clinical

judgement facilitates engagement with the patient and helps in the design of individual specific intervention plans. However, the unstructured nature and reliance on limited human cognition and subjective judgements lead to difficulties with poor consistency between clinicians and limited ability to identify future self-harm and suicide.

With actuarial tools, the structured approach ensures that all key risk factors are assessed and combined in a way that bypasses many of the shortcomings associated with human cognition, leading to improved reliability and a slightly improved ability to identify future self-harm and suicide. However, the highly structured nature of the assessments often limits the degree of engagement with the patient, can overlook the depth and nuance behind lots of the risk factors and can place too much emphasis on quantifying risk ahead of informing the most effective intervention procedures. Research into currently used suicide risk assessment procedures in mental health organisations has highlighted that the lack of consensus between the different procedures, inadequate training for each procedure, insufficient empirical validation of the various assessment procedures and the poor palatability of assessment procedures are the major challenges to the field of suicide risk assessment (Graney et al., 2020).

When considering new procedures for suicide risk assessment, it is important to reflect on the strengths and limitations of previous methods. Learning from the unstructured clinical judgement and actuarial approaches, it is important for risk assessment procedures to strike a balance between allowing the clinician to flexibly explore the factors pertinent to the individual's risk, whilst maintaining some degree of structure that ensures empirically supported risk factors are considered in a consistent fashion. When reflecting on the core issues with many of the current approaches to suicide risk assessment, there is a clear need for the development of a suicide risk assessment procedure that (1) can be understood and implemented across a wide range of services, (2) provides clinicians with adequate training to implement the procedure effectively, (3) has empirical validation establishing its ability to help clinicians understand risk and develop care plans that prevent future self-harm and suicide and, (4) is palatable for both clinicians and patients. This thesis aims to evaluate whether the structured professional judgement (SPJ) approach to risk

assessment can offer a solution to some of the key challenges associated with suicide risk assessment.

Structured Professional Judgement

What is Structured Professional Judgement?

SPJs are an approach to risk assessment that aim to bridge the gap between the unstructured clinical judgement approach and the actuarial approach to risk assessment (O'Shea, 2016). Whilst there are various SPJ assessment procedures that have been developed for different risk behaviours (e.g., violence, sexual offending, stalking), there are several core features that characterise the SPJ approach.

Typically, there are five distinct stages to the SPJ risk assessment process (Logan, 2016). Firstly, clinicians gather information from a variety of sources (e.g., interview with the patient, historical records, interview with the patient's family). The SPJ manual and worksheet prompts the clinician to collect information relevant to key evidenced base risk factors. The SPJ manuals typically comprises a list of empirically derived risk items identified from an extensive literature review of original research articles, reviews and books (De Bortoli et al., 2016). All risk items included within SPJs are selected due to their high levels of relevance to the risk behaviour. Typically, there are about twenty items included in most SPJ assessments (e.g., HCR-20, SVR-20 and RoSP), with the items usually organised into four categories (e.g., historical factors, clinical factors, current crisis, current thinking & feelings).

Secondly, the SPJ guides the clinician throughout the various risk items. Clinicians are provided with a succinct summary of the evidence base for each risk factor and are asked to consider whether each risk factor is *present* and whether it is *relevant* to the patient's risk (De Bortoli et al., 2016). There is typically a small section beneath each risk factor where the clinician is asked to write a brief formulation, describing whether it is present and whether it is relevant to the patient's potential to engage in the risk behaviour in the future (Logan, 2016). To illustrate the important distinction between the *presence* and *relevance* of a risk factor, consider the earlier example of alcohol abuse and suicide risk. If an individual drinks 50 units of alcohol per week, then this risk factor of alcohol abuse would be *present*. However, whether the risk factor is *relevant* depends on whether the alcohol

consumption is deemed to influence their risk of suicide. This process is reflected within the clinician's brief formulation for each risk item and facilitates a nuanced processing of key risk factors.

Thirdly, once the clinician has been through each individual risk item, they are asked to develop an overall risk formulation. A formulation is a hypothetical explanatory model of a person and their behaviour, that is used to help guide decision-making and interventions for that person (Snowden & Gray, 2022). Within the SPJ, a risk formulation brings together all the present and relevant risk items, along with any potential protective factors, into an organised framework. The risk formulation aims to produce a comprehensive and coherent explanation of the patient's presenting problems, the severity and imminence of their risk and the factors influencing their risks (Logan, 2016). Within the risk formulation stage, clinicians are also asked to engage in scenario planning, a process whereby several plausible alternative future scenarios for the patient are imagined. The clinician considers how the patient will react to various plausible future scenarios, which enhances their ability to prepare for different future eventualities. Once clinicians have completed their risk formulation and have considered the plausible future scenarios for the patient, they are well prepared to complete the risk management plan.

The fourth stage of the SPJ process involves distilling the risk formulation and scenario planning into an individualised risk management plan. The risk management plan (or safety plan) is based directly on targeting the factors influencing an individual's risk that were identified in the risk formulation (Logan, 2016). For example, if, throughout the risk formulation process, the clinician identifies that alcohol misuse, the recent bereavement of their mother and financial difficulties were the key factors driving the individual's desire to end their life, the risk management plan would likely suggest an intervention for their alcohol use (e.g., a referral to local drug and alcohol support groups), grief counselling to help the individual come to terms with their recent bereavement and a referral to social work or financial planning services to help them handle their finances.

The final stage of the SPJ process involves the clinician making an overall judgement of the patient's risk, usually on a five point scale (Douglas & Kropp,

2002). This is typically done for research purposes. This SPJ process is meant to provide clinicians with the structure and guidance for them to build a comprehensive understanding of the patient, the factors influencing their risks and what needs to be done to ameliorate those risks. It was designed to retain the idiographic and flexible nature of unstructured clinical judgement, whilst providing an evidence-based framework that helps clinicians process the vast amount of information involved in a risk assessment.

Structured Professional Judgement: A Review of the Evidence

The SPJ approach is not a new approach to risk assessment and many SPJs have been implemented in clinical practice over the past 25 years. One of the most well-established SPJ schemes is the HCR-20 (Webster et al., 1997), used for the risk assessment and management of future violence. Whilst several SPJ schemes exist for a variety of risks such as sexual offending (SVR-20; De Vogel et al., 2004a) or spousal violence (SARA; Helmus & Bourgon, 2011), this section reviews the evidence for the HCR-20 because it is the most widely used and extensively researched SPJ scheme in existence. This section aimed to review the core research surrounding the HCR-20 scheme, before reflecting on whether the SPJ method represents a promising approach to suicide risk assessment in accident and emergency services. When evaluating the efficacy of the HCR-20, it is important to consider its predictive validity (ability to identify future violent behaviour) and its reliability (whether independent assessors can come to the same risk judgements on the same patient). Consideration must also be given to the palatability of the HCR-20 and whether it can succeed in its primary aim of reducing violent behaviour.

Predictive Validity

The Historical Clinical and Risk Management 20 (HCR-20; Webster et al., 1997) is a structured professional judgement scheme for the assessment and management of violence risk across criminal, forensic and psychiatric settings. Whilst a full review of the history and evidence for the HCR-20 is beyond the scope for this thesis (see Douglas et al., 2005 for full review), some of the major studies investigating the efficacy of the HCR-20 are reviewed below.

Within psychiatric settings, De Vogel and De Ruiter (2006) conducted a prospective study, asking clinicians to complete HCR-20 assessments on 127 male

offenders admitted to a forensic psychiatric hospital. They examined whether risk judgements made using the HCR-20 could accurately identify future instances of violence within the psychiatric hospital and reported that the risk judgements demonstrated excellent levels of predictive validity (AUC = 0.86). The HCR-20 has also demonstrated predictive validity in correctional settings. Neves et al. (2011) investigated the predictive validity of clinical judgements made using the HCR-20 within a correctional, community setting in Portugal. Clinicians assessed 158 non-mentally disordered patients and completed the HCR-20 assessment both as an actuarial tool (mathematically scoring up the presence of the 20 risk items) and in the traditional SPJ manner with a risk judgement made at the end. Patients were prospectively followed up for 13 months after the assessment to identify future violence. Neves et al. (2011) found that the judgements made using the HCR-20 as an actuarial tool (AUC = 0.81) and as an SPJ (AUC = 0.83), both demonstrated excellent ability to predict future instances of violence.

Interestingly, Neves et al. (2011) found that the risk judgements made by clinicians using the HCR-20 as an SPJ were slightly better at predicting future violence relative to the HCR-20 used as an actuarial tool. The finding that SPJ judgements often outperform actuarial equivalents have been replicated elsewhere (Hart et al., 2016; Gray et al., 2021) and suggests that the SPJ approach facilitates an improved understanding of an individual's future risks compared to actuarial alternatives. A plethora of studies have demonstrated the ability of HCR-20 risk judgements to predict future violence across different countries (UK – Gray et al., 2008; USA – Douglas & Webster 1999; Portugal – Neves et al., 2011; Mexico – Sada et al., 2016; Belgium – Claix & Pham, 2004; Hong Kong – Ho et al., 2013), in both men (Gray et al., 2008) and women (Rossdale et al., 2019) and also in individuals with personality disorders (Grann et al., 2000), schizophrenia (Michel et al., 2013) and intellectual disabilities (Gray et al., 2007).

Whilst the evidence reported here predominantly supports the predictive validity of the HCR-20, there are some key limitations within this area of research that must be considered. One major difficulty with many of the studies discussed above is the consistently small sample sizes. Given the time, money and resources it takes to obtain ethical approval for the research, consent participants into the study, collate the information necessary for an assessment, get assessors to complete the

HCR-20 assessment and follow-up participants over the course of a year, most prospective studies can only feasibly recruit between 50 – 200 participants. This is substantially fewer than the thousands of participants recruited in the studies of actuarial tools (Steeg et al., 2018; Cooper et al., 2007). The smaller sample sizes mean the confidence intervals for the AUC values are wider and it is harder to precisely gauge the exact predictive accuracy of risk judgements made using the HCR-20. To overcome the problem of small effect sizes, O'Shea et al. (2013) collated multiple studies investigating the predictive efficacy of the HCR-20. O'Shea et al. (2013) combined twenty non-overlapping studies involving 2,067 participants and concluded that the HCR-20 SPJ risk judgements demonstrated good to excellent prediction of future aggressive and violent behaviour. Similar large-scale reviews of the HCR-20 (Guy et al., 2007; Douglas et al., 2005) have reached the same conclusion.

Other difficulties with studies investigating the predictive ability of the HCR-20 include (1) problems with non-random participant selection (O'Shea et al., 2013; McDermott et al., 2008), (2) high rates of missing data or attrition during the follow-up period (Gray et al., 2003; Macpherson & Kevan, 2005) and (3) biased assessment of the outcome measure, where the assessor who completed the HCR-20 assessment is also responsible for recording future incidents of violence (Nicholls et al., 2004). These methodological limitations increase the risk of bias, meaning the studies are more likely to report misleading results. The meta-analysis conducted by O'Shea et al. (2013) examined whether this risk of bias caused an overestimation of the predictive efficacy of the HCR-20. They found that studies with a higher risk of bias, reported slightly greater estimates of the HCR-20's ability to detect future violence (O'Shea et al., 2013). Whilst it is important to consider that some of the lower quality research may cause overestimations in the predictive efficacy of the HCR-20, it should also be noted that the four high quality, low bias studies included in O'Shea et al. (2013) all found that the HCR-20 demonstrated a good ability to identify future violent behaviour.

Furthermore, there are also methodological considerations that may cause these studies to underestimate the predictive validity of the HCR-20. As mentioned previously, the HCR-20 is an assessment procedure that primarily aims to reduce and manage the risk of violence. Therefore, in the studies examining the predictive

efficacy of the HCR-20, patients judged to represent the highest risk of future violence often receive the highest level of intervention and risk management strategies. If these risk management techniques are successful in preventing future violence, this is likely to cause an underestimation of the predictive efficacy of the HCR-20. Furthermore, many of the studies rely on violent convictions as the main measure of future violent behaviour (Gray et al., 2008; Gray et al., 2007). However, convictions for violent crimes only represent the "tip of the iceberg" of actual acts of violence, with most violent acts going unreported (Gray et al., 2008; Kroner et al., 2007). Given this large source of noise in the outcome measure, the predictive efficacy demonstrated by the HCR-20 in these studies becomes even more impressive (Gray et al., 2008).

Reliability

The HCR-20 has also demonstrated excellent inter-rater reliability. Inter-rater reliability is essential for risk assessment procedures as it means the perception and treatment of the patient is consistent between different clinicians. Douglas and Belfrage (2014) asked three assessors to, blindly and independently, complete an HCR-20 on 35 forensic psychiatric patients. They reported that the intraclass correlation coefficient (ICC) for both the HCR-20 actuarial total risk score (ICC = .94) and the HCR-20 SPJ risk rating (ICC = .81), was excellent according to the thresholds outline by Fleiss et al. (1981). Similarly, De Vogel et al. (2004b) asked three assessors to complete HCR-20 assessments on 30 forensic patients and found that their final HCR-20 risk judgements demonstrated good inter-rater reliability (ICC = .73). In a review of many studies examining the HCR-20, Douglas et al. (2005) reported that the HCR-20 demonstrated consistently good to excellent inter-rater reliability coefficients. Overall, there is a wealth of literature that has consistently reported that the HCR-20 facilitates a consistent understanding of risk between independent assessors.

Palatability

Whilst it is necessary for risk assessment procedures to demonstrate good predictive validity and reliability, these qualities alone do not make them sufficient for clinical practice. Risk assessment procedures also need to be useable within the context they are employed. Despite the fact the HCR-20 is one of the most widely used violence risk assessment tools in the world (Douglas & Reeves, 2010), limited

research has investigated its palatability amongst clinicians. Khiroya et al. (2009) contacted 47 medium secure forensic units in England and provided them with a questionnaire that assessed which violence risk assessment instruments were used, along with their perceived utility. Khiroya et al. (2009) received responses from 29 of the 47 units (62%) and found that the HCR-20 was implemented by most units, and that it scored highly on perceived clinical utility relative to many other actuarial instruments. Clinicians reported that the HCR-20 had great utility in its ability to help the clinician develop management plans and highlighted that it promoted transparency and created a shared language for describing and communicating risk.

However, Beazley et al. (2017) reviewed some of the key barriers and implementation issues amongst clinicians using the HCR-20. They noted that the amount of time it takes to complete the HCR-20 assessment was often a major barrier to successful implementation. Whilst the amount of time it takes to complete an HCR-20 assessment can vary considerably (from two hours to three days, depending on the volume of background information available), it is considerably longer than other risk assessment procedures (e.g., unstructured clinical judgement and actuarial tools). Given the high workload and intense time pressures present in forensic settings, this is a source of frustration for many assessors (Beazley et al., 2017; Covernton et al., 2019). The time taken to complete a SPJ assessment is a major barrier to the palatability of SPJ schemes and this is an important consideration for all SPJ research and implementation efforts.

Further research from Covernton et al. (2019) illuminated the importance of high quality training procedures in the implementation of the HCR-20. Prior to the commencement of an HCR-20 training programme, Covernton et al. (2019) asked clinicians to rate whether the HCR-20 was useful, whether it impacted risk management and whether it was easy to complete. Prior to any training, clinicians generally reported being unsure as to whether the HCR-20 was useful, whether it was easy to complete and whether it had any impact on managing risk. However, after the training programme, there was a large increase in clinicians' perceptions of the HCR-20's usefulness, ease of completion and impact upon risk management. Whilst the questionnaire used by Covernton et al. (2019) had no prior validation or testing, their findings reflect that bespoke and engaging training procedures are important in making SPJ schemes palatable for clinicians. Overall, there is a paucity of research

into the palatability of SPJ tools. The limited research suggests that clinicians find SPJs useful in their ability to assist in the development of safety plans and to create a transparency in the communication of risk. However, the time costs of SPJs are a major barrier to successful implementation. Training procedures are also important in improving the perceived efficacy of SPJs within clinicians.

Efficacy in Risk Reduction

Perhaps the most important consideration when evaluating SPJ schemes like the HCR-20, is their ability to successfully reduce instances of future risk behaviours. However, very few studies have investigated this. Jeandarme et al. (2017) evaluated the HCR-20 as it was administered as part of daily practice within three medium security units in Belgium. In their research, they compared the violent recidivism rates within a group of patients who received an HCR-20 assessment, with a group of patients who did not receive an HCR-20 assessment. They found no significant differences between these two groups, indicating that the HCR-20 did not lead to reductions in future violence (Jeandarme et al., 2017). Whilst the sample size for this study was impressive, (HCR-20 group: N = 205; no HCR-20 group: N = 326), the authors do not describe the process whereby participants were selected for HCR-20 assessments. Given that patients who represent a higher risk of future violence are often more likely to receive an HCR-20 assessment (Belfrage & Douglas, 2002), this was likely not a fair comparison. Random allocation into HCR-20 groups and no HCR-20 groups is required to assess the efficacy of the HCR-20's risk reduction abilities.

Vojt et al. (2013) assessed the number of violent incidents that occurred after administering an HCR-20 on 109 male mentally disordered offenders within a high security forensic hospital and compared this to rates of violence that had occurred in a similar cohort of patients from the same hospital a few years previously, prior to the hospital's implementation of the HCR-20. They found the prevalence of reconvictions and violent incidents were lower in the cohort of patients that had received an HCR-20 assessment, relative to the previously recorded rates, indicating that the HCR-20 was effective in reducing future violence. However, it is impossible to attribute the reduction in violence rates purely to the implementation of the HCR-20. Differences in the rates of future violence between the two cohorts may have been influenced by confounding factors such as the way future violence was

recorded, differences in the characteristics of the two cohorts of patients and differences in the staff and management styles within the hospital. Nonetheless, the reduction in violence within the cohort of patients that received an HCR-20 assessment supports the notion that the SPJ approach leads to effective risk reduction.

Troquete et al. (2013) conducted the only randomised control trial investigating whether a SPJ scheme could reduce violent recidivism. They evaluated the Short Term Assessment of Risk and Treatability (START), an SPJ intended to inform multiple risk domains relevant to everyday psychiatric clinical practice such as violence and harm to others. A randomised control trial was conducted in three out-patient forensic psychiatric clinics. In total, 310 patients received the START assessment and 322 patients received care as usual within the control group. Troquete et al. (2013) found no significant difference in the rates of future violent or criminal incidents between the START group and the control group, indicating that the START risk assessment did not lead to improvements in the prevention of violent and criminal behaviour compared to care as usual.

However, there were some important limitations within this study. Firstly, of the 310 participants in the intervention group, only 201 (64.8%) received the intervention as planned. Secondly, relative to the intervention group, significantly fewer participants in the control group agreed to take part in the follow-up interview, resulting in less opportunity to identify criminal or violent acts within the control group. Therefore, whilst the authors found no evidence that the SPJ scheme led to decreased criminal and violent behaviour relative to a control group, it is unclear whether this was due to the methodological shortcomings of the study.

In summary, very few studies have investigated whether the SPJ approach can successfully reduce the occurrence of future risk behaviours. These studies have produced mixed findings and contain important methodological shortcomings. More high quality research is needed to determine whether SPJ assessments can successfully reduce future risk behaviours.

HCR-20: A Summary

Overall, the HCR-20 has consistently demonstrated a good to excellent ability to identify future violent behaviour in a range of settings and cultures. This, along

with the good to excellent rates of inter-rater reliability and its ability to create individualised risk management plans, has led to the HCR-20 becoming one of the most widely used risk assessments worldwide, with some authors referring to it as the "gold-standard" for violence risk assessment (Douglas & Reeves, 2010; Morrissey et al., 2013). The limited research into the palatability of the HCR-20 indicates that clinicians benefit from the way the HCR-20 creates transparency in the communication of risk and facilitates the development of individualised safety plans, however the time costs of SPJs are a significant obstacle. Further high quality studies are needed to establish whether the HCR-20 can effectively decrease future violence over the long-term.

Does the SPJ Approach Offer a Solution to the Challenges Facing Suicide Risk Assessment?

Reflecting on the current challenges with suicide risk assessments and the success of SPJ tools such as the HCR-20, it is important to consider whether the SPJ approach can overcome some of the key challenges in the field of suicide risk assessment. This section reflects on whether the SPJ approach represents a promising approach to suicide risk assessment.

Firstly, the SPJ approach can help overcome the problems of inconsistency and subjectivity associated with unstructured clinical judgement. The way in which the SPJ assessment provides a structure for clinicians to process, organise and combine key risk factors, ensures that there is some consistency in the way different assessors evaluate risk. This is reflected by the improved inter-rater reliability in the risk judgements made after SPJ assessments (Douglas et al., 2005) relative to risk judgements made after unstructured clinical judgement (Paterson et al., 2008). The use of SPJs in suicide risk assessment is likely to reduce the subjectivity and improve the consistency in clinicians' judgements of suicide risk.

Secondly, the SPJ approach to risk assessment ensures that the development of an individualised care plan is the main priority of the assessment process. Evaluations of the currently used suicide risk assessments have highlighted the need to produce and develop effective care and prevention plans which are clearly communicated to the patient (Graney et al., 2020). Actuarial tools offer limited help in understanding the causal aspects of risk, which can subsequently hinder the

development of risk prevention and care plans (Lamont & Brunero, 2009). The SPJ approach represents a way of making sure that individualised care plans are produced at the end of every risk assessment. Additionally, the SPJ approach allows for a more flexible and in-depth assessment of many risk factors. Whilst many actuarial approaches must condense complex and nuanced information into a binary (present or absent) format, the SPJ approach asks clinicians to reflect on both the *presence* of risk factors and the *relevance* of the risk factors to the individual's risk. This enables clinicians to build a complete understanding of an individual's risk which can inform the development of an individualised care plan.

Thirdly, SPJ schemes have demonstrated a good to excellent ability to identify future risk behaviours. Whilst accurate prediction of future risk is not the overarching point of suicide risk assessment, high levels of predictive ability often reflect a comprehensive, in-depth understanding of an individual's risk. The risk judgements made by clinicians using SPJ schemes have previously demonstrated an ability to identify future risk behaviour that is equivalent or even slightly better than the best actuarial tools in existence (Neves et al., 2011; Hart et al., 2016; Gray et al., 2021). Overall, the predictive accuracy of SPJ schemes in other fields, indicate that they can foster a comprehensive understanding of future risk.

Finally, one of the major problems associated with current suicide risk assessment procedures is the lack of consensus between many of the different procedures in place. With many patients and staff moving between different services, the different tools, procedures, training and language used can be a major source of confusion and miscommunication (Graney et al., 2020). Over the past 20 years, the SPJ scheme known as the HCR-20 has become the most widely used violence risk assessment scheme worldwide and had been recognised as the gold-standard approach in the field (Douglas & Reeves, 2010; Morrissey et al., 2013). Research into the palatability of the HCR-20 has outlined how clinicians have benefitted from the shared philosophy, language and understanding of risk provided by the HCR-20 (Khiroya et al., 2009). The shared conceptualisation of risk has helped the way patient's risks are communicated between different people involved in the patient's care (Khiroya et al., 2009). Given that the HCR-20 has promoted transparency and created a shared conceptualisation of risk in the field of violence risk assessment, it is possible that the SPJ approach could provide similar benefits within the field of

suicide risk assessment. In summary, the improved reliability of risk evaluations, the depth of information they capture and their ability to facilitate individualised care plans, all indicate that the SPJ approach represents a promising way of overcoming the difficulties experienced in current suicide risk assessment processes.

Structured Professional Judgement for Suicide Risk Assessment

Whilst SPJ approaches to risk assessment are well-established in other fields, there is no well-established, widely employed SPJ tool specifically for suicide risk assessment (Ijaz et al., 2009). To this author's knowledge, there are two SPJ schemes that have been developed specifically for the purpose of suicide risk assessment: The Suicide Risk Assessment and Management Manual (S-RAMM; Bouch & Marshall, 2003) and the Risk of Suicide Protocol (RoSP; Snowden & Gray., 2022). These two SPJ schemes are discussed and reviewed below.

Suicide Risk Assessment and Management Manual (S-RAMM)

The S-RAMM is a SPJ scheme designed to assess the risk of suicide (Bouch & Marshall, 2003). The S-RAMM consists of 22 risk factors divided into three categories: Background (B), Current (C) and Future (F). Table 2.3 displays the sub scales and risk factors for the S-RAMM.

Table 2.3

Items and Structure of the S-RAMM

Item	Description
Background 1	History of deliberate self-harm
Background 2	Seriousness of previous attempts
Background 3	Previous hospitalisation
Background 4	Mental disorder
Background 5	Substance abuse
Background 6	Personality
Background 7	Childhood adversity
Background 8	Suicide in family
Background 9	Age, gender, marital status

Current Clinical 1	Suicidal ideation
Current Clinical 2	Hopelessness
Current Clinical 3	Psychological symptoms
Current Clinical 4	Treatment adherence
Current Clinical 5	Substance use
Current Clinical 6	Psychiatric admission
Current Clinical 7	Psychosocial stress
Current Clinical 8	Problem solving deficits
Future 1	Access to preferred means
Future 2	Future service contact
Future 3	Future response to drug treatment
Future 4	Future response to psychosocial treatment
Future 5	Future stress

Ijaz et al. (2009) first investigated the inter-rater reliability of the S-RAMM. Two independent researchers jointly interviewed 25 current in-patients within a psychiatric hospital. Both researchers were trained in the use of the S-RAMM by two qualified S-RAMM trainers. Each researcher completed an S-RAMM assessment for each patient and Cohen's Kappa was calculated for the researcher's ratings for each of the 22 risk items and the final risk judgement. They reported that the inter-rater reliability was acceptable (>.5) for all risk items apart from "current treatment adherence" (.28), "psychosocial stress" (.37) and "future response to psychological treatment" (.34). Inter-rater reliability for the overall risk judgement made by the two researchers was acceptable (.53). Whilst a Cohen's Kappa of 0.53 is regarded as "moderate reliability" (McHugh, 2012) and the authors claimed that the S-RAMM demonstrated "better than minimum" characteristics for use as a clinical tool (Ijaz et al., 2009), it should be acknowledged that this rate of inter-rater reliability is smaller than those typically demonstrated in HCR-20 research (Douglas et al., 2005) and less than ideal for a structured assessment tool designed to bring more consistency to the process of suicide risk assessment. Whilst some degree of between-clinician variance is inevitable, higher rates of inter-rater reliability are crucial to ensure that the

perception and treatment of the same patient does not differ greatly between different clinicians.

Further research has attempted to prospectively validate the S-RAMM. Fagan et al. (2009) asked two clinicians to carry out S-RAMM assessments on 81 in-patients within a psychiatric hospital. Any recorded instance of self-harm or attempted suicide over the six month follow-up period served as the outcome measure. Fagan et al. (2009) examined whether the S-RAMM could predict future self-harm or attempted suicide better than random chance. Importantly, the clinicians used the total risk score of the S-RAMM rather than a global judgement of risk to predict future instances of self-harm or attempted suicide. This involved summing up the individual scores (0 – 2) on each of the 22 subscales to arrive at a total score ranging from 0 – 44, rather than asking the clinician to make a global judgement of risk at the end of the SPJ process. Therefore, this study is more of an evaluation of the S-RAMM used as an actuarial tool, rather than as a SPJ.

Fagan et al. (2009) found that the S-RAMM performed better than chance at predicting future self-harm and attempted suicide (p = .02), with 67% sensitivity, 83% specificity and an AUC value of 0.90. Whilst an AUC of 0.90 is within the outstanding range (Mandrekar, 2010), it should be noted that only three out of the 81 participants engaged in self-harm behaviour, which resulted in a very wide 95% confidence interval (0.80 – 0.99). Future research in larger samples with more instances of self-harm and attempted suicide are required to further determine whether the S-RAMM can accurately identify future self-harm and attempted suicide. Nevertheless, these findings do indicate that the S-RAMM, when used as an actuarial tool, demonstrated excellent to outstanding ability to identify future self-harm within a small sample of psychiatric in-patients. This evidence provides initial validation of the S-RAMM, supporting its use as a clinical aid to self-harm and suicide risk assessment.

Abidin et al. (2013) conducted a prospective cohort study investigating the ability of the S-RAMM to identify future self-harm and attempted suicide within a psychiatric hospital. The S-RAMM was completed by an advanced nurse practitioner on 98 patients. Abidin et al. (2013) recorded whether patients engaged in self-harm or attempted suicide over a six month period. The S-RAMM total score was

significantly better than chance at identifying future incidents of self-harm or attempted suicide (p = .01, AUC = 0.81, 95% CI = 0.73 – 0.91). However, only seven out of the 98 patients engaged in self-harm or attempted suicide over the six month period, which meant that the ability of the S-RAMM to identify future self-harm or attempted suicide had very wide 95% confidence interval, ranging from "acceptable" (AUC = 0.73) to "outstanding" (AUC = 0.91).

SanSegundo et al. (2018) also investigated the predictive validity of the S-RAMM in an 18 month prospective cohort design. They asked clinicians to assess 51 mentally disordered, violent offenders within a forensic psychiatric hospital in Spain. Hospital staff monitored and recorded occurrences of suicide attempts over a period of 18 months, which served as the outcome measure. SanSegundo et al. (2018) reported that the S-RAMM total score demonstrated good to excellent predictive validity for future suicide attempts (AUC = 0.84, 95% CI = 0.74 – 0.93). Once again, the small number of patients that attempted suicide (N = 6) meant that the 95% confidence interval had a wide range between "acceptable" (AUC = 0.74) and "outstanding" (AUC = 0.93). Similar to Fagan et al. (2009), both Abidin et al. (2013) and SanSegundo et al. (2018) investigated the S-RAMM used as an actuarial tool rather than a SPJ scheme, with the total risk score being used to predict future risk rather than a clinical judgement of risk at the end of the SPJ process. The results from both studies are similar to those reported by Fagan et al. (2009) and highlight that the S-RAMM, when used as an actuarial tool, demonstrates an acceptable to outstanding ability to identify future self-harm and attempted suicide, providing support for the use of the S-RAMM to guide clinicians through the suicide risk assessment and management process.

S-RAMM Summary

Overall, the S-RAMM has demonstrated acceptable inter-rater reliability and good predictive validity, suggesting it is a useful tool to guide clinicians through the assessment of suicide risk. Several prospective cohort studies with small (N = 50) to medium (N = 98) sample sizes have consistently reported that the S-RAMM demonstrates a good ability to identify future self-harm or attempted suicide. However, it is important to be aware of some limitations.

Firstly, it should be acknowledged that most investigations into the S-RAMM (SanSegundo et al., 2018; Abidin et al., 2013; Fagan et al., 2009) only report the predictive validity of the total risk score from the 22 risk items, rather than the global risk judgement made by the clinician at the end of the assessment process. Given that the clinician's global judgement of risk at the end of the SPJ process, not the total risk score, is used to guide the individual's care plan, it is important that future research reports the predictive validity of the global risk judgement.

Secondly, each of the three studies investigating the predictive validity of the S-RAMM (Fagan et al., 2009; Abidin et al., 2013; SanSegundo et al., 2018) produced 95% confidence intervals much wider than those typically produced in prospective analyses of risk assessments (Steeg et al., 2018). Whilst the AUC values themselves indicated that the S-RAMM was excellent at identifying future self-harm and attempted suicide, the 95% confidence interval indicated that it generally ranged somewhere between "acceptable" (0.7 – 0.8) and "outstanding" (>0.9). Further research in large samples with higher rates of future self-harm and attempted suicide, are required to further determine the predictive accuracy of the S-RAMM.

Furthermore, S-RAMM research has predominantly focused on its use within psychiatric hospitals and it is unclear whether the S-RAMM would be a valid and reliable assessment scheme in other settings (e.g., emergency departments, prisons, community mental health settings). Additionally, some reports have outlined that the S-RAMM has not received wide acceptance in clinical practice since it's development in 2003 (Khadivi et al., 2008). This may be due to the time consuming nature of the assessment, the attention given to demographic and static risk factors such as age, gender, marital status and the rates of inter-rater reliability that are lower than equivalent SPJ schemes (Khadivi et al., 2008). Whilst initial research has suggested that the S-RAMM can identify future self-harm and attempted suicide better than chance, further research is required to establish whether the S-RAMM can be used in a variety of settings, whether it is a palatable tool for clinicians and whether it can successfully reduce instances of suicide and attempted suicide.

Risk of Suicide Protocol (RoSP)

The RoSP is a SPJ scheme designed to facilitate a detailed evaluation of suicide risk with the development of an associated individualised risk management

plan (Gray et al., 2021). The RoSP was designed to follow a similar structure to the HCR-20 for violence risk assessment and consists of 20 items that are divided into four categories: History, Current Clinical, Current Crisis and Current Thinking. Table 2.4 displays the sub scales and risk factors for the RoSP. The clinician is asked to evaluate each of these 20 items before creating a formulation that describes the individual's suicide risk and the factors moderating the risk. The clinician then constructs a safety plan that addresses the key drivers of the individual's risk and makes an overall judgement about the level of risk.

Table 2.4

Items and Structure of the RoSP

Item	Description
History 1	Past suicide attempts
History 2	Past non-suicidal self-injury (NSSI)
History 3	Past violent behaviour
History 4	History of major mental disorder
History 5	Membership of a high risk group
Current Clinical 1	Personality disorder
Current Clinical 2	Current depressive symptoms
Current Clinical 3	Substance use problems
Current Clinical 4	Other current symptoms of mental illness
Current Clinical 5	Poor treatment and management outcomes
Current Crisis 1	Recent loss of significant other
Current Crisis 2	Severe health problems
Current Crisis 3	Relationship problems
Current Crisis 4	Employment or financial problems
Current Crisis 5	Problems with the law
Current Thinking 1	Lack of personal support
Current Thinking 2	Feelings of hopelessness
Current Thinking 3	Feelings of anger and hostility
Current Thinking 4	Suicidal ideation
Current Thinking 5	Preparatory activity

Only two studies to date have evaluated the efficacy of the RoSP. Gray et al. (2021) examined the ability of the RoSP to distinguish between individuals who had died from suicide and individuals who had died from other causes. For this study, the authors accessed a database of individuals known to mental health services within an NHS Health Board who had died unexpectedly between March 2009 and March 2013. These individuals were divided into two groups depending on whether the coroner judged the person to have died from suicide (suicide group, N = 39) or whether they had died from natural causes or from an accidental death (non-suicide group, N = 29). Individuals within older adult services were excluded from the study due to their higher likelihood of dying from natural causes. Two assessors were trained in the RoSP by the authors of the RoSP manual. Each assessor then accessed the multidisciplinary mental health records available prior to each individual's death and completed RoSP assessments for all 68 individuals. The assessors provided both a total risk score for the RoSP as well as an overall SPJ risk judgement. Gray et al. (2021) reported that both the RoSP used as an actuarial scale ($p < .001$, AUC = 0.83, 95% CI = 0.73 – 0.93) and the RoSP used as an SPJ ($p < .001$, AUC = 0.80, 95% CI = 0.69 – 0.91) both demonstrated an excellent ability to differentiate between the suicide group and the non-suicide group. However, it should be acknowledged that this retrospective research design is more likely to experience problems with selection biases and missing information which can introduce bias into the findings (Talari & Goyal, 2020). It is also worth noting that the relatively small sample size resulted in broad 95% confidence intervals, which indicated that the RoSP's ability to predict future suicide ranged between the acceptable and outstanding range. Nevertheless, this initial study indicated that the RoSP is a valid way of identifying individuals at risk of suicide.

In the second study, Gray et al. (2021) used a prospective cohort design and asked two trained assessors to complete a RoSP assessment on 62 patients within a low-security psychiatric hospital that specialised in the treatment of personality disorders. The assessors completed the RoSP assessments based on a series of clinical interviews and a review of the patient's medical and psychiatric records. The patients were followed up for three months after their assessment, with instances of self-harm and attempted suicide serving as the two outcome variables. Ten patients were evaluated independently by two RoSP assessors to examine inter-rater

reliability. The RoSP demonstrated excellent inter-rater reliability, with the intraclass correlation coefficients (ICC) revealing good to excellent agreement between raters on the History (.96), Current Clinical (.93), Current Crisis (.79) and Current Thinking (.86) subscales and excellent agreement on the RoSP total score (.96) and overall SPJ judgement of risk (.93).

Gray et al. (2021) reported that both the RoSP used as an actuarial scale ($p < .01$, AUC = 0.73, 95% CI = 0.57 – 0.87) and the RoSP used as an SPJ ($p < .01$, AUC = 0.81, 95% CI = 0.69 - 0.93) had good to excellent ability to identify future self-harm behaviour. Gray et al. (2021) also reported that the RoSP, used as a SPJ, was excellent at predicting future suicide attempts ($p < .01$, AUC = 0.80, 95% CI = 0.69 – 0.91). However, the RoSP, used as an actuarial scale, was unable to predict future suicide attempts better than chance ($p > .05$, AUC = 0.60, 95% CI = 0.44 – 0.73). This study provides a first prospective validation of the RoSP's ability to identify future self-harm and suicide attempts and supports the use of the RoSP as a SPJ tool to guide clinicians through the suicide risk assessment and management process.

RoSP Summary

The evidence base for the RoSP is in its infancy, but the studies conducted so far, indicate that it is a valid and reliable method for the clinical evaluation of suicide risk within an inpatient psychiatric sample and a community mental health sample. The levels of inter-rater reliability and predictive validity reported in Gray et al. (2021) are similar to other well established SPJ schemes designed to assess and manage risk behaviours such as the HCR-20. However, only two small-scale studies have investigated the efficacy of the RoSP and more research is needed to establish whether it is a suitable instrument to guide clinicians through the suicide risk assessment process. Prospective research designs with larger sample sizes are needed to further establish the validity and reliability of the RoSP and research needs to be conducted in a variety of settings (e.g., emergency departments, prisons) to examine whether the RoSP is applicable to a range of services.

Comparing the S-RAMM and the RoSP

Whilst the S-RAMM and the RoSP are both SPJ approaches to suicide risk assessment with many overlapping features, there are a few critical differences between the two assessments. Firstly, the RoSP contains four subscales (History,

Current Clinical, Current Crisis and Current Thinking), whereas the S-RAMM has three subscales (Historical, Current and Future). However, whilst the subscale structure differs slightly, many of the core items within these subscales remain the same. Each approach asks the authors to consider previous self-harm and previous suicide attempts, past and current mental health difficulties, substance abuse, current suicidal ideation, hopelessness, membership to various high risk groups (e.g., childhood adversity or exposure to suicide), personality difficulties, treatment adherence or compliance and current suicidal planning or access to means.

One key difference between these two SPJ schemes is the amount of emphasis on static, demographic risk factors. Whilst the S-RAMM asks clinicians to consider items relating to demographic risk factors (e.g., age, gender, marital status), the authors of the RoSP intentionally omitted such items to focus on more dynamic risk factors that can be targeted and modified through treatment (Gray et al., 2021). The RoSP is less concerned with factors with high predictive validity and more focused on modifiable risk factors that clinicians can identify, treat and ameliorate in order to reduce the individual's risk of future suicide. One example of this is the risk factor of age. Whilst a great deal of epidemiological research has indicated that different age groups are associated with different levels of suicide risk (Merrill & Owens, 1990), it would be unfeasible for a clinician to suggest changing one's age to reduce their suicide risk. Whilst the omission of demographic risk factors may sacrifice the reliability and predictive validity of the RoSP, it encourages the clinician to focus only on factors that can be targeted to reduce suicide.

An additional difference between the S-RAMM and the RoSP concerns the amount of attention given to the individual's social circumstances. The S-RAMM has one item (Psychosocial Stress) that assesses the social circumstances of the individual, whereas the RoSP dedicates six items that considers an individual's physical health, romantic relationships, employment or financial situation, difficulties with the law, recent bereavements and levels of personal and social support. The authors of the RoSP manual included this added emphasis on social factors to ensure that the RoSP adhered to the recent NICE (2011) guidance standards. These standards recommend that, after an episode of self-harm, each individual should receive a psychosocial assessment that enquires about the

individual's physical health issues, social circumstances, personal relationships, financial problems and recent life difficulties (Snowden & Gray, 2022; NICE, 2011).

Another difference between the two schemes is that the RoSP includes items that consider an individual's history of violence (History 3) and their current feelings of anger and hostility (Current Thinking 3). The RoSP manual (Snowden & Gray, 2022) justifies the inclusion of the "History 3" item by citing research that found a history of violent behaviour was associated with a 5-fold increase in death from suicide (Conner et al., 2001), along with research that found aggressive and violent behaviour frequently preceded suicide attempts in psychiatric patients (Daffern et al., 2010). The manual also cites evidence demonstrating the strong association between current feelings of anger and suicide (Daniel et al., 2009; Sadeh et al., 2011) and between current feelings of hostility with suicide attempts (Brezo et al., 2006; Sadeh et al., 2011) to justify the inclusion of the "Current Thinking 3" item. After considering this research, the RoSP authors felt it was important that past violence and current anger and hostility were integrated into the risk formulation process (Snowden & Gray, 2022).

One further difference between the two assessments is that the S-RAMM contains items that explicitly ask the clinician to consider a range of future clinical factors (F1-F5), such as "future response to treatment" and "future stress". However, whilst a factor such as "future stress" is not an explicit item in the RoSP, the future stressors that an individual is likely to encounter will be considered when compiling the current range of social stressors (Current Crisis 1-5) in the risk formulation and scenario planning processes. Finally, the S-RAMM (22 items) contains more items than the RoSP (20 items), which is likely to be an important consideration when evaluating the palatability of these assessments for clinicians working in time-sensitive environments (Gray et al., 2021).

What Does the RoSP Add?

Given the overlap between the S-RAMM and the RoSP, it is important to question what the RoSP adds and how it might improve upon existing methods. Compared to the S-RAMM, the RoSP has demonstrated a clear improvement in rates of inter-rater reliability. As explored earlier, the S-RAMM has shown moderate levels of inter-rater reliability (Ijaz et al., 2009). These rates are lower than those

offered by other SPJ schemes (Douglas et al., 2005) and they fall short of the high rates of reliability required to bring some much-needed consistency to the process of suicide risk assessment. Conversely, the RoSP has demonstrated excellent inter-rater reliability (Gray et al., 2021). The improved rates of inter-rater reliability demonstrated by the RoSP could help improve the accuracy and consistency of suicide risk assessments by ensuring that different assessors come to the same conclusions based on the same information.

Furthermore, the RoSP has fewer items than the S-RAMM and is likely to be faster to complete. Considering that the time taken to complete a suicide risk assessment is a major source of negative feedback from clinicians (Graney et al., 2020), alongside claims that the S-RAMM has not received widespread acceptance in clinical practice (Khadivi et al., 2008), the shorter length of the RoSP may improve the acceptance of the SPJ approach to suicide risk assessment.

Finally, the RoSP is more closely aligned with the NICE (2011) guidelines compared to the S-RAMM. The RoSP (Snowden & Gray, 2022) was developed specifically to align with NICE (2011) guidelines, whereas the S-RAMM (Bouch & Marshall, 2003) was developed prior to the 2011 guidance. One consequence of this is the additional attention that the RoSP gives to an individual's social circumstances. As highlighted earlier, the S-RAMM only has one item related to the individual's social circumstances (Psychosocial Stress), whereas the RoSP contains six items (physical health, romantic relations, employment or financial situation, problems with the law, recent bereavement and personal and social support). The RoSP facilitates a more in-depth processing of an individual's social circumstances which can then inform risk management strategies. Overall, the RoSP may offer an improvement on the S-RAMM due to the superior inter-rater reliability, the faster completion times, and the closer alignment with NICE (2011) guidelines.

Current Research

So far, this chapter has reviewed current methods of suicide risk assessment in accident and emergency departments, explored the challenges facing current suicide risk assessment procedures, reviewed the effectiveness of the SPJ approach for the risk assessment of violent behaviour, outlined why the SPJ approach offers a promising way of overcoming the current difficulties with suicide risk assessment in

accident and emergency services and, reviewed and compared current SPJ schemes designed to assess the risk of suicide.

So far, no research to date has investigated the efficacy of an SPJ scheme used to assess suicide risk within an accident and emergency department. Therefore, this research investigated the efficacy of the RoSP in the assessment of suicide risk within an accident and emergency department. The RoSP was chosen ahead of the S-RAMM for a few reasons. Firstly, the RoSP was specifically designed to adhere closely to current NICE recommendations for the assessment, management and prevention of self-harm (NICE, 2011). NICE guidelines are evidenced-based recommendations about best health and care practices in the UK and it is essential that these are considered when developing procedures to be used by practicing clinicians within the NHS. Secondly, the risk judgements made using the RoSP have demonstrated excellent inter-rater reliability, whereas risk judgements made using the S-RAMM only demonstrated acceptable inter-rater reliability. High inter-rater reliability is essential in ensuring a consistent understanding of risk amongst different clinicians and eliminating the problems that arise from subjective conceptualisations of risk.

Furthermore, the RoSP is also likely to be more palatable for clinicians working in accident and emergency departments. Whilst very limited research has evaluated the palatability of the S-RAMM or the RoSP with clinicians, past papers have commented on the fact that the S-RAMM has not been widely accepted into clinical practice since it’s development in 2003 (Khadivi et al., 2008; Gray et al., 2021). The fact that the RoSP has fewer items and thus, should take less time to complete, may mean that it is a more suitable tool for the time pressured environment of accident and emergency services. Finally, this research was conducted in collaboration with the authors of the RoSP manual and a team of clinicians working in accident and emergency services, providing a unique opportunity to adapt and mould the RoSP to improve its palatability within that setting.

This research aimed to evaluate the efficacy of the RoSP in assessing the risk of suicide within an accident and emergency setting. This is the first prospective study of an SPJ scheme for suicide within accident and emergency services and the research intended to answer three core questions. Firstly, were risk judgements made

using the RoSP reliable? Secondly, were risk judgements made using the RoSP able to identify future suicide attempts more accurately than current assessment methods? Finally, was the RoSP assessment palatable for clinicians and patients?

Challenges in Suicide Research

Research in the field of suicide risk assessment faces several ethical and methodological challenges which have shaped the design of this research. The following section summarises the key difficulties associated with suicide risk assessment research and explores how it influenced this thesis.

Ethics

There are several important ethical considerations when conducting research with individuals at risk of suicide. This research project underwent a thorough review by the NHS research ethics committee and some of the key ethical considerations are outlined below.

One important concern was the balance between ensuring participant confidentiality and prioritising patient safety. Participant confidentiality refers to the protection of private, personal participant information that may be obtained during the research process, ensuring it is not shared beyond the confines of the research (Allen & Wiles, 2015). This is especially important in research relating to suicide, where researchers access sensitive, personal information that participants may not wish to share outside the research setting. However, should the participant disclose information that suggests they, or someone else, are in danger, it would seem unethical to withhold potentially lifesaving information. Considering this balance, this research ensured participant confidentiality was always maintained, except in circumstances where the participant disclosed information to the researcher that suggested their, or someone else's, life was in danger. In this scenario, the information was passed on to their local Home Treatment Team (HTT) who would contact the individual and enact the appropriate intervention. Participants were informed this was the confidentiality procedure prior to providing informed consent and all procedures were approved by the NHS research ethics committee.

Another important ethical consideration is ensuring that the research does not exert additional or unnecessary stress on the individual. Given the vulnerability of individuals who have recently engaged in self-harm or attempted suicide, their

wellbeing must be a key consideration throughout the research. One concern from the research ethics committee was the follow-up phone call with participants. The phone call aimed to identify whether participants had engaged in any self-harm or attempted suicide in the three months since their hospital assessment. Historically, ethical committees have been concerned that enquiring about suicidality may lead to increased suicidal tendencies (Omerov et al., 2013). Dazzi et al. (2014) conducted a review that examined whether enquiring about suicide resulted in increased suicidal ideation. They found that no published study had reported an increase in suicidal ideation in individuals who had been asked about suicidal thoughts or behaviours. In fact, Dazzi et al. (2014) reported that talking about suicide led to decreases in suicidal ideation and improvements in mental health. This evidence suggested the follow-up telephone call was unlikely to result in increased distress for the individual. Furthermore, the follow-up telephone call provided an opportunity to signpost individuals to helpful services, ensuring that individuals experiencing difficulties could access appropriate help. Participants were also free to end the telephone call at any point if they felt it was causing them distress. The NHS research ethics committee judged that the follow-up interview procedures were unlikely to cause participants distress and approved the interview procedure.

A final ethical consideration refers to the process of obtaining informed consent from participants. Informed consent is the process of informing a participant of all aspects of the research and asking for their permission to participate. It is a process that is required prior to any research involving human being as subjects for study (Nijhawan et al., 2013). One difficulty that can arise when conducting research on individuals that may be experiencing severe mental health difficulties is the issue of mental capacity. Capacity refers to the everyday ability that enables individuals to make decisions such as what to eat for lunch or whether to get vaccinated (Health Research Authority [HRA], 2020). A person lacks capacity if they cannot understand information relevant to the decision, retain the information, weigh up the information or communicate their decision (HRA, 2020). Individuals experiencing severe mental health difficulties may be more likely to lack capacity and it is important that they are not pressed into providing consent to a research process they do not fully understand. Therefore, after advice from the NHS research ethics committee, this research project included a short assessment of capacity prior to the consenting

process. The researcher assessed whether the individual could understand the information relevant to their involvement in the research, whether they could retain the information and whether they could weigh up the information and communicate it clearly. If an individual was unable to understand, retain and weigh up the information relevant to the research or communicate their decision, they were judged to lack capacity and were not consented into the research.

Outcome Measures

Much of the research attempting to validate suicide risk assessment procedures, typically measures whether risk judgements made after the risk assessment process can predict future self-harm or attempted suicide (the outcome measure). However, the process of measuring whether an individual engaged in self-harm or attempted suicide can be challenging. Research has used a variety of methods to try and accurately measure future self-harm or attempted suicide, each of which have their advantages and disadvantages.

One popular method for obtaining the outcome measure is recording hospital attendance for self-harm (Cooper et al., 2007; Nock et al., 2010). This involves reading through an individual's health records at a particular hospital and seeing if they have attended hospital for any reasons relating to self-harm. One advantage to this approach is that the researchers can be fairly certain in the classification of self-harm or attempted suicide. It does not rely on the memory, honesty, or perception of the participant. Instead, a researcher can read the hospital records and decide whether the described behaviour meets the definition of self-harm or attempted suicide (Nock et al., 2010). Furthermore, the act of hospital attendance for self-harm or attempted suicide is also commonly used as an outcome measure because it is arguably the most important risk factor for future suicide (Chan et al., 2016; Cooper et al., 2006), and because of its large impact on hospital resource use (Murphy et al., 2010). A disadvantage of this approach is that it fails to capture self-harm behaviours that does not result in hospital attendance. There is evidence that the majority of self-harm behaviours do not involve hospital attendance (Jollant et al., 2020; Hawton et al., 2009). Even with suicide attempts, it is estimated that only one-third of non-fatal suicide attempts receive medical attention (Grunbaum et al., 2004). Additionally, given that most records are not shared between hospitals, this method will miss the occurrence of self-harm or attempted suicide that occurs at different hospitals.

Another frequently used outcome measure is self-report, with many studies employing a follow-up interview in which participants are asked questions about whether they have engaged in any self-harm or attempted suicide (Nock & Banaji, 2007; Dickstein et al., 2015). Interview procedures such as the Self-Injurious Thoughts and Behaviours Interview (SITBI: Nock et al., 2007) are commonly employed to measure whether participants engaged in self-harm or attempted suicide. One advantage of this approach is that it can capture self-harm behaviours that occur outside the hospital setting. However, this method relies entirely on the patient's self-report and is vulnerable to participants lying about, misremembering or misinterpreting recent instances of self-harm or attempted suicide. Participants may be motivated to hide instances of self-harm to avoid intervention efforts (Blanchard & Farber, 2018), may give false accounts of self-harm behaviours to elicit additional care (Rumschik & Appel, 2019), or may lack insight into their previous behaviours (Nock et al., 2010). Another difficulty with follow-up interviews is the high levels of attrition, with most research reporting a follow-up rate of about 60% (Tello et al., 2019; Vaiva et al., 2006). Whilst this method can capture self-harm behaviours that occur without hospital attendance, it is vulnerable to the biases associated with self-report measures along with high rates of attrition.

For research concerned with suicide as the outcome measure, a common method used is the coroner's report (Brown et al., 2000). Some projects access national, centralised databases that records the cause of death for all individuals (Brown et al., 2000). Researchers can examine whether individuals in their original study were registered as having died from suicide (as described by the coroner's report) within this centralised database. The degree of thoroughness behind the coroner's inquest (Gunnell et al., 2012) means the researchers can be almost entirely certain that a coroner's verdict of suicide, meant the individual died from suicide. However, this measure can only be used to record deaths from suicide and does not record suicide attempts or self-harm behaviours. Furthermore, it has also been reported that coroners sometimes misclassify death from suicide as death by "misadventure" or "accident" (Gunnell et al., 2012). Additionally, it can take months or even years for a coroner's inquest to be conducted and recorded within the centralised database (Gunnell et al., 2012), making it an unsuitable method for research conducted within a tight time frame.

One way of overcoming the various shortcomings of the different approaches, is to combine them. For example, Nock et al. (2010) conducted a six month follow-up of suicide attempts and used both a follow-up interview and an examination of the hospital medical records for each participant. They considered a suicide attempt to have taken place if either the follow-up interview, or the examination of hospital records showed evidence of a suicide attempt. This combination of approaches helps researchers maximise their chances of capturing suicide attempts that occurred with or without hospital attendance. Individuals that do not attend the follow-up interview are still followed up via their hospital records and individuals that attempt suicide without hospital attendance are able to disclose this in the follow-up telephone call. This research also employed a combination of hospital record and self-report approaches to increase the likelihood of capturing any self-harm and attempted suicide that occurred during the follow-up period.

Types of Self-Harming Behaviour

It is also very important to consider the exact type of self-harming behaviour that is used as the outcome measure. Research into the efficacy of suicide risk assessment or prediction instruments have employed outcome measures such as death from suicide (Brown et al., 2000), attempted suicide (Nock et al., 2010), suicidal gestures (Nock et al., 2007), self-harm (Steeg et al., 2018) and suicidal thoughts (Ellis et al., 2015). These outcome measures all differ in the frequency at which they occur and the extent to which they endanger life. It is therefore important for researchers to reflect on what exactly the risk assessment process is trying to identify and prevent, before choosing the outcome measure.

With regards to this research examining the RoSP, having death from suicide as the outcome measure would be too narrow. Death from suicide is a very rare event, which means that a prospective research design using death from suicide as an outcome measure would be severely underpowered. Furthermore, considering the profoundly negative physical and psychological impact that a non-fatal suicide attempt can have on an individual and their loved ones, along with the significant impact on health care services (Centre for Disease Control and Prevention, 2021), most suicide risk assessment procedures aim to identify and prevent all suicidal behaviour, rather than just death from suicide. Additionally, the difference between death from suicide and a non-fatal suicide attempt can often depend on chance

factors, such as whether the individual is found in time, or how long it takes the ambulance to arrive. Through being able to identify and prevent all attempted suicides, one would be able to prevent all suicides. Therefore, it makes sense to include all attempted suicides within the outcome measure.

Conversely, using suicidal thoughts as an outcome measure would be too broad. Suicidal thoughts are relatively common within the general population, with studies investigating the one-year prevalence of suicidal ideation reporting that rates vary between 8 to 19% (Renberg, 2001; Casey et al., 2008). Additionally, suicidal thoughts in and of themselves, are not necessarily dangerous, given that the majority of individuals who experience suicidal thoughts do not attempt suicide (Klonsky & May, 2013). Therefore, the RoSP manual outlines that the aim of the RoSP is to identify and prevent the occurrence of suicide and attempted suicide (Snowden & Gray, 2022). Given that the objective of the RoSP is to identify and prevent future suicide and attempted suicide, it follows that suicide attempts were the main outcome variable for this research.

However, it can be difficult to make a clear distinction between a suicide attempt and other non-suicidal self-harm behaviours. The first difficulty lies with the continuous scale of suicidal intent. The distinction between suicide attempts and non-suicidal self-harm lies in whether there is an intention to die from the act of self-harm. However, intention to die is more of a continuous variable than a dichotomous one. For example, an individual may take an overdose of medication and feel indifferent as to whether they die. There is a sliding scale of suicidal intent and the point at which an act of self-harm becomes a suicide attempt is often not obvious.

Secondly, determining the degree of suicidal intent behind an act of self-harm is challenging because it relies heavily on the individual's self-reported mental state prior to the behaviour. As outlined previously, after a non-fatal suicide attempt, individuals may be motivated to conceal suicidal intentions (Blanchard & Farber, 2018), because they feel ashamed (Blanchard & Farber, 2018) or because they believe they would be stigmatised for revealing such thoughts (Frey et al., 2018). Equally, some individuals may inflate the extent to which they intended to die in order to elicit additional care (Rumschik & Appel, 2019) and individuals that engaged in impulsive acts of self-harm, may not have truly considered whether they

intended to end their life (Kim et al., 2015). As a result, clinicians struggle to ascertain the degree of intent behind self-harming behaviours, making it difficult to distinguish between suicide attempts and non-suicidal self-harm.

A third difficulty with distinguishing between suicide attempts and other acts of self-harm, is that the degree of intent behind the act of self-harm, is often unrelated to how lethal the behaviour is. This can create situations where some instances of self-harm are more life-threatening than some suicide attempts. For example, an individual who severely lacerates their arm and loses a large amount of blood, as an act of non-suicidal self-harm, is in more danger than an individual who takes a small, non-lethal overdose of medication in an attempt to end their life. Whilst one would typically expect suicide attempts to have a higher degree of lethality than acts of non-suicidal self-harm, this is not always the case. Indeed, Gjelsvik et al. (2016) found no association between the degree of suicidal intent and degree of lethality behind acts of self-harm and concluded that they should be considered as separate dimensions. Therefore, if one was to only use suicide attempts as an outcome measure, instances such as the potentially lethal self-inflicted laceration described above, would not be included.

Overall, it is difficult for clinicians or researchers to distinguish between attempted suicide and other self-harm behaviours. Due to the blurred lines between the various types of self-harm, this research attempted to break down self-harm into three constructs that delineated the key aspects of self-harming behaviours. This research separately judged (1) the intention behind the self-harming behaviour (i.e., whether it was a suicide attempt), (2) the actual level of harm sustained from the self-harming behaviour and, (3) the potential level of harm that could have been sustained from the self-harming behaviour, for each incident of self-harm. This created three key outcome variables for the RoSP: Suicidal Intent, Actual Harm and Potential Harm.

Suicidal Intent examined whether the individual possessed any intent to die during the act of self-harm. Actual Harm measured whether the individual experienced major physical harm from the act of self-harm. Potential Harm examined the potential level of harm the individual could have sustained from their act of self-harm, in a realistic worst case scenario (e.g., if someone did not find them

and call an ambulance). Each of these outcome measures captured a different aspect of self-harming behaviour that most risk assessments would broadly seek to prevent. These three outcome measures allowed the research to examine the degree to which the RoSP could identify (1) individuals who self-harmed with any intent to end their life (also referred to as a suicide attempt), (2) individuals who incurred major physical harm as a result of self-harm and, (3) individuals who engaged in self-harm that could have resulted in major harm. Details on the coding of self-harming behaviours are described in more depth in chapter 3.

Interference of Risk Management

Another key consideration with research investigating suicide risk assessment procedures is the role of risk management. To validate various suicide risk assessment procedures, studies often investigate whether a risk assessment instrument can accurately identify future instances of self-harm or attempted suicide. However, most risk assessments do not simply predict the risk of suicide and wait to see if the predictions are correct. Instead, they use their understanding of the risk to try and reduce the chances of future suicide. In this scenario, often the individuals with higher perceived risk of suicide receive the highest level of prevention strategies (e.g., inpatient admission) and individuals with lower perceived risk receive less intense prevention strategies (e.g., community-based counselling). Therefore, the role of risk management systematically biases the research such that higher risk individuals receive more severe interventions. Whilst the need to ensure the safety of all individuals involved in the research makes this unavoidable, it is important to consider that this may cause underestimations of the ability of risk assessment procedures to accurately identify future suicide.

Kapur et al. (2005) acknowledged that risk assessments often impact risk management but argued that it was unlikely to have a profound influence on the measurement of predictive validity. This is partly because very few individuals receive specialist follow-up treatment after instances of self-harm in accident and emergency departments (Hawton et al., 1998) and because the efficacy of even the most intensive interventions is quite small (Kapur et al., 2003). However, Kapur et al. (2005) was referring to risk management that followed unstructured clinical judgement, whereas this research is investigating the SPJ approach. The SPJ approach is designed to facilitate the development of effective, individualised

intervention strategies which could result in more effective risk prevention strategies. Therefore, when interpreting the findings from this research, one should be aware that risk reduction strategies may cause an underestimation of the predictive validity of the RoSP.

Do Risk Assessments Actually Decrease Future Suicide?

Another challenging aspect of research into suicide risk assessment is how to measure whether suicide risk assessment procedures fulfil their primary purpose in *preventing* suicide. Typically, research attempting to validate suicide risk assessment procedures investigate the reliability and validity of the assessment. However, there has been a paucity of research investigating whether risk assessment procedures are effective in reducing the occurrence of future suicide and suicide attempts. To properly examine whether a suicide risk assessment procedure (such as the RoSP) could effectively lead to reductions in suicide and attempted suicide, a randomised control trial (RCT) would need to be conducted. This would involve half of the participants being randomly assigned to a RoSP risk assessment pathway and half being assigned to an assessment as usual control risk assessment pathway. The two groups would be followed up in order to ascertain whether there were fewer instances of attempted suicide in the RoSP group, relative to the control group.

There are a few reasons why it is challenging to conduct this type of research. Firstly, there are ethical difficulties associated with assigning individuals to a control group and an experimental group when it comes to preventing suicide. There would be ethical concerns with regards to depriving half the participants access to a risk assessment pathway that was hypothesised to reduce the risk of future suicide. Secondly, conducting a large-scale randomised control trial in this area is very resource intensive and was beyond the scope of this PhD. Given these ethical and resource difficulties, this research focused on establishing the reliability, validity and palatability of the RoSP within an accident and emergency setting. Should the RoSP prove to be an effective tool in this setting, this may provide the foundation for future research to consider conducting a RCT investigating whether the RoSP is effective at reducing attempted suicide, relative to other assessment procedures.

Research Aims and Summary

This research aimed to evaluate the efficacy of the RoSP in assessing the risk of future suicide within a Psychiatric Liaison Team operating in an accident and emergency department. This research consisted of two major stages. The first stage aimed to evaluate the reliability and predictive validity of the RoSP. The reliability of the RoSP was measured by getting multiple trained RoSP assessors to independently complete a RoSP assessment on the same individual and calculating the inter-rater reliability for the different assessors' risk judgements. The predictive validity of the RoSP was measured by comparing the RoSP and assessment as usual in their ability to identify future suicide attempts over a three month period. Both the Psychiatric Liaison Team and the RoSP assessor were present during the hospital assessment and had access to the individual's hospital and mental health records. The Psychiatric Liaison Team staff member completed their assessment as usual and the RoSP assessor completed the RoSP, before both providing a global judgement of suicide risk. These risk judgements were then compared in their ability to identify future suicide attempts during the three month follow-up period.

The second stage of this research aimed to evaluate the validity, reliability and palatability of the RoSP as it was implemented within the Psychiatric Liaison Team. The Psychiatric Liaison Team were to be trained in using the RoSP, before then implementing it within their clinical practice. As the Psychiatric Liaison Team used the RoSP, this research aimed to examine the inter-rater reliability of the RoSP as multiple Psychiatric Liaison Team staff members completed independent RoSP assessments on the same patients. This research also aimed to examine whether the Psychiatric Liaison Team could use the RoSP to successfully identify future suicide attempts during a three month follow up. Finally, this research aimed to assess the palatability of the RoSP as it was implemented within the Psychiatric Liaison Team. This would have involved a series of qualitative interviews with both staff and patients that evaluated whether the RoSP was a palatable assessment procedure. This information could be used to ascertain whether the RoSP was a suitable tool for suicide risk assessment in accident and emergency settings and identify ways to improve its palatability within the service.

However, the COVID-19 pandemic and associated research restrictions meant that this hospital-based research was no longer possible. The research limiting

restrictions came into place in March 2020, prior to the second phase of the research. Therefore, only the first stage of research is reported within this thesis.

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Chapter 3: Examining the Efficacy of the Risk of Suicide Protocol in Accident and Emergency Services

Introduction

Suicide and attempted suicide are serious public health concerns. Approximately 800,000 people worldwide die from suicide every year (World Health Organisation [WHO], 2021) and for every death from suicide, there are between 64-175 suicide attempts (Blasco-Fontecilla et al., 2018). Both suicide and non-fatal suicide attempts have far-reaching negative influences on the health and wellbeing of the individual (Centre for Disease Control and Prevention [CDC], 2021; Chapman & Dixon-Gordon 2007), their family, friends and the wider community (Hill et al., 2020), health care services (CDC, 2021) and the economy (Knapp et al., 2011). Early identification and intervention for individuals at risk of suicide represents a crucial component of effective suicide prevention (WHO, 2021). The assessment of suicide risk is one of the most common and important practices carried out by mental health professionals across a variety of settings (Ijaz et al., 2009). However, many of the methods that are commonly employed to identify individuals at risk of suicide, have drawn criticism.

The unstructured clinical judgement approach to risk assessment, whereby judgements and decisions around the patient's safety are based solely on the discretion of the clinician, is one of the oldest and most frequently used methods of suicide risk assessment (Bouch & Marshall, 2005). However, as outlined in chapter 2, this approach relies too much upon the subjective, intuitive judgement of the clinician, which means that judgements from unstructured clinical assessments are often unreliable (Lamont & Brunero, 2009; Paterson et al., 2008) and sometimes reflect the characteristics of the assessor, more than the characteristics of the patient (Murphy et al., 2010). Furthermore, the well documented limits of human cognition (Faust 1984; Tversky & Kahneman, 1974), combined with the vast quantities of information involved in suicide risk assessments, mean that clinicians often struggle to process, organise and integrate all the relevant information into a coherent judgement of risk.

Past research has consistently demonstrated that unstructured clinical assessments of suicide risk have a limited ability to identify future self-harm and

suicide attempts (Kapur et al., 2005; Cooper et al., 2007; Murphy et al., 2010). Indeed, in their systematic review of unstructured clinical judgements for suicide risk, Woodford et al. (2017) concluded that the clinical utility of a “high risk” prediction made during an unstructured clinical assessment, was poor and unsuitable for informing decisions around treatment and prevention. The unstructured clinical judgement approach has faced similar challenges in the assessment of other risk behaviours such as violence (Grove et al., 2000) and multiple authors and advisory panels have concluded that the unstructured clinical approach to risk assessment should no longer be supported (Bouch & Marshall, 2005; Scottish Executive, 2000; Woodford et al., 2017).

Concerns around the unstructured clinical approach to risk assessment gave rise to the development of actuarial measures. Actuarial tools are a statistical method of predicting the occurrence of a future risk behaviour. They use fixed, explicit algorithms developed from previous data on risk factors, to estimate the likelihood of future risk behaviours (Hart et al., 2016). As outlined in chapter 2, the pre-determined structure of actuarial tools helps overcome the issues of subjectivity and poor reliability that are associated with unstructured clinical judgement and their algorithmic nature surmounts the difficulties that humans have in processing large volumes of information (Grove et al., 2000). Indeed, predictions made using actuarial tools such as the ReACT Self-Harm Rule (Steeg et al., 2012) and the Manchester Self-Harm Rule (Cooper et al., 2006), have demonstrated an improved ability to identify future self-harm and suicide attempts relative to unstructured clinical judgement (Steeg et al., 2018; Steeg et al., 2012; Cooper et al., 2006).

However, there are some misgivings with the use of actuarial measures for the risk assessment of suicide. Firstly, whilst some actuarial tools are better at identifying future suicide attempts compared to unstructured clinical judgement, their ability to identify future suicide attempts still falls short of the levels required to direct decisions around intervention strategies (Steeg et al., 2018). Secondly, the binary fashion in which actuarial tools record risk factors as present (1) or absent (0), overlooks much of the depth and nuance behind important risk factors. Consideration is only given to whether each risk factor (e.g., substance abuse) is *present*, and not whether it is *relevant* to the individual’s risk.

Finally, and most crucially, actuarial tools are limited in their ability to inform care and prevention plans. Actuarial measures are primarily concerned with quantifying suicide risk ahead of developing a causal understanding of the factors driving an individual's risk and using this to mitigate the risk of suicide (Bouch & Marshall, 2005). Given that the purpose of suicide risk assessment is to identify those at risk of suicide and intervene, risk predictions that do not inform prevention procedures are of limited utility. For these reasons, it is widely considered that actuarial tools on their own, are not suitable to guide and determine future treatment and prevention strategies for suicide (Chan et al., 2016; Mulder et al., 2016). Indeed, NICE guidance standards explicitly recommends against the use of actuarial assessment tools to predict future self-harm or suicide and stipulate that they should not be used to determine future treatment or discharge (NICE, 2004; NICE, 2011).

The structured professional judgement (SPJ) approach to risk assessment arose in an effort to bridge the gap between unstructured clinical judgement and actuarial measures (O'Shea, 2016). SPJs are designed to systematically guide clinicians through the key, evidence-based risk factors associated with the risk behaviour and assist them in the production of both a clinical formulation of the individual, their risks and an individualised management plan designed to ameliorate their risks (Gray et al., 2021). They retain both the structure and consistency of actuarial methods and the flexible, idiographic nature of unstructured clinical judgement, whilst ensuring focus is placed on risk management and prevention ahead of risk prediction (Doyle & Dolan, 2002). SPJ schemes have demonstrated excellent reliability and good predictive validity within the fields of violence (Douglas et al., 2005) and sexual offending (De Vogel et al., 2004a). Over the past 20 years SPJ schemes such as the HCR-20 (Webster et al., 1997), used to assess the risk of violence, have become widely implemented risk assessments worldwide and are regarded by many as the "gold-standard" method of risk assessment within their fields (Morrissey et al., 2013).

Despite the widespread use of SPJs in other fields, the SPJ approach is not commonly used in suicide risk assessment (Khadivi et al., 2008). There has been one previous attempt to develop an SPJ tool designed for the assessment of suicide risk: the Suicide Risk Assessment and Management Manual (S-RAMM; Bouch & Marshall, 2005). However, despite previously demonstrating adequate inter-rater

reliability (Ijaz et al., 2009) and a good ability to prospectively predict self-harm events (Fagan et al., 2009), the S-RAMM has not received widespread clinical acceptance (Khadivi et al., 2008; Gray et al., 2021). A full review and comparison of the S-RAMM and the RoSP is presented in chapter 2.

The Risk of Suicide Protocol (RoSP; Snowden & Gray, 2022) is a recently developed SPJ scheme for the assessment and prevention of suicide and suicide attempts. The RoSP guides the clinician through 20 risk factors associated with suicide and attempted suicide that are divided into four categories: Historical, Current Clinical, Current Crisis and Current Thinking. The clinician evaluates the presence and relevance of each of these 20 items, before creating a formulation that describes the individual's risk of suicide and the important factors moderating the risk. The clinician then makes an overall judgement about the level of risk and constructs a safety plan that addresses the key factors driving the individual's risk. The RoSP was designed to provide an assessment structure that was consistent with NICE (2004) guidelines that state:

> All people who have self-harmed should be offered an assessment of needs, which should be comprehensive and include evaluation of the social, psychological and motivational factors specific to the act of self-harm, current suicidal intent and hopelessness, as well as a full mental health and social needs assessment (NICE, 2004, p. 6).

Initial validation studies reported that the RoSP could successfully discriminate between individuals who died from suicide and individuals who died from unexpected deaths in a retrospective study (Gray et al., 2021). The RoSP also demonstrated a good ability to prospectively predict future suicide attempts in patients within a forensic psychiatric hospital (Gray et al., 2021). In both investigations, the RoSP demonstrated excellent levels of inter-rater reliability (ICCs = .93 – .98), with independent assessors arriving at the same understanding of risk for the same patient. Whilst the evidence base for the RoSP is in its infancy, initial studies have indicated that the RoSP represents a valid and reliable method for suicide risk assessment and safety planning in accordance with NICE (2011) guidance standards.

To date, no study has investigated the efficacy of a SPJ suicide risk assessment procedure within an accident and emergency department. Accident and emergency departments represent a crucial setting for the early identification and prevention of suicide. Owens et al. (2002) reported that, within the UK, approximately one in 50 patients who attended hospital after an incident of self-harm, died from suicide within one year. Furthermore, in a review of 286 deaths from suicide in Northwest England, Da Cruz et al. (2010) reported that 43% of individuals who died from suicide had attended accident and emergency services in the year prior to their death. In NHS hospitals across the UK, individuals who attend accident and emergency services after any self-harming behaviours, suicidal thoughts or requests for psychiatric help, are referred to the on-site Psychiatric Liaison Team for an assessment (NHS, 2021). This study aimed to evaluate the efficacy of the RoSP when used in these Psychiatric Liaison Team assessments within an accident and emergency department.

This research attempted to provide an initial validation of the RoSP within an accident and emergency department. In a prospective design, this study aimed to (1) evaluate the inter-rater reliability of the RoSP and, (2) evaluate and compare both the RoSP and assessment as usual in their ability to identify future suicide attempts[2] over a three-month follow-up period.

Methods

Ethics

This study was given a favourable opinion by the NHS Research Ethics Committee on the 14th of March 2019 (REC reference: 19/WA/0002). All study procedures adhered to the protocol approved by the NHS Research Ethics Committee. After both the initial assessment with the Psychiatric Liaison Team and the follow-up telephone interview, all participants were provided with contact details for services available across Wales, that offered free, 24/7, confidential listening and

[2] For readability purposes, this chapter talks about analysing the ability to "identify future suicide attempts". However, more specifically, this research analyses the ability of the RoSP to identify (1) suicide attempts (defined as future self-harming behaviour with any intent to die), (2) future self-harming behaviour that resulted in major physical harm, and (3) future self-harming behaviour that had the potential to result in major physical harm. This is described in full within the Methods section.

support via the telephone, SMS messaging or e-mail, along with details of the NHS services they could use in moments of acute emotional or psychological distress. In circumstances where the participant disclosed any information to the researcher that indicated their life was in danger, this information was passed on to the participant's local Home Treatment Team who would contact the individual and enact the appropriate intervention.

Participants

Participants were adults that presented to the accident and emergency department of two large hospitals in Southeast Wales between May and September 2019, and were referred for an assessment with the Psychiatric Liaison Team. Any individuals who attended the hospital after any self-harming behaviours, suicidal thoughts or other urgent mental health difficulties were referred for an assessment with the on-site Psychiatric Liaison Team.

Participants were required to be aged 18 or over and needed to demonstrate the capacity to provide fully informed consent. Capacity was assessed by the researcher during the consenting process. Overall, 120 participants were approached to obtain informed consent, 13 of which were excluded from the analysis (a) because they were judged not to have the capacity to provide informed consent (N = 2), (b) because they did not provide informed consent (N = 10); or (c) because they later requested that their data be removed from the study (N = 1). Overall, 107 participants met the inclusion criteria, provided their informed consent and were included in the final analysis.

Power

A power analysis was conducted using MedCalc Statistical Software (2020). Assuming that (1) the accuracy of risk judgements made by the Psychiatric Liaison Team was similar to that reported in previous evaluations of unstructured clinical judgement of suicide risk (AUC = 0.60; Whiting & Fazel, 2019), (2) that the accuracy of risk judgements made using the RoSP was similar to the rates observed in Gray et al. (2021) (AUC = 0.80), (3) that one in five (20%) of participants would attempt suicide within the three-month follow-up period, (4) an alpha level of .05 and, (5) a power level of .80, this study would require a total of 102 participants in order to detect a difference in the accuracy of the judgements made using assessment

as usual and the RoSP. Therefore, the overall sample of 107 participants provided sufficient power for this analysis.

Materials

Capacity Assessment

All participants were assessed to ensure they had capacity to provide fully informed consent. The researcher did not approach participants until medical staff had declared them medically fit for discharge and ready for their assessment with the Psychiatric Liaison Team. Before the assessment, the researcher approached the participant and inquired whether they would be willing to participate in a research project being conducted in partnership with the Psychiatric Liaison Team. If they showed an interest in taking part, the researcher explained the nature of the study and provided an information sheet containing details about the research.

The participant was given time to review the information and then discussed it with the researcher. During the conversation, in accordance with the Mental Capacity Act (Health Research Authority, 2020) the researcher assessed whether the individual was able to understand the information relevant to the decision, retain that information, and use it to weigh up their options. If the participant demonstrated these qualities and wished to participate in the research, they were asked to provide their fully informed consent to take part in the research.

Demographics

All participants were provided with a short questionnaire that asked them to provide their name, contact details for the follow-up assessment along with their gender, age, ethnicity and occupation.

Assessment Interview

As part of typical clinical practice, all individuals who were referred to the Psychiatric Liaison Team, received an assessment interview. The assessment consisted of a 30-60 minute, semi-structured interview that enquired about the individual's perspective of their current problems, their mental health history, their use of alcohol and substances, their forensic history, their social circumstances, their history of self-harm, the presence of any suicidal thoughts or intentions, along with a mental state examination. All assessment interviews took place in a private hospital room. For each assessment interview, both the Psychiatric Liaison staff member and

the researcher were present, although the researcher was there in an observational capacity only. Typically, most assessment interviews were conducted without the presence of carers, friends or family members. Any friends, family members or individuals involved in the person's care were invited in at the end of the assessment, to discuss their perspective and communicate care plans.

Assessment as Usual

Assessment as usual refers to the process the Psychiatric Liaison Team used to assess the risk of suicide and guide future treatment and prevention strategies. The assessment as usual worksheet used to guide staff within the Aneurin Bevan University Health Board through the suicide risk assessment process is displayed in Appendix A. The assessment as usual worksheet asked staff to consider the reason for referral to Psychiatric Liaison services, the patient's perspective of their current problems, their mental health and self-harm history, their alcohol and substance use, their forensic history and their current mental state. The Psychiatric Liaison Team would typically read the patient's pre-existing hospital records, conduct the assessment interview and then collate the information obtained within their worksheet. After the Psychiatric Liaison Team staff had collated all relevant information within their worksheet and made their decision regarding the patient's risk and treatment plan, they were asked to provide a risk judgement (described below). This judgement was used to ascertain the predictive validity of the assessment as usual process.

RoSP

The RoSP is a SPJ scheme designed to facilitate effective risk assessment and safety planning for suicide (Gray et al., 2021). The RoSP asks the clinician to evaluate 20 risk items spread over four domains. The first domain, "History", evaluates the patient's past behaviour, including previous suicide attempts and non-suicidal self-injurious (NSSI) behaviours. The second domain, "Current Clinical" evaluates recently active clinical factors such as current symptoms of depression. The third domain, "Current Crisis", evaluates recent and current life-events such as the loss of others, physical health problems, legal or financial problems and the fourth domain, "Current Thinking" evaluates the individual's current thoughts and feelings, including their feelings of hopelessness and whether they are experiencing any suicidal thoughts or engaging in any preparatory suicidal behaviour. All 20 items

included in the RoSP assessment are displayed in chapter 2, Table 2.4. The Risk of Suicide Protocol assessment is also described in full within the RoSP Manual (Snowden & Gray, 2022).

The RoSP asks the clinician to consider whether each of these 20 risk-items are present and whether they are relevant to the individual's risk of suicide. For example, for the risk factor "Employment or financial problems", the clinician would not simply rate whether or not the individual was experiencing any employment or financial difficulties. Rather, they would build an understanding of the nature of the financial problems the individual was facing, their psychological and emotional reactions to these difficulties, how this problem was affecting their lives and consider whether it is a relevant factor for their risk of suicide. After considering each of the 20 individual factors, the RoSP asks clinicians to bring all the relevant factors together in a global formulation of the individual and their risk of future suicide. After writing the global formulation of risk, clinicians are asked to construct an individualised safety plan that targets the core factors driving the individual's suicide risk.

This study examined the predictive validity of both the RoSP used as an actuarial tool and the RoSP used as an SPJ. To examine the use of the RoSP as an actuarial tool, each of the 20 risk-items on the RoSP were rated as "present" (2), "partially present" (1) or "absent" (0). The scores of all 20 items were totalled up to form a score ranging from 0 – 40. If adequate information was not available for any risk item, it was rated as uncertain (?) and replaced with the mean score of the remaining items. If more than four of the 20 items from the RoSP were missing (>20%), the individual would have been excluded from this analysis, however no individual had more than four items missing from their RoSP. This score was used to calculate the predictive validity of the RoSP (actuarial). For the RoSP (SPJ), the researcher provided a risk judgement (described below) after they had completed their RoSP assessment. This risk judgement was used to calculate the predictive validity of the RoSP (SPJ).

Risk Judgement

The assessment of suicide risk in clinical settings often relies on the clinician's judgement of future risk after reviewing all relevant information (Kapur et

al., 2005). In this study, the clinician's prediction was assessed via the question: "*What is the likelihood that this individual will die as a result of self-harm over the next three months*". This question was rated on a 5 point Likert scale ranging from 1 (very unlikely) to 5 (very likely). Similar measures of clinician prediction have been implemented in previous studies and represent a valid and reliable method of ascertaining the clinician's current perception of suicide risk based on the available information (Nock et al., 2010).

Follow-Up Assessment

The presence of any self-harming behaviour during the three-month follow-up period was assessed using a combination of two methods: a telephone interview and an examination of the hospital records for each participant. Both methods are described below.

Self-Injurious Thoughts and Behaviours Interview

Information on the occurrence of any self-harming thoughts or behaviours over the three-month follow-up period was assessed using a modified version of the Self-Injurious Thoughts and Behaviours Interview (SITBI; Nock et al., 2007). The SITBI is a structured interview technique that assesses the presence, frequency and characteristics of a broad range of self-harming thoughts and behaviours (Nock et al., 2007). The SITBI has demonstrated strong inter-rater reliability and six-month test-retest reliability (Nock et al., 2007), as well as concurrent validity in American, Spanish and German samples (Fischer et al., 2014; Garcia-Nieto et al., 2013; Nock et al., 2007; Glenn et al., 2017). The SITBI, and shortened or modified versions of the SITBI, are commonly employed in studies attempting to follow up any self-harming thoughts or behaviours (Nock et al., 2010; Tello et al., 2019; Glenn et al., 2017; Harrison et al., 2018).

The SITBI was modified so that only questions relevant to the study aims were assessed, minimising the time disruption for participants. The modified version of the SITBI asked participants about the presence, frequency, recency and severity of any (1) suicide attempts ("*an actual attempt to kill yourself in which you had at least some intent to die*"), (2) nonsuicidal self-injurious behaviour ("*purposely hurting yourself without intending to die*"), (3) suicidal thoughts ("*thoughts of killing yourself"*), (4) nonsuicidal self-injurious thoughts ("*thoughts of hurting yourself*

without intending to die") and (5) suicidal plans ("*the formation of a plan to end one's life*"), during the three-month period since their initial assessment. The follow-up interview protocol and the list of questions asked in the interview are displayed in Appendix B.

Telephone contact with each participant was attempted a maximum of five times. If no successful contact was made with participants after this, no further follow-up was attempted. Prior to the commencement of the telephone interview, the researcher reminded participants of the study, checked they understood the purpose of the interview, confirmed that they were still happy to take part and informed participants of the safeguarding procedures in place. After the interview, participants were thanked for their time and provided details for services they could contact if they were experiencing any distress. The protocol for handling any distress over the telephone is displayed in Appendix C. A total of 61 of the 107 participants (57%) completed the follow-up telephone interview. This follow-up rate is similar to other studies that have conducted follow-up interviews to measure future self-harming behaviours (Tello et al., 2019; Vaiva et al., 2006).

Hospital Records Check

Examination of hospital records is a commonly employed method of measuring self-harming behaviours over a follow-up period (Nock et al., 2010; McAuliffe et al., 2008). Any hospital attendance, within the Aneurin Bevan Health Board region, for self-harming thoughts or behaviours was recorded within this system. All interactions between the Home Treatment Team (a community-based mental health support team) and the participant were also recorded within this system. In this study, three-months after the participant's original assessment, the researcher examined their hospital records and recorded the occurrence of any self-harming behaviours.

Self-Harming Behaviour Coding System

As described in chapter 2, it is difficult for researchers to accurately distinguish between non-suicidal self-harm and suicide attempts. Different self-harming behaviours can vary greatly in the degree of suicidal intent, the degree of harm caused (lethality) and the potential harm caused. Therefore, in order to more clearly distinguish between the different aspects of self-harming behaviours, this

study used three outcome measures, each of which represented an important aspect of self-harming behaviour. For each participant, all self-harming incidents that occurred in either the follow-up telephone interview or the hospital records check were transcribed (with all participant-identifying information removed) and rated on three separate criteria. For each incident of self-harming behaviour, the rater judged (1) the degree of suicidal intent behind the behaviour, (2) the actual level of physical harm caused by the behaviour and, (3) the potential physical harm that could have been caused by the behaviour in a realistic worst case scenario. These three measures served as the three main outcome measures for the analysis (described fully in the "Outcome Measures" section below).

Each incident of self-harming behaviour for each individual was rated on these three criteria on a scale ranging from 1 – 4. The nature of this coding is described in Table 3.1 and some examples of self-harming scenarios and their ratings are displayed in Table 3.2. One rater rated all instances of self-harming behaviour across the three criteria. To check the reliability of these ratings, two other raters were trained in the coding system and rated half (40/80) the instances of self-harming behaviours across the three criteria. The inter-rater reliability between the three independent raters on each of the three scales was examined using a two-way, mixed, absolute agreement, intraclass correlation analysis. The suicidal intent scale (ICC = .77), actual harm scale (ICC = .86) and potential harm scale (ICC = .88), all demonstrated excellent reliability according to the standards set out by Cicchetti (1994).

Table 3.1

The Self-Harming Behaviour Coding System

Rating	Suicidal intent	Actual harm	Potential harm
1	No intent to harm self.	No injuries sustained.	No potential harm.
2	Intention to harm self, but not die.	Minor physical harm. Injured, but not to the extent where it	Behaviour that could result in minor harm, but not to the

		required hospital treatment.	extent where it would have required hospital treatment.
3	*Intention to harm self with fluctuating intent to die, or not care if they do die.	Major physical harm. Required hospital treatment or monitoring.	Behaviour that could result in major harm, but not death. It would have required hospital treatment or monitoring but was unlikely to endanger life.
4	*Intention to harm self with clear intent to die.	Life-threatening harm or death from suicide. Required lifesaving hospital treatment or resulted in death.	Behaviour that could result in death or did so.

*Considered to be a suicide attempt.

Table 3.2

Examples of Self-Harming Scenarios and Associated Ratings

Scenario	Suicidal intent	Actual harm	Potential harm
[redacted] was staying in a psychiatric hospital. She accessed some nail clippers earlier in the day and hid them in her room. Later on, when alone in her room, she used the nail clippers to cut both of her wrists. She reported that she was cutting her wrists to end her life. However, the nail clippers were not sharp enough to make deep lacerations. Later on, a support worker noticed the cuts on her arms and small plasters were applied to her wounds.	4	2	2

[redacted] took 100 x 500mg tablets of paracetamol whilst he was at home on his own. He made no effort to contact anybody and passed out shortly after taking the overdose. [redacted] brother came round to visit him later that day and found [redacted] unconscious in his bed. The brother called an ambulance and [redacted] was administered life-saving parvolex treatment in hospital. After regaining consciousness, [redacted] reported that he had tried to end his life.	4	4	4
[redacted] reported that he regularly cuts his arms with a razor blade to regulate his emotions. On one occasion, [redacted] made a deep laceration to his arm, lost a large amount of blood and passed out. [redacted] mother found him unconscious, called an ambulance and he received a life-saving blood transfusion. [redacted] later reported that he only intended to harm himself and did not wish to die from the self-inflicted cuts.	2	4	4
[redacted] had absconded from the medium-security psychiatric hospital she was staying in. She walked to the train-tracks one mile away from the hospital and lay down on the tracks with the intention of ending her life. The Police were made aware of her absconding from hospital, tracked her location via CCTV and pulled her off the train-tracks. [redacted] was not harmed.	4	1	4

RoSP Reliability Vignettes

The inter-rater reliability of the RoSP was analysed by asking two trained RoSP assessors to independently perform a RoSP assessment on the same 12 cases.

However, it was not possible to allow two RoSP assessors into the assessment interview alongside the Psychiatric Liaison Team. From an ethical perspective, the presence of three assessors would have been excessive, could have been intimidating for the patient and may have limited their engagement with the assessment process. Therefore, for each of the 12 cases selected for the reliability analysis, all of the information obtained from the patient's assessment interview and their hospital records were compiled within a case vignette. Each vignette was stripped of any participant identifying information and was provided to the second trained RoSP assessor to evaluate. The use of case vignettes to assess the reliability of risk assessment procedures has been employed in previous studies (Sutherland et al., 2012; Orsi et al., 2014). The 12 cases were selected to provide a fair representation of different ages (M = 36.4, SD = 15.3, Range = 19 – 57), sexes (six men, six women) and risk ratings (original RoSP assessor risk ratings: M = 3.3, SD = 1.2, Range = 1 – 5).

Procedure

Consistent with standard clinical practice, upon presentation to the accident and emergency department, any individual who attended the hospital with recent self-harming behaviours, suicidal thoughts or urgent mental health difficulties, was referred for an assessment with the Psychiatric Liaison Team. If necessary, the patient received medical treatment and, after they had been declared medically fit for discharge, they were referred for an assessment with the Psychiatric Liaison Team. Whilst patients were waiting to be assessed by the Psychiatric Liaison Team, the researcher approached individuals who met the study inclusion criteria, described the study and follow-up procedures and obtained informed consent. After providing informed consent, participants provided their demographic and contact details. Next, participants were escorted to a private room where the assessment interview took place. After the assessment, participants were returned to the hospital ward, provided with a debrief form with information about the follow-up interview and thanked for their participation. Arrangements were then made for the individual to be discharged or transferred to further care.

After returning the individual to the ward, both the Psychiatric Liaison Team member and the researcher completed their respective assessment procedures; the Psychiatric Liaison staff completed the assessment as usual procedure and the

researcher completed the RoSP assessment. After the Psychiatric Liaison Team member and researcher completed their respective assessments, they recorded their risk predictions using the risk prediction form.

Three months after the participant's hospital assessment, the researcher checked each participant's hospital records to see if they had re-attended hospital for any self-harming behaviours. The researcher also contacted participants over the telephone and administered the modified SITBI. At the end of the telephone interview, participants were thanked for their engagement with the study and were provided with information for relevant supportive services.

Data analysis

This study aimed to (1) evaluate the inter-rater reliability of judgements made using the RoSP and, (2) evaluate the ability of the RoSP (SPJ), RoSP (actuarial) and assessment as usual to identify future suicide attempts during the three-month follow-up period.

Reliability

The interrater reliability was conducted by comparing the 12 RoSP assessments produced by the original RoSP assessor, with the 12 RoSP assessments produced by the second RoSP assessor using the case vignettes. Inter-rater reliability of the RoSP was examined using a two-way, mixed, absolute agreement, intraclass correlation analysis. Intraclass correlation coefficients were produced for each of the four subscales of the RoSP (History, Current Clinical, Current Crisis, Current Thinking), the overall RoSP score (actuarial) and the overall RoSP risk judgement (SPJ).

Identification of Future Suicide Attempts

Outcome Measures

As outlined in chapter 2, previous studies examining suicide risk assessments have experienced difficulties with conflating self-harm ("*any act of intentional self-poisoning or injury, irrespective of the apparent purpose of the act*" (National Institute for Health and Care Excellence, 2022)) and suicide attempts ("*a self-directed potentially injurious behaviour with any intent to die as a result of the behaviour*" (O'Connor et al., 2013)) in their outcome measures. This is a problem because many acts of self-harm are performed without suicidal intent, for purposes

such as affect regulation, interpersonal influence or sensation-seeking (Klonsky, 2007). Considering that the central purpose of the RoSP is to identify and prevent the occurrence of suicide and attempted suicide (Snowden & Gray, 2022), the primary outcome used for this research was "suicide attempts" (defined as self-harming behaviour with any intent to die). This was operationalised as a score of ≥3 on the "suicidal intent" rating scale described earlier.

However, having suicide attempts as the only outcome measure would mean that non-suicidal self-harm that seriously endangered life (e.g., George's example in Table 3.2), or had the potential to endanger life, would not be captured. Whilst non-suicidal self-harm that endangers life would not be considered a suicide attempt, it is an outcome that the RoSP would hope to prevent from occurring. Therefore "self-harm that caused major physical harm" and "self-harm with potential to cause major physical harm" were included as secondary outcome measures. The presence of any self-harming behaviour that caused major physical harm was operationalised by a score of ≥3 on the "actual harm" scale described previously. The presence of any self-harming behaviour that could have resulted in major physical harm was operationalised by a score of ≥3 on the "potential harm" scale.

For readability purposes, this chapter talks about analysing the ability to identify future suicide attempts, but more specifically, it is analysing the ability of various risk assessment procedures to identify (1) future suicide attempts (defined as self-harming behaviour with any intent to die), (2) future self-harming behaviour that resulted in major physical harm, and (3) future self-harming behaviour that could have resulted in major physical harm.

The follow-up period for each outcome measure was three months. Three months is a commonly employed follow-up duration for prospective studies of self-harm and suicidal behaviours (Lindh et al., 2020; King et al., 2019; Pfeiffer et al., 2014). This is because prior research has demonstrated that most repeat attendances at hospital for self-harm occur within 90 days (Kapur et al., 2006). Moreover, the RoSP, along with most SPJs, are designed for assessment of short-to-medium term risk behaviours. Given the dynamic nature of many of the risk factors, most SPJs require updating every three to six months. For these reasons, the follow-up period for each outcome measure was three months.

Statistical Analysis

The ability of the RoSP (SPJ), the RoSP (actuarial) and assessment as usual to predict each of the three outcome measures was examined using a signal detection analysis and calculating the area under the curve (AUC) for the Receiver Operating Characteristic (ROC). ROC curves display sensitivity on the y-axis and 1 minus specificity on the x-axis for all possible scale thresholds. The AUC represents the overall proportion of cases correctly predicted by the assessment method. An AUC of 0.5 indicates that the test does not perform better than chance, whilst an AUC of 1.0 indicates that every case is predicted correctly (Steeg et al., 2018). The optimal AUC threshold for each risk assessment procedure was calculated and reported for each outcome measure.

The AUCs produced by the RoSP (SPJ), RoSP (actuarial) and assessment as usual for each outcome measure were compared using methods described by Hanley & Mcneil (1983). In addition to the ROC curve analysis, the sensitivity and specificity for each assessment method was also calculated for each of the three outcome measures.

Results

Participant Characteristics

There were 107 participants included in the final analysis. The characteristics of the final sample are displayed in Table 3.3. No individuals died from suicide within the three-month follow-up period.

Table 3.3

Demographic Characteristics of the Sample

Demographic characteristic	Number	Percent
Total sample	107	100.0
Mean age in years (SD)	33.7 (12.6)	
Sex		
Female	64	59.8
Male	43	40.2

Ethnicity		
White - any	104	97.2
Asian - any	1	0.9
Mixed - any	2	1.9
Self-harm during three-month follow-up period		
Suicide attempt (self-harm with any intent to die)	20	18.7
Self-harm that caused major physical harm	20	18.7
Self-harm with potential to cause major physical harm	25	23.4

Reliability

Twelve cases were evaluated independently by two trained RoSP assessors. Table 3.4 displays the interclass correlation coefficients for each of the subscales of the RoSP (History, Current Clinical, Current Crisis and Current Thinking), the RoSP total score (RoSP actuarial) and the overall risk judgements made using the RoSP (RoSP SPJ). According to the standards set out by Cicchetti (1994), the Current Crisis subscale demonstrated fair inter-rater reliability, the History subscale demonstrated good inter-rater reliability and the Current Clinical subscale, Current Thinking subscale, overall RoSP score (RoSP actuarial) and the overall risk judgement (RoSP SPJ) demonstrated excellent inter-rater reliability.

Table 3.4

Intraclass Correlation Coefficients for the RoSP

Scale	ICC
History	0.73**
Current Clinical	0.78**
Current Crisis	0.56*
Current Thinking	0.87**
Overall RoSP score (RoSP actuarial)	0.76**
Overall risk judgement (RoSP SPJ)	0.90**

*$p < .05$, **$p < .01$

Identifying Future Suicide Attempts

Suicide Attempts

The presence of future suicide attempts (defined as self-harming behaviour with any intent to die) served as the primary outcome measure for this research. As illustrated in Table 3.5, the RoSP (SPJ) was significantly better than chance at identifying future suicide attempts during the three-month follow up period, AUC = 0.76, 95% CI = 0.66 – 0.87, $p < .001$. The RoSP (actuarial) was not significantly better than chance at identifying future suicide attempts, AUC = 0.63, 95% CI = 0.52 – 0.74, $p > .05$. Assessment as usual was not significantly better than chance at identifying future suicide attempts, AUC = 0.62, 95% CI = 0.48 – 0.75, $p > .05$.

Using the Hanley and McNeil (1983) method of comparing AUCs derived from the same set of cases, we found that the RoSP (SPJ) was significantly better at identifying future suicide attempts, compared to assessment as usual, AUC Difference = 0.15, $Z = -2.42$, $p < .05$. The RoSP (SPJ) was also better at identifying future suicide attempts compared to the RoSP (actuarial), AUC Difference = 0.13, $Z = -2.55$, $p < .05$. There was no difference between the RoSP (actuarial) and assessment as usual in their ability to identify future suicide attempts, AUC Difference = 0.01, $Z = 0.17$, $p > .05$.

Table 3.5

Diagnostic Accuracy of the Different Risk Assessment Methods to Predict Future Suicide Attempts (Defined as Self-Harming Behaviour with Any Intent to Die)

Assessment	AUC (95% CI)	Threshold[a] (scale)	Sensitivity	Specificity
AAU	0.62 (0.48 – 0.75)	≥2 (1 – 5)	80.0%	39.1%
RoSP (SPJ)	0.76 (0.66 – 0.87)**	≥4 (1 – 5)	80.0%	69.0%
RoSP (Act)	0.63 (0.52 – 0.74)	≥17 (0 – 40)	100.0%	35.0%

Note. AAU = assessment as usual; AUC = area under the curve; 95% CI = 95% confidence interval; SPJ = structured professional judgement; Act = actuarial.

[a] Threshold refers to the cut-off threshold that produced the optimal rates of sensitivity and specificity for each assessment measure.

*$p < .05$, **$p < .01$

Major Physical Harm

Self-harm that caused major physical harm served as a secondary outcome measure for this research. As illustrated in Table 3.6, the RoSP (SPJ) was significantly better than chance at identifying future self-harming behaviour that caused major physical harm during the three-month follow up period, AUC = 0.79, 95% CI = 0.69 – 0.88, $p < .001$. The RoSP (actuarial) was significantly better than chance at identifying future self-harming behaviour that caused major physical harm, AUC = 0.64, 95% CI = 0.53 – 0.76, $p < .05$. Assessment as usual was not significantly better than chance at identifying future self-harming behaviour that caused major physical harm, AUC = 0.62, 95% CI = 0.48 – 0.75, $p > .05$.

Using the Hanley and McNeil (1983) method of comparing AUCs derived from the same cases, we found that the RoSP (SPJ) was significantly better at identifying future self-harming behaviour that caused major physical harm compared to assessment as usual, AUC Difference = 0.17, $Z = 2.94$, $p < .01$. The RoSP (SPJ) was also better at identifying future self-harming behaviour that caused major physical harm compared to the RoSP (actuarial), AUC Difference = 0.14, $Z = 2.90$, $p < .01$. There was no difference between the RoSP (actuarial) and assessment as usual in their ability to identify future self-harming behaviour that caused major physical harm, AUC Difference = 0.03, $Z = 0.36$ $p > .05$.

Table 3.6

Diagnostic Accuracy of the Different Risk Assessment Methods to Predict Future Self-Harming Behaviour that Caused Major Physical Harm

Assessment	AUC (95% CI)	Threshold[a] (scale)	Sensitivity	Specificity
AAU	0.62 (0.48 – 0.75)	≥2 (1 – 5)	80.0%	39.1%
RoSP (SPJ)	0.79 (0.69 – 0.88)**	≥4 (1 – 5)	85.0%	70.1%
RoSP (Act)	0.64 (0.53 – 0.76)*	≥17 (0 – 40)	100.0%	34.5%

Note. AAU = assessment as usual; AUC = area under the curve; 95% CI = 95% confidence interval; SPJ = structured professional judgement; Act = actuarial.

[a] Threshold refers to the cut-off threshold that produced the optimal rates of sensitivity and specificity for each assessment measure.

*$p < .05$, **$p < .01$

Potential for Major Physical Harm

Self-harm that had the potential to cause major physical harm served as a secondary outcome measure for this research. As illustrated in Table 3.7, the RoSP (SPJ) was significantly better than chance at identifying future self-harming behaviour with potential to cause major physical harm during the three-month follow up period, AUC = 0.77, 95% CI = 0.68 – 0.87, $p < .001$. The RoSP (actuarial) was significantly better than chance at identifying future self-harming behaviour with potential to cause major physical harm, AUC = 0.66, 95% CI = 0.56 – 0.77, $p < .05$. Assessment as usual was not significantly better than chance at identifying future self-harming behaviour with potential to cause major physical harm, AUC = 0.58, 95% CI = 0.45 – 0.70, $p > .05$.

Using the Hanley and McNeil (1983) method of comparing AUCs derived from the same cases, we found that the RoSP (SPJ) was significantly better at identifying future self-harming behaviour with potential to cause major physical harm compared to assessment as usual, AUC Difference = 0.19, $Z = 3.47$, $p < .01$. The RoSP (SPJ) was also better at identifying future self-harming behaviour with potential to cause major physical harm compared to the RoSP (actuarial), AUC Difference = 0.11, $Z = 2.34$, $p < .05$. There was no difference between the RoSP (actuarial) and assessment as usual in their ability to identify future self-harming behaviour with potential to cause major physical harm, AUC Difference = 0.08, $Z = 1.18$ $p > .05$.

Table 3.7

Diagnostic Accuracy of the Different Risk Assessment Methods to Predict Future Self-Harming Behaviour with Potential to Cause Major Physical Harm

Assessment	AUC (95% CI)	Threshold[a] (scale)	Sensitivity	Specificity
AAU	0.58 (0.45 – 0.70)	≥2 (1 – 5)	76.0%	39.0%
RoSP (SPJ)	0.77 (0.68 – 0.87)**	≥4 (1 – 5)	80.0%	72.0%
RoSP (Act)	0.66 (0.56 – 0.77)*	≥17 (0 – 40)	100.0%	36.6%

Note. AAU = assessment as usual; AUC = area under the curve; 95% CI = 95% confidence interval; SPJ = structured professional judgement; Act = actuarial.

[a] Threshold refers to the cut-off threshold that produced the optimal rates of sensitivity and specificity for each assessment measure.

*$p < .05$, **$p < .01$

Discussion

This study aimed to provide an initial validation of the RoSP within an accident and emergency department setting. The study aimed firstly, to evaluate the inter-rater reliability of the RoSP and secondly, to evaluate and compare the RoSP (SPJ), the RoSP (actuarial) and assessment as usual, in their ability to identify future suicide attempts over a three-month follow-up period. Regarding reliability, it was found that the overall risk judgements made using the RoSP demonstrated excellent inter-rater reliability, whilst the RoSP subscales and the RoSP actuarial score had fair to excellent inter-rater reliability. Regarding the identification of future suicidal behaviour, this study demonstrated that risk judgements made using the RoSP (SPJ) were significantly better than judgements made using the RoSP (actuarial) and assessment as usual at identifying future suicide attempts (defined as self-harming behaviour with any intent to die). The findings also showed that risk judgements made using the RoSP (SPJ) were significantly better than judgements made using the RoSP (actuarial) and assessment as usual at identifying self-harm that produced major physical harm and self-harm with the potential to cause major physical harm. Overall, these results demonstrated that the RoSP is a reliable and valid assessment for the structured clinical evaluation of suicide risk within an accident and emergency department and may offer some improvement over current assessment methods.

As outlined earlier, there are a number of methods that have been developed for the risk assessment of suicide, namely the unstructured clinical judgement and actuarial approaches. This research found that risk judgements made using the RoSP (SPJ) offered improvements in both the levels of inter-rater reliability and the ability to identify future suicide attempts, compared to previous observations of unstructured clinical judgement (Paterson et al., 2008; Kapur et al., 2005; Cooper et al., 2007; Murphy et al., 2010; Woodford et al., 2017). This research also directly compared the accuracy of judgements made using the RoSP (SPJ), with judgements made using assessment as usual and found that risk judgements made using the RoSP were better at identifying future suicide attempts. Whilst the assessment as usual

process employed by the Psychiatric Liaison Team in this study did contain some guidance regarding the risk factors for the clinician to consider, and therefore might not strictly be considered as unstructured clinical judgement, it did not contain the level of structure and guided formulation that was provided by the RoSP. Overall, these findings indicate that the RoSP offers improved reliability and predictive validity compared to risk assessment approaches with less structure and guidance for clinicians.

There are a few features of the RoSP that may be driving these improvements in reliability and validity compared to unstructured clinical judgement and assessment as usual. Firstly, the RoSP systematically guides the clinician through the relevant risk factors to ensure that the assessor is considering the same factors in each assessment. This minimises the chances of the clinician's subjective judgement biasing the factors that are considered and increases the reliability of the assessments. Secondly, the RoSP provides a clear structure for the assessor to consider the presence and relevance for each of the potential risk factors, before asking the assessor to combine all relevant risk factors in a global formulation of the patient and their risks. This highly structured and organised approach to risk formulation may help surmount the difficulties clinicians face when trying to process and combine large volumes of information into a coherent judgement. Overall, it is likely that the structure and guidance provided by the RoSP manual is useful in improving the reliability and accuracy of risk judgements.

These findings also demonstrated that risk judgements made using the RoSP (SPJ) compare favourably to actuarial tools in the field of suicide risk assessment (Steeg et al., 2018; Steeg et al., 2012; Cooper et al., 2006). The ability of the RoSP to predict future suicide attempts (AUC = 0.76) in this study is similar, if not slightly better, than rates observed in previous studies of the best available actuarial instruments (AUC = 0.71; Steeg et al., 2018). This study, combined with previous findings (Gray et al., 2021) also demonstrate that the RoSP, used as an SPJ, is better at identifying future suicide attempts relative to the RoSP used as an actuarial tool. This suggests that the process of helping clinicians structure an individual-specific risk formulation is important in building an accurate understanding of suicide risk. The RoSP also offers an improvement on actuarial tools with regards to its close adherence to NICE (2011) guidelines. Unlike actuarial tools which place emphasis

on quantifying risk, the RoSP ensures that each patient receives a comprehensive evaluation of the social, psychological and motivational factors relevant to their risks, along with the production of a safety plan that is specific to the needs of the individual. Given the RoSP's similar, if not slightly improved, ability to identify future suicide attempts relative to actuarial tools, along with its adherence to NICE (2011) guidelines, the RoSP represents a potentially useful tool for the evaluation of suicide risk in individuals attending accident and emergency departments.

The ability of the RoSP to identify future suicide attempts in the present study (AUC = 0.76) is comparable to previous studies of the RoSP in a community mental health (AUC = 0.83) and forensic in-patient settings (AUC = 0.80) (Gray et al., 2021). These rates of predictive validity are also similar to previous validation studies of the S-RAMM (AUC = 0.81 – 0.84; Abidin et al., 2013; SanSegundo et al., 2018), an alternative SPJ scheme for suicide risk assessment. These findings reiterate that the SPJ approach is a valuable framework for the evaluation of suicide risk. Furthermore, the ability of the RoSP to identify future suicide attempts in the current study and in Gray et al. (2021), is similar to the ability of the HCR-20 to identify future violent behaviour (AUC = 0.83 – 0.86; Neves et al., 2011; De Vogel & De Ruiter, 2006). Given that the HCR-20 is regarded as the gold-standard within the field of violence risk assessment (Morrissey et al., 2013), this similarity in predictive validity highlights the potential of the RoSP to become a well-established and valuable method of risk assessment for suicide.

The inter-rater reliability of the overall RoSP (SPJ) judgements in this study (ICC = 0.90) was similar to the rates of inter-rater reliability reported by Gray et al. (2021) in their investigation of the RoSP (ICC = 0.93 – 0.96), with both studies demonstrating that the overall RoSP (SPJ) judgements had excellent agreement between independent assessors. The excellent inter-rater reliability of the overall RoSP (SPJ) judgements demonstrated in this study and in Gray et al. (2021) compares favourably to the rates of inter-rater reliability demonstrated by the S-RAMM. Ijaz et al. (2009) reported that "global risk judgements" made by independent assessors completing the S-RAMM on 25 patients, demonstrated moderate inter-rater reliability ($\kappa = 0.53$) according to the standards outlined by McHugh (2012). Additionally, the inter-rater reliability demonstrated by the RoSP in

this research is similar to the rates of reliability observed in studies of the HCR-20 (ICC = 0.81, Douglas & Belfrage, 2014; ICC = 0.73, De Vogel et al., 2004b).

Whilst the inter-rater reliability of the RoSP subscales and the RoSP overall (actuarial) score was lower than the rates observed in the previous study of the RoSP (Gray et al., 2021), they all demonstrated good to excellent inter-rater reliability, with the exception of the Current Crisis subscale which showed fair inter-rater agreement. It is possible that the slightly lower rates of inter-rater reliability for each of the RoSP subscales and the overall RoSP actuarial score, were caused by the second RoSP assessor having to perform their RoSP assessments on case vignettes. Whilst the case vignettes were intended to be comprehensive descriptions of the assessment interview and the patient's history, it is possible that important non-verbal information (e.g., tone of voice, facial expressions) were not fully captured within the case vignette. In particular, this may explain why the inter-rater reliability for the Current Crisis subscale was lower compared to Gray et al. (2021), as non-verbal clues may have been particularly important when interpreting the severity of the individual's current crises. Nevertheless, these findings demonstrate that the RoSP has sufficient levels of inter-rater reliability required to guide suicide risk assessment evaluations within accident and emergency services.

Strengths and Limitations

It is important to interpret these findings in light of some important limitations. Firstly, only 57% of participants were contacted for the follow-up interview. Whilst this attrition rate is comparable with other studies that have used follow-up interviews to measure suicide attempts (Tello et al., 2019; Vaiva et al., 2006) and all participants were followed up via their hospital records, it should be noted that any suicide attempts that did not involve hospital attendance would not have been captured for 43% of the sample. However, the fact that judgements made using the RoSP were still able to accurately identify future suicide attempts despite this "noise" in the outcome variable, is quite impressive (Gray et al., 2008).

Secondly, the 107 participants recruited in this research was substantially smaller than the thousands of participants used in studies to investigate other suicide risk assessment procedures (Kapur et al., 2005; Steeg et al., 2018). Whilst practical constraints often limit the recruitment of large sample sizes in prospective, hospital-

based research (Gray et al., 2021; Fagan et al., 2009; De Vogel & De Ruiter, 2006), it is important to understand that the confidence intervals for the AUCs reported in this study are much wider, relative to studies with larger samples (Kapur et al., 2005; Steeg et al., 2018). Future prospective research with larger sample sizes is required to establish the predictive accuracy of the RoSP with greater precision. However, the aim of this research was to evaluate the efficacy of the RoSP within an accident and emergency department relative to assessment as usual, rather than to precisely gauge the predictive accuracy of the RoSP. The present study was adequately powered to detect differences in the predictive ability of the RoSP (SPJ) and the assessment as usual methods.

Thirdly, when comparing the RoSP and assessment as usual in their ability to predict future suicide attempts, it should be acknowledged that there was only one assessor producing risk judgements using the RoSP. Whereas, for assessment as usual, there were ten different Psychiatric Liaison Team members providing risk judgements. Therefore, this additional between-clinician-variance may have caused an underestimation of the predictive value of risk judgements made using assessment as usual. Future research must evaluate whether the RoSP is able to retain the high levels of predictive ability demonstrated in this study when it is employed within a team of different clinicians. The excellent rates of inter-rater reliability for risk judgements made using the RoSP supports the idea that different assessors can produce consistent risk judgements for the same individual.

Fourthly, evaluations of risk made by the Psychiatric Liaison Team in this study influenced the intervention plans for each participant, with individuals perceived to be most at risk of suicide often receiving the highest level of prevention strategies (e.g., admission to a psychiatric hospital) and individuals judged to be less at risk receiving less restrictive interventions (e.g., community-based counselling). Risk management may therefore have been a source of systematic bias for this research, with higher risk individuals receiving more severe and restrictive interventions aimed to prevent suicide. Whilst the need to ensure the safety of all individuals involved in the research means this is unavoidable, it is important to consider that this may have caused an underestimation of the predictive ability of judgements made using both the RoSP and assessment as usual.

Fifthly, it is important to acknowledge that, for the reliability analysis, both assessors did not have the same access to the patient information. One assessor completed their RoSP after attending the assessment interview and reading the patient's hospital records, whilst the second assessor conducted their RoSP using a case vignette of the same patient. Whilst this method is commonly employed in studies where having several individuals in the assessment interview is either impractical or unethical (Sutherland et al., 2012; Orsi et al., 2014), there are some notable limitations with this method. Much of the non-verbal communication (e.g., facial expressions, tone of voice, body language) may not be fully captured within the case vignette and it is possible that the original assessor's own perceptions and biases may have filtered into the vignettes and influenced the assessments produced by the other assessor. Therefore, future research should investigate the inter-rater reliability of the RoSP under circumstances where both assessors have access to the same assessment interview and patient histories.

Finally, whilst this study demonstrated that the RoSP was better than assessment as usual at identifying future suicide attempts, the RoSP should not be used merely as a means to predict future suicide attempts. This research demonstrated that the RoSP could identify future self-harming behaviour that caused major physical harm with 85% sensitivity. Hence, if the RoSP was used simply to categorise individuals into low risk and high risk groups, with interventions provided only to those in the high risk group, approximately 15% of individuals that would go on to engage in major self-harming behaviour would have been categorized as low risk and would not have received any intervention. The focus on the predictive ability of the RoSP in this study served to establish the validity of the RoSP, demonstrating that it can help assessors build an accurate understanding of an individual's risk of suicide. This study does not advocate the use of the RoSP as a predictive instrument. It is important to understand that the RoSP should not be used to predict suicide, or decide who is eligible for interventions, rather it serves to help the clinician build a comprehensive understanding of the individual's risk of suicide that directly facilitates the development of a detailed, individualised safety plan.

There were also some important strengths associated with this research. Firstly, unlike previous studies of the RoSP (Gray et al., 2021) and other research into SPJs (Gray et al., 2008) that employed retrospective research designs, this

research implemented a prospective design. Whilst prospective designs are more ethically challenging and resource intensive, they overcome the problems of selection biases and missing information that often leads to biases in retrospective research (Talari & Goyal, 2020).

A second strength of this study was the way in which the RoSP was directly compared with assessment as usual. Previous research into the use of SPJ schemes for suicide risk assessment have analysed whether the SPJ could identify future self-harm and suicide attempts better than chance (Fagan et al., 2009; Gray et al., 2021). This research went a step further and analysed whether the RoSP could identify future suicide attempts better than the currently employed methods. When considering whether to implement a new risk assessment procedure, it is important to assess whether it is better at identifying future risk behaviours relative to the currently employed procedure, rather than assess whether it is better than random chance.

Thirdly, considering the challenges associated with recruiting individuals recently referred for a hospital-based suicide risk assessment into a prospective study, the recruitment of a sample size of 107 participants is notable. This sample is larger than previous hospital-based prospective studies of the RoSP (N = 62; Gray et al., 2021), the S-RAMM (N = 81 – Fagan et al., 2009) and other SPJ tools (N = 34 – Gray et al., 2003; N = 41 – Belfrage et al., 2000; N = 78 – Arbach-Lucioni et al., 2011). Moreover, the sample size from this study provided sufficient power to detect a difference in the RoSP's ability to identify future suicide attempts relative to assessment as usual. Overall, whilst the sample size may initially seem small relative to large-scale studies of actuarial tools (Steeg et al., 2018), the study recruited more participants than similar prospective studies of SPJ schemes and provided adequate power to achieve the aim of validating the RoSP within an accident and emergency department setting.

Furthermore, many studies typically use just one method of following up participants (e.g., telephone interview or hospital record check), with each method vulnerable to different biases. This study followed up participants both via their hospital records and by a follow-up telephone interview, maximising the chances of capturing relevant self-harming behaviour. This study also made a careful effort to

distinguish between suicide attempts (self-harm with any intent to die) and self-harm that did, or had the potential to, cause major physical harm. Some studies into suicide risk assessment measures only use the presence of self-harming behaviour as the outcome measure (e.g., Nock et al., 2010). This conflation of self-harm and suicide attempts can be problematic because many acts of self-harm are performed without suicidal intent, for purposes such as affect regulation, interpersonal influence or sensation-seeking (Klonsky, 2007). Considering that the central aim of the RoSP is to identify and prevent suicide and suicide attempts, this study ensured that suicide attempts (defined as self-harm with any intent to die) served as the primary outcome variable. However only including suicide attempts as an outcome measure could overlook non-suicidal self-harm behaviour that could seriously endanger life; something the RoSP would ideally like to prevent. Therefore, self-harm that caused major physical harm and self-harm that had potential to cause major physical harm were included as secondary outcome measures. The distinction between suicide attempts, self-harm that caused major physical harm and self-harm that had potential to cause major physical harm was a strength of this research, as it enabled this study to separately evaluate the ability of the RoSP to identify different but important aspects of self-harming behaviours.

Future Directions

This study, along with previous research (Gray et al., 2021) has demonstrated that researchers trained in using the RoSP were able to produce reliable and valid judgements of future suicide risk. However, it is important to consider that a researcher often has more time to complete their risk assessment, more in-depth training in the use of the risk assessment and more motivation to complete the risk assessment thoroughly compared to clinicians, who frequently highlight a lack of adequate training and time restrictions as factors that impede their ability to use risk assessments effectively (Graney et al., 2020). Indeed, previous research has highlighted the decrease in effectiveness that occurs when therapies, assessments or other evidence-based practices cross the “implementation gap” from research into clinical practice (Olswang & Prelock, 2015). This has been observed with SPJ schemes. Jeandarme et al. (2017) reported that the ability of the HCR-20 to identify future violent behaviour substantially decreased when it was implemented in clinical settings, compared to when it was used for research purposes (De Vogel & De

Ruiter, 2006; Neves et al., 2011). Therefore, future research must investigate whether these impressive rates of inter-rater reliability and predictive validity remain once the RoSP has crossed the bridge from research, into clinical practice.

In addition to investigating the efficacy of the RoSP once it has been implemented in clinical practice, future research must also investigate the palatability of the RoSP amongst both staff and patients. Whilst it is necessary for risk assessment procedures to demonstrate good predictive validity and reliability, these qualities alone do not make them sufficient for clinical practice. Risk assessment procedures must be palatable and useable within the context they are employed. For example, a suicide risk assessment method with a perfect ability to identify future suicide attempts, could not feasibly be implemented into clinical practice if it took over 100 hours to complete, or if it caused severe levels of distress for the patient. Therefore, an important next step for this research is to investigate the palatability of the RoSP amongst both staff and patients. As staff are trained in the RoSP and begin to implement it, qualitative interviews with both staff and patients should evaluate whether the RoSP is a feasible, palatable tool within a Psychiatric Liaison service. These interviews should help shape the development of the RoSP, so that it can become a palatable tool for clinicians and patients.

The qualitative interviews should provide a platform for a wide range of feedback that could be used to improve the palatability of the RoSP, but specific attention should be given to (1) the length of time it takes staff to complete the interview and assessment process, (2) the degree to which the RoSP training process prepares staff to use the assessment effectively, (3) whether the information provided to the clinician within the RoSP manual successfully assists the clinician in understanding particular risk factors, (4) whether staff feel the RoSP helps them develop and communicate effective, individualised safety plans, (5) whether the assessment interview causes any distress for the patient and (6) whether the patient feels that they have been listened to, engaged with and provided with an effective safety plan. Ensuring that risk assessment procedures are useable for clinicians and patients is crucial in ensuring successful implementation and future research must prioritise evaluating and improving the palatability of the RoSP. Researching the implementation and palatability of the RoSP was originally part of the plans for this thesis. However, due to the COVID-19 research restrictions on hospital-based

research, this was not possible. It is hoped that this research will be conducted in the near future.

Future research should also consider examining the reliability, validity and palatability of the RoSP in other settings that play an important role in suicide prevention. The existing studies of the RoSP have established that the RoSP is a valid and reliable method of evaluating and developing safety plans for suicide risk in community mental health settings (Gray et al., 2021), forensic psychiatric hospital settings (Gray et al., 2021) and accident and emergency settings. Future research could consider whether the RoSP could be used within settings such as prisons, GPs, child and adolescent mental health services and older adult mental health services.

One final future direction for this research is to investigate whether the RoSP assessment procedure can successfully reduce future suicide attempts. The overarching aim of the RoSP is to facilitate risk assessments that lead to effective individualised safety plans that ultimately reduce the instances of future suicide and suicide attempts (Snowden & Gray, 2022). Therefore, future research should consider conducting a randomised control trial whereby half the participants are randomly assigned to a "RoSP" risk assessment and treatment pathway and half are referred to a "control" risk assessment and treatment pathway. The researchers could examine whether suicide and suicide attempts occur less frequently in the "RoSP" group relative to the "control" group to determine whether the RoSP can successfully reduce the occurrence of future suicide and suicide attempts. Research of this nature would require careful ethical consideration but would be important in demonstrating the efficacy of the RoSP in reducing future suicide.

Conclusion

In summary, these findings demonstrate that the RoSP represents a valuable method for the evaluation of suicide risk within an accident and emergency department. The RoSP demonstrated good levels of inter-rater reliability and an improved ability to identify (1) future suicide attempts, (2) future self-harm that caused major physical injury and (3) future self-harm with potential to cause major physical injury, relative to assessment as usual. Given the RoSPs close adherence to NICE (2011) guidelines, it's emphasis on the creation of individualised safety plans and the levels of reliability and predictive validity demonstrated here, the RoSP

appears to be a promising method of suicide risk assessment. Future research should investigate the palatability of the RoSP, monitor the reliability and validity of the RoSP once it is implemented within clinical practice and evaluate whether the use of the RoSP can successfully reduce future suicide.

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Chapter 4: How the COVID-19 Pandemic Affected Population Mental Health and Suicidality

Introduction

The second part of this thesis aimed to identify and understand the factors modifying suicidal thoughts and suicide attempts during the COVID-19 pandemic. This chapter aimed to review how the pandemic affected population mental health and suicidality.

Population Mental Health and Suicidality During the COVID-19 Pandemic

Mental Health

Initial Stages of the Pandemic (March – April 2020)

During the initial stages of the COVID-19 pandemic, reports from across the world indicated a sharp increase in psychological distress within the general population. One month after the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic (WHO, 2021), McGinty et al. (2020) conducted a longitudinal investigation using a probability-based panel survey of 1,468 adults living in the USA. McGinty et al. (2020) found that by April 2020, 13.6% of adults reported clinically significant psychological distress on the Kessler 6 Psychological Distress Scale (Kessler et al., 2002), compared to just 3.9% of adults in a comparable 2018 sample. Similar UK based longitudinal research, using a representative probability sample of 17,542 adults, also found that clinically significant levels of mental distress, as indexed by the GHQ-12 (Goldberg, 1986), rose from 18.9% in 2018-19 to 27.3% in April 2020. Both studies (McGinty et al., 2020; Pierce et al., 2020) also reported that the increases in psychological or mental distress were more pronounced for females, young people and lower socioeconomic groups.

In a systematic review of the impact of COVID-19 in the general population, Xiong et al. (2020) found that elevated rates of anxiety, post-traumatic stress disorder, depression and psychological distress had been reported in the general public within China, Spain, Italy, Iran, America, Turkey, Nepal and Denmark. Xiong et al. (2020) also reported that young people (<40), women, those with chronic and psychiatric illnesses, students and unemployed individuals were among the most

negatively impacted. Further research by Robinson et al. (2022) reviewed 65 longitudinal cohort studies from around the world that had examined population mental health prior to and after the onset of the pandemic. Robinson et al. (2022) reported that there was a small but statistically significant increase in mental health problems soon after the onset of the pandemic (March – April 2020).

All the studies reported here (McGinty et al., 2020; Pierce et al., 2020; Xiong et al., 2020; Robinson et al., 2022) implemented longitudinal cohort designs containing pre-pandemic data, employed large probability samples and used well validated measures of mental health and psychological distress. These high quality research methodologies decreased the risk of bias, and the consistency between the different results provides high levels of confidence in their reported findings. Taken altogether, these studies indicate that populations across the world experienced an increase in mental health difficulties in the first few months after the onset of the COVID-19 pandemic.

After the Onset of the Pandemic (May – October 2020)

Many of the studies investigating the impact of COVID-19 on population mental health implemented longitudinal designs that assessed participants over various stages of the pandemic. This enabled them to monitor the trends in population mental health over the various stages of the pandemic. Fancourt et al. (2021) conducted a longitudinal observational study weighted to population proportions and measured levels of anxiety and depression on a weekly basis in the UK between March and August 2020. They found that the highest levels of depression and anxiety symptoms occurred in the early stages of lockdown, with symptoms steadily improving from April 2020 through to August 2020.

In a similar design, Pierce et al. (2021) used a probability sample to track mental health in the UK population from 2018-19 pre-pandemic data to October 2020. Pierce et al. (2021) reported that by October 2020, the mental health of most UK adults had returned to pre-pandemic levels. Studies in Korea (Choi et al., 2021) and Australia (Pieh et al., 2021) also demonstrated similar effects, with population wellbeing showing signs of improvement in the months after the initial onset of the pandemic. Robinson et al. (2022), in their meta-analysis of 65 studies investigating mental health problems throughout the pandemic, reported that after the initial

increase in mental health problems during the early stages of the pandemic (March – April 2020), rates of mental health problems generally decreased and returned to pre-pandemic levels by July 2020. Overall, it appeared that the heightened levels of mental health difficulties experienced between March – April 2020, had gradually returned to pre-pandemic levels by the latter half (August – October) of 2020.

Beginning of the Second Wave (November 2020 – March 2021)

Whilst most research indicated that population mental health had returned to pre-pandemic levels by July 2020, it would be premature to interpret this as evidence of a completed recovery pathway. It is important to acknowledge that in the months following July 2020, the UK and many other countries experienced a second surge in COVID-19 cases, hospitalisations and deaths, along with the introduction of COVID-19 variants and a prolonged period of new lockdown restrictions (Senedd Research, 2021).

Indeed, Fancourt et al. (2021), in their weekly longitudinal observational study, observed that symptoms of depression and anxiety steadily increased from August 2020 until March 2021, to levels similar to those observed during the initial onset of the pandemic. Furthermore, a longitudinal analysis of depressive symptoms in the UK population demonstrated that the percentage of adults experiencing moderate to severe depressive symptoms had increased from 19% in November 2020 to 21% by February 2021 (Office for National Statistics [ONS], 2021a). These studies indicate that after the recovery in population mental health observed between May and October 2020, the UK population experienced a further decline in population mental health and wellbeing by early 2021.

Summary

Initially, the COVID-19 pandemic appeared to have an immediate negative impact on population mental health and wellbeing. After the initial impact, there appeared to be a recovery period where mental health symptoms appeared to return to pre-pandemic levels. However, after the second wave of rising COVID-19 cases, hospitalisations, deaths and new lockdown restrictions, mental health difficulties appeared to have increased once again. Overall, it seems that the COVID-19 pandemic had a negative influence on population mental health and the recovery process is likely to be a non-linear pathway that takes multiple years (Cream et al.,

2021). Importantly, this research has also highlighted how different demographic groups were impacted differently by the pandemic, with females, young people and those from lower socioeconomic groups often more adversely affected.

Suicidality

During the onset of the pandemic, many authors expressed concerns that the economic hardships, social restrictions and health anxiety would result in sharp increases in suicidal thoughts and suicide attempts within the general population (Gunnell et al., 2020; Sher, 2020). Considering the plethora of studies that highlighted the detrimental impact of the pandemic on mental health, it would be sensible to expect the pandemic to also result in increased suicidality within the population. However, the current evidence presents a more complex picture. This next section reviews the latest research describing the impact of the COVID-19 pandemic on suicidal thoughts and suicide attempts in the general population.

Suicidal Thoughts

Much of the early research into suicidality during the pandemic analysed Google Trends data. Google Trends is a publicly available data source of real-time internet search patterns that has previously been used for population health surveillance (Knipe et al., 2020). Previous research has demonstrated a moderate positive association between Google searches for suicide related search terms (e.g., “commit suicide” or “suicide prevention”) and population suicide rates (Gunn & Lester, 2013). Between January 2020 and March 2020, Knipe et al. (2020) analysed Google Trend data for suicide related search terms in Italy, Spain, the USA and the UK. They reported that searching for suicide related topics decreased after the announcement of the pandemic. A similar analysis of Google Trends data in America between March 2020 and April 2020 also reported that the proportion of searches for suicide related terms was lower compared to pre-pandemic rates (Halford et al., 2020). Sinyor et al. (2020) also compared suicide related search terms between a pre-COVID-19 period (April 2015 – February 2020) and the COVID-19 period (March 2020 – April 2020) and found that in both the USA and worldwide samples, there were significant reductions in searches for suicide related terms after the onset of the pandemic. Overall, early research using Google Trends data indicated that, during the onset of the COVID-19 pandemic, searches for suicide related terms decreased relative to pre-pandemic rates. However, it is important to remember that searches

for suicide related terms only serve as a broad indicator of suicidal thoughts in a population. Further observational research that directly measures suicidal thoughts and suicide attempts is required to determine the influence of the COVID-19 pandemic on population suicidality.

Czeisler et al. (2020) attempted to assess the prevalence of suicidal thoughts during the onset of the COVID-19 pandemic using a representative panel survey of adults (≥18) living in America. Czeisler et al. (2020) reported that 10.7% of adults had reported seriously considering suicide within the past 30 days. This was over double the rate (4.3%) observed in a similar study conducted in 2018 (Substance Abuse and Mental Health Services Administration, 2018). Raifman et al. (2020) also measured rates of suicidal ideation over the past two weeks during the COVID-19 pandemic (March 2020 – April 2020) in American adults and compared this to rates of suicidal ideation previously collected in a 2017-2018 national survey. Both studies used nationally representative samples, with the 2020 survey collecting data from 1,415 participants and the 2017-2018 survey recruiting 5,856 participants. Raifman et al. (2020) reported that rates of suicidal ideation increased from 3.4% in the 2017-2018 survey to 16.3% in the 2020 survey. They also reported that the increase in suicidal ideation was even more pronounced for individuals in low-income households.

Iob et al. (2020) conducted a similar study during the first month of the COVID-19 pandemic in the UK (March 2020). Iob et al. (2020) examined the rates of self-harm and suicidal thoughts in UK adults in a sample weighted to population proportions. They reported that approximately 17.8% of individuals had experienced self-harm or suicidal thoughts during the first month of the pandemic. This rate was considerably higher than the typical annual prevalence (5.4%) of UK adults that experience suicidal thoughts (House of Commons Library, 2020), however it should be acknowledged that this rate only refers to the presence of suicidal thoughts, not self-harm or suicidal thoughts which limits the validity of the comparison. Nevertheless, the fact that the one month prevalence of self-harm or suicidal thoughts (17.8%), was over three times higher than the typical 12 month prevalence of suicidal thoughts (5.4%), likely indicates some degree of increase in suicidal thoughts during the onset of the pandemic. Additionally, Iob et al. (2020) also noted that the rates of self-harm and suicidal thoughts were higher in Black, Asian and

minority ethnic (BAME) groups, along with individuals experiencing socioeconomic disadvantages, unemployment, disability, chronic physical illnesses, mental disorders and COVID-19 symptoms.

Contrary to the Google Trends research, these three studies indicate an increase, rather than a decrease in suicidal thoughts during the onset of the COVID-19 pandemic (Czeisler et al., 2020; Raifman et al., 2020; Iob et al., 2020). These studies have the advantages of using a more direct measure of suicidal thoughts (self-report) and using representative samples weighted to population proportions. However, Czeisler et al. (2020), Raifman et al. (2020) and Iob et al. (2020) all acknowledged that comparing rates of suicidal thoughts to rates observed in previous studies using different samples, is far from ideal. Differences in the survey methodology and the sample characteristics mean that the rates of suicidal thoughts are not directly comparable. Furthermore, Iob et al. (2020) also acknowledged that their recruitment strategy involved partnerships with charities that represented vulnerable people who may therefore have been more likely to report suicidal thoughts. Longitudinal research that measured suicidal thoughts before and after the pandemic within the same sample is required to understand the impact of the pandemic on suicidal thoughts more accurately.

Zhang et al. (2020) conducted a longitudinal cohort study that examined rates of suicidal thoughts among a cohort of 1,241 Chinese children and adolescents prior to (November 2019) and after (May 2020) the outbreak of the virus. Zhang et al. (2020) observed a 45% increase in suicidal thoughts between November 2019 and May 2020. Whilst it is important to acknowledge that this sample of Chinese children and adolescents may not be representative of other cultures and age groups, this is one of the few longitudinal cohort studies that measured suicidal thoughts before and after the onset of the COVID-19 pandemic within the same sample. Considering this study alongside the research mentioned above, the overall picture suggests that the onset of the COVID-19 pandemic did result in increased suicidal thoughts in populations across the world.

Killgore et al. (2020) also conducted three cross-sectional surveys tracking rates of suicidal thoughts in American adults during the first three months of the pandemic. Each survey used convenience sampling methods and were roughly one

month apart from each other (survey 1: April 2020, survey 2: May 2020, survey 3: June 2020). Killgore et al. (2020) reported that rates of suicidal thoughts remained stable and unchanged in areas with no lockdown restrictions (April = 17%; May = 16%; June = 17%), however, within areas under lockdown restrictions, rates of suicidal thoughts increased every passing month (April = 17%; May = 22%; June = 31%). O'Connor et al. (2020) also investigated the trajectory of suicidal thoughts in the UK adult population over the first six weeks of the national lockdown period (Wave 1: 31 March – 9 April 2020; Wave 2: 10 April – 27 April 2020; Wave 3: 28 April – 11 May 2020). O'Connor et al. (2020) used a sample weighted to population proportions and roughly 3,000 participants completed each wave of the survey. O'Connor et al. (2020) reported that the prevalence of suicidal thoughts increased from 8% in April 2020, to 10% in May. Similar to Killgore et al. (2020), these findings indicated that rates of suicidal thoughts continued to increase under lockdown restrictions.

Whilst each individual study explored here has certain limitations, a picture starts to emerge when they are processed altogether. Initial research examining Google Trend data indicated that searches for suicide related terms, a moderate correlate of population suicide rates, had decreased during the first few months of the pandemic. However, cross-sectional comparison surveys and longitudinal studies examining suicidal thoughts indicated that, for areas experiencing lockdown restrictions, the number of individuals experiencing suicidal thoughts had increased. Furthermore, many studies noted that the increases in suicidal thoughts varied between demographic groups, with effects more pronounced in minority ethnic groups, low socioeconomic groups and individuals with health conditions.

Suicide Attempts

Whilst the evidence outlined above indicated that rates of suicidal thoughts increased after the onset of the COVID-19 pandemic, this does not necessarily mean there was a concomitant increase in suicide attempts. Suicidal thoughts are weakly to moderately correlated with suicide attempts, with the majority of individuals who experience suicidal thoughts not attempting suicide (Klonsky & May, 2013). The section below explores how the COVID-19 pandemic has influenced rates of attempted suicide within the general population.

A plethora of studies measured attendance at psychiatric emergency departments for suicide attempts before and after the onset of the COVID-19 pandemic. Data from three psychiatric emergency departments in Paris reported that, during the first four weeks of the French COVID-19 lockdown period, there was a 42.6% reduction in attendances for suicide attempts compared to the equivalent four week period in 2019 (Pignon et al., 2020). A similar study was conducted in Madrid by Hernández-Calle et al. (2020). In a time-series analysis of suicide related visits to emergency departments between November 2018 and April 2020, Hernández-Calle et al. (2020) reported that there were significantly fewer suicide related emergency department attendances after the onset of the COVID-19 pandemic. These findings have been replicated across the globe. Dragovic et al. (2020) compared the rates of suicidal and self-harm presentations to three psychiatric emergency departments in Western Australia before (January 2019 – May 2019) and after (January 2020 – May 2020) the introduction of COVID-19 into Australia and found a 26% reduction in presentations during the pandemic. Similar findings have also been reported in England (Hawton et al., 2021), Portugal (Goncalves-Pinho et al., 2020), Italy (Capuzzi et al., 2020), Ireland (McAndrew et al., 2020) and America (Walker et al., 2020).

Overall, there is strong evidence to suggest that rates of hospital attendances for suicide attempts across the world fell considerably after the onset of the pandemic. However, the reason behind this decrease is less clear. There are two likely causes for the reduction in suicide related hospital attendances. Firstly, there could be a genuine reduction in suicide attempts in populations across the world. Secondly, individuals may be choosing not to present to emergency departments due to the infection control risks associated with attending hospital. Whilst suicide related attendances at emergency departments are typically related to rates of attempted suicide within the population (Larkin et al., 2008), it may not be sensible to use this as a valid and reliable indicator of population suicide attempts during a pandemic, where infection control measures are likely to deter individuals from attending hospitals. More direct measures are required to further examine the influence of the pandemic on suicide attempts.

Other research has measured the prevalence of suicide attempts during the pandemic using online surveys. Every-Palmer et al. (2020) recruited a large (N =

2,010), demographically representative sample of adults living in New Zealand during the COVID-19 pandemic (April 2020). They found that 2.1% of their sample reported attempting suicide during the lockdown period. Every-Palmer et al. (2020) noted this was substantially higher than the 0.4% 12 month prevalence rate for suicide attempts observed in the 2006 nationally representative New Zealand Mental Health Survey (Beautrais et al., 2006). However, the 15 year age gap between the two studies and the higher risk of selection bias in the COVID-19 survey may limit the appropriateness of this comparison.

Furthermore, O'Connor et al. (2020) used a series of online surveys over the first six weeks of the UK lockdown and measured rates of self-reported suicide attempts between April 2020 and May 2020 in a sample weighted to population proportions. O'Connor et al. (2020) reported that the prevalence of past-week suicide attempts in their UK sample increased from 0.1% in April 2020, to 0.7% in May 2020. Whilst this finding certainly indicated an increase in the rates of suicide attempts as the pandemic related restrictions continued, the reliance on self-report data is an important limitation to consider. When asking individuals to self-report their suicide attempts online, studies often use single item, yes/no questions such as "*Have you made an attempt to end your life within the past X weeks?*" (O'Connor et al., 2020). Hom et al. (2016) reported that single item, self-report measures of attempted suicide often result in the misclassification of suicide attempts. They found that of 100 participants who reported a previous suicide attempt, 30 had not previously attempted suicide, seven had an aborted attempt and three had an interrupted attempt. This, combined with the fact that people may not wish to disclose their suicide attempts in an online survey for data security fears, means we must apply caution when interpreting these findings. Nevertheless, whilst online self-reported suicide attempts can be a very noisy outcome variable, the sizeable increase from 0.1% to 0.7% prevalence certainly suggests that attempted suicide increased under the pandemic related restrictions.

In summary, during the early stages of the pandemic, studies used self-report surveys and emergency department attendances to gauge the impact of the pandemic on rates of attempted suicide. Data from emergency departments showed a decline in suicide-related attendances during the pandemic, however it is likely that this was impacted by a reluctance to attend hospitals during a global pandemic, rather than a

genuine reduction in attempted suicide. Data from cross-sectional and longitudinal surveys suggested that rates of attempted suicide had increased after the onset of the COVID-19 pandemic, however caution must be applied due to the limitations with self-selection sampling biases and self-report measures of attempted suicide. Perhaps a more useful indication of population suicidality during the COVID-19 pandemic would be to obtain data on population suicide rates. The difficulty with this, is that it takes approximately six months from an individual's death, for a coroner's inquest to take place (ONS, 2021b). This means that there is often a long delay between death from suicide and an acknowledgement of the death in surveillance records. However, one year on from the onset of the pandemic, researchers across the world have started to publish data on population suicide rates during the pandemic.

Suicide Rates

Faust et al. (2021) analysed the suicide death data for persons aged ten years or above in Massachusetts using the Massachusetts Department of Health Registry of Vital Records and Statistics. They compared the rates of suicide deaths in Massachusetts during the lockdown period (March 2020 to May 2020) to the corresponding period in 2019. Faust et al. (2021) reported that the incident rate for suicide deaths in Massachusetts during lockdown was 0.67 per 100,000 per month, compared to 0.81 per 100,000 per month during the corresponding 2019 period. These findings suggest there was no increase in suicide during the onset of the pandemic and associated lockdown restrictions and even suggest that there might have been a small decrease. The latest data from the ONS in the UK paints a similar picture (ONS, 2021b). The ONS calculated the number of registered deaths from suicide in the UK between April 2020 and July 2020. They found that 1,603 deaths from suicide occurred during this period at a rate of 9.2 per 100,000 people. The ONS reported that this was statistically significantly lower than rates for the same period in the previous three years and noted that this decrease was driven mainly by the reduction in male suicides.

Additionally, the Monthly Suicide Data Report by the Coroners Court in Victoria, Australia reported that the monthly frequency of deaths from suicide between March 2020 to September 2020 were lower compared to the equivalent period in 2019 (Coroners Court of Victoria, 2020). Similar research from Sweden (Rück et al., 2021) also reported that the suicide rates in January – June 2020 were

slightly lower compared to January – June 2019. National data from Norway has also revealed that between March – May 2020, the rates of registered suicide deaths was slightly lower than the rate for the five previous years in the same period. Similar findings reporting that suicide rates have remined stable or have slightly declined since the onset of the COVID-19 pandemic have been reported in Greece (Vandoros et al., 2020), Germany (Radeloff et al., 2021), Peru (Calderon-Anyosa et al., 2021) and South Korea (Pirkis et al., 2021).

Overall, deaths from suicide do not appear to have increased since the onset of the COVID-19 pandemic. Indeed, a systematic review of suicide rates (Pirkis et al., 2021) during the COVID-19 pandemic concluded that suicide deaths have remained unchanged or have slightly declined in the period after the onset of the pandemic, compared to the pre-pandemic period. However, it is crucial to acknowledge that this data has predominantly come from high-income and upper-middle-income countries. Given that these countries have all been able to provide substantial social and economic subsidies to their populations, it is important that these findings are not generalised to middle- and low-income countries.

Summary

In summary, research from the USA, UK and China all indicated that rates of suicidal thoughts in their respective populations had increased after the onset of the COVID-19 pandemic (Czeisler et al., 2020; Raifman et al., 2002; Iob et al., 2020; Zhang et al., 2020) and some online surveys across the UK and New Zealand indicated that rates of attempted suicide also increased during the pandemic (O'Connor et al., 2020; Every-Palmer et al., 2020). However, this did not result in an increase in deaths from suicide across the world, with the majority of countries reporting either no increase, or a slight decrease in suicide rates after the onset of the pandemic (Pirkis et al., 2021). Nevertheless, many experts have urged extreme caution when interpreting these finding and have called for governments and researchers to remain vigilant in their efforts to monitor, understand and prevent suicide during the pandemic (John et al., 2021; Appleby, 2021; Pirkis et al., 2021). This next section explores why key figures have urged caution when interpreting the current suicide rates.

An Urge for Caution

Key authors in the field have urged extreme caution and continued vigilance when interpreting these findings (John et al., 2021; Appleby, 2021; Pirkis et al., 2021). One reason for this is because many of the factors that supposedly protected against suicide during the early stages of the pandemic, have started to wane.

For example, some authors have highlighted how a “pulling together” effect or “honeymoon period” may have created a short-term decrease in population mental health difficulties and suicidality during the initial stages of the COVID-19 pandemic (Zortea et al., 2021; DeWolfe, 2000). It is thought that the period after the immediate impact of a disaster is often characterised by increased social connectedness, community cohesion, mutual support and a sense of togetherness that can temporarily increase the wellbeing of a population and protect against suicide (Zortea et al., 2021; DeWolfe, 2000).

Qualitative research can also provide some insight into how the COVID-19 pandemic may have had a protective influence. Bock et al. (2022) engaged in structured group discussions with a small sample of adolescent participants who were receiving psychological therapy during the pandemic. When asked to reflect on the positive aspects of the pandemic, participants reported that they had more time for relaxation, reflection and quality family time. Some participants stated that having more time helped them to experience less stress and appreciate everyday life more. One participant also reflected on how the pandemic led to fewer distractions, which enabled them to understand their emotions on a deeper level and deal with them more effectively. This qualitative work highlights how the additional time many individuals experienced during the initial stages of the pandemic may have helped decrease feelings of stress and aid relaxation and emotional development. This, combined with the “pulling together” effect or “honeymoon period” provide some idea as to why suicide did not increase in the population during the pandemic.

However, this is unlikely to confer protection against population suicidality over the longer term. The “honeymoon period” is typically followed by a period of disillusionment, when the long term reality of a disaster and fatigue sets in and the emotional wellbeing of a population decreases (DeWolfe et al., 2000; Cream et al., 2021). Therefore, it would be premature to interpret the slight decrease in population

suicide rates as evidence that the COVID-19 pandemic has not increased the risk of suicide in the population. Additionally, the sizeable economic and social subsidies (e.g., furlough schemes, housing security schemes) that governments provided their citizens with are also thought to have played a role in protecting against population suicidality (Tanaka & Okamoto, 2021). The short-term financial and housing security afforded by these schemes may have provided temporary protection against some important stressors linked to suicidal thoughts and suicide attempts. However, these government subsidies are gradually being withdrawn over time (Pope & Shearer, 2021) and are not likely to provide protection over the longer term. The waning of these protective influences has caused concerns about rising suicide rates in the later stages of the pandemic.

Furthermore, whilst some of the protective factors may be diminishing, many of the social and economic difficulties associated with the pandemic persist. Whilst a comprehensive review of all social and economic stressors is beyond the scope of this thesis (see Akat & Karatas, 2020), some of the major long-term difficulties include: the large-scale global economic contraction projected to result in millions of job losses across the world and send an additional 130 million people into extreme poverty (United Nations Conference on Trade and Development, 2020); widening social, health, economic and educational inequalities (Griffin, 2020); delayed diagnosis and treatment of cancer and other major illnesses (Richards et al., 2020); longer waiting lists for important medical procedures (Rathnayake et al., 2020); school closures and low-quality remote learning leading to learning loss and educational dropout (Dorn et al., 2020; Khan & Ahmed, 2021); along with increased health problems caused by “long COVID” (Sudre et al., 2021). The withdrawal of the previously mentioned protective influences, combined with the persisting physical, social and economic challenges, has given rise to concerns about increasing suicide rates in the population over the longer term.

Indeed, recent findings in Japan reported that after the initial 14% reduction in population suicide rates between February – June 2020, there was a 16% increase in suicide rates toward the end of the year (Tanaka & Okamoto, 2021). Given the time delay in the monitoring of population suicide rates, much of the available data only reports suicide rates in the first six months of the pandemic. When one factors in the withdrawal of initial government subsidies and the thinning of the initial

“honeymoon” and “pulling together” atmosphere over time, there are valid concerns about rising suicide rates over the longer term. This has caused many authors to call for continued vigilance in understanding and preventing suicide during these uncertain and changing times (John et al., 2021; Appleby, 2021; Pirkis et al., 2021).

A Need for Outreach

Alongside the call for continued vigilance in understanding and preventing suicide, many authors have also called for governments and health care services to engage in active outreach to the individuals that have been most adversely impacted by the pandemic (Sher, 2020; Sheffler et al., 2020). The COVID-19 pandemic has not impacted each member of the population equally and it is important for research to identify the groups of individuals most adversely affected, so that outreach programs can target those most in need of help.

Studies investigating psychological distress and mental wellbeing throughout the COVID-19 pandemic consistently reported that women, young people and those from low socioeconomic groups were more adversely impacted by the COVID-19 pandemic and associated restrictions (Pierce et al., 2020; Xiong et al., 2020). Likewise, many studies investigating population suicidality during the pandemic, have found that the impact of the pandemic on suicide rates has differed for different demographic groups. Data from the National Child Mortality Database (2020) indicated that deaths from suicide among individuals aged under 18 increased during the first phase of the UK lockdown. O’Connor et al. (2020) also reported that suicidal ideation was higher in younger adults relative to older adults in the first months of the UK lockdown. Ueda et al. (2021) monitored monthly suicide statistics and online mental health surveys and found that, whilst there was no overall increase in suicide rates in the population after the onset of the pandemic, there was a considerable increase in the number of female suicides. Moreover, the recent data published by the ONS (2021b) revealed that male suicides had significantly decreased compared to rates prior to the pandemic, yet there was no change in the rate of suicide in females. Additionally, Iob et al. (2020), in their longitudinal survey, observed that rates of self-harm and suicidal thoughts were higher in those experiencing socioeconomic disadvantages.

The finding that different groups of individuals have been differently impacted by the COVID-19 pandemic, encourages a more in-depth and nuanced approach to understanding and preventing suicide throughout the pandemic. Such findings serve as an important indicator that researchers should look beneath the general trends in population suicide rates and ask more nuanced questions (Appleby, 2021). In addition to asking whether suicidality has increased or decreased in the population, research should be pursuing questions such as which demographic groups are particularly vulnerable to suicide throughout the COVID-19 pandemic, what pandemic related stressors are driving suicidal thoughts and suicide attempts and what factors are important in protecting individuals from suicide during the pandemic? This thesis aimed to look beneath the general trends in population suicidality and identify important demographic, social and psychological factors that influenced suicidal thoughts and attempts throughout the COVID-19 pandemic.

Current Research

Wales Wellbeing

The Wales Wellbeing research group was a collaborative project between researchers in Swansea University, Cardiff University and the seven Health Boards across Wales that aimed to examine the wellbeing of the Welsh population during the COVID-19 pandemic using a series of online surveys. The surveys were designed using a collaborative process between the Health Board's divisional directors for mental health and the researchers. The directors raised research questions they thought would help inform the development of effective community outreach and recovery structures. These questions included how the COVID-19 pandemic influenced wellbeing and suicidality of different demographic groups, the effect of various pandemic related stressors on wellbeing and suicidality and whether there were any psychological or social factors that protected against poor wellbeing or suicidality during the pandemic. The researchers sought to find methodologically valid ways of answering these questions. The researchers and divisional directors worked together to ensure the content of the survey was both methodologically valid and capable of answering the original research questions.

Research Questions

The COVID-19 pandemic resulted in a wide range of challenges and difficulties for populations all over the world. Early research indicated that the pandemic had a deleterious impact on population mental health (Pierce et al., 2020; Robinson et al., 2022; Xiong et al., 2020). Whilst the most recent research indicated that the COVID-19 pandemic did not result in increased suicide rates (Pirkis et al., 2021), experts have called for researchers, governments and health care services to remain vigilant in their efforts to understand and prevent suicide as the long-term social and economic effects of the pandemic persist (John et al., 2021; Appleby, 2021). Furthermore, research into population mental health and suicidality during the COVID-19 pandemic has consistently found that different groups of individuals have been impacted in different ways, with young people, women and low socioeconomic groups being more adversely affected by the pandemic. In order to ensure that suicide rates in the population do not rise as the long term social and economic effects of the pandemic continue, many have highlighted the need for outreach programmes that can provide help and support to those who are particularly vulnerable to suicide during the COVID-19 pandemic (Sher, 2020; Vigo et al., 2020; Moreno et al., 2020). Therefore, this research broadly aimed to develop an understanding of the factors that could help develop effective outreach to individuals that may be at risk of suicide during the COVID-19 pandemic. More specifically, this research had three core aims.

Firstly, this research aimed to identify the demographic groups most vulnerable to suicidal thoughts and suicide attempts during the pandemic. Secondly, this research aimed to identify the key stressors associated with suicidal thoughts and suicide attempts during the pandemic. These two aims are addressed in chapter 5. Thirdly, this research sought to investigate the psychological and social factors that protected against the development of suicidal thoughts during the COVID-19 pandemic. This aim is addressed in chapter 6. Through establishing the demographic groups most vulnerable to suicide, the factors driving suicide and the factors protecting against suicide, this research will provide useful information that could aid the development of effective community outreach and recovery structures for individuals vulnerable to suicide during the COVID-19 pandemic.

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Chapter 5: Identifying Factors Contributing to Suicidal Thoughts and Suicide Attempts During the COVID-19 Pandemic

Introduction

This research aimed firstly, to identify the demographic groups most vulnerable to suicidal thoughts and suicide attempts during the pandemic and secondly, to identify which pandemic related stressors were strongly associated with suicidal thoughts and attempts.

Demographic Groups

One of the key challenges that community leaders and policy makers face in the aftermath of a disaster is how to identify the individuals most in need of help and support (Cream et al., 2021). Research from previous large-scale disasters have demonstrated how different demographic groups are impacted differently. For example, in the months after the rail disaster that destroyed Lac-Megantic in 2013, researchers found that the mental health of middle-aged men was disproportionately affected relative to other demographic groups (Cream et al., 2021). It was posited that the loss of jobs, financial security and housing difficulties that followed the disaster was more difficult to deal with for a group that had previously been financially stable and had no experience of asking for support (Cream et al., 2021).

Conversely, research into the Ebola and Zika virus outbreaks have highlighted how women were more impacted by the social and economic effects of the disease outbreak, were more likely to bear the brunt of caring responsibilities and were disproportionately disadvantaged by limited access to sexual healthcare services (Wenham et al., 2020). These examples highlight how different demographic groups can be impacted differently by the same event. In their review of population recovery efforts after large-scale disasters, Cream et al. (2021) highlighted the importance of developing an informed understanding of the groups most adversely impacted by the disaster, in order to inform effective community outreach and support efforts.

Early research into how the COVID-19 pandemic impacted population mental health, revealed that certain groups had been more adversely affected by the

pandemic than others. Research in the USA (McGinty et al., 2020), UK (Pierce et al., 2020a), Italy (Rossi et al., 2020) and China (Qiu et al., 2020) revealed that younger individuals (<40), women and those from lower socioeconomic groups, experienced a sharper decline in their mental health relative to older individuals, men and those from higher socioeconomic groups. Whilst there has been plenty of research highlighting the way the COVID-19 pandemic has differentially impacted the *mental health* of different demographic groups, less research has examined how the pandemic influenced *suicidality* within these groups.

Only one previous study investigated the rates of suicidal ideation within different demographic groups during the pandemic. O'Connor et al. (2020) conducted an online survey assessing a range of mental health factors in adults during the first six weeks of the UK lockdown. O'Connor et al. (2020) found higher rates of suicidal thoughts in younger adults relative to older adults, lower socioeconomic groups compared to higher socioeconomic groups and equal rates of suicidal thoughts between males and females. However, a lot of things have changed in the 6-8 months since this research was conducted. There has been the introduction of new COVID-19 variants, a second set of lockdown restrictions and the withdrawal of various protective factors such as the furlough and housing security schemes (Pope & Shearer, 2021). Furthermore, O'Connor et al. (2020) did not analyse the differences in the prevalence of suicide attempts in different demographic groups. Therefore, this research aimed to investigate the demographic groups most vulnerable to both suicidal thoughts and suicide attempts throughout the COVID-19 pandemic. The main demographic characteristics examined in this study was age, gender and socioeconomic status. The rational for choosing these demographic characteristics is outlined below.

Age

Past research has highlighted how the COVID-19 pandemic has imposed different challenges on different age groups. For example, the severity and mortality of COVID-19 has disproportionately affected older adults, with adults over 65 having a 23-fold greater risk of death than those under 65 (Mueller et al., 2020). Research has also demonstrated that health anxiety was more pronounced in older adults during the onset of the pandemic (Bergman et al., 2020) and older adults were

much more likely to adhere to strict stay-at-home restrictions relative to younger adults (Wong et al., 2020).

Whilst younger adults were less vulnerable to the physical effects of COVID-19, there is some evidence suggesting they were more impacted by the restrictions caused by the pandemic. Younger adults experienced severe disruptions to their education (d'Orville, 2020), experienced the sharpest increase in unemployment rates (Gould & Kassa, 2020), were more likely to experience financial difficulties (Varma et al., 2021) and were the least likely to be eligible for government COVID-19 related subsidies (Gould & Kassa, 2020). Alongside these educational and financial difficulties, research has also suggested that young people were most adversely impacted by the restrictions on socialising (Beam & Kim, 2020). Social relationships are thought to play a pivotal role in the psychosocial development of young adults and have an especially protective influence against anxiety, depression and suicidal ideation in young people (Roach, 2018). Therefore, the lockdown restrictions that limited young people's social contact, may have disproportionately affected young adults.

After considering the different ways in which the COVID-19 pandemic impacted younger and older age groups, it is likely that an individual's age will have influenced their experience during the pandemic. Indeed, research conducted during the early stages of the pandemic indicated that the mental health of younger adults was more adversely impacted by the pandemic relative to older adults (Pierce et al., 2020a; Xiong et al., 2020). Additionally, O'Connor et al. (2020) found a higher prevalence of suicidal thoughts in younger individuals compared to older individuals. This research sought to build upon previous work and examined whether age moderated the likelihood of experiencing suicidal thoughts and suicide attempts during the second UK COVID-19 pandemic lockdown.

Gender

The COVID-19 pandemic has affected men and women in different ways, the most obvious of which is in the vulnerability to the virus itself. Epidemiological research has reliably established that being male is associated with higher COVID-19 morbidity and mortality (Bwire, 2020). In Spain, almost twice as many men died from COVID-19 relative to women (Bwire, 2020) and similar findings were reported

in Italy (Onder et al., 2020), South Korea (Shim et al., 2020) and the UK (Bwire, 2020).

However, whilst the physical effects of COVID-19 have had a more severe impact on men, several papers have highlighted how the wider economic and social changes caused by the pandemic have disproportionately affected women. Women were approximately 33% more likely than men to work in an industry that was hardest hit by the pandemic such as hospitality, travel, education and retail (Wenham et al., 2020). Women were also less likely to be in jobs that were tele-commutable (Tertilt et al., 2020), were more likely to have fewer hours of employed work and had less secure zero-hour contracts which made them more vulnerable to economic instability (Bandiera et al., 2019; Wenham et al., 2020). This has culminated in increased unemployment in women, with a recent literature review demonstrating that unemployment was significantly higher for women relative to men during the COVID-19 pandemic (Carli, 2020).

Women were also more likely to carry a heavier load in childcaring duties during the pandemic, even if they were still working. The pandemic restrictions led to large-scale school and nursery closures in the UK and many other countries (Sevilla & Smith, 2020). This led to sudden increases in the need for childcare and home-education. Research from America found that among co-habiting couples with school-aged children, women took on more of the responsibilities in childcare relative to men after the school closures, with 14% of men and 44% of women reporting being the only one in the household providing childcare in April 2020 (Zamarro et al., 2020). This pattern continued in the following months. Within the UK, reports estimated that the absolute number of childcare hours increased more for women (from 15 to 30 hours per week) than for men (from 6 to 15 hours per week; Sevilla & Smith, 2020). This increase in childcare hours for women relative to men remained even when controlling for levels of employment. Indeed, women who reported working from home were found to perform as many additional hours of childcare as men who reported being furloughed (Sevilla & Smith, 2020).

In addition to the increased economic and childcare challenges, women were also at greater risk of domestic violence during the early stages of the pandemic (Wenham et al., 2020). Domestic abuse refers to a pattern of controlling, coercive,

threatening, degrading or violent behaviour performed by a partner, ex-partner or family member (Women's Aid, 2021). Whilst both men and women can be victims of domestic abuse, most victims are women (Bradbury-Jones & Isham, 2020; Richardson, 2002). Research from around the world highlighted the marked increase of domestic abuse after the implementation of lockdown restrictions. Within the UK, in the week after the announcement of lockdown measures in March 2020, Refuge reported that calls to the UK Domestic Violence Helpline increased by 25% and visits to the Refuge website had increased 150% (Bradbury-Jones & Isham, 2020). Additionally, the European member states of the World Health Organization reported a 60% increase in emergency calls from women subjected to domestic abuse in April 2020 compared to April 2019 (Mahase, 2020a).

Considering the different ways in which the pandemic has affected men and women, it seems likely that an individual's gender will influence their experience of the pandemic. Indeed, early research from around the world indicated that the mental health of women was disproportionately negatively impacted by the pandemic relative to men (Pierce et al., 2020a; Xiong et al., 2020; Qiu et al., 2020). This asymmetry has led to concerns about increasing suicidality in females. Whilst most research has indicated no increase in population suicide rates during the COVID-19 pandemic (Pirkis et al., 2021) and UK based research found no gender differences in prevalence of suicidal thoughts during the early stages of the pandemic (O'Connor et al., 2020), more recent research from Japan indicated that there was a considerable increase in the number of female suicides towards the end of 2020 (Ueda et al., 2021). Therefore, this research examined whether gender moderated an individual's likelihood to experience suicidal thoughts or suicide attempts during the second UK lockdown period of the COVID-19 pandemic.

Socioeconomic Status

Socioeconomic status refers to the social standing or class of an individual or group and is typically a combination of education, income and occupation (American Psychological Association, 2021). Put simply, socioeconomic status can be thought of as the degree of access to opportunities and resources that one might expect in society (Welsh Government, 2019a). Whitehead et al. (2021) highlighted that exposure to infection from COVID-19 was higher in individuals belonging to lower socioeconomic groups who were more likely to work in manual jobs in the caring,

retail and service industries that cannot be done from home. Whitehead et al. (2021) also highlighted that lower socioeconomic groups tend to live in smaller, overcrowded housing in densely populated areas which increases risk of infection. Research has also demonstrated that the risk of death from COVID-19 is higher in lower socioeconomic groups. Cross-sectional research from America reported a strong association between socioeconomic status and likelihood of both contracting and dying from COVID-19 (Karmakar et al., 2021) and similar findings have been demonstrated in Chile (Mena et al., 2021). This increased vulnerability to death from COVID-19 in lower socioeconomic groups is thought to be caused by higher rates of pre-existing health conditions along with decreased access to and knowledge of healthcare systems (Patel et al., 2020).

Aside from the physical effects of the pandemic, the restrictions imposed by governments to control the spread of infection have also disproportionately impacted lower socioeconomic groups. Individuals belonging to lower socioeconomic groups were more likely to work in jobs that could not easily transfer to tele-commuting (e.g., service industries, manufacturing, hospitality, retail, transport) and therefore were more likely to have lost their job or experienced a reduction in their earnings due to COVID-19 (Adams-Prassl et al., 2020; Blundell et al., 2021). Those from lower socioeconomic groups were also more likely to be in less secure work arrangements (e.g., zero-hour contracts), which made employment and income less predictable and interfered with eligibility for government subsidy schemes (Blundell et al., 2021). Low-income families with children also incurred substantial extra costs from having children at home for longer without the access to the free childcare services that were available prior to lockdown (Whitehead et al., 2021). Indeed, Fancourt (2020) found that 70% of individuals who stated that their financial situation was “very difficult” prior to the first UK lockdown in March 2020, reported that their financial situation was “much worse” or “worse” by November 2020. Conversely, only 30% of individuals who stated their financial situation was “comfortable” prior to the first UK lockdown, reported that their financial situation was “much worse” or “worse” by November 2020. This finding suggests that the impact on people’s financial situations was not even, with existing financial inequalities widening because of the pandemic.

In addition to the widening financial inequality, the different living conditions for different socioeconomic groups have influenced people's functionality and wellbeing throughout the lockdown restrictions. Individuals from lower socioeconomic groups are much more likely to live in overcrowded accommodation with limited access to outdoor space (Patel et al., 2020). Living in overcrowded conditions during lockdown restrictions made it much more difficult to work or educate oneself from home (Patel et al., 2020), increased the risk of illness from almost all infectious diseases (McNicholas et al., 2000) and was a major source of distress (Patel et al., 2020).

Given that the COVID-19 pandemic disproportionately affected the health and finances of lower socioeconomic groups, it is likely that socioeconomic status influenced people's experience of the COVID-19 pandemic. Indeed, early research suggested that the mental health of lower socioeconomic groups was more adversely impacted by the pandemic (Pierce et al., 2020a; Xiong et al., 2020) and one study reported a higher prevalence of suicidal thoughts in lower socioeconomic groups relative to higher socioeconomic groups during the first six weeks of the UK lockdown (O'Connor et al., 2020). This research aimed to build upon previous research and investigate whether socioeconomic status influenced an individual's likelihood to experience suicidal thoughts and suicide attempts during the second UK COVID-19 lockdown.

Demographic Groups: Summary

In summary, prior research has established how individuals of different ages, genders and socioeconomic groups have been differently impacted by the COVID-19 pandemic. This research aimed to examine the extent to which these demographic factors influenced the likelihood that an individual would experience suicidal thoughts or attempt suicide during the COVID-19 pandemic. Increasing our knowledge and understanding of the vulnerability to suicidal thoughts and suicide attempts across these different groups can help inform outreach and recovery strategies designed to help those impacted by the pandemic.

Pandemic Related Stressors

As highlighted in chapter 1, the COVID-19 pandemic introduced and exacerbated several stressors within the population (e.g., food insecurity, social

isolation, financial problems). Whilst many authors have speculated that these stressors will lead to increased suicidality in the general population (Sher, 2020; Gunnel et al., 2020), very little research has measured the relationship between each of these stressors and suicidal thoughts or suicide attempts. Indeed, there are multiple theoretical accounts of suicide that highlight how the introduction or exacerbation of stressors can contribute to suicidal thoughts and behaviours.

The Integrated Motivational-Volitional (IMV) model of suicidal behaviour (O'Connor, 2011) was developed with a diathesis-stress model as it's spine, which acknowledges how pre-existing biological, social and psychological vulnerabilities can lead to an increased risk of suicidal ideation when combined with stressful life events (O'Connor & Kirtley, 2018). The IMV posits that one's intention to engage in suicidal behaviour is caused by feelings of entrapment, and these feelings often arise after defeat or humiliation appraisals that occur after experiencing acute or chronic stressors (O'Connor & Kirtley, 2018). Other theoretical accounts of suicide also place emphasis on the role of stressful life events. The Cubic model of suicide (Shneidman, 2015) argues that it is the combination of stress, pain and perturbation that results in suicide risk and cognitive models of suicide (Wenzel & Beck, 2008) outline how pre-existing cognitive vulnerabilities interact with life stressors to cause psychiatric problems and suicidal thoughts to arise.

These theoretical accounts highlight how the introduction or exacerbation of stressful events play a key role in the pathway to suicidal thoughts and behaviours. Given that many authors within the scientific community have raised concerns about the increased prevalence of stressors within the population during the pandemic (Gunnell et al., 2020), the second aim of this research was to investigate the relationship between certain pandemic related stressors and suicidal thoughts and attempts. Establishing whether exposure to specific pandemic related stressors (e.g., social isolation) are linked to increased suicidal thoughts and suicide attempts could help communities (1) identify individuals exposed to the stressor and provide them with outreach and support and, (2) work to prevent or lessen the severity of such stressors in the community.

The choice of the specific pandemic related stressors investigated within this study was influenced by three main factors. The first influence was various

theoretical models of suicide risk that highlighted the deleterious impact of disruptions to social integration. There are multiple sociological theories of suicide that specifically highlight how stressors related to poor social integration (Durkheim, 1897) or the weakening of social bonds (Rubenstein, 1986) can play an integral role in the development of suicidal thoughts and behaviours. Indeed, after observing increased rates in suicide among men compared to women, single individuals compared to married individuals and individuals with children compared to individuals without children, Durkheim (1897) posited that poor integration into the social structures within society can result in feelings of meaninglessness and depression which may ultimately lead to suicide. Additionally, the Interpersonal Theory of Suicide (Van Orden et al., 2010) proposes that a thwarted feeling of social belongingness (the sense of being close and connected to others) combined with perceived burdensomeness and hopelessness provides the conditions necessary for suicidal desire to arise. After understanding the heightened suicide risk that can be conferred by disrupted social integration and the weakening of social bonds, this study specifically wanted to understand whether stressors such as social isolation, relationship problems and bereavement during the pandemic increased the risk of suicidal thoughts or behaviours.

The second influence was two key scientific papers that were published during the initial stages of the pandemic (Sher, 2020; Gunnel et al., 2020). One paper published by the COVID-19 Suicide Prevention Research Collaboration (Gunnel et al., 2020) issued an urgent call for consideration of how the pandemic might impact population suicide rates. Specifically, the paper highlighted how the pandemic would increase the prevalence of well-recognised suicide risk factors such as financial stressors, redundancy, restricted access to food and healthcare and domestic abuse. They raised concerns that these stressors, combined with many other physical, social and economic consequences of the pandemic, could negatively impact population suicide rates. Sher (2020) also raised concerns about how individuals with major COVID-19 symptoms would be at increased risk of suicide. Sher (2020) reviewed studies that outlined the neurobiological effects of COVID-19 and argued that survivors of COVID-19 may represent a high risk of future suicide. These two papers inspired this research to investigate how these factors might influence suicidal thoughts and attempts within the population during the pandemic.

The third influence was a result of the collaboration with the Health Board's divisional directors for mental health. As stated in chapter 4, the Wales Wellbeing survey was a collaboration with the Welsh Health Boards and aimed to answer key questions raised by the Health Boards that could aid community recovery. The Health Boards were particularly interested in how stressors such as being a key worker, not being able to access necessary health care and experiencing increased difficulties in providing care for someone, were related to psychological wellbeing and suicide risk within the Welsh population.

Therefore, this study aimed to measure the extent to which experiencing major COVID-19 symptoms, financial problems, being made redundant, food insecurity, bereavement, being a key worker, having responsibility to home-school a child, social isolation, relationship problems, domestic abuse, being unable to access necessary healthcare and experiencing increased difficulties in caring for someone were related to suicidal thoughts and attempts during the COVID-19 pandemic. The specific pandemic related stressors that were selected for investigation, along with their theoretical and empirical links to suicide are explained in the sections below.

Major COVID-19 Symptoms

There are a few reasons why contracting COVID-19 could lead to distress and increased suicidality. The physical symptoms of COVID-19 are likely to range from unpleasant (high temperature, continuous cough, loss of smell and taste, sore throat), to life-threatening (extreme breathing difficulties; NHS, 2021a). The physical pain and discomfort caused by COVID-19 symptoms alone has the potential to cause high levels of distress. Secondly, the knowledge that one has contracted a virus that has killed millions of people across the world (WHO, 2020) and caused long term health difficulties in millions of others (Mahase, 2020b), is likely to invoke health anxiety regarding one's own mortality and future physical functioning (Tyrer, 2020). Thirdly, given the long incubation period of COVID-19 (Zaki & Mohamed, 2020), a person experiencing symptoms may also experience anxiety around the idea that they have infected family, friends, or members of the community with a potentially deadly disease. Indeed, a case report from Bangladesh tragically illustrates how a fear of infecting others from COVID-19 may lead to suicide (Mamun & Griffiths, 2020).

Overall, experiencing COVID-19 symptoms is likely to be a distressing and anxiety invoking experience. In fact, a large-scale (N = 62,354) electronic health record network study by Taquet et al. (2021) demonstrated that for individuals with no psychiatric history, a diagnosis of COVID-19 was associated with an increased likelihood of a first psychiatric diagnosis (Hazard Ratio = 2.1) in the following three months. Considering the deleterious impact of experiencing COVID-19 symptoms on one's mental health, the present research was interested in establishing whether experiencing major COVID-19 symptoms was associated with an increased risk of suicidal thoughts and attempted suicide.

Financial Problems and Job Losses

Many individuals experienced financial difficulties because of the COVID-19 pandemic. In America, the unemployment rate rose from 3.5% in February 2020, to 14.7% in April 2020, the highest rate in over 80 years (Altig et al., 2020). Within the UK, the unemployment rate rose from 4% before the pandemic to 5% during the pandemic (Office for National Statistics [ONS], 2021a). Whilst the furlough scheme enabled millions across the UK to keep their jobs, it still resulted in at least a 20% reduction of monthly wages, which meant that millions of households across the UK saw a sizeable reduction in income. Alongside job losses, the COVID-19 pandemic also resulted in high levels of inflation, with the Consumer Price Index (a measure that tracks the average price of a basket of consumer goods) rising 3.2% between August 2020 and August 2021, the largest increase ever recorded in the 12 month inflation rate (ONS, 2021b). This increased cost of living combined with the lower household income caused by the pandemic, caused increased financial difficulties within the general population.

Some academics have warned that the increase in job losses and financial problems could result in increased population suicidality (Sher, 2020). Unemployment is a well-established risk factor for suicide. Past research has demonstrated that unemployment is associated with a two- to three-fold increase in risk of dying from suicide (Blakely, 2003) and there is a well-documented positive association between annual variations in unemployment rates and suicide rates that has been demonstrated in Canada, France, Germany, Japan, Sweden and America (Boor, 1980). The immediate impact of involuntary job loss (e.g., being made

redundant) is also a strong predictor of psychological distress and suicide (Milner et al., 2014).

Experiencing financial problems is also a major risk factor for suicide. Choo et al. (2019) conducted an archival examination of 460 individuals who were admitted to the emergency department after a suicide attempt and found that serious financial problems was one of the strongest predictors of attempted suicide. Furthermore, Bhatia and Verma (2006) examined the content of suicide notes in a sample of 40 individuals that died from suicide and found that financial problems were amongst the most cited reasons for suicide attempts. Additionally, a review of 300 coroner's records found that financial and employment issues contributed substantially to 13% of deaths by suicide (Coope et al., 2015). Given the pandemics impact on job losses, economic problems and financial hardships, this research investigated whether both losing one's job and experiencing financial difficulties during the COVID-19 pandemic, was associated with an increased risk of experiencing suicidal thoughts or attempting suicide.

Food Insecurity

The COVID-19 pandemic disrupted supply chains, impacted access to food and caused many individuals to experience food insecurity; defined as not having enough nutritious food for one's needs, or one's family's needs (Niles et al., 2020). Within the UK, the number of adults experiencing food insecurity was estimated to have quadrupled over the initial lockdown period (Loopstra, 2020). Reports noted that roughly half of the food insecurity was caused by a lack of food in the shops and other causes of food insecurity included income losses, loss of free school meals and quarantine processes making it more difficult to shop for food (Loopstra, 2020).

Food insecurity could lead to increased suicidal thoughts and suicide attempts. Previous large-scale, cross-sectional research of a nationally representative US adult sample (Nagata et al., 2019) demonstrated that food insecurity was associated with an increased risk of depression (OR = 1.67), anxiety (OR = 1.47), insomnia (OR = 1.78) and suicidal ideation (OR = 2.76). Further research that included data from 179,771 participants across 44 countries confirmed that food insecurity was associated with a two-fold increased risk of attempted suicide, after adjustments for potential confounders such as age and gender (Koyanagi et al.,

2019). Whilst it could be argued that the association between food insecurity and suicide could be explained by the relationship between socioeconomic status and suicide, previous research has established that food insecurity is associated with suicidality independent of socioeconomic status (Alaimo et al., 2002; Melchior et al., 2012; Koyanagi et al., 2019). Whilst the findings reported here are from cross-sectional work that precludes the drawing of a directional, causal relationship between food insecurity and mental health difficulties, these findings have also been replicated in prospective research (Bruening et al., 2017).

The pathway linking food insecurity to suicide attempts is unclear but numerous potential mechanisms have been proposed. Firstly, an inadequate supply of nutrients (vitamins, micronutrients, fats, glucose) important for neurological functioning may lead to increased mental health problems, which in turn increases the likelihood of an individual experiencing suicidal thoughts (Koyanagi et al., 2019). Secondly, small caloric consumption has been linked to impaired hypothalamic-pituitary-adrenal (HPA) axis reactivity to stress (Macht, 1996), which can cause increased suicidality (Coryell & Schlesser, 2001; Koyanagi et al., 2019). Thirdly, it is also possible that the stigma and shame associated with not being able to provide food for oneself and one's family could also cause increased suicidality (Pompili et al., 2003). Considering the pandemic's impact on food insecurity and the previously established links between food insecurity and suicidality, this research investigated whether experiencing food insecurity during the COVID-19 pandemic was associated with suicidal thoughts and suicide attempts.

Bereavement

The COVID-19 pandemic has led to an increase in mortality across the world. Between March 2020 and August 2020, Woolf et al. (2020) reported that deaths in America increased 20% over the expected rate, relative to historical data. The authors attributed two-thirds of the excess deaths directly to COVID-19, with the remaining third being indirectly related to the pandemic (e.g., deaths from healthcare shortages or delayed access to healthcare assessment and treatment). This increase in all-cause mortality has been documented in most countries around the world (Ritchie et al., 2020). This increase in mortality has inevitably resulted in a surge in the number of individuals grieving for the loss of loved ones (Verdery et al., 2020). Indeed, Verdery et al. (2020) estimated that for every mortality in America,

approximately eight family members experience kin bereavement. With Woolfe et al. (2020) estimating that the pandemic resulted in 267,312 excess deaths between March and August 2020, this meant that approximately 2,138,496 individuals in America experienced kin bereavement due to COVID-19. If one was to include the number of close friends also bereaved, this number would be considerably higher. The death of a family member or close friend can have a devastating psychological impact. Bereavement is associated with an increased risk of both physical health problems (Elwert & Christakis, 2008), mortality (Stroebe et al., 2007), loneliness (Stroebe et al., 2005) and psychological distress (Stroebe et al., 2007). Experiencing the loss of a close friend, partner or family member is also a well-established risk factor for suicide (Powell et al., 2000), with rates of suicide often elevated for five years after the bereavement (Bunch, 1972). Therefore, it is possible that the increased bereavement experienced during the pandemic may have increased population suicidality.

In addition to increasing the number of individuals experiencing bereavement, the pandemic has also profoundly impacted the bereavement process, with restrictions influencing traditional grieving processes. Throughout the UK lockdown, restrictions ensured that only small groups were permitted to attend funerals and social distancing procedures were to be observed. This limited people's ability to say farewell to their loved ones in traditional ways and observe cultural or religious practices (Stroebe & Schut, 2020). Cultural, religious and spiritual traditions play an important role in offering support to the bereaved and providing an opportunity to convey love and respect for the deceased (O'Rourke et al., 2011; Burrell & Selman, 2020). Depriving individuals of these experiences may exacerbate the already distressing grieving process.

Overall, the increased mortality brought on by the pandemic has resulted in a rising number of people experiencing bereavement and the infection control restrictions have made traditional grieving processes more difficult. Therefore, this research investigated whether experiencing bereavement during the COVID-19 pandemic was associated with an increased risk of suicidal thoughts and suicide attempts.

Home-Schooling A Child

To reduce transmission of COVID-19, countries across the world imposed strict lockdown measures that included school closures. This led to parents being required to home-educate their children (Thorell et al., 2021). Villadsen et al. (2020) compiled the results from five UK longitudinal studies that collected data from parents with school-aged children. They found that, 58% of parents reported engaging their children in some form of home-schooling on a typical weekday during lockdown, with the average parent spending 2.2 hours a day on home-schooling (Villadsen et al., 2020). Many parents assumed these home-schooling responsibilities in addition to their jobs and pre-existing childcare commitments. Thorell et al. (2021) conducted a survey examining the experiences of 6,720 parents from seven European countries and found that most parents reported negative experiences for both themselves and their children. Most parents reported they were worried that their child was falling behind academically, they felt that schools were not providing enough support towards the home-education process, they felt it interfered with their jobs and stated that it had increased the number of domestic conflicts. Parents reported that home-schooling had increased their levels of stress, anxiety and had a negative impact on their emotional wellbeing. The finding that home-schooling resulted in higher rates of domestic conflict is particularly concerning given the strong link between domestic conflict and suicidality (Randell et al., 2006).

In summary, the lockdown restrictions imposed by the pandemic resulted in many parents of school-children taking on the responsibility of home-educating their children. This increased workload, stress and the additional conflict caused by home-schooling may have negatively impacted the mental health of home-educators. This research investigated whether home-schooling responsibilities during the COVID-19 pandemic was associated with suicidal thoughts and suicide attempts.

Key Worker Status

Whilst most UK workers were instructed to work from home or were furloughed throughout the COVID-19 lockdown periods, individuals whose jobs involved the provision of essential goods, infrastructure and vital public services were asked to endure the heightened risk of infection to perform their professional duties (Pink et al., 2021). Key workers such as healthcare professionals, police officers, firefighters and first responders were in frequent close contact with the

public and experienced much higher rates of COVID-19 infections and deaths during the first wave of the pandemic (Khadse et al., 2020; Nguyen et al., 2020).

Alongside the elevated risk of infection, past research highlighted the adverse psychological consequences experienced by frontline healthcare workers during a pandemic. During the SARS outbreak between 2002 and 2004, frontline healthcare workers experienced higher rates of psychological distress, depression, anxiety and post-traumatic stress disorder compared to individuals not involved in patient care (Brooks et al., 2018). Moreover, a review of 24 studies investigating the impact of COVID-19 on the mental health of healthcare workers during the first few months of the pandemic concluded that the pandemic had a considerable impact on the mental health and wellbeing of front-line hospital staff (De Kock et al., 2021). The heightened levels of infection risk and psychological distress experienced by key workers during the COVID-19 pandemic has led to concerns that suicide rates may have increased within this population (Mortier et al., 2020). Therefore, this research investigated whether key worker status during the COVID-19 pandemic was associated with suicidal thoughts and suicide attempts.

Social Isolation

Another major stressor imposed by the pandemic was the quarantine and isolation protocols for individuals exposed to, or infected by, COVID-19. Within the UK, if an individual experienced COVID-19 symptoms or received a positive COVID-19 test result, they were required to self-isolate in their homes for at least ten full days. These isolation rules also applied to individuals living in the same household of someone with COVID-19 symptoms or a positive COVID-19 test result. With over 18 million COVID-19 cases confirmed in the UK (Ritchie et al., 2020) and an average household size of 2.4 people (ONS, 2020a), this meant that a large portion of the population was likely to have experienced at least one period of isolation. Within the UK, isolation protocols dictated that an individual could not leave the house to work, to get food, to get medication, to exercise and could not have visitors in their home (Williams et al., 2020). Even if an individual was not under self-isolation procedures, the lockdown restrictions placed severe limits on the ability to meet up and socialise with individuals outside of one's household. Whilst these procedures were necessary to prevent the spread of infection, there have been concerns around their long term impact on mental health.

There is an extensive body of literature that has focused on the detrimental impact of social isolation, defined as the absence of social interaction, contacts and relationships with friends, family and society at large (Berg & Cassells, 1992). In their review of the effects of social isolation, Cacioppo and Cacioppo (2014) highlighted how social isolation, even over the short term, has been shown to cause issues with sleep (Cacioppo et al., 2002), worse immune system functioning (Dixon et al., 2006), increased blood pressure (Hawkley et al., 2003) and is strongly associated with the progression of Alzheimer's disease (Wilson et al., 2007). Aside from the impact on physical health, the effects of social isolation on mental health can be even more damaging. Indeed, Naher et al. (2020) conducted an analysis of social isolation and suicide rates using German Microcensus data on 149,033 suicides that occurred in Germany between 1997 and 2010. Naher et al. (2020) found that living in a one-person household was associated with elevated suicide rates. However, it is important to acknowledge that, whilst living alone may increase the chances of social isolation, it is not the same as social isolation. Individuals can experience social isolation whilst living in a large household and vice versa. Research using more direct measures of social isolation are required.

Additionally, Liu et al. (2019) conducted a prospective study analysing the relationship between social isolation and depressive symptoms in 741 college students. Depressive symptoms were measured using the Chinese Self-Rating Depression Scale (SDS; Lee et al., 1994) and social isolation was measured using a six-item questionnaire assessing the participant's number of friends, their contact time with others and their engagement in social activities. After adjusting for baseline depression symptoms and personality traits, Liu et al. (2019) found that social isolation measured at baseline significantly predicted depressive symptoms three years later. Many cross-sectional and longitudinal research designs have analysed the relationship between social isolation and mental health. Leigh-Hunt et al. (2017) conducted a systematic review of 40 systematic reviews (a systematic overview) on the public health consequences of social isolation and concluded there was moderately strong evidence in support of the idea that social isolation increased the likelihood of an individual experiencing depression, anxiety and suicidal thoughts.

Indeed, initial data from the ONS (2021c) highlighted the negative impact of self-isolation procedures during the pandemic. They found that 37% of a representative UK adult sample reported that the period of isolation had a negative impact on their mental health. This research wanted to further investigate the impact of social isolation during the COVID-19 pandemic and examined whether those who experienced social isolation were at greater risk of suicidal thoughts or suicide attempts.

Difficulty Accessing Necessary Healthcare

One of the key challenges imposed by the COVID-19 pandemic has been the increased demand on healthcare services (Willan et al., 2020). The high rates of hospital and critical care admissions due to COVID-19 cases has placed an overwhelming workload on the NHS. Thousands of medical students graduated early and began working as junior doctors, many doctors and nurses returned from retirement and many medical staff who were working in research or education returned to clinical duties (Willan et al., 2020). Hospital beds and critical care facilities were rapidly expanded, many operating theatres were repurposed and there was a call for increased production of oxygen and ventilators (Willan et al., 2020).

One of the most difficult consequences of this increased demand on healthcare services was the delays, cancellations or scaling down of elective procedures, outpatient work and primary care patient contact (Willan et al., 2020; Mansfield et al., 2021). Indeed, research from America found that 44% of 609 adult breast cancer patients reported experiencing cancer treatment delays during the pandemic (Papautsky & Hamlish, 2020) and by June 2020, it was estimated that 41% of US adults had experienced delayed, cancelled, or had avoided medical care during the pandemic (Czeisler et al., 2020). There is also evidence that the cancellation or delaying of important screening procedures such as colonoscopies (Blanco et al., 2020), cervical smears (Ivanus et al., 2021; Winata & Juniarti, 2020) and abdominal aortic aneurysm (AAA) screening (Bozzani et al., 2021) led to undetected cases of colorectal cancer, cervical cancer, AAA ruptures and increased mortality.

These delays, cancellations or scaling down of important healthcare procedures can be a major source of psychological distress. Qualitative analysis on cancer patients during the COVID-19 pandemic identified that the uncertainty and

fear around treatment timelines was a major source of distress (Forner et al., 2021). Additionally, Pouwels et al. (2021) conducted an online, cross-sectional study on 680 patients in the Netherlands with chronic cardiopulmonary disorders. They found that the reduction in contact with healthcare professionals during the pandemic was associated with a decrease in physical health status and an increase in depression, anxiety and stress levels. In summary, the increased difficulty in accessing important healthcare may have been a source of distress for many individuals during the COVID-19 pandemic. This research sought to examine whether experiencing increased difficulty accessing necessary healthcare was associated with suicidal thoughts or suicide attempts.

Increased Caring Responsibilities

A carer is anyone who, on an unpaid voluntary basis, looks after a partner, family member or friend who requires help due to an illness, frailty, disability, mental health problem or an addiction and cannot cope without their support (NHS, 2021b). The adoption of caring responsibilities can have an adverse impact on an individual's mental health. For example, a population-based study of 26,000 households in Australia examined how caregiver status influenced psychological wellbeing. Schofield et al. (1998) found that, after controlling for age and marital status, caregivers reported less life satisfaction, less positive affect and more negative affect compared to non-caregiving individuals. Additionally, in a review of 41 studies investigating the impact of dementia caregiving, Schulz et al. (1995) found that "virtually all studies" reported elevated depression and anxiety symptoms among caregivers. In the UK, the State of Caring Review (Carers UK, 2013) revealed that 84% of carers reported that caring had negatively impacted their mental health. In summary, there is a wide range of research indicating that the responsibility of providing care can have a significant psychological and emotional impact on an individual.

During the initial UK lockdown period between March and April 2020, the ONS (2020b) reported that approximately half of the UK adult population (48%) reported that they were providing regular care or support to someone outside of their household. This was a dramatic increase from the 11% of adults that reported providing regular care or support for an elderly, disabled or ill person outside of their household prior to the pandemic (ONS, 2020b). Furthermore, the ONS report also

found that, of the adults who were providing help during the start of the pandemic, 32% reported providing support to someone who they had not supported prior to the pandemic and 33% reported that they were having to provide additional support to those they had already been caring for.

In addition to more people assuming caring responsibilities during the pandemic, studies have also indicated that carers were more adversely impacted by the pandemic compared to non-carers. The UK based charity Carers Trust conducted a survey on young adult carers in July 2020 and reported that 60% of young adult carers said their mental health had declined since the onset of the pandemic (Carers Trust, 2020). Another survey by the ONS conducted between March and April 2021 reported that carers were more likely to avoid physical contact with others outside the household compared to non-carers and found that a higher percentage of unpaid carers (63%) were “very” or “somewhat” worried about the effects that the pandemic was having on their life compared to non-carers (56%). It was also reported that the pandemic had more detrimentally affected work and employment, access to healthcare, physical health and access to essentials for carers compared to non-carers (ONS, 2021d).

Overall, caring responsibilities have been shown to negatively impact mental health. During the COVID-19 pandemic, many individuals experienced an increase in caregiving responsibilities which may have further exacerbated some of the difficulties experienced by carers. This research investigated whether increased caring responsibilities during the pandemic were associated with suicidal thoughts and suicide attempts.

Relationship Difficulties

The lockdown and social distancing measures in place during the COVID-19 pandemic impacted romantic relationships around the world (Yarger et al., 2021). These lockdown restrictions often resulted in romantic partners either being physically separated from each other or confined to the same space for a prolonged period (Luetke et al., 2020). Both the physical separation from a romantic partner or the prolonged confinement to the same household have the potential to place a strain on romantic relationships throughout the course of the pandemic (Luetke et al., 2020).

Additionally, the distress associated with crisis periods have historically been shown to cultivate the conditions that exacerbate romantic relationship conflict (Lee et al., 2021). For example, romantic relationship conflict has been shown to increase after natural disasters such as hurricanes (Harville et al., 2010) and economic disasters such as the great recession (Schneider et al., 2016). Indeed, most forms of external stressors (e.g., job loss, health problems) have demonstrated a robust association with impaired romantic relationship functioning (see Neff & Karney, 2017). External stressors can cause romantic partners to perceive more problems in their relationships and to engage in fewer positive relationship behaviours, which often results in increased conflict (Ogan et al., 2021). With the COVID-19 pandemic providing a large source of external distress, whilst also physically separating or confining couples to the same household, many have speculated that the pandemic could cause a rise in romantic relationship difficulties (Ogan et al., 2021; Luetke et al., 2020).

Indeed, Li and Samp (2021) investigated the impact of the COVID-19 pandemic on adult couples. In an online survey they measured the extent to which the pandemic had adversely impacted participant's daily life, their perceived threat of COVID-19, their relationship satisfaction, their anxiety, their depression and their substance use levels. Li and Samp (2021) found that the extent to which the pandemic had adversely impacted participant's daily life predicted lower relationship satisfaction. Further research by Luetke et al. (2020) assessed the association between COVID-19 related conflict and changes in romantic relationships using a nationally representative probability survey of over 1,000 American adults in April 2020. They found that, of individuals currently in romantic relationships, over one-third reported experiencing some degree of conflict due to the pandemic and the related restrictions.

Overall, romantic relationship problems are a well-established risk factor for suicide (Love et al., 2018; Donald et al., 2006) and the increase in romantic relationship difficulties throughout the COVID-19 pandemic has led to concerns about rising population suicidality. Therefore, this research investigated whether people experiencing romantic relationship problems throughout the pandemic were at an increased risk of suicidal thoughts and attempted suicide.

Domestic Abuse

Whilst domestic abuse is not directly caused by COVID-19, it has been widely documented that the rates of domestic abuse markedly increased in areas where lockdown restrictions were imposed. As outlined earlier, calls to domestic violence helplines (Bradbury-Jones & Isham, 2020), visits to domestic violence refuge websites (Bradbury-Jones & Isham, 2020), deaths attributed to domestic violence (Grierson, 2020) and police reports of domestic violence (Boserup et al., 2020) all increased after the implementation of lockdown measures.

Domestic violence has severe and wide-ranging physical and psychological consequences. In a review of some of the physical effects of domestic abuse, Ali et al. (2016) outlined that cuts, bruises, bites, sexually transmitted diseases, loss of hearing, unwanted pregnancies, miscarriages, gynaecological problems and chronic pain were commonly reported consequences of domestic abuse. Individuals who have experienced domestic abuse also report worse physical health, memory difficulties, dizziness and increased difficulty walking (Ali et al., 2016; Ellsberg et al., 2008; Vung et al., 2009). Regarding the psychological impact of domestic abuse, rates of depression, anxiety, post-traumatic stress and eating disorders are higher in women who have experienced domestic abuse (Ali et al., 2016; Plichta & Falik, 2001; Romito et al., 2005). The immense physical and psychological suffering caused by domestic abuse often results in the victims feeling trapped and unable to escape their abusive circumstances (Gadd et al., 2019; Crawford et al., 2009) and these feelings of entrapment are thought to play a prominent role in the development of suicidal thoughts (O'Connor & Portzky, 2018).

In addition to the increased rates of domestic abuse during the COVID-19 pandemic, it is also thought that domestic violence experienced during lockdown was particularly harmful for the victim. Firstly, the opportunity for domestic abuse to be identified and prevented was more difficult during the pandemic. Face to face contact with many GP and mental health services has been replaced with telephone or online consultations (Murphy et al., 2021), which makes it harder to both speak to an individual without the presence of their partner and spot physical signs of abuse. Attendances at accident and emergency departments, a service that can play an important role in identifying and preventing domestic abuse (Ali et al., 2016), have also decreased substantially over the pandemic (Pritchard et al., 2020). Secondly, the

act of physically not being able to leave the home that is shared with the abuser is likely to increase the frequency of abuse and exacerbate feelings of entrapment. Considering that the feeling of entrapment is frequently cited as a key driver of suicidal thoughts (O'Connor & Portzky, 2018), there are concerns that domestic abuse experienced during the pandemic will result in even higher rates of suicidal thoughts and suicide attempts. Therefore, this research investigated the extent to which experiencing domestic abuse during the COVID-19 pandemic was associated with suicidal thoughts and attempted suicide.

Pandemic Related Stressors: Summary

In summary, many of the stressors introduced or exacerbated by the COVID-19 pandemic may have increased the likelihood of individuals experiencing suicidal thoughts and attempting suicide. This research aimed to examine the extent to which these risk factors were associated with suicidal thoughts and suicide attempts. Through furthering our understanding of the aspects of the pandemic linked to suicidal thoughts and attempts, communities can work to (1) provide those exposed to such stressors with outreach and support and (2) limit or prevent such stressors from occurring in the future.

Present Research

The second part of this thesis focused on identifying and understanding the factors influencing suicidality throughout the COVID-19 pandemic. The research presented here aimed to identify (1) the demographic groups (age, gender, socioeconomic status) most vulnerable to suicidal thoughts and suicide attempts during the COVID-19 pandemic and (2) the pandemic related stressors associated with suicidal thoughts and suicide attempts. The research consisted of an online survey to a large sample of adults living in Wales between the 18th of January 2021 to the 7th of March 2021 (4-11 weeks into the second Welsh lockdown). Participants were asked to provide their demographic information along with information about the pandemic related stressors they had faced and whether they had experienced suicidal thoughts or attempted suicide during the pandemic.

Methods

Ethics

The online survey used for this research was approved by the Swansea University College of Health and Human Sciences Research Ethics Committee (ID: 4908). In accordance with the ethical considerations for mental health research during the COVID-19 pandemic put forward by Townsend et al. (2020), participants were informed that the survey would ask questions about emotional wellbeing, suicidal thoughts and suicidal behaviours prior to informed consent procedures. After participants finished the survey, they took part in a mood restoration exercise designed to mitigate any distress experienced during the survey. Participants were also provided with contact details for services available across Wales, that offered free, 24/7, confidential listening and support via the telephone, SMS messaging or e-mail. Participants were encouraged to contact the provided services if they were experiencing any emotional difficulties.

Participants

Participants were recruited using online snowball sampling procedures. The survey was advertised across the Welsh population using a series of emails and social media adverts. This consisted of emails and messages being sent to various organisations across Wales, asking them to share the survey URL to their staff and service-users. The organisations that agreed to support the research and disseminate the survey URL included all seven NHS Health Boards in Wales, the four Welsh Police Forces, the Welsh Ambulance Service Trust, the Welsh Fire and Rescue Service, multiple GP practices, schools, colleges, universities, care homes for elderly residents, private businesses, government organisations, the Welsh Farmers' Union, sports clubs and third sector partnership organisations (charitable organisations supporting specific sectors of the community). The survey was also advertised via celebrity tweets and newspaper articles. All participants were required to be aged 16 or over at the time of taking the survey.

In total, 13,333 participants clicked on the survey link. Participants who did not provide informed consent (N = 23) or were under the age of 16 (N = 27) did not meet the study's inclusion criteria and were excluded from the study. Of the 13,283 participants that met inclusion criteria for the survey, 2,910 did not complete the

sections relating to the pandemic stressors, suicidal thoughts and suicide attempts and were therefore excluded from further analysis. Due to the anonymous nature of the research, reasons for non-completion were not known. Analysis of the time taken to complete the survey found the median completion time was 832s (IQR: 607s – 1058s). Individuals who completed the survey in under 240s were excluded from the survey (N = 4) as such fast completion times were not commensurate with carefully answering the questions (Gray et al., 2020). In total, 10,369 participants were included in the final analysis. The final sample sizes and the demographic characteristics of participants are displayed in Table 5.1.

Materials

Wales Wellbeing Survey

The online survey that participants completed was the second in a series of surveys conducted by the "Wales Wellbeing" research group, (Gray et al., 2020). The "Wales Wellbeing" group was a team of researchers from Cardiff University, Swansea University and the NHS in Wales that aimed to monitor and understand the mental health and wellbeing of the Welsh population throughout the various stages of the COVID-19 pandemic.

The survey pertaining to this research was conducted between the 18th of January 2021 and the 7th of March 2021, 4-11 weeks into the second lockdown in Wales, UK[3.] The survey consisted of seven sections. The first section presented participants with information about the survey and asked them to provide their informed consent and the second section asked participants to provide their demographic details. The third section asked participants to complete questionnaires asking about their current levels of psychological distress and emotional wellbeing (not reported here). The fourth section asked participants whether they had experienced any suicidal thoughts or attempted suicide over the course of the pandemic and during the fifth section, participants reported the pandemic related stressors they had experienced. The sixth section contained questionnaires about levels of hopelessness, social connectedness, resilience and pandemic acceptance

3 For the purposes of this report, the "second" lockdown refers to lockdown restrictions implemented across Wales from the 19th of December 2020, until the 12th of March 2021 (Senedd Research, 2021). This does not include the "fire-break" lockdown that occurred across Wales from the 23rd of October until the 9th of November 2020.

(reported in chapter 6). The seventh and final section presented participants with the mood restoration and the debrief. Only measures relevant to this study are outlined below.

Demographic Factors

Participants were asked to select their age group (16-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75+), their gender (Male, Female, Other, Prefer not to say), their ethnicity (White, Asian, Black, Mixed, Arab, Prefer not to say, Other) and their relationship status (Married, Civil partnership, Co-habiting, Partner non-cohabiting, Separated, Divorced, Widowed, Single, Prefer not to say, Other) from a list of options presented to them via a drop down menu. The demographic options offered to participants were the same options presented to participants in the National Survey for Wales (Welsh Government, 2019b). This was to enable a comparison to pre-COVID-19 wellbeing data across the same demographic categories in research that has been presented elsewhere (Gray et al., 2020).

Participants were also asked to provide their postcode as an index of socioeconomic deprivation. The Welsh Index of Multiple Deprivation (WIMD) is produced by the Welsh Government (Welsh Government, 2019a) and serves as an index of socioeconomic deprivation for 1,909 areas of Wales (1 = most deprived, 1,909 = least deprived), with each area containing an average of 1,600 people. It broadly defines socioeconomic deprivation as the lack of access to opportunities and resources that might be expected in society (Welsh Government, 2019a). Participant's postcodes were used to calculate their WIMD rank and participants were split into 5 approximately equal groups based on their WIMD rank. Group 1 represented the most socioeconomically deprived participants and group 5 represented the least socioeconomically deprived participants.

Pandemic Related Stressors

This survey wanted to capture which of the previously discussed pandemic related stressors participants had experienced since the onset of the pandemic. Whilst structured interview protocols such as the Life Events and Difficulties Schedule (LEDS; Brown & Harris, 2011), are considered the gold standard for assessing stressor exposure, the online and time-sensitive nature of this research required the use of self-report measures of stress exposure.

One frequently employed self-report measure for stress exposure is a pre-determined stressor checklist inventory such as the Social Readjustment Rating Scale (SRRS; Holmes & Rahe, 1967). The SRRS is a frequently employed (Scully et al., 2000) and well-validated (Noone et al., 2017) self-assessment tool that provides participants with a list of 43 stressful events and asks them to select whether they have experienced each event within the last year. Each stressor has an associated life change unit and the total value for stressful life events is the sum of the scores for each stressor experienced. However, despite the availability of many well-validated stressful event checklists such as the SRRS, this study wanted to capture a specific list of stressors that were caused or exacerbated by the pandemic. There was no existing measure that contained a list of all the stressors mentioned in the introduction.

There were some attempts to develop a COVID-19 pandemic specific stress checklist such as the COVID-19-Related Stressors Checklist (Li et al., 2021). This was a 16-item list of pandemic related stressors that included items such as "cancelling a vocational trip due to the pandemic" where participants were required to mark whether they had or had not experienced the stressor. However, this instrument was not available at the time of designing the survey and did not contain all the pandemic related stressors this research aimed to investigate. Therefore, this research created a similar checklist that included all the stressors of interest for this study. The methodological limitations associated with this method are explored in the discussion.

Participants were asked to report which pandemic related stressors they had experienced since the onset of the pandemic. Participants were provided with a list of 12 pandemic related stressors and were asked to tick the box next to the listed stressor if they had experienced that stressor since the onset of the COVID-19 pandemic. The list of stressors included: experiencing major COVID-19 symptoms, financial problems, being made redundant, food insecurity (defined as not having enough nutritious food for one's needs, or one's family's needs), bereavement, being a key worker (defined as having a job critical to the COVID-19 response), having responsibility to home-school a child, social isolation (defined as complete, or near complete, lack of contact with other people), relationship problems, domestic abuse, being unable to access necessary healthcare and experiencing increased difficulties in

caring for someone. Similar measures utilising "Yes/No" responses to a list of stressors has previously demonstrated good test-retest reliability (*rs* = .78), convergent validity (Kujawa et al., 2020) and represents a quick, non-intrusive method of ascertaining the stressors experienced by participants.

Suicidal Thoughts and Suicide Attempts

Participants were asked to report whether they had experienced suicidal thoughts or attempted suicide during the COVID-19 pandemic. To assess suicidal thoughts, participants provided a "Yes/No" response to the question: "*Since the start of the COVID-19 pandemic, have you experienced suicidal thoughts?".* To assess suicide attempts, participants were asked to provide a "Yes/No" response to the question: "*Since the start of the COVID-19 pandemic, have you harmed yourself with the intention to end your life?".* Similar single-item dichotomous questions assessing the presence of suicidal thoughts and suicide attempts have been used in previous studies (Glashouwer et al., 2009) and have demonstrated strong relationships with gold-standard, multi-item measurements of suicidal thoughts and behaviours (Desseilles et al., 2012), indicating that they are suitable for fast, non-intrusive, screening of a large online population.

Mood Restoration

After completing the online survey, participants were asked to listen to calming music (*Eine Kleine Nachtsmusik, Allegro*) whilst reflecting on happy memories and pleasant thoughts. This method has successfully induced positive affect in multiple previous studies (Vastfjall, 2001; Gorn et al., 2001).

Procedure

The survey was administered online (Qualtrics software, Version January 2021, Provo, UT, USA, Copyright © 2020Version) for all participants. The survey was designed to take approximately 15 minutes to complete and was made available in both English and Welsh languages. To access the survey, participants clicked on the survey URL. Participants were then asked to provide informed consent before completing the online survey. After completing the survey, participants took part in a mood restoration exercise, were thanked for their participation and were presented with the debrief form.

Data Analysis Plan

Demographic Factors

A binary logistic regression evaluated whether demographic factors influenced the likelihood of an individual experiencing suicidal thoughts throughout the COVID-19 pandemic. The presence or absence of suicidal thoughts during the pandemic served as the outcome measure and participant's gender, age and WIMD group (1-5) were entered as predictor variables. Participants who did not provide details relating to their age, gender or WIMD group were excluded from this analysis. The same analysis was also conducted with the presence of a suicide attempt during the pandemic as the outcome measure.

Pandemic Related Stressors and Suicidal Thoughts

A series of binary logistic regressions analysed whether each pandemic related stressor (e.g., social isolation, food insecurity) was associated with an increased risk of experiencing suicidal thoughts. Demographic factors (age and gender) were entered as covariates. Socioeconomic deprivation was not entered as a covariate because over one quarter of the sample (25.7%) had missing data for this variable. Given the large number of statistical tests conducted, a Bonferroni correction was implemented to reduce the chance of a type 1 error. A total of 12 tests analysed the relationship between each pandemic related stressor and suicidal thoughts. Therefore, an alpha level of .004 (.05/12) was used for statistical significance. The same analysis was also conducted with suicide attempts as the outcome measure in place of suicidal thoughts. The same alpha level was applied. Due to the high powered analysis, more attention was given to effect sizes (odds ratios) than statistical significance. In total, 1,132 (10.9%) participants reported experiencing suicidal thoughts and 74 (0.7%) of participants reported attempting suicide during the COVID-19 pandemic.

Power

A post hoc power analysis was conducted using G*power3 (Faul et al., 2007). To examine whether one of the pandemic related stressors was significantly associated with the presence of suicidal thoughts during the pandemic, using a two-tailed test, assuming a small effect size (OR = 1.5, according to the standards set by Chen et al. (2010)), an alpha level of .004, a power level of 0.80 (the commonly used

minimum level of statistical power; Di Stefano, 2003), an outcome variable (suicidal thoughts) with a prevalence of 10.9% and other covariates (gender, age) variables accounting for 6% of the variance ($R^2 = 0.06$), a sample size of 1,331 participants was required. After excluding participants that did not complete the relevant sections, approximately 9,000 participants were included in the analysis of pandemic related stressors and suicidal thoughts, providing sufficient power.

To examine whether one of the pandemic related stressors was significantly associated with the presence of a suicide attempt during the pandemic, using a two-tailed test, assuming a small effect size (OR = 1.5), an alpha level of .004, a power level of 0.80, an outcome variable (suicide attempt) with a prevalence of 0.7% and other covariates (gender, age) variables accounting for 6% of the variance ($R^2 = 0.06$), a sample size of 11,934 participants was required. After excluding participants that did not complete the relevant sections, approximately 9,000 participants were included in the analysis of pandemic related stressors and suicide attempts. Therefore, this analysis was slightly underpowered for the detection of small effect sizes. However, for exploratory purposes these analyses were still conducted and more attention was given to the effect sizes (odds ratios) for each stressor rather than statistical significance.

Results

Sample Characteristics

The final sample consisted of 10,369 participants. All participants responded to the questions pertaining to the presence of suicidal thoughts, suicide attempts and the COVID-19 pandemic related stressors. Not all participants completed the measures relating to the demographic factors and the number of participants included in each analysis is described below. The demographic characteristics of participants are displayed in Table 5.1.

Table 5.1

Demographic Characteristics of Participants

Variable	Number	Percentage (%)
Total	10369	100.0
Gender		

Female	7848	75.7
Male	1450	14.0
Other	16	0.2
Prefer not to say/no response	1055	10.1
Age		
16-24	516	5.0
25-34	1348	13.0
35-44	2040	19.7
45-54	2487	24.0
55-64	2358	22.7
65-74	1290	12.4
75+	330	3.2
WIMD		
Group 1 (most deprived)	1539	14.8
Group 2	1530	14.8
Group 3	1543	14.9
Group 4	1542	14.9
Group 5 (least deprived)	1542	14.9
Prefer not to say/no response	2673	25.7
Pandemic experiences		
Experienced suicidal thoughts	1132	10.9
Attempted suicide	74	0.7
Experienced major COVID-19 symptoms	377	3.6
Experienced financial problems	1602	15.4
Made redundant	238	2.3
Experienced food insecurity	354	3.4
Key worker	4300	41.5
Had responsibility to home-school a child	2858	27.6
Experienced a bereavement	2412	23.3
Experienced social isolation	3814	36.8
Experienced relationship problems	2048	19.8
Experienced domestic abuse	214	2.1
Unable to access necessary healthcare	1652	15.9

Increased difficulties in caring for someone	1466	14.1

Demographic Factors

Suicidal Thoughts

A binary logistic regression analysis examined whether gender, age and socioeconomic status were associated with suicidal thoughts during the pandemic. The presence or absence of suicidal thoughts during the pandemic served as the outcome variable and participant's gender, age group and WIMD group were entered as predictor variables. A preliminary analysis indicated that multicollinearity was not a concern (Gender, Tolerance = 0.99, VIF = 1.01; Age, Tolerance = 0.99, VIF = 1.01; WIMD group, Tolerance = 0.99, VIF =1.00). After excluding participants who did not provide their gender[4] (N = 1,071) and/or WIMD group (N = 2,673) details, 6,892 participants were included in this analysis. Within this sample of 6,892 participants, 739 (10.7%) reported experiencing suicidal thoughts during the pandemic.

All variables were standardised before being entered in the regression to make interpretation of parameter estimates easier. The standard error, Wald and Nagelkerke R^2 values remained the same regardless of whether the variables were standardised. The model containing all predictors was statistically significant χ^2 (3, N = 6,892) = 197.79, $p < .001$, Nagelkerke $R^2 = .057$, indicating that it could distinguish between individuals who did and did not experience suicidal thoughts during the COVID-19 pandemic better than chance. As shown in Table 5.2, gender, age and socioeconomic group all significantly contributed to the model. As displayed in Figures 5.1, 5.2 and 5.3, being male, being younger in age or being from a low socioeconomic group were all associated with an increased risk of experiencing suicidal thoughts during the COVID-19 pandemic. The prevalence of suicidal thoughts within each demographic group are displayed in Table 5.4.

4 As well as excluding participants who did not provide their gender, the 16 participants who reported their gender as "other" were also excluded from this analysis. This was because this group was too small (<0.2% of the sample) to allow for the detection of statistical differences between gender groups (Dickinson et al., 2012).

Table 5.2

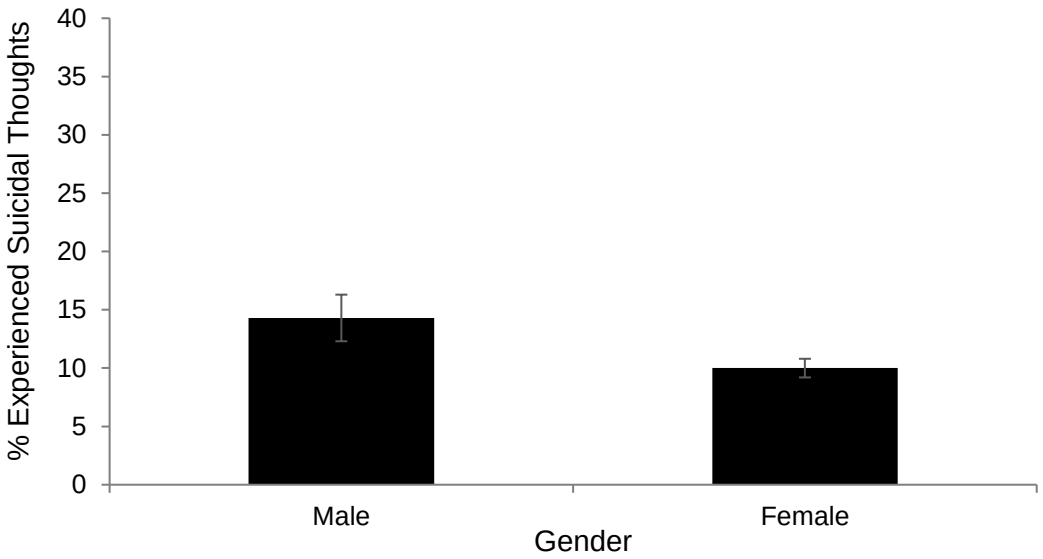
Demographic Factors Predicting the Likelihood of Suicidal Thoughts During the Pandemic

Variable	β	SE	Wald	Df	*p*	Exp(β) (95% CI)
Gender	-0.20	0.04	29.22	1	<.001	0.82 (0.77 – 0.88)
Age group	-0.49	0.04	145.95	1	<.001	0.61 (0.57 – 0.66)
Socioeconomic group	-0.18	0.04	21.55	1	<.001	0.83 (0.77 – 0.90)

Note. β = beta coefficient; SE = standard error; df = degrees of freedom; 95% CI = 95% confidence interval; Exp(β) = exponentiation of the β coefficient (equivalent to an odds ratio).

Figure 5.1

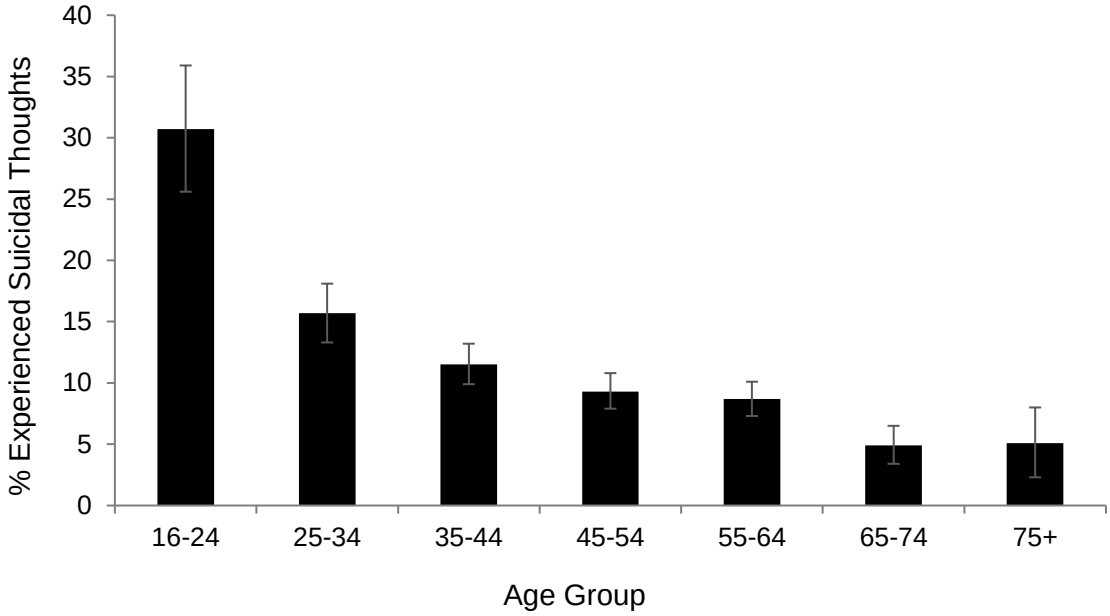
Proportion of Males and Females that Experienced Suicidal Thoughts During the COVID-19 Pandemic



Note. Error bars represent 95% confidence intervals.

Figure 5.2

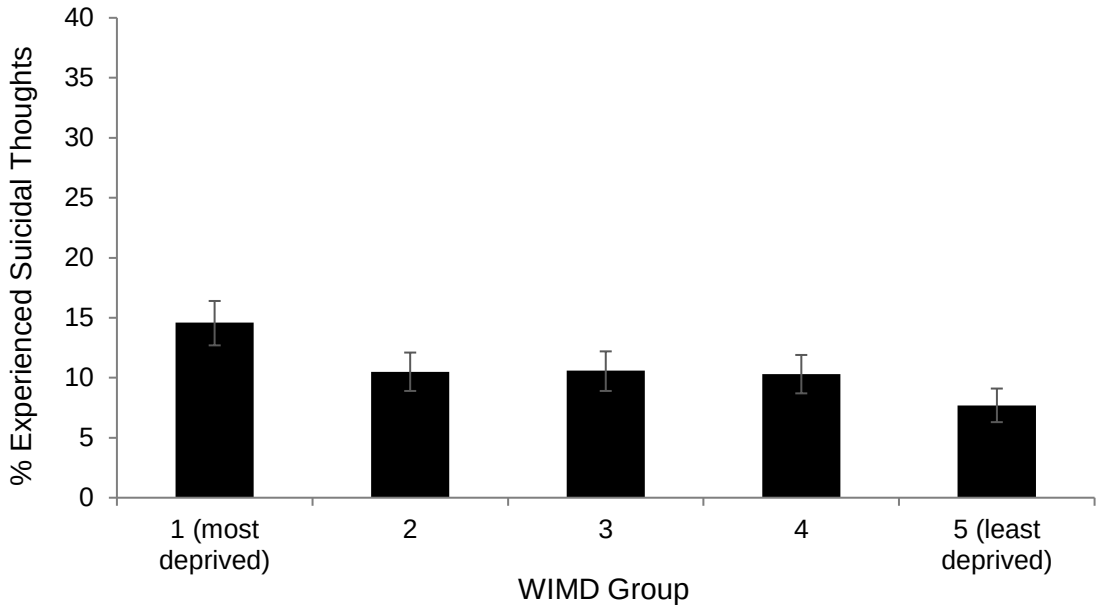
Proportion of Individuals that Experienced Suicidal Thoughts During the COVID-19 Pandemic Within Each Age Group



Note. Error bars represent 95% confidence intervals.

Figure 5.3

Proportion of Individuals that Experienced Suicidal Thoughts During the COVID-19 Pandemic Within Each Socioeconomic Deprivation Group



Note. Error bars represent 95% confidence intervals.

Suicide Attempts

A binary logistic regression analysis examined whether gender, age and socioeconomic status were associated with the presence of suicide attempts during the pandemic. The presence or absence of a suicide attempt during the pandemic served as the outcome variable and participants' gender, age group and socioeconomic group were entered as predictor variables. A preliminary analysis revealed there was no violation of multicollinearity (Gender, Tolerance = 0.99, VIF = 1.01; Age, Tolerance = 0.99, VIF = 1.01; Socioeconomic group, Tolerance = 0.99, VIF =1.00). After excluding participants who did not provide their gender (N = 1,071) and/or socioeconomic deprivation details (N = 2,673), 6,892 participants were included in this analysis. Within this sample of 6,892 participants, 45 (0.7%) reported attempting suicide during the pandemic.

All variables were standardised before being entered into the regression to make interpretation of parameter estimates easier. The standard error, Wald and Nagelkerke R^2 value remained the same regardless of whether the variables were

standardised. The model containing all predictors was statistically significant χ^2 (3, N = 6,892) = 40.32, $p < .001$, Nagelkerke $R^2 = .077$, indicating that it could distinguish between individuals who did and did not attempt suicide during the COVID-19 pandemic better than chance. As shown in Table 5.3, only age significantly contributed to the model. As displayed in Figure 5.4, being younger was associated with an increased risk of attempting suicide during the COVID-19 pandemic. The prevalence of suicide attempts within each demographic group are displayed in Table 5.4.

Table 5.3

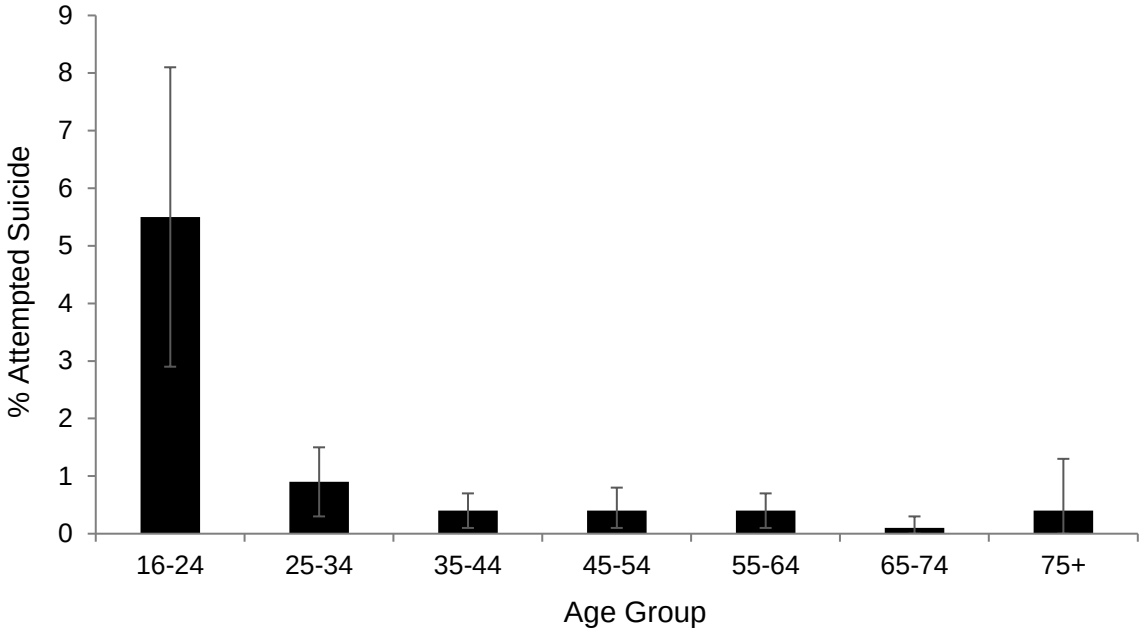
Demographic Factors Predicting the Likelihood of Attempting Suicide During the Pandemic

Variable	β	SE	Wald	Df	*p*	Exp(β) (95% CI)
Gender	-0.08	0.15	0.31	1	.58	0.92 (0.69 – 1.23)
Age group	-0.99	0.17	33.52	1	<.001	0.37 (0.26 – 0.52)
Socioeconomic group	-0.15	0.15	1.03	1	.31	0.86 (0.64 – 1.15)

Note. β = beta coefficient; SE = standard error; df = degrees of freedom; 95% CI = 95% confidence interval; Exp(β) = exponentiation of the β coefficient (equivalent to an odds ratio).

Figure 5.4

Proportion of Individuals Who Reported Attempting Suicide Within Each Age Group



Note. Error bars represent 95% confidence intervals.

Table 5.4

Prevalence of Suicidal Thoughts and Suicide Attempts Within Each Demographic Group

Demographic group		N	% Experienced suicidal thoughts (95% CI)	% Attempted suicide (95% CI)
All		6892[a]	10.7 (10.0 – 11.5)	0.7 (0.5 – 0.8)
Gender	Male	1450	14.3 (12.3 – 16.3)	0.7 (0.2 – 1.2)
	Female	7848	10.0 (9.2 – 10.8)	0.6 (0.4 – 0.9)
Age	16-24	516	30.7 (25.6 – 35.9)	5.5 (2.9 – 8.1)
	25-34	1384	15.7 (13.3 – 18.1)	0.9 (0.3 – 1.5)
	35-44	2040	11.5 (9.9 – 13.2)	0.4 (0.1 – 0.7)
	45-54	2487	9.3 (7.9 – 10.8)	0.4 (0.1 – 0.8)
	55-64	2358	8.7 (7.3 – 10.1)	0.4 (0.1 – 0.7)

	65-74	1290	4.9 (3.4 – 6.3)	0.1 (0.0 – 0.3)
	75+	330	5.1 (2.3 – 8.0)	0.4 (0.0 – 1.2)
WIMD rank	1 (most deprived)	1539	14.5 (12.7 – 16.4)	1.1 (0.5 – 1.6)
	2	1530	10.5 (8.9 – 12.1)	0.4 (0.1 – 0.8)
	3	1543	10.6 (8.9 – 12.2)	0.6 (0.2 – 0.9)
	4	1542	10.3 (8.7 – 11.9)	0.6 (0.2 – 1.0)
	5 (least deprived)	1542	7.7 (6.3 – 9.1)	0.6 (0.2 – 1.0)

Note. 95% CI = 95% confidence interval.

[a] This table reflects the prevalence rates of suicidal thoughts and attempted suicide for the 6,892 participants included in the analysis of demographic factors, excluding the 2,673 participants who did not provide their gender or WIMD group details.

Pandemic Related Stressors and Suicidal Thoughts

A series of binary logistic regression analyses examined the relationship between each of the pandemic related stressors and the presence of suicidal thoughts during the pandemic, with gender and age included as covariates. After excluding participants who did not provide their gender (N = 1,071), 9,298 participants were included in this analysis. Within this sample of 9,298 participants, 1,004 (10.8%) reported experiencing suicidal thoughts during the pandemic.

It was revealed that experiencing domestic abuse (OR = 4.76), food insecurity (OR = 3.55), having difficulty accessing necessary healthcare (OR = 3.07), relationship problems (OR = 2.83), social isolation (OR = 2.83), financial problems (OR = 2.39), being made redundant (OR = 1.90), having increased difficulties in caring for someone (OR = 1.76), major COVID-19 symptoms (OR = 1.66) and bereavement (OR = 1.39), were all significantly positively associated with the presence of suicidal thoughts during the COVID-19 pandemic ($p < .004$). Conversely, it was also found that being a key worker (OR = 0.65) and having responsibility to home-school a child (OR = 0.73) were significantly negatively associated with the presence of suicidal thoughts during the pandemic ($p <.004$). These results are presented in Table 5.5.

Table 5.5

Relationship Between Each Pandemic Related Stressor and Suicidal Thoughts During the COVID-19 Pandemic

Stressor	N[a]	β	SE	Wald	OR (95% CI)	*p*
Major COVID-19 symptoms	349	0.50	0.15	11.01	1.66 (1.26 – 2.21)	<.001*
Financial problems	1437	0.87	0.08	125.85	2.39 (2.05 – 2.78)	<.001*
Made redundant	216	0.64	0.18	13.29	1.90 (1.35 – 2.68)	<.001*
Key worker	3824	-0.43	0.07	36.99	0.65 (0.56 – 0.75)	<.001*
Food insecurity	319	1.27	0.13	98.34	3.55 (2.76 – 4.56)	<.001*
Bereavement	2174	0.33	0.08	18.76	1.39 (1.20 – 1.61)	<.001*
Social isolation	3443	1.04	0.07	223.01	2.83 (2.47 – 3.24)	<.001*
Relationship problems	1830	1.04	0.07	207.30	2.83 (2.46 – 3.26)	<.001*
Domestic abuse	177	1.56	0.16	90.17	4.76 (3.45 – 6.56)	<.001*
Responsibility to home-school	2596	-0.31	0.08	16.14	0.73 (0.63 – 0.85)	<.001*
Difficulty accessing necessary healthcare	1463	1.12	0.07	211.85	3.07 (2.64 – 3.57)	<.001*
Increased difficulties in caring for someone	1319	0.56	0.09	42.37	1.76 (1.48 – 2.08)	<.001*

Note. β = beta coefficient; SE = standard error; df = degrees of freedom; OR = odds ratio; 95% CI = 95% confidence interval.

[a] The N for each stressor differs from the N reported in Table 5.1 due to the 1,071 participants that were excluded for not providing the relevant demographic details (gender), that were used as covariates.

* $p < .004$

Pandemic Related Stressors and Suicide Attempts

A series of binary logistic regression analyses examined the relationship between each of the pandemic related stressors and the presence of attempted suicide during the pandemic, with gender and age included as covariates. After excluding participants who did not provide their gender (N = 1,071), 9,298 participants were included in this analysis. Within this sample of 9,298 participants, 61 (0.7%) reported attempting suicide during the pandemic.

It was revealed that domestic abuse (OR = 11.49), food insecurity (OR = 7.25), being made redundant (OR = 3.74), financial problems (OR = 3.10), difficulty accessing necessary healthcare (OR = 2.72), social isolation (OR = 2.59) and relationship problems (OR = 2.34) were all significantly positively associated with the presence of attempted suicide during the COVID-19 pandemic ($p < .004$). Conversely, it was found that being a key worker (OR = 0.31) and having responsibility to home-school a child (OR = 0.32) were significantly negatively associated with the presence of attempted suicide during the pandemic ($p < .004$). Experiencing major COVID-19 symptoms (OR = 1.72, $p = .30$), bereavement (OR = 1.66, $p = .06$) or increased difficulties in caring for someone (OR = 1.06, $p = .87$) were not significantly associated with the presence of attempted suicide during the COVID-19 pandemic. These results are presented in Table 5.6.

Table 5.6

Relationship Between Each Pandemic Related Stressor and Attempted Suicide During the COVID-19 Pandemic

Stressor	N[a]	β	SE	Wald	OR (95% CI)	*p*
Major COVID-19 symptoms	349	0.54	0.52	1.08	1.72 (0.62 – 4.79)	.30
Financial problems	1437	1.13	0.27	18.23	3.10 (1.84 – 5.20)	<.001*
Made redundant	216	1.32	0.44	8.94	3.74 (1.58 – 8.86)	.003*
Key worker	3824	-1.18	0.31	14.19	0.31 (0.17 – 0.57)	<.001*
Food insecurity	319	1.98	0.31	41.73	7.25 (3.98 – 13.23)	<.001*
Bereavement	2174	0.51	0.28	3.43	1.66 (0.97 – 2.85)	.06
Social isolation	3443	0.95	0.27	12.42	2.59 (1.53 – 4.39)	<.001*
Relationship problems	1830	0.85	0.26	10.38	2.34 (1.40 – 3.92)	.001*
Domestic abuse	177	2.44	0.34	52.22	11.49 (5.93 – 22.28)	<.001*
Responsibility to home-school	2596	-1.16	0.38	9.18	0.32 (0.15 – 0.67)	.002*
Difficulty accessing necessary healthcare	1463	1.00	0.28	12.74	2.72 (1.57 – 4.71)	<.001*
Increased difficulties in caring for someone	1319	0.06	0.38	0.03	1.06 (0.50 – 2.25)	0.87

Note. β = beta coefficient; SE = standard error; df = degrees of freedom; OR = odds ratio; 95% CI = 95% confidence interval.

[a] The N for each stressor differs from the N reported in Table 5.1 due to the 1,071 participants that were excluded for not providing the relevant demographic details (gender), that were used as covariates.

* $p < .004$

Discussion

Demographic Groups

This research aimed to identify the demographic groups most vulnerable to suicidal thoughts and suicide attempts during the COVID-19 pandemic. In the present sample, 10.9% of participants reported experiencing suicidal thoughts in the 10-12 month period since the onset of the pandemic. This represents an increase from the 5.4% of English adults that reported having past-year suicidal thoughts prior to the pandemic (McManus, 2014). However, the prevalence of suicide attempts in this sample (0.7%) was consistent with the past-year prevalence of suicide attempts (0.7%) in English adults (McManus, 2014). These findings indicated that age, gender and socioeconomic deprivation all significantly predicted the presence of suicidal thoughts during the pandemic, with men, younger individuals and socioeconomically deprived individuals more likely to experience suicidal thoughts compared to women, older individuals and less socioeconomically deprived individuals. For suicide attempts, only age was a significant predictor, with younger individuals more likely to attempt suicide.

Gender

Suicidal Thoughts

This study found that men (14.3%) were more likely to experience suicidal thoughts compared to women (10.0%) during the COVID-19 pandemic. This finding is different from the results reported by O'Connor et al. (2020) that reported no gender differences in suicidal thoughts in the opening weeks of the COVID-19 pandemic. This finding also disagrees with pre-pandemic data that reported that women (10.4%) were more likely to experience past-year suicidal thoughts compared to men (6.4%; McManus et al., 2014). These findings are especially surprising considering that research during the earlier stages of the pandemic found that the mental health of women was disproportionately negatively impacted relative to men (Pierce et al., 2020a; Xiong et al., 2020). It is important to consider why, contrary to previous findings, this study found men were more likely to experience suicidal thoughts compared to women.

One potential explanation for this could be the timing of this survey. Most of the research that found the mental health of women had been more adversely impacted by the pandemic took place between March 2020 to May 2020 (Pierce et al., 2020a; Xiong et al., 2020; Qiu et al., 2020; Iob et al., 2020). However, this study took part between January 2021 and March 2021, during the second UK lockdown. If men were more impacted by the social and economic circumstances caused during the second UK lockdown, it might explain why this study differed to earlier research and found that men were more likely to experience suicidal thoughts compared to women.

However, this notion does not align with UK data taken during the second set of lockdown restrictions. Research conducted by the ONS from March 2020 through to February 2021 reported that more women were furloughed because of the pandemic compared to men, women spent more time on unpaid childcare and household work relative to men and women reported higher anxiety, depression and loneliness than men (ONS, 2021e). Additionally, Flor et al. (2022) investigated gender disparities in over 193 countries across a range of health, social, and economic indicators between March 2020 and September 2021. They found that, women were more likely than men to report employment loss, forgo work to assume caring responsibilities, experience educational disruption and report increases in gender based violence. Furthermore Flor et al. (2022) observed that these gender gaps widened over the course of the pandemic. These findings do not support the idea that men were more impacted by the later stages of the pandemic.

An alternative explanation as to why the pandemic affected the mental health of women more than men, yet men experienced more suicidal thoughts, could lie in gender differences in the causes of suicidality. Previous research has established that unemployment and financial problems contribute more to suicidal thoughts and behaviours in men compared to women (Freeman et al., 2017). Research has also outlined that men are more susceptible to suicidal thoughts and behaviours after relationship conflict or separation (Scourfield & Evans, 2014; Ide et al., 2010; Corcoran & Nagar, 2009). Given that the COVID-19 pandemic resulted in major increases in both economic and financial problems (Adams-Prassl et al., 2020; Blundell et al., 2021), along with relationship conflicts (Luetke et al., 2020), this may have caused an increase in suicidal thoughts for men more than women. Moreover,

whilst women's mental health appeared to have been more impacted during the pandemic, women are also more likely to reach out and access both social and professional sources of support (McKenzie et al., 2018; Mental Health Foundation; 2021). Seeking social and professional support can be an important protective factor that prevents mental health difficulties escalating to suicidal thoughts and behaviours. Women's increased tendency to access forms of support, could also explain why suicidal thoughts were less prevalent in women relative to men in this study.

Furthermore, much of the evidence supporting the idea that the pandemic had a more detrimental impact on the mental health of women, used traditional measures of depressive and mental health symptoms such as the PHQ-9 (Kroenke et al., 2001), the GHQ-12 (Goldberg, 1986) or the K10 (Kessler et al., 2003). It has been argued that men often underreport their mental health symptoms on these measures relative to women because men tend to deny mental illness, underreport their problems and avoid seeking help in the belief they can self-manage their difficulties (Ogrodniczuk & Oliffe, 2011). There is also evidence supporting the idea that men possess less insight into their emotional and mental health compared to women (Levant et al., 2009). Some authors have claimed that these screening tools are often biased towards feminine depressive symptoms (e.g., sadness, crying, loss of appetite) ahead of more masculine depressive symptoms (e.g., anger, irritability, aggression, risk taking, substance abuse), causing a systematic underestimation of male mental health symptoms (Ogrodniczuk & Oliffe, 2011). Taken together, this might suggest that prior research may have underestimated the extent to which the pandemic affected men's mental health, due to a combination of men underreporting their symptoms and screening tools measurement bias. Whilst the mental health screening tools used in epidemiological research may have suggested that women were more adversely affected by the COVID-19 pandemic, this research indicated that by January and March 2021, men were more likely to have experienced suicidal thoughts during the pandemic.

Suicide Attempts

Although these findings reported that men were more likely to experience suicidal thoughts during the pandemic compared to women, this did not extend to suicide attempts. This research showed there was no statistical difference in the

prevalence of suicide attempts between men (0.7%) and women (0.6%). Considering that in research prior to the pandemic, women (0.8%) were more likely to report past-year attempted suicide relative to men (0.6%; McManus et al., 2014), combined with the many studies that indicated women's mental health was more adversely affected by the pandemic compared to men (Pierce et al., 2020a; Xiong et al., 2020; McGinty et al., 2020), it was surprising that these results found no difference between men and women in rates of attempted suicide. The same points outlined above may also explain why the expected gender differences in suicide attempts were not observed in the current study. The potential underestimation of male mental health symptoms during the pandemic may explain why no gender differences in attempted suicide were found in the current study.

Age

Suicidal Thoughts

The current findings found that age influenced the likelihood of an individual experiencing suicidal thoughts during the COVID-19 pandemic, with younger individuals more likely to experience suicidal thoughts compared to older individuals. As seen in Figure 5.2, this effect was large, with the prevalence of suicidal thoughts much higher in the two youngest age groups (16-24 = 30.7%; 25-34 = 15.7%) compared to the two oldest age groups (65-74 = 4.9%; 75+ = 5.1%).

The most recent data from the Adult Psychiatric Morbidity Survey (McManus et al., 2014) also reported that younger individuals were more likely to experience past-year suicidal thoughts (16-24 = 8.4%; 25-34 = 5.7%) relative to older individuals (65-74 = 1.9%). Whilst this pre-pandemic research also found that younger individuals were more likely to experience suicidal thoughts compared to older adults, the current results indicate that this gap has widened substantially, with the prevalence of suicidal thoughts increasing much more for younger individuals. This agrees with much of the public health research that indicated the mental health of younger individuals had been more adversely impacted compared to older individuals in the UK (Pierce et al., 2020a; Pierce et al., 2021) and across the world (McGinty et al., 2020; Xiong et al., 2020) and also aligns with research conducted during the early stages of the pandemic that reported increased prevalence of suicidal thoughts in younger adults relative to older adults (O'Connor et al., 2020).

There are a few key reasons why younger individuals may have been more vulnerable to suicidal thoughts during the pandemic. Firstly, younger individuals have experienced more economic and financial disruptions. Data from the UK (ONS, 2021f) indicated that young people's employment rate experienced a much larger decline compared to other age groups during the first year of the pandemic, with labour mobility decreasing for young people, young people being less able to work effectively from home and a much higher percentage of young people on zero-hour contracts and less eligible for government furlough schemes. This, coupled with the fact that younger individuals have the lowest rates of savings or wealth to fall back on, may explain why younger individuals were more likely to experience suicidal thoughts during the pandemic.

Secondly, some authors have posited that the lockdown restrictions had a more severe impact on younger adults due to the heightened importance of social relations for younger individuals. Previous research has highlighted how social relationships play a crucial role in the psychosocial development of young adults (Hartup, 1989) and has outlined the important protective influence of social relations against anxiety, depression and suicidal ideation in younger individuals (Roach, 2018). Indeed, Beam & Kim (2020) outlined how the social isolation and loneliness associated with lockdown restrictions has had a more profound influence on younger individuals compared to older individuals. This, combined with the economic and financial consequences imposed on younger individuals may explain why they were more likely to experience suicidal thoughts during the pandemic relative to older individuals.

Suicide Attempts

As well as being more likely to experience suicidal thoughts, younger adults were also more likely to attempt suicide during the COVID-19 pandemic. The prevalence of suicide attempts was higher in the two youngest age groups (16-24 = 5.5%; 25-34 = 0.9%) compared to the two oldest age groups (65-74 = 0.1%; 75+ = 0.4%). According to the Adult Psychiatric Morbidity Survey, younger adults (16-24 = 2.2%; 25-34 = 0.6%) also had higher past-year prevalence of suicide attempts compared to older adults (65-74 = 0.1%) prior to the pandemic (McManus et al., 2014). The current findings suggest that the prevalence of suicide attempts in young adults has increased during the COVID-19 pandemic whereas the prevalence of

attempted suicide in older adults has remained largely unchanged. Particular attention should be given to individuals in the 16-24 age category, with the current data indicating that their rates of attempted suicide have more than doubled during the pandemic. Again, the previously explored reasons relating to the increased financial and economic hardship on younger age groups and the restrictions on socialisation having a more profound impact on younger individuals, may explain younger adults increased vulnerability to suicide during the pandemic.

Socioeconomic Deprivation

Suicidal Thoughts

It was also found that participant's socioeconomic group influenced their likelihood of experiencing suicidal thoughts throughout the COVID-19 pandemic, with individuals from the most deprived socioeconomic group (14.6%) more likely to experience suicidal thoughts relative to the least deprived socioeconomic group (7.7%). Cross-sectional UK research prior to the pandemic also established that suicidal thoughts were more prevalent in lower socioeconomic groups. Aschan et al. (2013) conducted a household survey of 1,075 randomly selected households in London and found that lifetime prevalence of suicidal thoughts was higher in participants within the lowest bracket of household income (31.1%) and lowest in participants within the highest bracket of household income (16.7%). Whilst Aschan et al. (2013) used a different measure of socioeconomic deprivation (household income) compared to the present research (WIMD rank) and measured lifetime prevalence of suicidal thoughts rather than suicidal thoughts in the 10-12 months since the onset of the pandemic, the pattern of findings in both studies showed that the prevalence of suicidal thoughts was approximately twice as prevalent in the lowest socioeconomic group relative to the highest socioeconomic group.

The absence of directly comparable pre-pandemic data on past-year prevalence of suicidal thoughts across socioeconomic groups makes it difficult to ascertain whether the pandemic disproportionately increased suicidal thoughts in lower socioeconomic groups. However, the finding that participants from low socioeconomic groups had higher rates of suicidal thoughts compared to those from high socioeconomic groups is broadly in-line with the studies that reported that the mental health of low socioeconomic groups was more adversely impacted by the pandemic (Pierce et al., 2020a; Xiong et al., 2020) and is very similar to the results

reported by O'Connor et al. (2020) that found individuals from lower socioeconomic groups were more likely to experience suicidal thoughts during the initial weeks of the pandemic.

Some of the key reasons why individuals from lower socioeconomic backgrounds have been more adversely impacted by the pandemic include the fact that they are more likely to be infected with COVID-19 (Whitehead et al., 2020), more likely to die from COVID-19 (Karmakar et al., 2021), more likely to have lost their jobs or experienced a reduction in their earnings due to COVID-19 (Adams-Prassl et al., 2020; Blundell et al., 2021) and that they were more likely to live in overcrowded conditions during a period in which people were confined to their homes (Patel et al., 2020; Tinson & Clair, 2020).

Suicide Attempts

Although this study found that socioeconomic deprivation was related to the prevalence of suicidal thoughts, socioeconomic deprivation did not predict suicide attempts during the COVID-19 pandemic. This was contrary to expectations considering that (1) pre-pandemic research reported that lifetime-prevalence of attempted suicide was highest within the lowest bracket of household income (18.3%) and lowest within the highest bracket of household income (4.3%; Aschan et al., 2013) and (2) previous research indicated that the mental health of lower socioeconomic groups had been more adversely impacted by the pandemic compared to higher socioeconomic groups (Pierce et al., 2020a; Xiong et al., 2020).

There are a few potential reasons why, contrary to expectations, socioeconomic status did not significantly predict suicide attempts within this study. Firstly, it is important to consider that only a small number of individuals in the current study reported attempting suicide during the pandemic. This meant that the analysis relating to suicide attempts was underpowered and increased the chance of a type 2 error. Given that the prevalence of suicide attempts in this study was higher in the most deprived socioeconomic group (1.1%) compared to the least deprived group (0.6%), it is possible that a study with increased power could have revealed a relationship between socioeconomic group and suicide attempts during the pandemic. Secondly, this study used an indirect measure of socioeconomic deprivation, using postcodes to estimate participant's deprivation rather than more

direct measures such as household income (Aschan et al., 2013). Whilst the Welsh Government's official measure of socioeconomic deprivation for small geographic areas is strongly related to socioeconomic status (Welsh Government, 2019a), the indirect nature of the measure inevitably means that there will be wealthy individuals that live in "more deprived" areas and vice versa. Therefore, this combination of lower power and an indirect measure of socioeconomic deprivation may have caused an underestimation of the relationship between socioeconomic status and suicide attempts.

A final possibility is simply that the worse mental health and suicidal thoughts did not translate to increased suicide attempts in the lower socioeconomic groups. As outlined in the introduction, many authors highlighted how certain factors such as government subsidies and the "pulling together" effect within communities may have protected against the expected rise in suicides within the population (John et al., 2021, Cream et al., 2021). Whilst the evidence suggests that the mental health and prevalence of suicidal thoughts has increased more in lower socioeconomic groups, it is possible that the government subsidies and the "pulling together" effect within communities conferred stronger protection against suicide attempts in more socioeconomically deprived groups.

Pandemic Related Stressors

The second aim of this research was to examine the extent to which key COVID-19 pandemic related stressors were associated with suicidal thoughts and suicide attempts. After controlling for age and gender, this study found that domestic abuse, food insecurity, difficulty accessing necessary healthcare, relationship problems, social isolation, financial problems, being made redundant, having increased difficulties in caring for someone, major COVID-19 symptoms and bereavement, were all associated with the presence of suicidal thoughts during the pandemic. Regarding suicide attempts, domestic abuse, food insecurity, being made redundant, financial problems, difficulty accessing necessary healthcare, social isolation and relationship problems were all associated with the presence of suicide attempts during the pandemic. Interestingly, being a key worker and having responsibility to home-school a child were negatively associated with both suicidal thoughts and suicide attempts during the COVID-19 pandemic.

Major Pandemic Related Stressors

Experiencing domestic abuse and food insecurity were the pandemic related stressors most strongly associated with both suicidal thoughts and suicide attempts. After controlling for age and gender, exposure to domestic abuse was associated with a 376% increase in the risk of experiencing suicidal thoughts and a 1049% increase in the risk of attempting suicide, relative to individuals not exposed to domestic abuse. Previously, a meta-analysis of 13 studies that investigated the relationship between domestic abuse and suicidality (any instance of suicidal thoughts, plans or attempts) found that domestic abuse was associated with a 155% increased risk of suicidality (Golding et al., 1999). Considering this, the current findings suggest that the relationship between domestic abuse and suicidal thoughts and suicide attempts became even stronger during the COVID-19 pandemic. This is in line with evidence that suggested there was an increase in both the frequency and severity of domestic abuse within the UK during the COVID-19 pandemic (ONS, 2020c). Furthermore, the act of not being able to leave the home that one shares with their abuser is likely to exacerbate the feelings of entrapment that partially mediate the link between domestic abuse and suicidality (O'Connor & Portzky, 2018). These reasons may explain why the relationship between domestic abuse and suicide appears to have strengthened during the pandemic.

After controlling for age and gender, exposure to food insecurity was associated with a 255% increase in the risk of experiencing suicidal thoughts and a 625% increase in the risk of attempting suicide. Previous research of 14,786 adults in America estimated that, after controlling for demographic factors, the presence of food insecurity was associated with a 176% increased risk of past-year suicidal thoughts (Nagata et al., 2019). The findings from this research suggests that the relationship between food insecurity and suicidal thoughts may have strengthened during the COVID-19 pandemic.

One potential reason why this relationship has grown stronger during the pandemic relates to the relationship between food insecurity and the hypothalamic-pituitary-adrenal (HPA) axis. Prior research has established that caloric and nutritional deficiencies are linked to dysfunctional HPA axis reactivity to stress (Macht, 1996) and that dysfunctional HPA axis reactivity to stress is linked to increased suicidality (Coryell & Schlesser, 2001). As highlighted in the introduction,

the COVID-19 pandemic resulted in the introduction or exacerbation of a vast array of stressors. Therefore, experiencing food insecurity during a period in which individuals are exposed to multiple stressors, is likely to increase the chances of experiencing suicidal thoughts. Another possibility is that the distress and uncertainty caused by food insecurity became even more severe during the pandemic. Prior to the pandemic, financial difficulties were typically the main cause of food insecurity (Loopstra, 2020). However, since the onset of the pandemic, many other causes of food insecurity have arisen such as supply chain issues, panic buying, loss of free school meals, quarantine processes and additional income losses. For individuals who were already experiencing food insecurity, their access to food and the uncertainty around accessing food may have become more severe, further strengthening the relationship between food insecurity and suicidal thoughts and attempts.

Moderate Pandemic Related Stressors

Difficulty accessing necessary healthcare, relationship problems, social isolation, financial problems and redundancy all demonstrated a moderate relationship with suicidal thoughts and suicide attempts during the COVID-19 pandemic. Whilst these stressors were not as strongly linked to suicidal thoughts and suicide attempts compared to domestic abuse and food insecurity, exposure to these stressors conferred approximately a 100-200% increase in the risk of both suicidal thoughts and attempts during the COVID-19 pandemic.

After controlling for age and gender, having difficulty accessing necessary healthcare was associated with a 207% increase in the risk of experiencing suicidal thoughts and a 172% increase in the risk of attempting suicide. Previous studies have demonstrated that having important healthcare cancelled, delayed, or scaled down can result in both worsening physical health, elevated anxiety, depression and uncertainty around one's health (Pouwels et al., 2021; Forner et al., 2021). The current findings build upon this previous research and suggests that problems with accessing important healthcare are also related to an increased risk of suicidal thoughts and suicide attempts. This provides further evidence supporting the idea that difficulty accessing necessary healthcare leads to negative psychological outcomes and highlights the need to prioritise the accessibility of healthcare and to provide support to individuals who cannot access the healthcare they need.

Romantic relationship difficulties were also an important predictor of suicidal thoughts and suicide attempts during the pandemic. After controlling for demographic factors, exposure to relationship problems was associated with a 183% increase in the risk of experiencing suicidal thoughts and a 134% increase in the risk of attempting suicide. Prior to the pandemic, large-scale research in Australia estimated that relationship separation was associated with a 173% increase in suicidal thoughts (Batterham et al., 2014). Considering that the current research measured "relationship problems", a term that encompasses less severe relationship difficulties compared to "relationship separation", yet it still reported a slightly stronger association between relationship problems and suicidal thoughts compared to Batterham et al. (2014), this suggests that the association between relationship difficulties and suicidal thoughts may have increased during the pandemic. This is in line with the literature that indicated that crisis periods like economic recessions (Schneider et al., 2016), natural disasters (Harville et al., 2010) and pandemics (Luetke et al., 2020) often exacerbate the conditions that lead to relationship conflict and ultimately results in severe romantic relationship conflicts and difficulties. It seems likely that the increased severity of relationship difficulties during the pandemic may be driving the slightly stronger association between relationship problems and suicidal thoughts.

Experiencing social isolation, a lack of interactions with others or the wider community, was also related to suicidal thoughts and behaviours during the pandemic. After controlling for age and gender, exposure to social isolation was associated with a 183% increase in the risk of experiencing suicidal thoughts and a 159% increase in the risk of attempting suicide. This finding is in line with the research outlined in the introduction that established the negative impact of social isolation on physical health (Cacioppo & Cacioppo, 2014) and depression (Liu et al., 2019). These findings are also consistent with data from the ONS (2021c) who reported that over one-third of UK adults reported that social isolation during COVID-19 had a negative impact on their mental health and wellbeing. The current findings built upon previous research by providing a gauge of the extent to which social isolation was related to suicidal thoughts and suicide attempts during a period in which many individuals were forced into social isolation through government restrictions. This research finding provides evidence that highlights the damaging

psychological consequences of social isolation. It is important for policy makers and community leaders to understand the relationship between social isolation and suicidality when considering the implementation of infection control measures and to consider ways in which individuals can remain connected to each other whilst confined to their own homes.

This study also reported that financial problems and being made redundant were important risk factors for suicidal thoughts and suicide attempts during the pandemic. Pre-pandemic UK based research demonstrated that experiencing debt was associated with a 104% increase in the risk of past-year suicidal thoughts after controlling for demographic and lifestyle factors (Meltzer et al., 2010). In the present study, after controlling for demographic factors, exposure to financial problems was associated with a 139% increase in the risk of experiencing suicidal thoughts and a 210% increase in the risk of attempting suicide. Similarly, being made redundant was associated with a 90% increase in the risk of experiencing suicidal thoughts and a 274% increase in the risk of attempting suicide.

Whilst the current study assessed "financial problems", a much broader stressor in comparison to "experiencing debt" (Meltzer et al., 2010), the findings do suggest a slight strengthening of the relationship between financial problems and suicidal thoughts during the COVID-19 pandemic. This strengthening in the relationship between financial problems and suicidality during the pandemic could reflect the increased severity of financial problems experienced during the pandemic. With many individuals in lower socioeconomic groups experiencing a reduction in income (Adams-Prassl et al., 2020), the loss of employment (Blundell et al., 2021) and a sharp increase in living costs (ONS, 2021b), many individuals that experienced financial difficulties prior to the pandemic are now experiencing more severe financial problems. Alternatively, it may also be that financial problems confer an even greater degree of stress during a period in which there are so many other sources of distress and uncertainty (e.g., one's health, the health of loved ones, food insecurity and social isolation).

Mild Pandemic Related Stressors

This research also identified that increased difficulties in caring for someone, major COVID-19 symptoms and bereavement were mildly associated with suicidal

thoughts during the COVID-19 pandemic. Exposure to these stressors were associated with a 39 – 76% increase in the risk of experiencing suicidal thoughts during the pandemic. None of these stressors, however, were associated with an increase in suicide attempts.

After controlling for age and gender, experiencing an increase in difficulties in caring for someone was associated with a 76% increase in the risk of experiencing suicidal thoughts. This finding was consistent with previous research that demonstrated the relationship between caring responsibilities and increased mental health difficulties (Schofield et al., 1998; Schulz et al., 1995; Carers UK, 2013). Furthermore, these findings are also in line with data from the ONS (2020b) that highlighted how the pandemic had more detrimentally impacted work and employment, physical health and access to essentials for carers compared to non-carers. This research builds upon these previous findings by providing initial evidence that the increased caring difficulties brought on by the pandemic also conferred an increased risk of experiencing suicidal thoughts. This highlights the importance of ensuring that individuals with high levels of caring responsibilities are provided with outreach and support during the pandemic. Interestingly, there was no association between increased difficulties in caring for someone and suicide attempts. It may be that the responsibility and sense of duty that accompanies the provision of care for others prevented suicidal thoughts from leading to attempted suicide (Heisel et al., 2015).

Experiencing major COVID-19 symptoms was associated with a 66% increase in the risk of experiencing suicidal thoughts. This aligns with the research conducted by Taquet et al. (2021) that found that individuals who experienced COVID-19 symptoms had an increased likelihood of a psychiatric diagnosis within the next three months. The current study builds upon those findings to suggest that experiencing major COVID-19 symptoms also increases the chances of an individual experiencing suicidal thoughts. Whilst further research is required to establish why major COVID-19 symptoms were associated with the presence of suicidal thoughts, it is possible that the physical distress caused by the physical symptoms, health anxiety about the long term impact on one's physical health and concerns around infecting other people, may be driving the link between major COVID-19 symptoms and suicidal thoughts.

The final pandemic related stressor associated with suicidal thoughts was bereavement. Undergoing a bereavement during the pandemic was associated with a 39% increase in the risk of experiencing suicidal thoughts. This finding is consistent with previous studies that have outlined the association between bereavement and physical health problems, loneliness, psychological distress and suicidality (Stroebe et al., 2007). Whilst there was some expectation that the infection control restrictions around funerals and memorials may have been detrimental to the grieving process, the modest relationship between bereavement and suicidality demonstrated in the current research is similar to the relationship between bereavement and suicidality observed in pre-pandemic populations (Stoebe et al., 2005; Molina et al., 2019). This indicated that the COVID-19 pandemic did not strengthen the relationship between bereavement and suicidality.

Negative Associations

Whilst this research established that several pandemic related stressors were associated with suicidal thoughts and suicide attempts, there were two supposed "risk factors" that were actually negatively related to suicidal thoughts and suicide attempts during the pandemic. Being a key worker was negatively related to experiencing suicidal thoughts, with non-key workers having a 54% increased risk of experiencing suicidal thoughts and a 223% increase in the risk of attempting suicide compared to key workers. On the surface, this finding appears surprising given that (1) key workers were asked to endure the heightened risk of infection to perform their professional duties (Pink et al., 2021), (2) research from the 2002-2004 SARS epidemic found that key workers experienced elevated rates of psychological distress compared to non-key workers (Brooks et al., 2018). However, there are some reasons why key workers may have been less likely to experience suicidal thoughts during this pandemic. Firstly, in a pandemic associated with severe economic concerns, key workers experienced strong job security. Secondly many key workers experienced a sense of duty, responsibility and meaning in their work throughout the pandemic that can protect against suicide (Heisel et al., 2015). Thirdly key workers were shown to have demonstrated higher levels of psychological resilience (Pink et al., 2021), which can help buffer the relationship between distress and suicidality.

Having the responsibility to home-school a child was also negatively related to suicidal thoughts and suicide attempts during the pandemic. Having no

responsibility to home-school a child was associated with a 37% increase in the risk of experiencing suicidal thoughts and a 213% increase in the risk of attempting suicide compared to individuals with home-schooling responsibilities. Again, whilst this seems to be inconsistent with the finding that home-schooling responsibilities caused increased stress, anxiety, worse emotional wellbeing and elevated domestic conflict (Randell et al., 2006), there are reasons that might explain why a negative relationship was found. Having children itself is one of the most well-established protective factors against suicidality (Masango et al., 2008; Qin & Mortensen, 2003). Furthermore, there has been some evidence indicating that home-schooling provided an opportunity for parents to strengthen bonds with their children and has promoted feelings of connectedness within families (Vincent et al., 2021; Evans et al., 2020). These factors may explain why having responsibility to home-school children was negatively associated with suicidal thoughts and suicide attempts.

Implications

Demographic Factors

This research aimed to look beneath the general trends in population suicidality and identify some of the demographic groups that were particularly vulnerable to suicidal thoughts and suicide attempts during the pandemic. Through identifying the demographic groups with heightened risk of suicidal thoughts and behaviours, this research hoped to inform the development of effective outreach and support programmes that target individuals most in need of help.

Arguably the most striking finding from this research was the elevated suicidality in young adults. Almost one in three young adults (16-24) experienced suicidal thoughts and one in 20 young adults attempted suicide during the pandemic. This is markedly higher than pre-pandemic rates (McManus et al., 2014) and has important implications. Firstly, policy makers and community leaders must consider how to provide targeted support and outreach to young people impacted by the COVID-19 pandemic and associated restrictions. Organisations in contact with young adults (e.g., universities, churches, mental health services, support groups, charities), must be made aware of this increased vulnerability to suicidality in young adults and should consider offering additional help and support to young adults that have been impacted by the pandemic. Secondly, further research must establish the factors driving this elevated suicidality in young adults. Once research can more

confidently establish the factors causing increased suicidality in young adults (e.g., social restrictions, financial problems, educational uncertainty), high-level decision makers can then work to lessen the prevalence and severity of these factors within the population.

Pandemic Related Stressors

The second aim of this research was to identify some of the major stressors that were associated with suicidal thoughts and suicide attempts throughout the pandemic. Establishing which pandemic related stressors were linked to increased suicidal thoughts and suicide attempts can allow communities to (1) provide outreach and support to individuals exposed to such stressors and, (2) work to prevent or lessen the severity of such stressors in the community. These findings have important implications for the development of community recovery strategies.

The stressors most strongly associated with suicidal thoughts and suicide attempts during the COVID-19 pandemic were domestic abuse and food insecurity. This research suggests that particular attention and effort should be given to preventing or limiting the occurrence of these stressors. Whilst domestic abuse has become more frequent, severe and harder to detect during the pandemic, increased efforts must be made to help victims. It will be important to consider the availability and accessibility of helpful telephone and internet services to individuals living with an abusive partner, the accessibility of women's shelters during period of strict infection control and how healthcare services can detect signs of abuse and communicate messages of help and support securely over videoconferencing platforms. Regarding food insecurity, the provision of additional funding to food banks, ensuring the continuation of free school meals to families during home-schooling and holiday periods and making sure that quarantined individuals can have food delivered could have an important protective effect against suicidality during the pandemic.

After domestic abuse and food insecurity, there was a group of different stressors that all had meaningful associations with suicidal thoughts and suicide attempts. Difficulty accessing necessary healthcare, social isolation, relationship problems, financial problems and redundancy were all associated with at least a doubling of the risk of suicidal thoughts and suicide attempts. This carries important

implications for recovery, outreach and support strategies. The strong link between difficulty accessing necessary healthcare and suicidality highlights the psychological toll it can take on an individual when healthcare is cancelled, delayed, or scaled down. Whilst it may not always be possible to provide the necessary healthcare to all individuals during a pandemic that has overwhelmed healthcare services, it is important to consider how communication can be improved and how these individuals can be monitored and supported in order to mitigate the negative consequences associated with limited access to important healthcare.

Thought should also be given to how to ameliorate the negative impact of social isolation. Whilst infection control measures may require many individuals to remain confined within their own homes, consideration should be given to how communities can stay socially connected to each other during these periods. Online social prescribing services, befriending services and other initiatives that facilitate the strengthening of social relationships through remote means, may help those confined to their homes stay connected and lessen the negative psychological impact of social isolation.

Other noteworthy stressors linked to suicidal thoughts and attempts during the pandemic included financial problems and redundancies. Whilst stressors such as financial problems and redundancies are well known risk factors for suicide in non-pandemic conditions (Blakely, 2003; Coope et al., 2015; Love et al., 2018), the present findings highlight that these stressors may confer an even greater association with suicidality during the pandemic. This information should be factored in as policy makers, charities, community groups and grassroots organisations design ways of providing support and outreach to those most affected by the pandemic.

Overall, whilst research examining the general trends in population suicidality have indicated that suicide rates have remained stable or decreased during the pandemic (Pirkis et al., 2021), this research highlights how many of the stressors related to the pandemic are linked to increased rates of suicidal thoughts and suicide attempts. Moving forwards, this research provides an initial understanding of how the various pandemic related stressors have influenced population suicidality. Knowledge of this can allow communities to both provide outreach and support to

individuals exposed to such stressors, and to work to prevent or lessen the severity of such stressors in the community.

Limitations

These findings must be interpreted in light of some important limitations. Firstly, the cross-sectional design used in this research prevents the drawing of directional, causal relationships between the pandemic related stressors and suicidal thoughts and suicide attempts. It is possible that experiencing suicidal thoughts or attempting suicide caused individuals to be more likely to experience domestic abuse or food insecurity, rather than the reverse. Longitudinal research is required to further understand the nature of the relationship between these pandemic related stressors and suicidality.

Secondly, it is important to consider that participants were recruited using online convenience sampling methods. This sampling method often attracts volunteers who are already engaged with and interested in the topic and excludes those with difficulty accessing the internet (Pierce et al., 2020b). This sampling method also resulted in an underrepresentation of men, young individuals (aged 16-24) and older individuals (aged 75+) relative to the demographics of the population of Wales (Welsh Government, 2019b), meaning that the sample cannot be considered representative of the Welsh population. Thirdly, whilst this study had sufficient power to examine the relationship between the stressors and suicidal thoughts, the study was underpowered when investigating the relationship between stressors and suicide attempts. This increased the chances of type 2 errors and limited our ability to detect small associations between demographic factors or pandemic stressors and suicide attempts. For example, there is a chance that small associations between socioeconomic status and suicide attempts or bereavement and suicide attempts may have been found in a higher powered investigation.

Fourthly, this research utilised single-item measures of suicidal thoughts and suicide attempts. Whilst this method offers a fast, non-intrusive assessment of suicidal thoughts and suicide attempts that is compliant with the ethical guidelines for mental health research during the pandemic (Townsend et al., 2020), previous studies have demonstrated that the use of single-item self-report measures can result in a small over-endorsement of the standard definition of suicidal thoughts (8%) and

suicide attempts (11%), potentially resulting in slight overestimations of true effects (Millner et al., 2015).

Fifthly, the survey employed a newly developed stressor checklist to measure participants' exposure to pandemic related stressors. Although similar pandemic stressor checklists have been used in other studies (Li et al., 2021; Kujawa et al., 2020) and have demonstrated good test-retest reliability and convergent validity (Kujawa et al., 2020), there are difficulties associated with this method. The binary (yes/no) nature of a stressor checklist does not capture the depth of information around the stressor, such as the severity of the stressor and the individual's interpretation and response to the stressor (Crosswell & Lockwood, 2020). Raphael et al. (1991) also highlighted that checklist measures of life events are vulnerable to problems of memory recall and misclassification, which can lead to imprecise and unreliable accounts of life events. Considering this was an exploratory piece of research on the relationship between certain stressors and suicidal thoughts and attempts, the stressor checklist represented a useful method of capturing surface level information on the relevant stressors in a fast and non-intrusive manner. However, for future research aiming to unearth a richer understanding of pandemic related stressors, it may be more suitable to employ methods that capture more than just the presence or absence of a stressor.

Additionally, the list of stressors included in this study should not be considered an exhaustive list of all stressors brought on or exacerbated by the pandemic. Upon reflection there were more pandemic related stressors that would have been interesting to investigate. For example, later research has demonstrated that the pandemic led to a rise in anti-Asian discrimination (Dhanani et al., 2022), the worsening of many individuals' pre-existing physical and mental health conditions (Bailey et al., 2021) and the cancellation or postponement of important events (Kujawa, 2020). These stressors are also likely to impact the mental health and suicide risk of individuals and would be worthy of future investigation.

Finally, over a quarter of participants did not provide their postcode and therefore socioeconomic information was not available for a substantial proportion of the sample. This prevented the analyses from examining the relationship between pandemic related stressors and suicidality whilst controlling for socioeconomic

deprivation. Given that some of the stressors such as food insecurity and financial problems are more prevalent in those from lower socioeconomic groups, this may have caused a slight overestimation of the extent to which these stressors were associated with suicidal thoughts and suicide attempts.

Conclusion

This study aimed to identify the demographic factors and pandemic related stressors that were associated with suicidal thoughts and suicide attempts during the COVID-19 pandemic. The findings established that men, younger individuals and socioeconomically deprived individuals were more likely to experience suicidal thoughts during the pandemic, with younger individuals also more likely to attempt suicide. Regarding pandemic related stressors, domestic abuse and food insecurity were the stressors most strongly linked with suicidal thoughts and attempts. There were also strong associations between difficulty accessing healthcare, social isolation, relationship problems, financial problems, redundancies and suicidal thoughts and attempts. Smaller associations between increased caring difficulties, major COVID-19 symptoms, bereavement and suicidal thoughts were also found. Overall, this study provides an important initial overview of the factors related to suicidality during the COVID-19 pandemic. These findings should be taken into consideration by policy makers and community leaders aiming to prevent increased suicidality within the population and provide outreach and support to individuals most affected by the COVID-19 pandemic.

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Chapter 6: Identifying Factors That Protect Against Suicidal Thoughts During the COVID-19 Pandemic

Introduction

This study aimed to build on the research from the previous chapter and identify some of the key factors that played a role in protecting against suicidal thoughts during the COVID-19 pandemic.

Not All Adversity Causes Mental Health Difficulties

Experiencing adversity is an unfortunate reality of a pandemic. However, not all individuals that undergo adversity experience severe mental health difficulties, suicidal thoughts or engage in suicidal behaviours (PeConga et al., 2020). In fact, previous research has demonstrated that many individuals that experience significant adversity maintain a stable trajectory of healthy functioning long after the adverse or traumatic experience (PeConga et al., 2020). A full review of the modal human response to trauma and adversity is reported in Bonanno et al. (2010), however some powerful examples of how some humans can undergo severe trauma and adversity without developing mental health difficulties or suicidal thoughts are highlighted below. Outlining this research is not done with the intention of arguing that individuals should not develop mental health difficulties or experience suicidal thoughts in response to trauma or adversity, rather it serves to highlight the immense human capacity to withstand or bounce back from difficult experiences.

Bonanno et al. (2002) collected data on depressive symptoms from 205 individuals prior to, and 18 months after, the death of their spouse. Bonanno et al. (2002) found that approximately half of participants showed no evidence of clinically relevant depressive symptoms or “otherwise maladjustment” in the 18 month period after their bereavement. Similarly, Deshields et al. (2006) investigated the mental health trajectories of individuals diagnosed with breast cancer and reported that well over half (61%) of participants reported no clinically relevant depressive symptoms and maintained healthy psychological functioning throughout the difficult circumstances associated with a cancer diagnosis and radiation treatment. Other research has highlighted that the majority of first responders to the 9/11 World Trade Centre attacks did not experience clinically relevant PTSD (Pietrzak et al., 2013),

depression (Biggs et al., 2010) or anxiety (Bowler et al., 2016) symptoms in the months and years after their traumatic experience.

Further research has demonstrated that not all individuals experience suicidal thoughts or attempt suicide after exposure to adverse, abusive or traumatic circumstances. Ackard and Neumark-Sztainer (2002) studied the prevalence of sexual abuse and suicidal thoughts in a sample of 81,247 adolescent American schoolchildren. Whilst they found that the prevalence of lifetime suicidal thoughts was much higher in victims of sexual abuse, they also reported that the majority (69%) of sexual abuse victims had not experienced lifetime suicidal thoughts despite their abuse. Research into torture victims has also highlighted the immense ability of some humans to withstand awful and traumatic experiences. Somasundaram (1993) followed a group of 160 former prisoners of war subjected to torture in Sri Lanka and found that 62% of these prisoners had not experienced suicidal thoughts. Further research by Ferrada-Noli et al. (1998) studied 149 refugees who had experienced severe traumatic experiences (such as undergoing imprisonment, torture, combat atrocities or sexual violence). Within this sample, over half of the participants (50.3%) reported not engaging in suicidal behaviours. Whilst across these studies, rates of suicidal thoughts or behaviours were certainly elevated in those exposed to extreme adversity, when one considers the horrific nature of their experience, it is remarkable that so many individuals did not experience suicidal thoughts or attempt suicide.

It is worth reiterating that this research was not described in an attempt to argue that individuals should never experience suicidal thoughts in response to adversity. Indeed, adversity such as bereavement (Stroebe et al., 2007), cancer diagnoses (Linden et al., 2012), sexual abuse (Ackard & Neumark-Sztainer, 2002) or trauma exposure (Abraham et al., 2021) are all associated with a wide range of psychiatric morbidities and suicidal thoughts). Instead, the aim was to draw attention to the remarkable human capacity to withstand or bounce back from difficult or traumatic experiences. Furthering our understanding of the factors that help individuals maintain their desire to live after experiencing adversity, can help inform intervention strategies that enable individuals and communities to withstand and bounce back from the challenging circumstances brought on by the COVID-19 pandemic. This research aimed to build an understanding of some of the key factors

that protected individuals from experiencing suicidal thoughts during the pandemic. The following section outlines the key protective factors examined in this research.

Protective Factors

There are many social and psychological factors that have been found to protect against mental health difficulties and suicidality. This study chose to investigate whether hope, social connectedness, resilience and acceptance could protect against suicidal thoughts and attempts during the pandemic. These protective factors were chosen for three main reasons.

Firstly, there was a strong theoretical rationale and empirical evidence indicating that these factors conferred important protection against mental health difficulties and suicidality. The hopelessness theory of suicide (Abramson et al., 2002), the interpersonal theory of suicide (Van Orden et al., 2010), the meta-theory of resilience (Richardson, 2002) and Hayes' et al. (1996) theory of acceptance all provide a theoretical explanation as to why hope, social connectedness, resilience and acceptance might protect against the development of suicidal thoughts and behaviours. These theoretical models and associated empirical evidence are explored in the sections below.

Secondly each of these factors have previously been highlighted for their importance in community recovery from large-scale natural or man-made disasters. Hackbarth et al. (2011) studied families that lived through Hurricane Katrina and observed a strong positive relationship between hope and effective coping after the hurricane. Qualitative work also established the importance of maintaining hope in communities recovering from large-scale adversities. Bradfield et al. (1989) conducted interviews with ministers and mental health professionals that provided relief work after the 1985 floods in West Virginia and found that instilling hope within the damaged communities was one of the central tenets of their recovery.

Blackmon et al. (2016) highlighted the important role that psychological resilience played in the recovery of individuals exposed to the Deepwater Horizon Oil Spill in 2010. In a spatially stratified random sample of 294 Mississippi Gulf Coast residents, Blackmon et al. (2016) found that self-reported psychological resilience reduced the likelihood of depression and aided recovery during the aftermath of the oil spill.

Social connectedness is also a key factor in helping communities and individuals cope during disasters. A plethora of studies investigating communities hit by both natural and man-made disasters, have demonstrated that well-connected social networks are a key predictor of successful recovery (Akama et al., 2014; Islam & Walkerden, 2014; Story et al., 2020). After the 2011 Great East Japan Earthquake, survivors who interacted more with other victims within the community experienced improved mental health and decreased cognitive decline compared to victims with fewer sources of social support (Hikichi et al., 2020; Mayer, 2019).

Qualitative research after the 1999 Earthquake in Taiwan highlighted the role that acceptance can play in post-disaster recovery. Jang and Wang (2009) collected qualitative data through in-depth interviews with 15 survivors of the earthquake and observed that acceptance played a crucial role in helping individuals respond positively to the disaster. Many participants reported that accepting disasters was a part of life and a natural consequence of living harmoniously with nature. Individuals who accepted the earthquake understood that they did not have power to change what had happened but were capable of coping with its effects (Jang & Wang, 2009). This account aligns with prior research that found individuals with a more accepting attitude towards disasters were more likely to adopt a problem-focused coping style which increased disaster-resilience (Paton & Johnston, 2001).

Finally, each of these factors has previously demonstrated they were amenable to change or improvement through therapy, education or social programmes. This research wanted to uncover factors that protected against suicide during the pandemic so that these factors could be instilled, developed or improved within communities in order to facilitate an effective recovery. Therefore, it was important that the protective factors investigated in this research were dynamic and responsive to intervention. For hope, research has demonstrated how positive psychology exercises such as writing letters of gratitude or reflecting on personal strengths have successfully improved individuals' self-reported levels of hope (Huffman et al., 2014).

There is also evidence to suggest that social prescribing can improve social connectedness. Social prescribing is a method of linking individuals in primary care settings with social activities provided by volunteer and community sector

organisations such as cooking, sports or befriending groups (Buck & Ewbank, 2020) and research has demonstrated social prescribing can help improve social connectedness (Kellezi et al., 2019) and decrease loneliness (Polley et al., 2019). Resilience is also conceptualised as a dynamic construct (Stainton et al., 2018) and there are numerous "resilience training" interventions that have demonstrated an ability to improve levels of self-reported resilience (Joyce et al., 2018). Furthermore, research has demonstrated that acceptance-based interventions such as acceptance and commitment therapy (Hayes et al., 2004) and mindfulness-based stress reduction (Grossman et al., 2004) can increase participant's acceptance of reality.

Hope, social connectedness, resilience and acceptance each have (1) strong theoretical and empirical research outlining their protective value, (2) evidence that they assist community recovery from large-scale adversities and (3) studies demonstrating that they are amenable to improvement through intervention. The next section outlines each of these protective factors in more detail.

Hope

Hope can broadly be defined as the belief or expectation that "one will have positive experiences in the future, or that a potentially threatening or negative situation will not materialise or will ultimately result in a favourable state of affairs" (American Psychological Association, 2021, para. 1). In simpler terms, it is the belief that things will improve in the future. Hope, or it's antonym hopelessness, plays a central role in many theories of suicide.

Abramson et al. (2002) put forward the hopelessness theory of suicidality, in which hopelessness is an important cognitive vulnerability that provides a key link between a depressive attributional style and suicidality. In addition, the Three-Step Theory of suicide put forward by Klonsky & May (2015), posits that experiencing great pain or suffering alone is not sufficient to produce suicidal ideation. An individual experiencing great suffering is unlikely to develop suicidal thoughts and feelings if they believe that their situation will eventually improve. Rather, it is the combination of great pain and suffering with a sense of hopelessness (a belief that the situation cannot improve) that causes suicidal ideation to develop. Furthermore, the Interpersonal Theory of Suicide (Van Orden et al., 2010) also includes the construct of hopelessness as a central component, proposing that thwarted feelings of

belonging and burdensomeness are proximal and sufficient causes of suicidal desire only if one is hopeless regarding the ability of these states to improve.

Whilst there are many differences between the various theories of suicide, they each argue that suicidal thoughts will not develop if an individual believes that their situation can improve. This theoretical account for the protective role of hope against suicidal thoughts is supported by empirical evidence. Uncapher et al. (1998) studied the relationship between depressive symptoms, hopelessness and suicidal ideation in a sample of institutionalised elderly males. The Geriatric Depression Scale (GDS; Abraham, 1991) was used to measure depression symptoms, the Geriatric Hopelessness Scale (GHS; Fry, 1984) was used to ascertain levels of hopelessness and the Beck Scale of Suicide Ideation (BSS; Beck et al., 1979) assessed suicidal ideation. They found that levels of hopelessness moderated the relationship between depressive symptoms and suicidal ideation, such that the relationship between depressive symptoms and suicidal ideation was stronger in participants with higher levels of hopelessness.

Similar findings were also reported by Tucker et al. (2013) who asked 298 undergraduate students to complete self-report measures of hope, rumination and suicidal ideation. Levels of hope were measured using the 18-item Revised Trait Hope Scale (HS-R2; Shorey et al., 2009). Their results demonstrated that high levels of hope weakened the relationship between rumination and suicidal ideation, indicating that the presence of hope protected against suicidal ideation in individuals with a tendency to ruminate. Taken together, these two studies indicated that hope plays an important role in protecting against suicidal ideation in individuals experiencing difficult internal states.

Similar cross-sectional research from Chang et al. (2015) examined whether hope could protect against stressful or traumatic experiences. Chang et al. (2015) measured participant's history of sexual assault, their current levels of hope and their suicidality in a sample of 325 college students in America. Hope was measured using the 12-item Hope Scale (HS; Snyder et al., 1991) and suicidality was measured using the Suicidal Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001). Using a hierarchical regression analysis, Chang et al. (2015) reported that (1) previous sexual assault increased an individual's levels of suicidality, (2) higher levels of hope

decreased suicidality and, (3) hope moderated the relationship between sexual assault and suicidality, with higher levels of hope weakening the relationship between sexual assault and suicidality. This finding extends upon the research by Uncapher et al. (1998) and Tucker et al. (2013) and suggests that hope can play an important role in protecting against suicidality in the face of both difficult internal (e.g., depression, rumination) and external (e.g., sexual assault) experiences. However, it is important to acknowledge that these three studies all implemented cross-sectional designs which limits the inference of directional, causal relationships between variables.

Kwok and Gu (2018) conducted a longitudinal analysis of 910 adolescents from China. They measured participant's depressive symptoms, sense of hope and suicidal ideation at two time points, one year apart. Depressive symptoms were measured using the depression subscale of the Hospital Anxiety and Depression Scale (HADS; Leung et al., 1993) and hope was measured using the 6-item Children's Hope Scale (Snyder et al., 1997). Kwok and Gu (2018) conducted a hierarchical regression analysis to examine the moderating effects of hope. They reported that the pathway between adolescents' depressive symptoms and later suicidal ideation was moderated by their sense of hope. The relationship between depressive symptoms and suicidal ideation was much weaker for individuals with high levels of hope. This longitudinal study adds weight to the idea that hope plays an important protective role against the development of suicidal thoughts.

In summary, hope plays a central role in many theories of suicide, many of which stipulate that hopelessness is a necessary state for the development of suicidal thoughts (Abramson et al., 2002; Klonsky & May, 2015; Van Orden et al., 2010). There is also a large body of research that has demonstrated that hope can protect against suicidal thoughts in individuals who have experienced adverse events (e.g., sexual assault) or difficult internal experiences (e.g., depression, rumination). Considering this protective role of hope against suicidal thoughts, this research sought to investigate whether hope was able to protect against suicidal thoughts in the general population throughout the stressful events of the COVID-19 pandemic. Based on the research outlined above, it was predicted that hope would moderate the relationship between pandemic stress and suicidal thoughts, with the relationship between pandemic stress and suicidal thoughts weaker for individuals with higher levels of hope.

Social Connectedness

Social connectedness is the sense of belongingness and the feeling of being close and connected to others. It involves the feeling of being cared for and valued in one's social relationships (Eisenberger, 2012). The construct of social connectedness extends beyond the simple presence of social support and refers to having a sense of closeness, belonging and connection in one's social relationships. Much like hope, social connectedness plays a central role in many theoretical models of suicidality. Durkheim (1897) initially identified that feelings of social connectedness served as a protective factor against suicide. Durkheim (1897) posited that the likelihood of suicide was influenced by one's degree of social integration and connection, with individuals who possessed a greater attachment to social groups, less likely to attempt suicide. Furthermore, Baumeister and Leary (1995) argued that the need to belong and feel socially connected to others is such a fundamental human need, that when thwarted, a desire for death starts to develop.

Van Orden et al. (2010) built on Baumeister and Leary's (1995) work when establishing the Interpersonal Theory of Suicide. The Interpersonal Theory of Suicide emphasises the importance of belongingness in the pathway to suicidal desire. Belongingness, a construct similar to social connectedness, is a two-dimensional construct comprising of a sense of loneliness (feeling disconnected from others) and the absence of reciprocal care (feeling that you have no one to turn to; Van Orden et al., 2010). The Interpersonal Theory of Suicide posits that the absence of a sense of belongingness, alongside feelings of burdensomeness (the perception that one is a burden on family members, friends and larger society), combined with a sense of hopelessness about these states, provides the conditions necessary for suicidal desire to arise (Van Orden et al., 2010). In summary, multiple theoretical accounts acknowledge that the human need to belong or feel socially connected plays a crucial role in protecting against the development of suicidal thoughts and desires. These theoretical accounts are supported by several studies that demonstrate the protective value of social connectedness.

Pidgeon et al. (2014) investigated the protective role of social connectedness within a sample of over 200 university students from Australia, Hong Kong and America. Pidgeon et al. (2014) measured participant's levels of perceived stress, depression symptomology and social connectedness. Social connectedness was

measured using a 14-item self-report scale designed to measure student's perception of their connection to others and their sense of belongingness on their university campus. Using a moderated multiple regression analysis, they found that social connectedness significantly moderated the relationship between perceived stress and depression symptomology, such that this relationship was weaker for individuals with higher social connectedness. This cross-sectional investigation supports the notion that social connectedness protects against negative psychiatric outcomes. However, it is important to acknowledge that the measure of social connectedness used within the study only measured social connectedness within the university campus, excluding connectedness with family members and peers outside of university. Additionally, the study consisted exclusively of university students which limits the generalisability of the findings to other demographic groups.

Kelley et al. (2019) examined the protective role of social connectedness within 189 combat veterans. Kelley et al. (2019) measured participant's levels of self-directed moral injury (feelings of guilt, shame, moral concerns and an inability to forgive themselves), other-directed moral injury (feelings of anger betrayal, revenge and disgust over the actions of others), social connectedness and suicidality. Social connectedness was measured using the Friendship Scale (Hawthorne, 2006), which comprises of six items assessing the connectivity and quality of one's friendships (e.g., "*It has been easy to relate to others*"; "*I have someone to share my feelings with*"). Within a series of moderation regression models, Kelley et al. (2019) reported that levels of social connectedness moderated the relationship between other-directed moral injury and suicidality, with higher social connectedness weakening the association between other-directed moral injury and suicidality. Kelley et al. (2019) extended the findings from Pidgeon et al. (2014) by using a military sample, indicating that the protective nature of social connectedness generalises to other demographic groups.

Large-scale, longitudinal research using over 20,000 participants has also investigated the relationship between social connectedness and suicidality. Kidd et al. (2006) used data from the Longitudinal Study of Adolescent to Adult Health dataset (N = 20,745) and examined whether peer connectedness, parental connectedness and school connectedness at time one was related to suicidal thoughts and suicide attempts one year later (time two). Parental connectedness was measured

using the 11-item family connectedness scale (Borowsky et al., 2001), peer connectedness was assessed using five items that assessed the frequency with which participants shared and discussed their problems with their friends and school connectedness was assessed via a six-item questionnaire that evaluated feelings of closeness and connectedness to the teachers and the school. Kidd et al. (2006) reported that parental connectedness and school connectedness (but not peer connectedness) at time one was related to decreased risk of suicide attempts at time two. They also reported that within the demographic group most at risk of suicide (boys with a history of suicide attempts), peer, parental and school connectedness had an interactive relationship in mitigating the risk of future suicide attempts. This highly powered longitudinal study provides evidence in support of the idea that social connectedness protects against the future development of suicidal behaviour. However, it is important to note that the measure of peer connectedness (frequency of discussing problems with peers) was more of a measure of peer support. Whilst the two constructs overlap a great deal, social connectedness extends beyond the provision of help and support to the sense of closeness, belonging and connection in one's relationships. This may explain why peer connectedness on its own did not protect against suicide attempts within this study.

Gunn et al. (2018) used the same database as Kidd et al. (2006) and examined whether *changes* in social connectiveness over the course of the year (from time one to time two) was associated with changes in suicidal thoughts and suicide attempts. Gunn et al. (2018) measured parental connectivity using the family connectedness scale (Borowsky et al., 2001), measured school connectivity using two questions relating to feelings of closeness and belonging to the school and measured social integration using a five-item questionnaire that assessed whether participants felt loved, wanted, liked and connected to their friends. Changes in each of these constructs was measured by subtracting time two scores from time one scores. Gunn et al. (2018) found that increases in social integration and parental connectedness over time, predicted lower rates of suicidal ideation at time 2. Taken altogether, the research explored here has demonstrated that both outright social connectedness and improvements in social connectedness over time play an important role in protecting against the development of suicidal thoughts and behaviours. A variety of experimental designs across a diverse range of demographic groups (adolescents,

students, war veterans, psychiatric inpatients) all provided evidence of the protection that social connectedness can provide against the development of suicidal thoughts and attempts. This evidence has led the Centers for Disease Control and Prevention (2011) to highlight social connectedness as a key protective factor at the heart of their strategic direction for suicide prevention.

The protective nature of social connectedness is most needed in times of crises (Barrera et al., 1981; Schwarzer et al., 1994). As described earlier, the lockdown and social distancing measures implemented during the COVID-19 pandemic led to decreased in-person socialisation with family members, friends and significant others that live outside one's household (Hiremath et al., 2020), the cessation of many social groups, clubs, societies (Evans et al., 2020) and even offices and schools were shut down as people were required to work or learn from home (Bick et al., 2021). As the severity of the COVID-19 pandemic increased and the protective influence of social connectivity was most needed, the accessibility to many sources of social and community connectedness constricted. It is both interesting and important to understand whether social connectedness could still provide protection against suicidal thoughts and attempted suicide during a period in which opportunities to socially connect with others was restricted. This research aimed to investigate whether social connectedness protected against suicidal thoughts during the COVID-19 pandemic. Based on the literature explored above, it was predicted that social connectedness would moderate the relationship between pandemic related stress and suicidal thoughts, with the relationship between pandemic stress and suicidal thoughts weaker for individuals with higher social connectedness.

Resilience

Resilience, broadly defined, is the ability to "bounce back" and maintain or regain good psychological outcomes and quality of life after experiencing stressful circumstances or more serious adversity (Guihard et al., 2018; Herrman et al., 2011). Resilience is generally conceptualised as a multidimensional and dynamic construct, comprising of personality, biological, social and environmental factors (Herrman et al., 2011). Resilience is a very popular concept within the psychological and medical literature and there are multiple theoretical models of resilience that have emerged (Fletcher & Sakar, 2013). Perhaps the most frequently cited theory of resilience (e.g.,

Campbell-Sills et al., 2006; Fletcher & Sakar, 2013; Gu & Day, 2007) is the meta-theory of resilience and resiliency (Richardson, 2002).

The theory begins with a point in time where a person exists in a state of biopsychospiritual homeostasis, where an individual's mind, body and spirit has adapted to, and is largely comfortable with, their current set of circumstances. This state of homeostasis is constantly bombarded with potential disruptions such as stressors, life events, adversities, opportunities and other types of change. Disruption to one's homeostatic state can occur if an individual has insufficient resources to buffer against the stressor and this brings about the reintegration process. The reintegration process can lead to four possible outcomes.

The optimal outcome is resilient reintegration, whereby the individual recovers from the disruption and experiences some insight and personal growth that helps them become more resilient for the future and return to a higher level of homeostasis. Homeostatic reintegration describes the outcome where the individual manages to get past the disruption and return to their previous level of homeostasis. Reintegration with loss is where the disruption causes the loss of protective factors and the individual returns to a lower future level of homeostasis. The least optimal outcome, dysfunctional reintegration, occurs when the disruption leads individuals towards destructive behaviours such as substance abuse and a much lower level of homeostasis (Richardson, 2002; Fletcher & Sakar, 2013). In this model, an individual's level of resilience is determined by their capacity to bounce back even stronger than before after experiencing a disruption. Resilience is an emerging concept within the suicide literature (Wang et al., 2022), with many authors theorising that an ability to bounce back stronger from disruptions can protect individuals exposed to adversity, from developing suicidal thoughts and attempting suicide.

Past work has demonstrated that resilience is an important protective factor in relation to suicidal thoughts and suicide attempts. Roy et al. (2011) conducted cross-sectional research into the relationship between resilience and attempted suicide. They sampled 166 prisoners who had previously attempted suicide and 166 prisoners matched for age and historical trauma levels, who had no history of suicide attempts. They asked participants to complete the Connor Davidson Resilience Scale (CD-

RISC; Connor & Davidson, 2003), a 25-item self-report measure of resilience. Roy et al. (2011) reported that the prisoners who had never attempted suicide had significantly higher self-reported resilience scores compared to the prisoners who had attempted suicide. This exploratory study suggested that resilience could play a role in protecting against suicide attempts. The study also ensured that levels of historical trauma were equal between the two groups, which counters the alternative explanation that historical trauma independently mediated the relationship between resilience and suicide attempts. However, the cross-sectional nature of this research makes it hard to infer directional relationships between resilience and suicide attempts. It is difficult to establish whether resilience makes one less likely to attempt suicide or whether attempting suicide can cause someone to perceive themselves as less resilient.

Further work by Min et al. (2015) measured levels of depression, anxiety, resilience and suicidal ideation in 436 patients from Korea with a diagnosis of depression or anxiety. Resilience was measured using the Korean version of the Connor Davidson Resilience Scale (Connor & Davidson, 2003). Min et al. (2015) split participants into two groups based on their resilience scores (high vs low resilience) and examined whether the relationship between depression and suicidal ideation was stronger for participants with low, rather than high, resilience. The same analysis was also conducted with anxiety in place of depression. Min et al. (2015) found that resilience significantly moderated the relationships between (1) depression and suicidal ideation and, (2) anxiety and suicidal ideation. This meant that the relationship between depression/anxiety and suicidal ideation, was weaker for individuals with high resilience and stronger for individuals with low resilience. This study supports the findings reported by Roy et al. (2011), strengthening the idea that resilience plays an important role in protecting against suicidal ideation and suggests that these findings generalise across different cultures and to individuals with mental health diagnoses. One important limitation of Min et al. (2015) involves the transformation of the continuous resilience variable into a dichotomous measure. Whilst the dichotomisation of a continuous variable can be helpful for clinical application, it greatly reduces the power to detect a relation between the variable and the outcome and may have caused an underestimation of the protective influence of resilience (Altman & Royston, 2006).

Nrugham et al. (2010) explored the protective influence of resilience against attempted suicide in a prospective study of 2,464 adolescents in Norway. They measured whether the individual had been a victim of violence, levels of resilience (using the CD-RISC) and depressive symptoms at baseline and at a one-year follow-up. Using a logistic regression, they reported that the number of violent events an individual had experienced at baseline predicted suicide attempts one year later. Interestingly, this relationship was partially moderated by resilience, such that the relationship between exposure to violent events and suicide attempts was much stronger for individuals with low resilience. Combined with the results from Roy et al. (2011) and Min et al. (2015), this prospective study strengthens the idea that resilience actively protects against the development of suicidality in individuals experiencing adversity.

In a similar longitudinal study, Chen and Kuo (2020) examined the levels of stress, self-reported resilience, suicidal thoughts and suicidal plans in 1,035 adolescents at baseline and one year later. The inventory of adolescent resilience (Chan, 2009) measured participant's resilience. Chen and Kuo (2020) reported that resilience at baseline predicted lower rates of suicidal ideation and suicidal planning one year later. They also found that the relationship between perceived stress and suicidal ideation was stronger for individuals with lower levels of resilience, providing further evidence of the protective influence of resilience against suicidality. The fact that high levels of resilience (at baseline) has weakened the relationship between various life adversities (lifetime violent events – Nrugham et al., 2010; perceived stress – Chen & Kuo, 2020) and later suicidality, suggests that resilience plays an active role in protecting against the development of suicidal thoughts and behaviours in individuals undergoing adversity. However, it should be noted that these studies were conducted within adolescent samples and further research is required to establish the protective influence of resilience against suicidality in adults.

Muzik et al. (2016) conducted a longitudinal evaluation of suicidal ideation in 116 postpartum adult women with a history of childhood maltreatment. They measured participant's resilience at baseline using the 25-item CD-RISC and assessed levels of suicidal ideation at four, six, 12, 15 and 18 months postpartum. Musik et al. (2016) found that rates of suicidal ideation was high in their sample,

with 37% of post-partum women experiencing suicidal ideation at the four-month follow-up. Resilience at baseline was negatively associated with later suicidal ideation at four, six, 12 and 15 months postpartum, demonstrating the protective effects of resilience against suicidal ideation within an adult sample. Furthermore, in a three-year longitudinal study, Youssef et al. (2013) measured a range of clinical and demographic variables including resilience (using the CD-RISC) and suicidal ideation (using the Beck Scale for Suicide Ideation; Beck et al., 1979) in 178 Iraq and Afghanistan war veterans. They reported that, even when controlling for suicidal ideation at baseline, resilience measured during the initial assessment predicted lower suicidal ideation three years later. Whilst both these studies used modest sample sizes and postpartum women and war veterans are not representative of all adults, these prospective studies strengthen the idea that resilience acts as a protective buffer against suicidal thoughts for individuals exposed to stressful experiences.

The research reviewed here has demonstrated that resilience can protect against the development of suicidal thoughts and behaviours in a variety of samples (adults, adolescents, postpartum women, prisoners), cultures (America, Norway, Korea) and types of adversity (early motherhood, violence, depression, anxiety). This study aimed to build on previous research and establish the extent to which resilience could provide protection against suicidal thoughts within the general population during the COVID-19 pandemic. Specifically, this research evaluated the hypothesised that resilience would moderate the relationship between pandemic stress and suicidal thoughts, with higher resilience weakening the relationship between pandemic stress and suicidal thoughts.

Acceptance

Acceptance is an individual's capacity to recognise the reality of a set of circumstances and acknowledge them for what they are, without an attempt to alter or protest them (Viane et al., 2004; McCracken & Vowles, 2006). The construct of acceptance has emerged as an important protective factor that helps individuals maintain physical and mental wellbeing throughout difficult circumstances outside of their control (Viane et al., 2004). The protective nature of acceptance has received particular attention within the chronic pain literature.

McCracken (1998) identified the protective nature of acceptance in a cross-sectional study of 160 adults experiencing chronic pain. McCracken (1998) measured participant's acceptance of their chronic pain, along with their depressive symptoms, anxiety symptoms and their overall adjustment to chronic pain. Acceptance of chronic pain was measured using the Chronic Pain Acceptance Questionnaire (CPAQ; Vowles et al., 2008), a 34-item inventory designed to measure an individual's acceptance of their pain that includes items such as "*I accept the fact that my basic pain level is not going to change in any lasting way*". McCracken (1998) reported that greater acceptance of one's pain was related to less pain-related anxiety, fewer depressive symptoms and more adaptive adjustment to the pain. McCracken (1998) also demonstrated that pain acceptance predicted adaptive adjustment to chronic pain independent of perceived pain intensity, countering the idea that the relationship between pain acceptance and adaptive adjustment to pain was mediated by the severity of one's pain.

This finding that acceptance of one's chronic pain can protect against mental health difficulties and maladaptive adjustment has been replicated on multiple occasions. Acceptance of one's pain has been shown to protect against dysfunctional coping (McCracken et al., 1999), pain anxiety (Cary et al., 2015), depression (Weiss et al., 2013) and fatigue (Van Damme et al., 2006). Longitudinal research has also demonstrated that acceptance of chronic pain at baseline uniquely predicts lower depressive symptomology, lower pain anxiety and increased improved emotional, physical and social functioning four months later, even after controlling for pain severity and demographic variables (McCracken & Eccleston, 2005). Overall, research conducted in the field of chronic pain provides compelling evidence supporting the notion that accepting the reality of one's difficult circumstances can protect against negative psychiatric outcomes.

Hayes et al. (1996) explored the mechanism by which acceptance of difficult experiences or circumstances can protect against negative mental health outcomes. Hayes et al. (1996) proposed that through accepting the reality of negative experiences or events, individuals do not expend scarce emotional and attentional resources on trying to avoid, change or control these circumstances and instead, can divert their energies towards observing their environment, reflecting, deciding and completing the course of action required to achieve their valued goals in a way that

integrates the negative circumstances (Hayes et al., 1996; Bond & Bunce, 2003). Viane et al. (2004) tested this idea within the context of chronic pain in two studies.

Firstly, they asked 501 chronic pain patients to self-report their levels of pain severity, acceptance of pain and their attention to pain. They found that acceptance of pain was significantly associated with less attention given to pain. Importantly this relationship was independent of pain severity and other demographic variables, strengthening the idea that acceptance of pain uniquely causes an individual to pay less attention to their pain. Secondly, Viane et al. (2004) conducted a diary study, in which 62 patients with chronic pain recorded their pain intensity, attention to pain and their goal-directed behaviour eight times a day over a two-week period. They reported that acceptance of pain, recorded on the first day of the study, significantly predicted attention to pain in the subsequent two-week period. They also reported that acceptance of pain significantly predicted engagement in goal-directed behaviours, with individuals who were more accepting of pain on the first day of the study, reporting better efficacy to perform activities, greater engagement with daily activities and improved motivation to complete activities in the following two-week period. This supports the idea that acceptance of negative experiences leads to improved functioning through diverting an individual's attention away from their aversive experiences and allowing them to dedicate energy to goal-directed tasks.

Whilst acceptance appears to provide protection against dysfunctional coping and mental health difficulties in individuals experiencing chronic pain, it is important to ask whether acceptance can provide protection against other forms of negative or adverse experiences. Research has investigated whether acceptance can have similar protective effects against external sources of adversity such as workplace stress, frontline healthcare work during the 2002-2003 SARS outbreak and serious illness diagnoses.

Kuba and Schiebe (2017) examined the role of acceptance in protecting against negative work events within a sample of 92 employees working in healthcare. They conducted a micro-longitudinal study across ten days and measured participants' levels of acceptance of everyday experiences and events, exposure to negative work events, emotional wellbeing, fatigue and work engagement. As hypothesised, Kuba and Schiebe (2017) found that participants' levels of acceptance

were associated with increased emotional wellbeing and decreased levels of fatigue. Moreover, levels of acceptance moderated the effect of negative work events on emotional wellbeing, with the emotional wellbeing of "high acceptance" employees being less negatively impacted on days where they experienced negative work events compared to "low acceptance" employees. This finding indicates that acceptance can protect against decreased wellbeing in those experiencing negative work events and suggests that the protective effects of acceptance extend beyond chronic pain.

Furthermore, Wu et al. (2009) investigated the protective influence of acceptance in 549 randomly selected hospital employees in Beijing during the 2003 SARS outbreak. After learning that rates of PTSD were elevated in hospital employees after the SARS outbreak, the researchers were interested in factors that protected against this. They measured exposure to the SARS outbreak, acceptance of circumstances (e.g., *"I was willing to accept the risks involved"*) and the levels of PTSD symptoms experienced during the three years after the outbreak. Wu et al. (2009) found that acceptance of circumstances was negatively related to PTSD symptoms, even after controlling for exposure to the SARS outbreak and sociodemographic factors. Wu et al. (2009) concluded that acceptance of their challenging reality protected individuals from negative psychological outcomes following the SARS outbreak.

Finally, Poppe et al. (2012) investigated the influence of acceptance within a sample of 99 nephrology patients diagnosed with chronic kidney disease. Poppe et al. (2012) investigated whether acceptance of one's disease contributed to improved physical and mental quality of life. Acceptance was measured using the acceptance subscale of the Illness Cognition Questionnaire (ICQ; Evers et al., 2001), a questionnaire containing six-items that assess the degree to which a patient has accepted the circumstances of their illness (e.g., "*I have learned to accept the disability of my disease*"). Physical and mental quality of life was measured using the Short Form Health Survey (Ware & Sherbourne, 1992). Poppe et al. (2012) reported that participants' acceptance of their illness was strongly related to increased physical quality of life (r = .45) and increased mental quality of life (r = .56). Additional regression analyses reported that after controlling for demographic variables, disease severity, comorbidities and personality characteristics, acceptance of the disease accounted for 23% of the variance in mental quality of life. Overall,

the literature examining the role of acceptance indicates that, for circumstances where individuals experience challenging or difficult circumstances outside of their control (e.g., chronic pain, work stress, frontline work during a disease outbreak, serious illness) accepting the reality of the situation without an attempt to alter or protest it, can protect against negative physical and mental health outcomes.

In summary, the ability to accept the reality of difficult circumstances, can protect individuals from negative physical and mental health outcomes. This research considers whether the protective effects of acceptance observed in the chronic pain, work stress and illness literature, generalises to the challenges imposed by the COVID-19 pandemic. As outlined earlier in this thesis, the COVID-19 pandemic has resulted in the general population facing a plethora of challenging circumstances (e.g., social isolation, bereavement, financial problems) outside of their control. For many individuals, the reality of the COVID-19 pandemic has been very difficult to accept. The most obvious way in which this has manifested is the perpetuation of conspiracy theories and beliefs that the COVID-19 pandemic is a hoax. Indeed, a nationally representative poll conducted by YouGov (2020) in America during March 2020 reported that 13% of Americans believed the COVID-19 pandemic was "probably" or "definitely" a hoax.

Whilst believing that the COVID-19 pandemic is a hoax is an extreme example of individuals refusing to accept the reality of the COVID-19 pandemic, a greater number of individuals have refused to accept the reality of the pandemic in more subtle ways. For example, a survey using non-probability of roughly 26,000 people across 25 countries reported that 22% of individuals in the UK believed that the COVID-19 fatality rate has been deliberately and greatly exaggerated, indicating that over one fifth of the UK population believed the threat to health imposed by COVID-19 is not as great as reported by public health scientists and government officials (Henley & McIntyre, 2020). Other widespread beliefs that diminish the severity of the COVID-19 pandemic without being backed up by evidence includes ideas such as "*deaths from COVID-19 are similar to that of a bad flu season*" or "*COVID-19 cannot affect young people*" (Carroll, 2020). One thing these beliefs all have in common is that they downplay or reject the notion that COVID-19 is a serious threat to the health of the population. They disregard evidence-based scientific claims and government guidance and deny the reality that the COVID-19

pandemic is real, has resulted in millions of deaths worldwide and has caused long-term physical health difficulties in many more (World Health Organisation, 2021).

Whilst efforts to deny, reject, avoid, alter or protest negative circumstances outside of one's control is a natural human reaction (Travis et al., 2011), evidence from the chronic pain literature indicates that accepting the reality of negative circumstances can protect individuals against maladaptive adjustment to their new circumstances. Through accepting the reality of the COVID-19 pandemic, an individual does not expend their attentional and emotional resources on trying to change, protest or control the reality of the pandemic, but can direct these resources towards achieving their valued goals within their new circumstances. This research was interested in investigating whether acceptance of the COVID-19 pandemic could protect against suicidal thoughts. Building on the research described above, it was thought that acceptance of the COVID-19 pandemic would moderate the relationship between pandemic stress and suicidal thoughts, with the relationship between pandemic stress and suicidal thoughts weakening for those with high acceptance of the pandemic.

Current Research

Previous studies have demonstrated that hope, social connectedness, resilience and acceptance can protect against a variety of negative psychological outcomes in individuals exposed to adversity. This research aimed to build upon previous research and investigated whether these factors provided protection from suicidal thoughts during the COVID-19 pandemic. Furthering our understanding of factors that protect individuals from experiencing suicidal thoughts during the pandemic can help inform effective intervention and suicide prevention strategies. This research administered an online survey to a large sample of adults living in Wales between the 18th of January 2021 to the 7th of March 2021 (4-11 weeks into the second Welsh lockdown). Participants were asked to provide information about the COVID-19 pandemic related stressors they experienced, whether they had experienced suicidal thoughts during the pandemic, along with their levels of hope, social connectedness, resilience and pandemic acceptance.

Firstly, this study hypothesised that pandemic related stress would predict the likelihood of suicidal thoughts throughout the pandemic, with higher pandemic stress

predicting an increased likelihood of experiencing suicidal thoughts. Secondly, it was predicted that each of the protective factors (hope, resilience, social connectedness and pandemic acceptance) would independently predict lower rates of suicidal thoughts. Thirdly, this study aimed to investigate whether each of the protective factors moderated the relationship between pandemic related stress and suicidal thoughts. It was hypothesised that hope would moderate the relationship between pandemic related stress and suicidal thoughts, such that the relationship between pandemic related stress and suicidal thoughts would be stronger for individuals with low hope. The same hypothesis was applied to social connectedness, resilience and pandemic acceptance.

Methods

This research employed the same "Wales Wellbeing" survey described in chapter 5. Therefore, there is some overlap between this methods section and the methods section reported in chapter 5. To avoid repetition, sections that are exactly the same will refer back to the equivalent section in chapter 5.

Ethics

See "Ethics" section in chapter 5.

Participants

See "Participants" section in chapter 5.

Materials

Wales Wellbeing Survey

The online survey that participants completed was the second in a series of surveys conducted by the "Wales Wellbeing" research group (Gray et al., 2020). The survey was conducted between the 18th of January 2021 and the 7th of March 2021, 4-11 weeks into the second lockdown in Wales, UK[5]. The survey consisted of seven sections. The first section presented participants with information about the survey and asked them to provide their informed consent and the second section asked participants to provide their demographic details. The third section asked participants

[5] For the purposes of this report, the "second" lockdown refers to the lockdown restrictions implemented across Wales from the 19th of December 2020, until the 12th of March 2021 (Senedd Research, 2021). This does not include the "fire-break" lockdown that occurred across Wales from the 23rd of October until the 9th of November 2020.

to complete questionnaires asking about their current levels of psychological distress and emotional wellbeing (not reported here). The fourth section asked participants whether they had experienced any suicidal thoughts or attempted suicide over the course of the pandemic and during the fifth section, participants reported the COVID-19 pandemic related stressors they had experienced. The sixth section contained questionnaires about hopelessness, social connectedness, resilience and pandemic acceptance. The seventh and final section presented participants with the mood restoration and the debrief. Only measures relevant to this research are outlined below.

Demographic Factors

See "Demographic Factors" section in chapter 5.

Pandemic Related Stressors

See "Pandemic Related Stressors" section in chapter 5.

Suicidal Thoughts and Attempted Suicide

See "Suicidal Thoughts and Attempted Suicide" section in chapter 5.

Hope

Participants feelings of hope or hopelessness were measured using a shortened version of the Beck Hopelessness Scale (BHS; Beck et al., 1974). The BHS is the most widely used and highly regarded measure of hopelessness (Szabo et al., 2016). It has demonstrated good to excellent internal reliability (Steed, 2001; Beck et al., 1974), high test-retest reliability (Holden & Fekken, 1988), good convergent and discriminant validity (Thackston-Hawkins et al., 1994) and good predictive validity (Steed, 2001). However, the 20-item BHS can be too time consuming for quick, population-based online surveys. Based on a confirmatory factor analysis, Aish and Wasserman (2001) reported that most of the original 20 BHS items measured a single factor and, by using just four of the original 20 items, they could predict participant's BHS scores almost perfectly. Yip and Cheung (2006) also reported that the same four items were very highly correlated (r = .88) with scores from the 20-item BHS in a study of over 2,000 participants. Therefore, this study used this four item version of the BHS. These four items include item 6: "*In the future I expect to succeed in what concerns me most*", item 7: "*My future seems dark to me*", item 9: "*I just don't get the breaks and there is no reason to believe I*

will in the future" and item 15: "*I have great faith in the future*". Each item is rated as either true (T) or false (F). For items 7 and 9, a "true" response receives a score of 1 and a "false" response receives a score of 0 and for items 6 and 15, a "false" response receives a score of 1 and a "true" response receives a score of 0. The four items are totalled up out of 4, with higher scores indicating higher levels of hopelessness (low hope) and lower scores indicating low levels of hopelessness (high hope). The internal reliability of the four-item BHS in the current study was good ($\alpha = .80$).

Using a hopelessness scale to measure hope assumes that hope and hopelessness lie on opposite poles of the same dimension. Many authors have conceptualised hope and hopelessness as opposite ends of a bipolar spectrum (Snyder, 2000; Grewal & Porter, 2006), with hope a state of positive future-oriented expectation and hopelessness a state of negative future-oriented expectation (Huen et al., 2015; Grewel & Porter, 2006). Studies that have measured the relationship between measures of hope and hopelessness support this idea. Caretta et al. (2014) found a very strong negative correlation ($r_s = -0.71$) between participants' scores on the Miller Hope Scale (MHS; Miller & Powers, 1988) and a measure of hopelessness (the BHS). Indeed, the correlation between the MHS and the BHS was higher than the relationship between the MHS and another measure of hope (the Snyder Hope Scale; Snyder et al., 1991). Similar studies have also found very strong negative relationships ($r = -0.72$) between measures of hope (Herth Hope Index; Herth, 1992) and the BHS (Benzein et al., 2005). Therefore, this study interpreted low self-reported levels of hopelessness on the BHS as high levels of hope. The limitations of using the BHS to measure hope are explored in the discussion.

Social Connectedness

Social connectedness was measured using the Three-Item Loneliness Scale (TILS; Hughes et al., 2004). The TILS was developed from the Revised-UCLA Loneliness Scale (Russell, 1996) a scale designed to measure the extent to which an individual feels connected, in-tune and close to the people around them. The TILS was intended to be a shorter, simpler and less intrusive measure than the 20-item Revised-UCLA Loneliness Scale. The TILS consists of three items each rated on a three point scale (1 = hardly ever, 2 = some of the time, 3 = often). Participants are asked (1) how often they lack companionship, (2) how often they feel left out and (3)

how often they feel isolated from others. Item 1 assesses relational connectedness; item 2 assesses social connectedness; and item 3 assesses self-perceived isolation. The TILS has previously demonstrated acceptable internal reliability (α = .72; Hughes et al., 2004), good discriminant and convergent validity (Hughes et al., 2004), is strongly correlated (*r* = .82) with the gold standard, 20-item UCLA loneliness-scale it was derived from and has been validated in Spanish, American and Japanese samples (Trucharte et al., 2021). The TILS has been widely implemented as a quick, non-intrusive measure of loneliness and social connectivity. The three items were totalled up with scores ranging from 3-9, with higher scores indicating higher levels of loneliness (low social connectivity) and lower scores indicating lower levels of loneliness (high social connectivity). The internal reliability of the TILS in the current study was good (α = .85).

Resilience

Resilience was measured using the Brief Resilience Scale (BRS; Smith et al., 2008). The BRS is a six-item scale in which participants rate their responses on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Each item assesses the degree to which an individual can "bounce back" after difficult, stressful or challenging events. Items 1, 3 and 5 are positively worded (e.g., "*I tend to bounce back quickly after hard times*") and items 2, 4 and 6 are negatively worded (e.g., "*It is hard for me to bounce back when something bad happens*") and are reversed scored. All six items were totalled up out of a score of 30, with higher scores indicating higher levels of resilience. All six items have been shown to load on to a single factor of "resilience" and there is high internal reliability (α = .80 – .91) amongst the six-items (Rodríguez-Rey et al., 2016). The BRS has previously demonstrated high test-retest reliability (Chmitorz et al., 2018) and good convergent and discriminant validity (Rodríguez-Rey et al., 2016). The BRS has been widely implemented across multiple countries as a brief, reliable and valid measure of resilience (Smith et al., 2008; Rodriguez-Rey et al., 2016; Chmitorz et al., 2018). The internal reliability of the BRS in the current study was excellent (α = .90).

Pandemic Acceptance

Pandemic acceptance was measured using an adapted version of the acceptance subscale from the Illness Cognition Questionnaire (Evers et al., 2001). Originally, the acceptance subscale of the Illness Cognition Questionnaire was

designed to assess the degree to which an individual has accepted the conditions of their chronic disease or illness. The acceptance subscale of the Illness Cognition Questionnaire has previously demonstrated good test-retest reliability (r = .78), excellent internal reliability (α = 0.90) and the scale has shown to be a strong predictor of psychological wellbeing and adaptive coping to chronic illness (Evers et al., 2001).

Two items from the acceptance subscale of the Illness Cognition Questionnaire were adapted to measure participant's acceptance of the pandemic (items 10 and 13). These items were selected because they had the highest factor loadings onto the acceptance subscale (Evers et al., 2001). Item 10 was reworded to: "*I have learned to accept the limitations imposed by the COVID-19 pandemic*" and item 13 was reworded to "*I can accept the changes that the COVID-19 pandemic has had on my life*". For the purposes of this research, this two-item scale will be referred to as the Pandemic Acceptance Scale (PAS). The PAS was condensed to two items due to the time sensitive nature of volunteer-based online surveys. For each item, respondents were asked to indicate, on a 5-point Likert scale, the extent to which they agreed with each statement (1 = strongly disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree, 5 = strongly agree). The two items were then totalled up between 2 and 10, with higher scores indicating higher levels of pandemic acceptance. The internal reliability of the pandemic acceptance scale in the current study was good (α = .79).

Mood restoration

After completing the survey, participants were asked to listen to calming music (*Eine Kleine Nachtsmusik, Allegro*) whilst reflecting on happy memories and pleasant thoughts. This method has induced positive affect in previous studies (Vastfjall, 2001; Gorn et al., 2001).

Procedure

The survey was administered online (Qualtrics software, Version January 2021, Provo, UT, USA, Copyright © 2020Version) for all participants. The survey was designed to take approximately 15 minutes to complete and was made available in both English and Welsh languages. To access the survey, participants clicked on the survey URL. Participants were then asked to provide informed consent and

proceeded to complete the online survey. After completing the survey, participants took part in a mood restoration exercise, were thanked for their participation and were provided with the debrief form.

Data Analysis Plan

Descriptive Statistics and Relationship Between Variables

The range, mean and standard deviations for each variable is presented. A series of Spearman's correlations analysed the relationship between each of the variables included in this analysis. The variables included: presence of suicidal thoughts during the pandemic, presence of a suicide attempt during the pandemic, composite pandemic related stress, hope, social connectedness, resilience and pandemic acceptance. Spearman's correlations were used due to the categorical or ordinal nature of most variables. Due to the dichotomous nature of both the presence of suicidal thoughts variable and the presence of a suicide attempt variables, a phi-coefficient was used to assess the relationship between these variables.

Pandemic Related Stress and Suicidal Thoughts

To examine whether pandemic related stress predicted suicidal thoughts during the pandemic, a composite pandemic related stress variable was computed. Chapter 5 outlined the pandemic related stressors that were significantly ($p < .004$) associated with suicidal thoughts during the pandemic (major COVID-19 symptoms, financial problems, being made redundant, food insecurity, bereavement, social isolation, relationship problems, domestic abuse, difficulty accessing necessary healthcare and increased caring responsibilities).

The "composite pandemic related stress" variable (henceforth termed "pandemic stress") consisted of all ten COVID-19 pandemic related stressors that were positively and significantly ($p < .004$) associated with experiencing suicidal thoughts. Each pandemic related stressor was weighted according to the strength of its association with suicidal thoughts (as displayed in Table 5.5). The odds ratio calculated for each stressor's association with suicidal thoughts served as the variable's weight within the composite measure. For example, individuals who experienced food insecurity were 3.55 times more likely to experience suicidal thoughts during the pandemic relative to individuals who did not experience food insecurity. Therefore, food insecurity was assigned a weight of 3.55 within the

pandemic stress variable. Likewise, individuals who experienced a bereavement were 1.39 times more likely to experience suicidal thoughts, thus bereavement was assigned a weight of 1.39. Each of the ten pandemic stressors were assigned a weight and the pandemic stress variable consisted of the sum of the weights of the stressors that each participant had experienced. For each participant their pandemic stress score was comprised of the summed total of the weights of the stressors that they had experienced. For example, if a participant reported experiencing food insecurity (OR = 3.55), bereavement (OR = 1.39) and financial problems (OR = 2.39) during the pandemic, their score on the pandemic stress variable would be 7.33. Participants' scores on the pandemic stress variable could range between 0 (no stressors experienced) to 26.14 (all stressors experienced).

A binary logistic regression with suicidal thoughts as the outcome variable and pandemic stress as the predictor variable examined whether the amount of pandemic stress an individual had experienced could predict the presence of suicidal thoughts during the pandemic. Demographic factors (age and gender) were entered as covariates. Socioeconomic deprivation was not entered as a covariate because over one quarter of the sample (25.7%) had missing data for this variable.

Protective Factors

Relationship With Suicidal Thoughts

To examine whether each protective factor (hope, social connectedness, resilience, pandemic acceptance) was uniquely able to predict the presence of suicidal thoughts during the pandemic, all protective factors were entered as predictor variables in a binary logistic regression with suicidal thoughts as the outcome variable. Demographic factors (age and gender) were entered as covariates. All variables were standardised before being entered in the regression to make interpretation of parameter estimates easier.

Protection Against Pandemic Stress

Similar to the analysis employed by Johnson et al. (2010), a series of hierarchical logistic regression analyses examined whether participant's levels of hope moderated the relationship between composite pandemic stress and suicidal thoughts. Pandemic stress served as the predictor variable, hope was the moderator variable and the presence of suicidal thoughts was the outcome variable. The

pandemic stress scores and hope scores were entered as predictor variables in the first step of the regression along with key demographic factors (age and gender). The interaction term between the two variables (pandemic stress X hope) was entered in the second step of the regression. As recommended by Aiken et al. (1991) all continuous variables were standardised before being entered into the regression, due to the use of interaction variables. The same analysis structure examined whether each of resilience, social connectedness and pandemic acceptance moderated the relationship between pandemic stress and suicidal thoughts. The direction of significant interactions was interpreted using the beta coefficient and by interpreting figures representing the data. Given that multiple statistical tests were used to examine the moderation effect of each protective factor, a Bonferroni correction was implemented to reduce the chance of a type 1 error. A total of four hierarchical regressions were employed to analyse the moderation effect of each of the protective factors (hope, social connectedness, resilience and pandemic acceptance). Therefore, an alpha level of .0125 (.05/4) was used to indicate statistical significance.

Power

A post hoc power analysis was conducted using G*power3 (Faul et al., 2007). To examine whether a protective factor (e.g., hope) could moderate the relationship between pandemic stress and suicidal thoughts using a two-tailed test, with a small effect size (OR = 1.5), an alpha level of .0125, a power level of 0.80, an outcome variable (suicidal thoughts) with a prevalence of 10.9% and other predictor variables explaining 30% of the variance (R^2 = 0.30), a sample size of 989 participants was required. After excluding participants that did not complete the relevant sections, approximately 9,000 participants were included in each hierarchical regression, providing sufficient power for these analyses.

Due to the small number of participants that reported attempting suicide during the pandemic (N = 74 or 0.7% of the sample), there was insufficient power to conduct the hierarchical logistic regression analyses with attempted suicide as the outcome measure. Assuming a small effect size (OR = 1.5), an alpha level of .0125, a power level of 0.80, an outcome variable (attempted suicide) with a prevalence of 0.7%, other predictor variables explaining 30% of the variance (R^2 = 0.30), a sample size of 13,099 participants was required. Given that approximately 9,000 participants were included in each hierarchical regression, there was insufficient power for these

analyses. Therefore, only analyses with suicidal thoughts as the outcome measure were conducted.

Results

Sample Characteristics

The final sample consisted of 10,369 participants. All participants responded to the questions pertaining to the presence of suicidal thoughts and the COVID-19 pandemic related stressors. Not all participants completed the measures relating to the protective factors (hope, social connectivity, resilience and pandemic acceptance) or covariates (age and gender) and the number of participants included in each analysis is described below. The demographic characteristics of participants are displayed in Table 5.1 of chapter 5.

Descriptive Statistics

Correlations, means and standard deviations for the variables are displayed in Table 6.1. The correlations revealed that the presence of suicidal thoughts was significantly associated with attempted suicide, high pandemic stress, hopelessness, low social connectedness, low resilience and low pandemic acceptance (weak to moderate strength). Pandemic stress was significantly related to low hope, low social connectedness, low resilience and low pandemic acceptance (weak to moderate strength). Each of the protective factors (hope, social connectedness, resilience and pandemic acceptance) had weak to moderate correlations with one another.

Table 6.1

Means, Standard Deviations and Correlations (Spearman's) for all Variables

Variable (Scale)	Mean (SD)	1	2	3	4	5	6	7
(1) Suicidal thoughts (0-1)	0.11 (0.31)	-	.23**[c]	.25**	.33**	.28**	-.26**	-.15**
(2) Attempted suicide (0-1)	0.01 (0.08)		-	.07**	.09**	.07**	-.09**	-.03*
(3) Pandemic stress (0-26.14)	3.52 (3.67)			-	.32**	.44**	-.24**	-.21**
(4) Hopelessness[a] (0-4)	1.28 (1.46)				-	.46**	-.48**	-.30**
(5) Loneliness[b] (3-9)	5.74 (1.95)					-	-.40**	-.28**

(6) Resilience (6-30)	18.85 (5.05)	-	.27**
(7) Pandemic acceptance (2-10)	7.29 (1.77)		-

[a] Inverse of hope.

[b] Inverse of social connectedness.

[c] Phi-coefficient used due to the dichotomous nature of both variables.

*$p < .01$, **$p < .001$

Pandemic Stress and Suicidal Thoughts

A binary logistic regression analysed whether pandemic stress predicted the presence of suicidal thoughts during the COVID-19 pandemic. The presence or absence of suicidal thoughts during the pandemic served as the outcome variable and composite pandemic stress served as the predictor variable. Demographic variables age and gender were entered as covariates. All variables were standardised before being entered in the regression to make interpretation of parameter estimates easier. The standard error, Wald and Nagelkerke R^2 values remained the same regardless of whether the variables were standardised. After excluding participants who did not complete the questions relating to the demographic covariates (N = 1,071), 9,298 participants were included in this analysis.

The model containing age, gender and pandemic stress was statistically significant χ^2 (3, N = 9,298) = 779.26, $p < .001$, Nagelkerke $R^2 = .162$, indicating that it could distinguish between individuals who did and did not experience suicidal thoughts during the COVID-19 pandemic. As shown in Table 6.2, pandemic stress significantly predicted the likelihood of an individual experiencing suicidal thoughts during the pandemic, with higher pandemic stress increasing the risk for experiencing suicidal thoughts. An increase of one standard deviation in pandemic stress was associated with a 102% increase in the likelihood of experiencing suicidal thoughts.

Table 6.2

Gender, Age and Pandemic Stress Predicting the Likelihood of Suicidal Thoughts During the COVID-19 Pandemic

Variable	β	SE	Wald	Df	*p*	OR (95% CI)
Gender	-0.22	0.03	48.72	1	<.001	0.80 (0.75 – 0.85)
Age	-0.41	0.04	110.78	1	<.001	0.67 (0.62 – 0.72)
Pandemic stress	0.70	0.03	533.34	1	<.001	2.02 (1.90 – 2.14)

Note. β = beta coefficient; SE = standard error; Df = degrees of freedom; OR = odds ratio; 95% CI = 95% confidence interval.

Protective Factors

Logistic Regression Assumptions

All data for the following analyses met the assumptions required for a multiple binary logistic regression. The dependent variable (presence of suicidal thoughts) was binary. All observations were independent from one another. Tests to examine whether the independent variables violated the assumption of multicollinearity indicated that multicollinearity was not a concern (pandemic stress, Tolerance = 0.79, VIF = 1.26; hope, Tolerance = 0.65, VIF = 1.55; social connectedness, Tolerance = 0.67, VIF = 1.50; resilience, Tolerance = 0.72, VIF = 1.39; pandemic acceptance, Tolerance = 0.88, VIF = 1.14). The assumption of linear relationships between predictor variables and the logit transformation of the dependent variable was tested using the Box-Tidwell procedure to test for linearity. None of the predictor variables (pandemic stress, hope, social connectedness, resilience or pandemic acceptance) violated the assumption of the linearity of the logit.

Relationship With Suicidal Thoughts

A multiple binary logistic regression analysed whether each of the protective factors predicted the presence of suicidal thoughts during the COVID-19 pandemic. After excluding participants who did not complete all questionnaires relating to the demographic and protective factors (N = 1,442), 8,927 participants were included in this analysis. Demographic variables age and gender were entered as covariates. All

variables were standardised before being entered in the regression to make interpretation of parameter estimates easier. The standard error, Wald and Nagelkerke R^2 values remained the same regardless of whether the variables were standardised. The model containing all predictors was statistically significant χ^2 (6, N = 8,927) = 1505.93, $p < .001$, Nagelkerke $R^2 = .313$, indicating that it could distinguish between individuals who did and did not experience suicidal thoughts during the COVID-19 pandemic. As shown in Table 6.3 hope, social connectedness, resilience and pandemic acceptance all significantly contributed to the model.

Table 6.3

Protective Factors Predicting the Likelihood of Suicidal Thoughts During the COVID-19 Pandemic

Variable	β	SE	Wald	Df	*p*	OR (95% CI)
Gender	-0.28	0.04	62.41	1	<.001	0.76 (0.70 – 0.81)
Age	-0.41	0.04	93.97	1	<.001	0.67 (0.61 – 0.72)
Hopelessness[a]	0.69	0.04	248.28	1	<.001	2.00 (1.83 – 2.18)
Loneliness[b]	0.54	0.05	131.51	1	<.001	1.72 (1.56 – 1.88)
Resilience	-0.40	0.05	77.69	1	<.001	0.67 (0.61 – 0.73)
Pandemic acceptance	-0.13	0.04	12.44	1	<.001	0.88 (0.82 – 0.95)

Note. β = beta coefficient; SE = standard error; Df = degrees of freedom; OR = odds ratio; 95% CI = 95% confidence interval.

[a] Inverse of hope.

[b] Inverse of social connectedness.

Protection Against Pandemic Stress

Hope

A hierarchical logistic regression evaluated whether hope moderated the relationship between pandemic stress and suicidal thoughts. Gender and age were included as covariates. After excluding participants who did not complete the measure of hope or provide their demographic details (N = 1,385), 8,984 participants were included in this analysis. In step 1 of the hierarchical logistic regression, both

pandemic stress (β = 0.49, SE = 0.03, Wald = 207.03, OR = 1.63, 95% CI (1.52 – 1.74), *p* < .001) and hope (β = 0.94, SE = 0.04, Wald = 585.77, OR = 2.57, 95% CI (2.38 – 2.77), *p* < .001) were found to significantly contribute to the model.

As displayed in Table 6.4, hope significantly moderated the relationship between pandemic stress and suicidal thoughts. The interaction term between pandemic stress and hope significantly contributed to the model (β = -0.20, SE = 0.03, Wald = 38.68, OR = 0.82, 95% CI (0.77 – 0.87), *p* < .001) and the addition of the interaction term in step 2 significantly improved the model's prediction of suicidal thoughts (*p* < .001). The beta coefficient for the interaction term, along with the descriptive statistics displayed in Figure 6.1 indicated that the relationship between pandemic stress and suicidal thoughts was stronger for participants with low levels of hope, relative to participants with high levels of hope.

Table 6.4

Hierarchical Logistic Regression Analysis Examining the Role of Pandemic Stress and Hope in Predicting the Presence of Suicidal Thoughts

Moderator variable	Step	Variable entered	β	OR (95% CI)	Total R^2 (Nagelkerke)	R^2 change
Hope	1	Gender	-0.23**	0.80 (0.74 – 0.85)	.299**	
		Age	-0.44**	0.64 (0.59 – 0.70)		
		Pandemic stress	0.49**	1.63 (1.52 – 1.74)		
		Hope	0.94**	2.57 (2.38 – 2.77)		
	2	Gender	-0.24**	0.79 (0.74 – 0.85)	.306**	.007**
		Age	-0.43**	0.65 (0.60 – 0.70)		
		Pandemic stress	0.66**	1.93 (1.78 – 2.10)		
		Hope	1.05**	2.85 (2.62 – 3.11)		

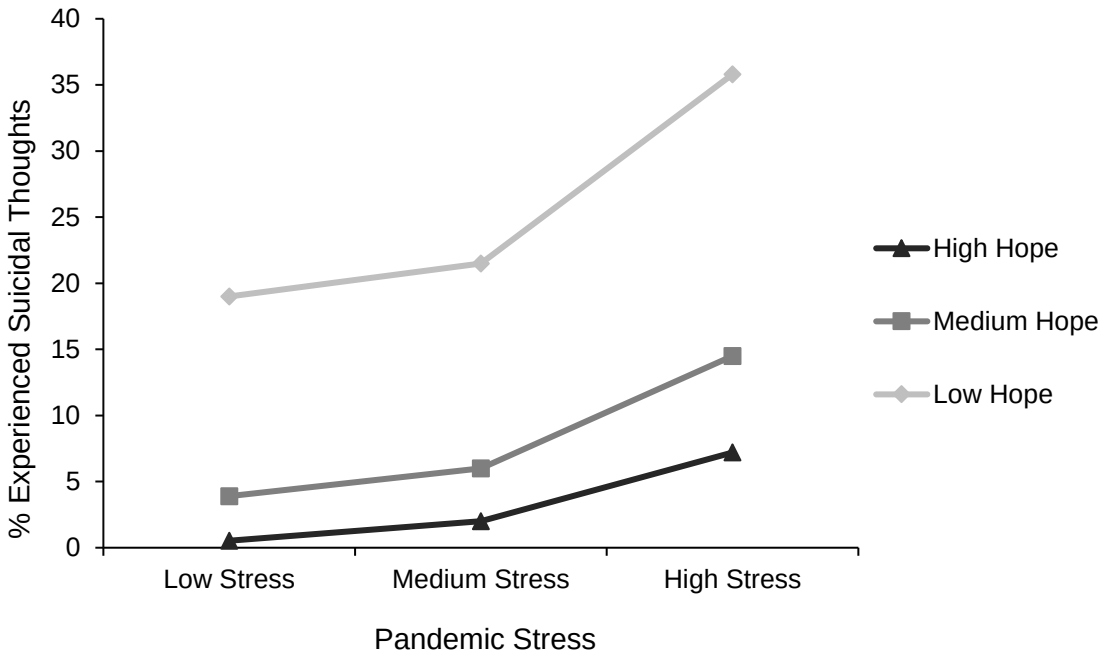
	Pandemic stress X Hope	-0.20**	0.82 (0.77 – 0.87)

Note. β = beta coefficient; OR = odds ratio; 95% CI = 95% confidence interval.

*$p < .0125$, **$p < .001$

Figure 6.1

A Line Graph Displaying the Relationship Between Pandemic Stress and Suicidal Thoughts at Different Levels of Hope



Note. For the purposes of this graph, participants were split into three approximately equal groups based on whether they experienced low (N = 2,702), medium (N = 3,093) or high (N = 3,189) levels of pandemic stress. Participants were also split into three approximately equal groups based on whether they reported having high (N = 4,124), medium (N = 2,687) or low (N = 2,173) levels of hope on the BHS-4.

Social Connectedness

A hierarchical logistic regression evaluated whether social connectedness moderated the relationship between pandemic stress and suicidal thoughts. Gender and age were included as covariates. After excluding participants who did not complete the relevant social connectedness or demographic measures (N = 1,370), 8,999 participants were included in this analysis. In step 1 of the hierarchical logistic regression, both pandemic stress (β = 0.49, SE = 0.03, Wald = 208.69, OR = 1.63, 95% CI (1.52 – 1.74), $p < .001$) and social connectedness (β = 0.80, SE = 0.04, Wald

= 331.49, OR = 2.22, 95% CI (2.04 – 2.42), $p < .001$) were found to significantly contribute to the model.

As displayed in Table 6.5, social connectedness did not significantly moderate the relationship between pandemic stress and suicidal thoughts. The interaction term between pandemic stress and social connectedness did not significantly contribute to the model (β = -0.09, SE = 0.04, Wald = 6.08, OR = 0.91, 95% CI (0.85 – 0.98), $p > .0125$ and the addition of the interaction term in step 2 did not significantly improve the model's prediction of suicidal thoughts ($p > .0125$). Whilst both social connectedness and pandemic stress could significantly predict suicidal thoughts during the pandemic, social connectedness did not significantly moderate the relationship between pandemic stress and suicidal thoughts.

Table 6.5

Hierarchical Logistic Regression Analysis Examining the Role of Pandemic Stress and Social Connectedness in Predicting the Presence of Suicidal Thoughts

Moderator variable	Step	Variable entered	β	OR (95% CI)	Total R^2 (Nagelkerke)	R^2 change
Social connectedness	1	Gender	-0.27**	0.76 (0.71 – 0.82)	0.241**	
		Age	-0.38**	0.68 (0.63 – 0.74)		
		Pandemic stress	0.49**	1.63 (1.52 – 1.74)		
		Social connectedness	0.80**	2.22 (2.04 – 2.42)		
	2	Gender	-0.27**	0.76 (0.71 – 0.81)	0.242**	0.001
		Age	-0.38**	0.68 (0.63 – 0.74)		
		Pandemic stress	0.56**	1.74 (1.60 – 1.90)		

Social connectedness	0.84**	2.30 (2.10 – 2.52)
Pandemic stress X Social connectedness	-0.09	0.91 (0.85 – 0.98)

Note. β = beta coefficient; OR = odds ratio; 95% CI = 95% confidence interval.

*$p < .0125$, **$p < .001$

Resilience

A hierarchical logistic regression evaluated whether resilience moderated the relationship between pandemic stress and suicidal thoughts. Gender and age were included as covariates. After excluding participants who did not complete the relevant resilience or demographic measures (N = 1,228), 9,141 participants were included in this analysis. In step 1 of the hierarchical logistic regression, both pandemic stress (β = 0.61, SE = 0.03, Wald = 353.21, OR = 1.84, 95% CI (1.73 – 1.96), $p < .001$) and resilience (β = -0.79, SE = 0.04, Wald = 377.15, OR = 0.45, 95% CI (0.42 – 0.49), $p < .001$) were found to significantly contribute to the model.

As displayed in Table 6.6 resilience significantly moderated the relationship between pandemic stress and suicidal thoughts. The interaction term between pandemic stress and resilience significantly contributed to the model (β = 0.17, SE = 0.03, Wald = 28.33, OR = 1.19, 95% CI (1.12 – 1.27), $p < .001$) and the addition of the interaction term in step 2 significantly improved the model's prediction of suicidal thoughts ($p < .001$). The beta coefficient for the interaction term along with the descriptive statistics displayed in Figure 6.2 indicated that the relationship between pandemic stress and suicidal thoughts was stronger for participants with lower levels of resilience relative to participants with higher levels of resilience.

Table 6.6

Hierarchical Logistic Regression Analysis Examining the Role of Pandemic Stress and Resilience in Predicting the Presence of Suicidal Thoughts

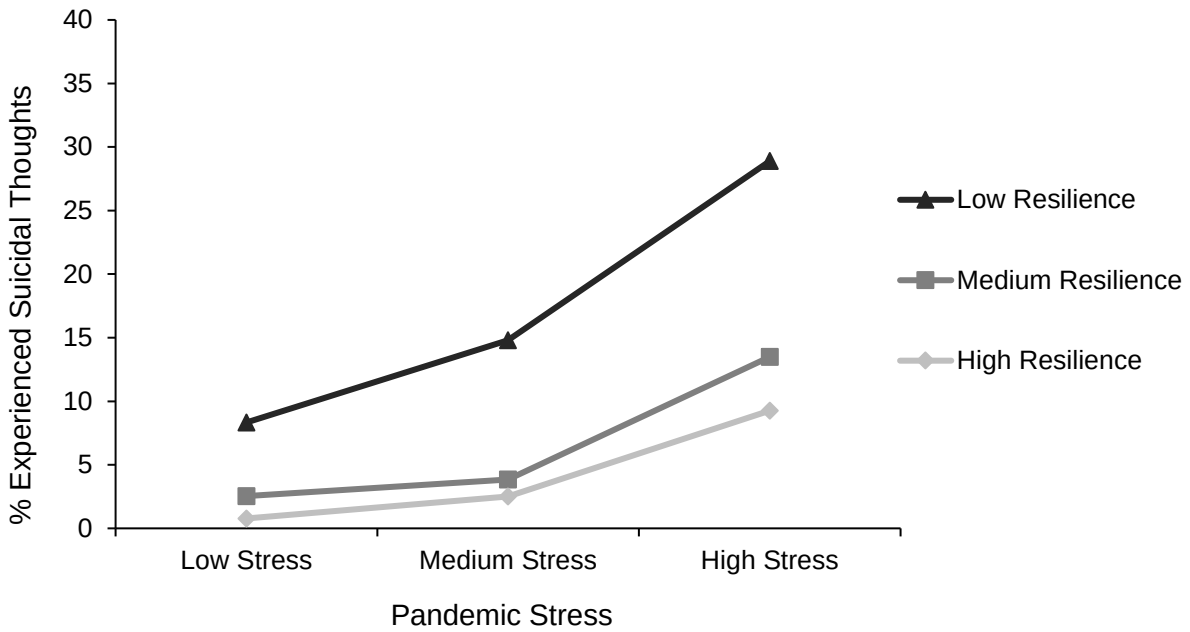
Moderator variable	Step	Variable entered	β	OR (95% CI)	Total R^2 (Nagelkerke)	R^2 change
Resilience	1	Gender	-0.29**	0.75 (0.70 – 0.80)	0.249**	
		Age	-0.33**	0.72 (0.66 – 0.78)		
		Pandemic stress	0.61**	1.84 (1.73 – 1.96)		
		Resilience	-0.79**	0.45 (0.42 – 0.49)		
	2	Gender	-0.29**	0.75 (0.70 – 0.80)	0.255**	0.006**
		Age	-0.32**	0.72 (0.67 – 0.78)		
		Pandemic stress	0.72**	2.05 (1.90 – 2.20)		
		Resilience	-0.90**	0.41 (0.37 – 0.45)		
		Pandemic stress X Resilience	0.17**	1.19 (1.12 – 1.27)		

Note. β = beta coefficient; OR = odds ratio; 95% CI = 95% confidence interval.

*$p < .0125$, **$p < .001$

Figure 6.2

A Line Graph Displaying the Relationship Between Pandemic Stress and Suicidal Thoughts at Different Levels of Resilience



Note. For the purposes of this graph, participants were split into three approximately equal groups based on whether they experienced low (N = 2,755), medium (N = 3,148) or high (N = 3,238) levels of pandemic stress. Participants were also split into three approximately equal groups based on whether they reported having high (N = 2,440), medium (N = 3,220) or low (N = 3,478) levels of resilience on the BRS.

Pandemic Acceptance

A hierarchical logistic regression evaluated whether pandemic acceptance moderated the relationship between pandemic stress and suicidal thoughts. Gender and age were included as covariates. After excluding participants who did not complete the relevant pandemic acceptance or demographic measures (N = 1,358), 9,011 participants were included in this analysis. In step 1 of the hierarchical logistic regression, both pandemic stress (β = 0.66, SE = 0.03, Wald = 444.21, OR = 1.94, 95% CI (1.83 – 2.07), $p < .001$) and pandemic acceptance (β = -0.32, SE = 0.03, Wald = 96.14, OR = 0.72, 95% CI (0.68 – 0.77), $p < .001$) were found to significantly contribute to the model.

As displayed in Table 6.7, pandemic acceptance significantly moderated the relationship between pandemic stress and suicidal thoughts. The interaction term between pandemic stress and pandemic acceptance significantly contributed to the

model (β = 0.09, SE = 0.03, Wald = 10.81, OR = 1.09, 95% CI (1.04 – 1.15), $p < .001$) and the addition of the interaction term in step 2 significantly improved the model's prediction of suicidal thoughts ($p < .001$). The beta coefficient for the interaction term along with the descriptive statistics displayed in Figure 6.3 indicated that the relationship between pandemic stress and suicidal thoughts was stronger for participants with low levels of pandemic acceptance relative to participants with high levels of pandemic acceptance.

Table 6.7

Hierarchical Logistic Regression Analysis Examining the Role of Pandemic Stress and Pandemic Acceptance in Predicting the Presence of Suicidal Thoughts

Moderator variable	Step	Variable entered	β	OR (95% CI)	Total R^2 (Nagelkerke)	R^2 change
Pandemic acceptance	1	Gender	-0.23**	0.80 (0.75 – 0.85)	0.186**	
		Age	-0.39**	0.68 (0.63 – 0.73)		
		Pandemic stress	0.66**	1.94 (1.83 – 2.07)		
		Pandemic acceptance	-0.32**	0.72 (0.68 – 0.77)		
	2	Gender	-0.23**	0.80 (0.63 – 0.73)	0.189**	0.003**
		Age	-0.39**	0.68 (0.63 – 0.73)		
		Pandemic stress	0.70**	2.00 (1.88 – 2.14)		
		Pandemic acceptance	-0.38**	0.68 (0.63 – 0.73)		
		Pandemic stress X	0.09**	1.09 (1.04 – 1.15)		

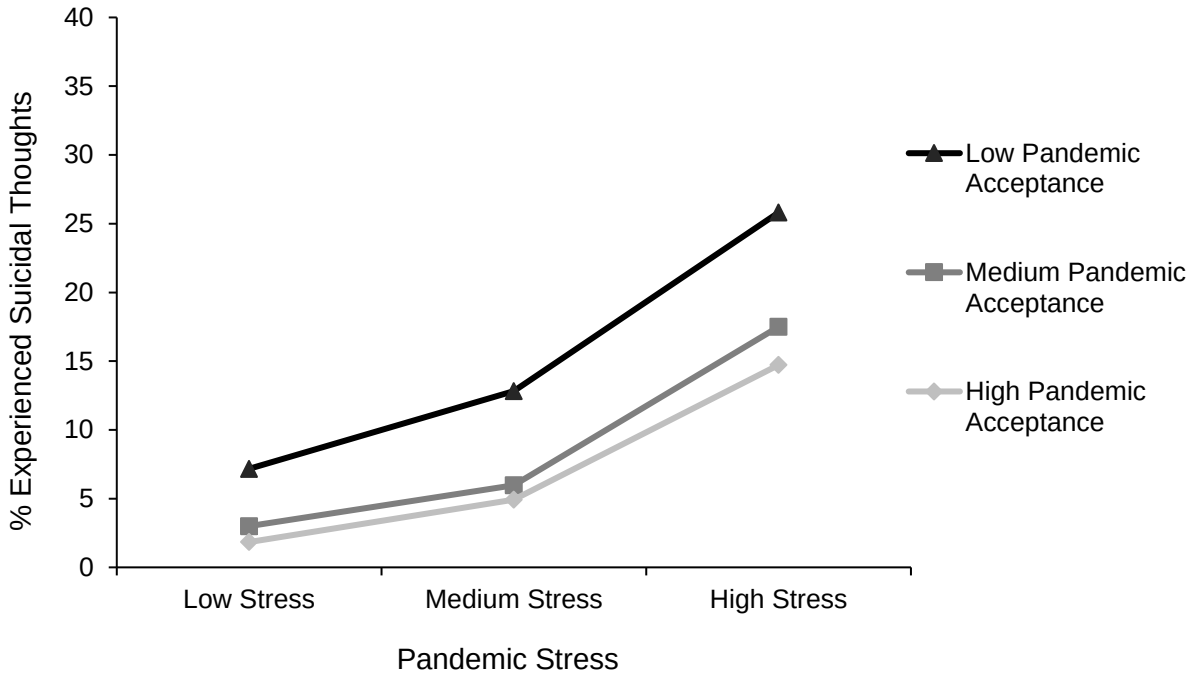
	Pandemic acceptance

Note. β = beta coefficient; OR = odds ratio; 95% CI = 95% confidence interval.

*$p < .0125$, **$p < .001$

Figure 6.3

A Line Graph Displaying the Relationship Between Pandemic Stress and Suicidal Thoughts at Different Levels of Pandemic Acceptance



Note. For the purposes of this graph, participants were split into three approximately equal groups based on whether they experienced low (N = 2,712), medium (N = 3,101) or high (N = 3,198) levels of pandemic stress. Participants were also split into three groups based on whether they reported having high (N = 1,627), medium (N = 4,974) or low (N = 2,410) levels of pandemic acceptance.

Discussion

This research aimed to investigate (1) the degree to which pandemic stress predicted suicidal thoughts during the COVID-19 pandemic, (2) whether each of the protective factors (hope, social connectedness, resilience and pandemic acceptance) independently predicted a decreased likelihood of experiencing suicidal thoughts during the pandemic and, (3) whether each of the protective factors weakened the

relationship between pandemic stress and suicidal thoughts. As hypothesised, this study found that the degree of pandemic stress predicted increased risk of suicidal thoughts. In line with the hypotheses, each protective factor (hope, social connectedness, resilience and pandemic acceptance) independently predicted a lower likelihood of experiencing suicidal thoughts during the pandemic. Finally, it was also found that each of hope, resilience and pandemic acceptance significantly moderated the relationship between pandemic stress and the presence of suicidal thoughts, such that the relationship between pandemic stress and suicidal thoughts was weaker for individuals with high levels of hope, resilience and pandemic acceptance. Contrary to the hypothesis, social connectedness did not statistically moderate the relationship between pandemic stress and suicidal thoughts.

Pandemic Stress

As outlined above, this study found that pandemic stress predicted suicidal thoughts during the COVID-19 pandemic. This finding is consistent with other research conducted during the early stages of the pandemic. Crasta et al. (2020) surveyed 1,003 American adults during April 2020, asking participants to report their desire for death, along with their exposure to two COVID-19 stressors (resource stress and bereavement). They reported finding a small correlation between bereavement and suicidal thoughts and a moderate correlation between poor access to resources and suicidal thoughts. The findings from chapter 5 reported a similar relationship between bereavement and suicidal thoughts and a slightly stronger relationship between access to resources (food insecurity/healthcare) and suicidal thoughts. However, moving beyond the relationship between individual stressors and suicidal thoughts, this study was among the first to measure the association between a composite measure of pandemic stress and suicidal thoughts. Indeed, this study found that an increase of one standard deviation on the composite pandemic stress variable conferred a 102% increase in the risk of experiencing suicidal thoughts. This finding is in line with the concerns voiced by many researchers that the difficulties and challenges associated with the COVID-19 pandemic could cause an increase in suicidality within the general population (Gunnell et al., 2020; Sher, 2020).

Hope

Consistent with prior theoretical accounts (Abramson et al., 2002; Klonsky & May, 2015; Van Orden et al., 2010) this research demonstrated that hope uniquely predicted a decreased likelihood of experiencing suicidal thoughts during the pandemic. When controlling for demographic (age and gender) and other protective factors (social connectedness, resilience and pandemic acceptance), a one standard deviation decrease in hope was associated with a 100% increase in the likelihood of experiencing suicidal thoughts, providing support to the idea that hope acts as a powerful protective factor against suicidal thoughts.

This study also found that hope moderated the relationship between pandemic stress and suicidal thoughts, with the link between pandemic stress and suicidal thoughts weaker for participants with higher hope. For individuals with low hope, their likelihood of experiencing suicidal thoughts increased from 19.0% under conditions of low pandemic stress to 35.8% under conditions of high pandemic stress (an increase of 16.8 percentage points), whereas for individuals with high hope, their likelihood of experiencing suicidal thoughts increased from 0.5% under conditions of low pandemic stress to 7.2% under conditions of high pandemic stress (an increase of 6.7 percentage points). Consistent with Klonsky and May's (2015) theoretical account, these results indicate that it is the interaction between stressful, challenging or painful experiences and a lack of hope that drives the occurrence of suicidal thoughts. For most individuals, the occurrence of stressful or challenging events alone is often not sufficient to cause suicidal thoughts if they believe their circumstances will improve.

This finding is consistent with the studies that found hope protected against suicidal thoughts in individuals who had experienced sexual assault (Chang et al., 2015), depressive symptoms (Uncapher et al., 1998; Kwok & Gu, 2018) or rumination (Tucker et al., 2013). The current findings build upon these previous studies by demonstrating that hope's ability to protect against suicidal thoughts extends to individuals experiencing high levels of pandemic related stress. Additionally, the large sample size recruited and the diverse range of age groups, genders and socioeconomic groups within the sample increases the generalisability of the findings. Taken altogether, the current findings, indicate that hope for the

future can provide an important protective effect against the relationship between pandemic stress and suicidal thoughts.

Social Connectedness

Social connectedness also predicted a decreased likelihood of experiencing suicidal thoughts during the pandemic. After controlling for age, gender, hope, resilience and pandemic acceptance, a one standard deviation decrease in social connectivity was associated with a 72% increase in the likelihood of experiencing suicidal thoughts. This finding is consistent with the multiple theoretical accounts outlined in the introduction (Durkheim, 1897; Baumeister & Leary, 1995; Van Orden et al., 2010) that all posited that the human need to belong and feel connected to others is a fundamental need that protects against suicidal thoughts. It also agrees with the findings from Gunn et al. (2018) and Kidd et al. (2006) that reported how higher rates of social connectedness were linked to lower rates of suicidal thoughts and behaviours.

Despite being negatively related to suicidal thoughts, social connectedness did not significantly moderate the relationship between pandemic stress and suicidal thoughts. It is worth noting that the interaction term between social connectedness and pandemic stress (p = .014) was very close to the Bonferroni corrected alpha level (p = .0125) used to determine statistical significance in this study. However, the high powered nature of this design suggests that this moderation effect either does not exist or is very small in size. Importantly, this does not mean that social connectivity was unrelated to suicidal thoughts during the pandemic, rather it means that the relationship between pandemic stress and suicidal thoughts was the same across all levels of social connectedness. In simpler terms, social connectedness was negatively related to suicidal thoughts but did not diminish the extent to which pandemic related stress impacted suicidal thoughts.

This finding differs from the research outlined earlier, that demonstrated how social connectedness can protect against negative psychological outcomes (e.g., depression and suicidality) in those exposed to adversity such as moral-injury (Kelley et al., 2019) or high levels of academic stress (Pidgeon et al., 2014). There are some important points to consider when deliberating why this research found no evidence that social connectedness moderated the relationship between pandemic

stress and suicidal thoughts. Firstly, the current research employed a more generalised measure of social connectedness (TILS; Hughes et al., 2004), whereas Pidgeon et al. (2014) and Kelley et al. (2019) measured connectedness to friends or peer groups. Pidgeon et al. (2014) measured participant's connectedness to peers on university campus and Kelley et al. (2019) measured the connection to and quality of an individual's friendships. It is possible that the more generalised measure of social connectedness employed within this research may have masked the protective effects of connectedness to peers or friends.

Secondly, it should be acknowledged that the measure of social connectedness used in this study (TILS; Hughes et al., 2004) was a shortened version of the original Revised-UCLA Loneliness Scale. Whilst this shortened version of the questionnaire was necessary to retain participants in a volunteer-based, online survey, it is psychometrically weaker than the original measure and may have resulted in an underestimation of the extent to which social connectedness moderated the relationship between pandemic stress and suicidal thoughts. Finally, it is important to consider whether the social restrictions in place during the pandemic could have weakened the protective influence conferred by social connectedness. It is possible that for some individuals, an increased sense of connection to friends, family and the wider community meant that they were more impacted by the lockdown conditions and social restrictions compared to individuals with a lower sense of social connectivity. This could have undermined some of the protective effects typically provided by a sense of social connectivity.

Overall, whilst social connectedness was negatively related to suicidal thoughts during the pandemic, social connectedness did not diminish the extent to which pandemic stress impacted suicidal thoughts. This may have been due to the shorter and more generalised measure of social connectedness used in this research or because the typically protective power of social connectedness was weakened by the restrictions on socialising during the pandemic.

Resilience

In line with the initial hypothesis, the findings from this study reported that participant's self-reported resilience uniquely predicted a decreased likelihood of experiencing suicidal thoughts during the pandemic. After controlling for age,

gender, hope, social connectedness and pandemic acceptance, a one standard deviation decrease in resilience was associated with a 49% increase in the likelihood of experiencing suicidal thoughts. This finding is consistent with the literature explored in the introduction that found resilience to be negatively related to suicidal thoughts in a sample of adult prisoners (Roy et al., 2011), postpartum women (Musik et al., 2016) and war veterans (Youssef et al., 2013).

As hypothesised, it was also found that resilience moderated the relationship between pandemic stress and suicidal thoughts. For those with low resilience, their likelihood of experiencing suicidal thoughts increased from 8.3% under conditions of low pandemic stress to 28.9% under conditions of high pandemic stress (an increase of 20.6 percentage points). However, for those with high resilience, their likelihood of experiencing suicidal thoughts increased from 0.8% under conditions of low pandemic stress to 9.3% under conditions of high pandemic stress (an increase of 8.5 percentage points). These findings indicate that resilience plays an important role in protecting against suicidal thoughts during the COVID-19 pandemic. This is consistent with previous studies that reported resilience could act as a buffer against certain stressors, moderating the relationship between depression and suicidal thoughts (Min et al., 2015), anxiety and suicidal thoughts (Min et al., 2015) and exposure to violent events and attempted suicide (Nrugman et al., 2010).

These findings build on the existing literature to indicate that the protective influence of resilience also extends to protecting against suicidal thoughts under conditions of high pandemic related stress. It is also important to note that this study measured resilience using the Brief Resilience Scale (BRS; Smith et al., 2008), whereas previous studies examining the relationship between resilience and suicidality (Roy et al., 2011; Min et al., 2015; Nrugham et al., 2010) employed the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003). The BRS was specifically designed to assess the most basic meaning of the word resilience: “to bounce back or recover from stress” (Smith et al., 2008, p. 199). Conversely. the CD-RISC aims to measure a range of personality characteristics, coping styles and outlooks that are associated with resilience such as self-efficacy, humour, patience, optimism and faith (Smith et al., 2008). The present findings indicate that the protective nature of resilience against suicidal thoughts is still found when using the more semantically precise BRS scale instead of the CD-RISC. Overall, these

findings, in combination with previous research, reiterate the negative relationship between resilience and suicidality and show that resilience can play an important role in weakening the relationship between pandemic stress and suicidal thoughts.

Pandemic Acceptance

The results relating to pandemic acceptance found that the degree to which participants accepted the reality of the COVID-19 pandemic uniquely predicted a decreased likelihood of experiencing suicidal thoughts. Controlling for age, gender, hope, social connectedness and resilience, a one standard deviation decrease in pandemic acceptance was associated with a 14% increase in the likelihood of experiencing suicidal thoughts during the COVID-19 pandemic.

This research also found that, as hypothesised, acceptance of the COVID-19 pandemic weakened the relationship between pandemic stress and suicidal thoughts, such that the association between pandemic stress and suicidal thoughts was weaker for individuals with higher pandemic acceptance. For those with low pandemic acceptance, their likelihood of experiencing suicidal thoughts increased from 7.2% under conditions of low pandemic stress to 25.8% under conditions of high pandemic stress (an increase of 18.6 percentage points). However, for those with high pandemic acceptance their likelihood of experiencing suicidal thoughts increased from 1.8% under conditions of low pandemic stress to 14.7% under conditions of high pandemic stress (an increase of 12.9 percentage points). Whilst this protective effect is not quite as strong as that demonstrated by hope or resilience, this finding still demonstrates that accepting the reality of the COVID-19 pandemic can help provide a protective buffer against the deleterious effects of pandemic stress.

These findings are in line with previous studies that outlined how an individual's acceptance of difficult circumstances outside of their control (e.g., chronic pain or serious illness) protected against negative psychological outcomes such as depressive symptoms (McCracken, 1998; Weiss et al., 2013; McCracken & Eccleston, 2005), anxiety (McCracken, 1998; Cary et al., 2015), dysfunctional coping (McCracken, 1998; McCracken et al., 1999; McCracken & Eccleston, 2005) and poor mental quality of life (Poppe et al., 2012). The present findings build upon this past work in two important ways. Firstly, they demonstrated that acceptance could provide protection against suicidal thoughts. Whilst previous work showed

how acceptance of reality was linked to lower rates of depression, anxiety and psychological distress, this study provides initial evidence that accepting the reality of difficult circumstances outside of one's control can protect against suicidal thoughts. Secondly, the present findings demonstrate that the protective effects of acceptance extend beyond the circumstances of chronic pain or illness, with acceptance providing protection from the stressful circumstances caused by the COVID-19 pandemic.

The theoretical account outlined by Hayes et al. (1996) can provide insight into why accepting the reality of the pandemic weakened the relationship between pandemic stress and suicidal thoughts. Hayes et al. (1996) proposed that by accepting negative circumstances outside of one's control, individuals do not expend scarce emotional and attentional resources trying to avoid, change or control these experiences. Instead, they can divert their energies towards understanding their new situation and working towards their valued goals in a way that incorporates their new circumstances. Applying this theory to the present findings, it would suggest that by acknowledging and accepting their new reality, individuals are saving themselves from expending energy on avoiding, ignoring or protesting the pandemic and using these resources to achieve their valued goals within their new circumstances.

Overall, these findings suggest that the protective influence of reality acceptance extends beyond chronic pain and illness, to protect against suicidal thoughts under conditions of high pandemic stress. In a time where significant proportions of the population are ignoring, denying or protesting many of the difficult circumstances imposed by the pandemic (Carroll, 2020), this research suggests that acceptance of the pandemic is important in protecting against suicidal thoughts.

Implications

The overarching aim for this study was to identify key factors that helped protect individuals exposed to pandemic stress, from experiencing suicidal thoughts. Advancing our understanding of the factors that weaken the relationship between pandemic stress and suicidal thoughts can inform intervention strategies that help individuals and communities withstand and bounce back from the challenges imposed by the pandemic. These findings have suggested that high levels of hope,

resilience and pandemic acceptance all weakened the relationship between pandemic stress and suicidal thoughts. This has important implications for potential intervention strategies.

Consideration should be given to ways in which these protective factors can be instilled, developed or improved within communities most impacted by the pandemic. Indeed, previous work has established that hope (Hernandez & Overholser, 2020), resilience (Stainton et al., 2018) and acceptance (Wicksell et al., 2008) are not fixed, stable traits, but modifiable constructs that can improve or deteriorate over time. For example, consistently engaging with positive psychology exercises such as writing a letter of gratitude, reflecting on one's personal strengths or writing a gratitude diary has been shown to improve levels of hope and optimism (Huffman et al., 2014) and lower depression and anxiety symptoms (Ducasse et al., 2019). Similarly, over the last decade numerous "resilience training" interventions have emerged with evidence indicating that they can successfully improve levels of resilience (Joyce et al., 2018) and lead to decreased stress, anxiety and improvements in quality of life relative to a control group (Sood et al., 2011). Likewise, several acceptance-based interventions (e.g., mindfulness-based stress reduction or acceptance and commitment therapy) have demonstrated an ability to increase participant's acceptance of reality (Wicksell et al., 2008) and have subsequently led to improvements in life satisfaction (Wicksell et al., 2008) and depressive symptoms (Veehof et al., 2011; Wicksell et al., 2008) in individuals experiencing chronic pain.

Taken together, these studies indicate that hope, resilience and acceptance are all amenable to intervention and, upon improvement, can confer important psychological benefits. Therefore, it seems sensible to conclude that similar interventions or schemes that promote these protective factors may be especially effective in helping individuals and communities withstand and bounce back from the challenges faced during the pandemic. Governments, community leaders, healthcare authorities and those with power to influence community recovery should consider this when devising community recovery strategies.

Limitations

It is important that the present findings are interpreted in light of several limitations. Firstly, this research used a cross-sectional design, which precludes the

inference of directional, causal relations between the protective factors, pandemic stress and suicidal thoughts. Further longitudinal research is required to establish whether protective factors such as hope, social connectedness, resilience and acceptance actively prevents the development of suicidal thoughts in individuals exposed to high levels of pandemic stress. Secondly, this research relied on single-item self-report measures to assess the presence of suicidal thoughts during the COVID-19 pandemic. Whilst this method offered a quick, non-intrusive assessment of suicidal thoughts that were compliant with the ethical guidelines set out for online mental health research during the pandemic (Townsend et al., 2020), past research has indicated that the use of single-item self-report measures of suicidal thoughts can result in a small (8%) over-endorsement of the standard definition of suicidal thoughts and therefore may result in slight overestimations of the true effects (Millner et al., 2015). Future research must consider the balance between the use of quick, less-intrusive and more ethically sensitive measures of suicidal thoughts, with the more extensive, lengthier and methodologically rigorous multi-item measures such as the Self-Injurious Thoughts and Behaviors Interview (Nock et al., 2007).

Thirdly, it is also important to note that of the 10,369 participants that were included in the study, 1,442 participants did not provide data on the demographic or protective factor variables and were subsequently excluded from the main regression analyses. This was mainly due to the large number of participants (N = 1,055) who did not provide information on their gender. This exclusion of a large number of participants both reduced the statistical power of the analyses and increased the vulnerability to bias. Nevertheless, the remaining sample size still possessed sufficient power to detect small effect sizes. Fourthly, it is also important to consider the representativeness of the sample when interpreting the results. Whilst the large sample size is a strength of the study and there was a diverse range of individuals from different age and socioeconomic groups, the sample was predominantly female (75.7%) and white (96.6%). It is therefore important to replicate these findings in more diverse samples.

Fifthly, this study used a hopelessness scale (Beck Hopelessness Scale; Beck et al., 1974) to measure participants' levels of hope, which relies on the assumption that hope and hopelessness lie at opposite ends on the same continuum. However, some have argued that hope and hopelessness are highly related, yet distinct

constructs that operate on separate dimensions. Huen et al. (2015) argued that having reduced positive future expectancies (low hope) is not quite the same as having increased negative future expectations (high hopelessness). Using a confirmatory factor analysis, Huen et al. (2015) demonstrated that a model with hope and hopelessness as separate but highly correlated constructs provided a slightly better fit to the data than a model that collapsed hope and hopelessness into one unidimensional factor. If this conceptualisation of hope and hopelessness is true, a low score on the BHS would represent an absence of hopelessness, rather than high levels of hope. Considering this, future research investigating hope as a protective factor for suicide should consider using measures of hope such as the Miller Hope Scale (Miller & Powers, 1988) or the Herth Hope Index (Herth, 1992). Nevertheless, it is important to consider that the BHS is very strongly negatively correlated with these measures of hope (Caretta et al., 2014; Benzein et al., 2005) and many of the items used in the BHS-4 in this study ("*I have great faith in the future*" and "*In the future I expect to succeed in what concerns me most*") appear to measure the presence of positive future tendencies that characterise the construct of hope.

Finally, it should be acknowledged that the measures of hope (BHS-4), social connectedness (TILS) and pandemic acceptance (PAS) were all shortened versions of the original measures. Whilst the use of shortened questionnaires was necessary to retain participants in a quick, volunteer-based online survey, these questionnaires are likely to have been psychometrically weaker compared to their original, lengthier counterparts which may have resulted in the protective value of these constructs being slightly underestimated. Future research should also consider using the Acceptance and Action Questionnaire (Bond et al., 2011) as an alternative method for measuring acceptance.

Conclusion

This study investigated whether certain protective factors could protect against the presence of suicidal thoughts during the COVID-19 pandemic. The results demonstrated that higher levels of hope, resilience and pandemic acceptance all weakened the relationship between pandemic stress and the presence of suicidal thoughts. These findings build upon previous research and highlight how the protective qualities of hope, resilience and acceptance extended to protect against suicidal thoughts during the COVID-19 pandemic. Focusing on interventions that

promote hope, resilience and acceptance of the pandemic may help protect those most affected by the COVID-19 pandemic. Future longitudinal research is required to establish the directional relationships between these protective factors, pandemic stress and suicidal thoughts.

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Chapter 7: General Discussion

Part 1: Examining the Efficacy of the Risk of Suicide Protocol in Accident and Emergency Services

Introduction

The first half of this chapter reviews the research conducted within "part one" of this thesis. This chapter provides a summary of the thesis, before considering the wider implications of the work, the limitations of the research and outlines the directions for future investigations.

Summary of Research

The first part of this thesis focused on understanding and improving the current methods of identifying and preventing suicide within an accident and emergency setting. Whilst the early identification and prevention of suicide is recognised as a crucial component of effective suicide prevention (World Health Organisation, 2021), many authors have argued that current risk assessment processes cannot reliably or accurately identify future suicide attempts (Large et al., 2016) and, more importantly, do not facilitate effective treatment or risk management (Large & Ryan, 2014; Wand, 2011; Mulder et al., 2016; Chan et al., 2016). This thesis sought to evaluate whether the Risk of Suicide Protocol (RoSP) represented a promising method of assessing the risk of suicide in a Psychiatric Liaison Team operating within an accident and emergency department. The first stage of the research aimed to (1) evaluate the inter-rater reliability of the RoSP assessment and, (2) examine whether risk assessments made using the RoSP could lead to improved identification of future suicide attempts compared to assessment as usual.

The findings showed that the overall risk judgements made using the RoSP demonstrated excellent inter-rater reliability, whilst the RoSP subscales and the RoSP actuarial score had fair to excellent inter-rater reliability. These rates of inter-rater reliability compared favourably to the rates demonstrated by the S-RAMM (Ijaz et al., 2009) and were similar to the rates of reliability observed in studies of well-established SPJ tools such as the HCR-20 (Douglas & Belfrage, 2014). The research also demonstrated that judgements of suicide risk made using the RoSP were more accurate than judgements made using assessment as usual at detecting (1) future

suicide attempts (defined as self-harming behaviour with any intent to die), (2) future self-harming behaviour that caused major physical harm and, (3) future self-harming behaviour with potential to cause major physical harm. Overall, these results demonstrated that the RoSP is a reliable and valid instrument for the structured clinical evaluation of suicide risk in accident and emergency services and may represent a promising solution to some of the key issues within the field of suicide risk assessment.

Implications for Clinical Practice

Overall, the findings provided an initial validation of the reliability and validity of the RoSP when used in an accident and emergency setting. This section reflects on the challenges facing the field of suicide risk assessment and considers whether the RoSP represents a promising solution to these problems and has the potential to be implemented within clinical practice.

Poor Empirical Validation

As highlighted by Graney et al. (2020) a lack of empirical validation is a key problem for many suicide risk assessment procedures employed across the UK. Most of the current procedures have little or no research demonstrating their ability to accurately and reliably identify and prevent future suicide attempts, and those that have been extensively researched (e.g., unstructured clinical judgement and actuarial tools) have been criticised for their limited ability to produce a reliable, accurate and in-depth understanding of an individual's suicide risk (Kapur et al., 2005; Steeg et al., 2018; Chan et al., 2016).

This research, combined with the one previous investigation of the RoSP (Gray et al., 2021), has provided an initial empirical validation of the RoSP. These findings demonstrated that the RoSP is more accurate at identifying future suicide attempts compared to the current methods employed by the Psychiatric Liaison Team. The RoSP's ability to identify future suicide attempts in the current research and in Gray et al. (2021) represents an improvement upon the rates observed when using unstructured clinical judgement (Woodford et al., 2017) and compares favourably to the best available actuarial tools (Steeg et al., 2018). Indeed, the ability of the RoSP to identify future suicide attempts is equivalent to the rates observed by the HCR-20 (Neves et al., 2011; De Vogel & De Ruiter, 2006), an SPJ scheme that has become the gold-standard for the risk assessment of violent behaviour (Douglas

& Reeves, 2010; Morrissey et al., 2013). Whilst it should be emphasised that prevention, not prediction, is the overarching aim of suicide risk assessment, this research demonstrates that the RoSP can help the assessor reach an enhanced understanding of an individual's future suicide risk, putting them in a more informed place to make decisions about effective intervention and risk management strategies.

Given the previous lack of empirical validation for many currently used suicide risk assessment processes, this research has taken an important step forward by providing initial validation that the RoSP can facilitate an accurate and reliable understanding of suicide risk within an accident and emergency department. Whilst additional research must be conducted before the RoSP can be implemented on a larger scale, this research has provided a foundation upon which future research can build.

Prevention Not Prediction: Adherence to NICE Guidelines

Another issue within the field of suicide risk assessment, was the fixation on quantifying suicide risk, ahead of suicide prevention. Much of the previous research on suicide risk assessment was overly focused on developing tools capable of accurately predicting future suicide attempts (Patterson et al., 1983; Bolton et al., 2012; Steeg et al., 2018). Whilst this did lead to the development of assessment tools with an improved ability to quantify suicide risk, these tools did not help clinicians build an in-depth understanding of the modifiable risk and protective factors required to inform the necessary treatment and prevention strategies (Simon, 2011).

These concerns are reflected in the current NICE (2011) guidance that instructs clinicians to "*not use risk assessment tools and scales to predict future suicide or repetition of self-harm*," (1.3.11 p.21) and to "*not use risk assessment tools and scales to determine who should and should not be offered treatment or who should be discharged*" (1.3.12 p.21)" and instead to conduct a "*detailed clinical assessment that includes the evaluation of a wide range of biological, social and psychological factors that are relevant to the individual*" (1.3.5 p.20).

The RoSP was designed to adhere closely to NICE (2011) guidelines (Snowden & Gray, 2022). The RoSP guides the clinician through all potential factors moderating an individual's risk of suicide, asking them to consider the presence and relevance of each factor that could be contributing to the individual's risk. The

clinician then constructs a comprehensive understanding of the individual, the factors driving their risk of suicide and what can be done to treat or manage their risks. Considering the current research, the RoSP is now one of the few suicide assessment procedures that both aligns with NICE (2011) guidelines and has been empirically validated in its ability to guide the clinician to an accurate and reliable understanding of suicide risk. Whilst further research is required, this places the RoSP in a strong position when considering its suitability for widespread use in clinical practice.

Lack of Consensus

Another difficulty posed by Graney et al. (2020) was the lack of consensus between many of the current risk assessment procedures across the UK, with over 150 different risk assessment tools being used across 85 different mental health organisations. With patients and staff frequently moving between different services, the different tools, procedures, training and language used can be a source of confusion and miscommunication (Graney et al., 2020). A commonly used and widely understood assessment procedure would facilitate faster and easier communication of an individual's risk as they move between different services and would save clinicians from having to learn multiple risk assessment procedures.

One of the main reasons this thesis chose to investigate the efficacy of a structured professional judgement (SPJ) suicide risk assessment tool, was the success that another SPJ tool had in solving this issue within the field of violence risk assessment. Over the past 20 years, the SPJ scheme known as the HCR-20 has become a widely used violence risk assessment scheme and is recognised as the gold standard approach in the field (Douglas & Reeves, 2010; Morrissey et al., 2013). Research into the HCR-20 demonstrated that clinicians have benefitted from the shared philosophy, language and understanding of risk provided by the HCR-20 (Khiroya et al., 2009) and the shared conceptualisation of risk has improved the way a patient's risks are communicated between different professionals involved in their care (Khiroya et al., 2009). In a field that has struggled with a similar lack of consensus over risk assessment procedures (Douglas, 2014), the HCR-20 was able to provide a solution.

The success of the HCR-20 does not guarantee that the RoSP will have the same effect within the field of suicide risk assessment. However, the fact that the

RoSP adheres to NICE (2011) guidelines, has demonstrated its ability to guide assessors towards an accurate and reliable understanding of future suicide risk and has a sister SPJ tool that provided a shared understanding of the risk of violence, highlights the potential of the RoSP to solve the lack of consensus problem within suicide risk assessment. Furthermore, the RoSP, much like the HCR-20 and other SPJ tools, has well-established training procedures and an accompanying manual to guide the clinician through the process of completing a RoSP assessment (Snowden & Gray, 2022). This is important when considering how a risk assessment could be implemented on a larger scale. Whilst the research is still in an early stage, the evidence thus far suggests that the RoSP could offer a solution to the lack of consensus problem.

Palatability

Perhaps the most pressing difficulty with current suicide risk assessment procedures is their palatability. Graney et al. (2020) highlighted how the time consuming nature of suicide risk assessments was a major source of negative feedback from clinicians. Palatability to both patients and staff is one of the most crucial factors to consider when implementing a new risk assessment. A suicide risk assessment process with a near perfect ability to identify and prevent suicide attempts would have limited utility in practice if it took 50 hours to complete and caused distress to the patient. Unfortunately, this research was unable to investigate the palatability of the RoSP amongst clinicians and patients. Whilst this was the aim of the second stage of the thesis, this did not take place due to the COVID-19 pandemic research restrictions.

Prior investigations into the palatability of the HCR-20 may provide an idea of the potential palatability of the RoSP. Some research reported that the HCR-20 has high perceived utility amongst clinicians and that it promoted a transparency and created a shared language and culture for describing and communicating risk (Khiroya et al., 2009). However, other research highlighted that the lengthy completion time and the high financial and time costs of the HCR-20 training process was a barrier to its uptake among clinicians (Beazley et al., 2017). Importantly, Covernton et al. (2019) demonstrated that high quality and engaging training procedures improved clinicians' perceptions of the HCR-20's usefulness and the speed of HCR-20 completion. It seems likely that a high quality and engaging

training process will be important in ensuring that the RoSP is a palatable assessment for clinicians.

In summary, this research did not investigate the palatability of the RoSP to clinicians and patients, but some important lessons can be learnt from the palatability of other SPJ tools. Whilst the length of time it takes to complete a RoSP assessment (between one and three hours) may initially seem unpalatable for clinicians, high quality and engaging training procedures may increase the ease and speed of RoSP completion and improve the palatability of the RoSP. Furthermore, it is important for researchers to work closely with both clinicians and patients to understand how the RoSP can be adapted to become more palatable and suitable for the time-pressured clinical environment, without sacrificing its ability to facilitate an increased understanding of risk.

Implications for Clinical Practice: A Summary

Prior to this research, the RoSP was viewed as a potentially useful solution to some of the problems that had faced the field of suicide risk assessment. However there was limited empirical evidence demonstrating the effectiveness of the RoSP, with only one previous, small-scale study investigating the efficacy of the RoSP (Gray et al., 2021). No research had provided a larger ($N > 100$), prospective examination of the RoSP, and this paucity of research was a significant barrier to the clinical implementation of the RoSP. Furthermore, no research had investigated the use of the RoSP within a primary healthcare setting (e.g., accident and emergency services), with previous research using the RoSP within secondary and tertiary services (Gray et al., 2021).

This research provided the first empirical validation of the RoSP within an accident and emergency department, showing that it can assist the assessor in building an accurate and reliable understanding of future suicide risk within such a setting. The prospective design and the larger sample size ($N = 107$) provided higher quality evidence supporting the effectiveness of the RoSP and further increased confidence that it can successfully guide clinicians through the complex process of suicide risk assessment. This research has played an important role in establishing the credentials of the RoSP, bolstering its credibility as an effective method of suicide risk assessment and strengthening the case for the RoSP to be implemented

within clinical practice. The RoSP is now one of the few suicide risk assessment procedures that both adheres closely with NICE (2011) clinical guidelines and has high quality empirical validation, putting the RoSP in a strong position to be used within clinical practice. Whilst this research makes a strong case for the RoSP to be implemented within clinical practice, more research is required to overcome some of the key limitations within this work.

Limitations

Whilst the specific methodological limitations were discussed in chapter 3, this section considers more general limitations within this thesis and reflects on how this impacted the interpretation of the findings.

One important limitation with this research, was that the RoSP assessments were completed by the researcher and not by the Psychiatric Liaison Team. There are some key differences between researchers using the RoSP for research purposes and clinicians using the RoSP within their practice and this influences the way the findings should be interpreted. Firstly, the researcher had a more extensive education and training in the RoSP compared to the typical programme used to train clinicians. This meant that the researcher was likely to have a richer and more in-depth understanding of the RoSP and how to use it. Secondly, the researcher was under much less time pressure to complete the RoSP assessment. The researcher was able to take the time needed to complete their assessment in full, whereas clinical staff would typically have other patients to attend to and time goals to reach, leading to greater time pressure. Thirdly, compared to the typical clinician, the researcher was likely to be more invested in the research project and subsequently, may put more time, effort and thought into the completion of their risk assessment and their final risk judgement.

Overall, the researcher is likely to have better training, more time and more motivation than the typical clinician using the RoSP within their clinical practice. As a result, the impressive predictive validity and reliability found in the current study may not be replicated when the RoSP is implemented in clinical practice. Indeed, previous research has highlighted the decrease in effectiveness that occurs when therapies, assessments or other evidence-based practices cross the “implementation gap” from research into clinical practice (Olswang & Prelock, 2015; Midgley, 2009).

For example, whilst multiple studies demonstrated impressive predictive validity and reliability for the HCR-20 when used by researchers (Neves et al., 2011; De Vogel & De Ruiter, 2006), Jeandarme et al. (2017) failed to replicate these findings when they examined the reliability and validity of the HCR-20 as it was used by clinicians as part of their daily practice. Therefore, it is important to clarify that this research demonstrated that the RoSP could facilitate an accurate understanding of suicide risk for a *researcher* within a clinical setting. Future research must investigate whether these findings can be replicated after the RoSP crosses the "implementation gap".

Another concern with this research, that applies to all other research in the field of suicide risk assessment, relates to the way future suicide attempts was measured. To assess whether a risk assessment can identify future suicide attempts, researchers must determine whether an individual has attempted suicide within the follow-up period. This is a very difficult task. Many experiments include a follow-up interview, where the patient is contacted after their assessment and is asked about any recent self-harm or suicide attempts. However, this approach is often paired with poor response rates (current study = 57%; Tello et al., 2019 = 60%; Vaiva et al., 2006 = 61%) and is overly reliant on the patient's self-report, which is vulnerable to deception, misremembering or misinterpretations of recent self-harm behaviour (Busch et al., 2003).

Alternatively, some studies monitor hospital records and look at hospital attendances for self-harm behaviour or suicide attempts. Whilst this circumvents the issues with self-report and poor response rates, most suicide attempts do not involve hospital attendance (Grunbaum et al., 2004) and this method often misses the occurrence of suicide attempts that occur at different hospitals. Whilst this study employed a combination of these approaches to maximise the chances of capturing suicide attempts over the follow-up period, there was still a large portion of individuals who did not attend the follow-up interview. Suicide attempts that did not involve hospital attendance would not have been captured within this group. This increased noise in the outcome variable makes it more difficult to measure the RoSP's ability to identify future suicide attempts. Building faith in the accuracy of the outcome measure is crucial in any research and it is important for this field to consider ways to improve the detection of future suicide attempts. Future research could consider incentivising participants to respond to follow-up interviews or

arranging in-person follow-up interviews to increase response rates. Furthermore, accessing data from a wider network of hospitals, police reports, mental health services and coroners' records may help to increase the detection of suicide attempts during follow-up periods.

A final limitation concerns the way the reliability of the RoSP was assessed. Whilst this research demonstrated that the RoSP possessed acceptable inter-rater reliability, the two independent RoSP assessors did not have equal access to the information about the patient. One RoSP assessor had access to the assessment interview and the patient's hospital records, whereas the other RoSP assessor only had access to a case vignette that described the assessment interview and hospital records. This limitation was a result of the ethical and practical challenges involved in having multiple assessors sit in on a risk assessment that contained sensitive topics. Individuals can often feel overwhelmed or intimidated if multiple assessors are involved in their assessment interview and may feel unable to share important information. Whilst the case vignette method of assessing inter-rater reliability has been employed in many previous studies (Sutherland et al., 2012; Orsi et al., 2014), there are some important limitations to note. Firstly, it is possible that, when writing the case vignette, some of the original assessor's own perceptions and biases may have filtered into the vignettes and influenced the assessments produced by the other assessor. Secondly, it is likely that not all the information available in the assessment interview was captured within the vignette. Much of the subtle, nuanced, non-verbal information such as facial expressions, tone of voice and body language would have been difficult to capture within the case vignette. Future research should investigate whether two trained RoSP assessors can independently produce similar evaluations of suicide risk after exposure to the same information. Ideally, two researchers should conduct the assessment interview together and have equal access to the individual's historical notes, before independently completing their RoSP assessments and producing their risk judgements.

Despite these limitations, there were many strengths to this work that enabled it to answer the research questions effectively. Unlike previous research into the RoSP (Gray et al., 2021) and other SPJs that employed retrospective research designs (Gray et al., 2008), this study employed a more resource intensive and ethically challenging prospective design. The prospective design overcomes the problems of

selection biases and missing information that often leads to biases in retrospective research (Talari & Goyal, 2020). Additionally, compared to other hospital-based prospective investigations of risk assessments (Gray et al., 2021; Fagan et al., 2009; Gray et al., 2003; Belfrage et al., 2000), this research recruited an impressive number of participants. The 107 participants recruited provided adequate power to achieve the aim of validating the RoSP within an accident and emergency department setting. For each participant recruited, the researcher had to find an individual eligible for a risk assessment with the Psychiatric Liaison Team, consent them into the study, sit in on their assessment, review their historical hospital records, complete the RoSP assessment, perform the risk predictions, collect the risk predictions from the Psychiatric Liaison Team and digitally backup all the relevant information. Each participant recruited required between four and six hours of work and was reliant upon a patient being referred to the Psychiatric Liaison Team and being eligible for discharge whilst the researcher was there. Considering the limited resources available for this project, the intense workload required for each participant and the smaller samples recruited in similar studies, the recruitment of 107 participants should be viewed as a major strength of the current study.

Future Directions

This final section explores the future directions for this research.

Implementation

An important next step for this research is to investigate the implementation of the RoSP. As highlighted earlier, many evidence-based practices have observed decreases in their effectiveness after they crossed the bridge from research into clinical practice. Therefore, it is important to investigate whether the present findings can be replicated when the RoSP is used by clinicians within their clinical practice. Whilst this research was originally meant to be a part of this thesis, the COVID-19 research restrictions prevented this from happening.

The Psychiatric Liaison Team that collaborated with this research represent an ideal team to conduct this research with. Given that the RoSP adheres closely to current NICE (2011) guidelines and has recently been validated within the accident and emergency department setting, it would be appropriate for the RoSP to be implemented within this setting. The Psychiatric Liaison Team should receive formal

training in the RoSP along with an associated RoSP manual and should start using the RoSP to guide their clinical assessments. Researchers should then examine whether the risk judgements made by the Psychiatric Liaison staff using the RoSP are able to accurately identify future suicide attempts. Researchers should also examine the reliability of RoSP judgements between clinical staff. This could be achieved through two staff members completing independent RoSP assessments on the same patient and calculating the similarity of their independent risk judgements. These studies would provide insight into whether the RoSP is still an effective method of suicide risk assessment after crossing the "implementation gap", a vital step for all evidence-based practices that hope to be implemented on a larger scale.

Palatability

As highlighted earlier, the palatability of a risk assessment is a major barrier to successful implementation in clinical practice. If the RoSP interview is too distressing for the patient, they may disengage and fail to communicate important information. If clinicians find that the RoSP assessment procedure is too laborious and time intensive, they may seek to rush or skip parts of the assessment which could be detrimental to the effectiveness of the process. Therefore, in addition to researching the implementation of the RoSP, it will also be important to investigate the palatability of the RoSP to both clinical staff and patients.

After training staff in the RoSP and allowing them to use it within their clinical practice for a short period, a series of qualitative interviews should ask staff to share their experience using the RoSP. Staff should be asked to reflect on how the RoSP fits within their service, whether they feel it helps with the assessment process, what difficulties they have with the RoSP and what changes they think would make it more palatable to their service. Similarly, patients should also be interviewed and asked for their thoughts on the RoSP assessment process. They should be asked whether there were parts of the assessment they did not like or did not see the purpose of and how their experience could have been improved. It will be important for the authors of the RoSP to work collaboratively with staff and patients and consider whether any changes could be made to the RoSP to make it more suitable for clinical practice, without compromising the effectiveness of the RoSP. Ideally, this research should be conducted prior to the research investigating the implementation of the RoSP. This way, issues with poor uptake or difficulties

implementing the RoSP, will hopefully have been overcome, creating better conditions for a fair examination of the efficacy of the RoSP once implemented in clinical practice.

Prevention

If future research manages to establish the palatability of the RoSP and its efficacy once implemented in clinical practice, the next step would be to investigate whether the RoSP can successfully reduce future suicide attempts. Almost all research investigating suicide risk assessment processes have focused on examining their reliability and their ability to identify future suicide attempts. Considering that the overarching purpose of suicide risk assessment is to *identify* and *prevent* future suicide attempts, it is vital that researchers investigate whether such assessment procedures lead to the prevention of future suicide attempts. This would require a randomised control trial (RCT) where half the participants are randomly assigned to a "RoSP" risk assessment and treatment condition and half are assigned to a "control" risk assessment and treatment pathway (e.g., assessment as usual). These two groups would be followed up and the research would investigate whether there were fewer suicide attempts in the "RoSP" group relative to the "control" group. Whilst this would be an ambitious project, requiring lots of resources and careful ethical considerations, it would help determine whether the RoSP truly leads to the prevention of future suicide attempts.

Conclusion

In summary, this thesis aimed to examine whether the RoSP represented a promising solution to some of the major challenges associated with current suicide risk assessment procedures. More specifically, the research examined whether the RoSP (1) could more accurately identify future suicide attempts compared to assessment as usual within a Psychiatric Liaison Team working in an accident and emergency department and, (2) had acceptable levels of inter-rater reliability. The findings demonstrated that the RoSP was significantly better than assessment as usual at identifying future suicide attempts (defined as self-harming behaviour with any intent to die), future self-harming behaviour that caused major physical harm and future self-harming behaviour with potential to cause major physical harm. The findings also showed that the overall risk judgements made using the RoSP demonstrated excellent inter-rater reliability, with the RoSP subscales and the RoSP

actuarial score demonstrating fair to excellent inter-rater reliability. Overall, these results demonstrated that the RoSP is both a reliable and valid instrument for the structured clinical evaluation of suicide risk for use in accident and emergency services.

This research provided high quality, prospective research demonstrating the effectiveness of the RoSP within an accident and emergency setting and has played an important role in bolstering the RoSP's credibility as an effective method of suicide risk assessment, strengthening the case for the RoSP to be used within clinical practice. These findings have provided a solid empirical foundation for the RoSP that future research can build upon. Future research needs to investigate whether the RoSP is a palatable tool to staff and patients, whether the RoSP can replicate its impressive validity and reliability after it has crossed the "implementation gap" and determine whether the RoSP leads to a reduction in future suicide attempts.

Part 2: Identifying Factors Moderating Suicidal Thoughts and Suicide Attempts During the COVID-19 Pandemic

Introduction

This section reviews the research conducted within the second part of the thesis. It provides a summary of the studies conducted and considers the wider meaning of the work, the limitations of the research along with the areas for future investigations.

Summary of Research

The COVID-19 pandemic and associated restrictions resulted in profound physical, social and economic changes. Whilst it is still unclear whether the pandemic caused an increase in population suicidality (Pirkis et al., 2021), many authors called for continued vigilance in understanding the factors influencing suicidal thoughts and attempts during the pandemic (John et al., 2021; Appleby, 2021; Pirkis et al., 2021). This research aimed to look beneath general trends and provide more information about the factors influencing suicidal thoughts and suicide attempts during the pandemic. More specifically this research aimed to (1) examine the demographic groups most vulnerable to suicidal thoughts and suicide attempts

during the pandemic, (2) identify the key pandemic related stressors driving suicidal thoughts and suicide attempts during the pandemic and, (3) investigate the factors that helped protect individuals from experiencing suicidal thoughts during the pandemic.

In the analysis of demographic groups most vulnerable to suicide during the pandemic, age, gender and socioeconomic group all predicted the presence of suicidal thoughts, with younger individuals, men and socioeconomically deprived individuals more likely to experience suicidal thoughts. For suicide attempts, only age group predicted the outcome variable, with younger individuals much more likely to attempt suicide.

For the analysis of pandemic related stressors, the results showed that domestic abuse, food insecurity, difficulty accessing healthcare, relationship problems, social isolation, financial problems, being made redundant, increased caring responsibilities, major COVID-19 symptoms and bereavement were all significantly associated with the presence of suicidal thoughts during the pandemic. Regarding suicide attempts, domestic abuse, food insecurity, being made redundant, financial problems, difficulty accessing healthcare, social isolation and relationship problems were associated with the presence of suicide attempts during the pandemic. Interestingly, being a key worker and having responsibility to home-school a child were negatively associated with both suicidal thoughts and suicide attempts during the pandemic.

The investigation into protective factors demonstrated that levels of hope, social connectedness, resilience and pandemic acceptance all independently predicted a lower likelihood of experiencing suicidal thoughts during the pandemic. It also showed that hope, resilience and pandemic acceptance significantly moderated the relationship between pandemic stress and the presence of suicidal thoughts, such that the relationship between pandemic stress and suicidal thoughts was weaker for individuals with high levels of hope, resilience and pandemic acceptance. This effect was not found for social connectedness.

Wider Meaning and Contribution of the Findings

This section reflects on the meaning and significance of these findings and considers the wider implications and contributions of the work.

Demographics

Prior to this thesis, many studies had investigated the impact of the COVID-19 pandemic on the mental health of different demographic groups, however less research had focused on how the pandemic had influenced suicidality within these groups. Whilst one previous study (O'Connor et al., 2020), conducted during the first UK lockdown period, found an increased prevalence in suicidal thoughts among younger adults and lower socioeconomic groups, more research was required to examine whether this finding extended to suicide attempts and to understand whether this had changed by the second UK lockdown period. This research was the first to shed light on the prevalence of both suicidal thoughts and suicide attempts among different demographic groups during the second UK lockdown period. The findings have important implications for governments, community leaders and the development of outreach programmes.

Arguably the most important finding was the extent to which younger individuals were more likely to experience suicidal thoughts and attempt suicide compared to older individuals. Whilst both pre-pandemic research (McManus et al., 2014) and early pandemic research (O'Connor et al., 2020) reported that suicidal thoughts were higher in younger adults compared to older adults, the current findings suggest that this gap had widened substantially by the second UK lockdown period. The elevated prevalence of suicidal thoughts and suicide attempts in young adults (16-24) in this study is a major concern, with almost one in three young adults experiencing suicidal thoughts and one in 20 young adults attempting suicide during the pandemic. This finding has several important implications.

Firstly, this finding should be factored into the development of community outreach strategies. Community leaders must consider ways in which support can be provided to young people that may be especially vulnerable to suicide during the pandemic. Schools, colleges, universities, workplaces, mental health services, healthcare services, churches, youth groups, charities and other community-based organisations in contact with young adults should be made aware of this heightened vulnerability to suicidal thoughts and suicide attempts in young people. This will enable them to consider appropriate and effective methods of providing help and support. Secondly, those responsible for making decisions around pandemic restrictions and recovery strategies must be made aware of the increased

vulnerability to suicide in young adults during the pandemic and factor this into their decisions. The infection control benefits of various pandemic restrictions must be balanced against the potential increases in suicidality in young adults and ways to support young adults throughout these restrictions must also be considered. Finally, future research must continue to monitor the prevalence of suicidal thoughts and attempts in young people, as well as establishing the factors driving this elevated risk. Knowledge of the specific factors driving this increased vulnerability to suicide in young adults could help inform effective intervention and recovery strategies.

The finding that men were more likely to experience suicidal thoughts relative to women is also worthy of consideration. This finding was particularly surprising given that pre-pandemic data indicated a higher prevalence of suicidal thoughts in women (McManus et al., 2014) and studies across the world demonstrated that the pandemic had more adversely impacted the mental health of women relative to men (Pierce et al., 2020a; Xiong et al., 2020). This finding raises important considerations for the future. Firstly, it is important that the mental health and wellbeing of men during the pandemic is not neglected by community outreach and support structures. With previous research reporting that the mental health of women was more impacted during the pandemic, many researchers called for increased support and funding towards women's mental health (Pierce et al., 2020a; Xiong et al., 2020). This is not an argument against the call for increased support of women's mental health during the pandemic but rather an appeal for a more nuanced understanding of how the mental health needs of both men and women can be effectively supported during these difficult times.

Secondly, this finding may cause epidemiological research to re-evaluate whether currently used measures of depression and mental health symptoms such as the PHQ-9 (Kroenke et al., 2001) or the GHQ-12 (Goldberg, 1986) can accurately measure the mental health and wellbeing of men. As outlined in chapter 5, one potential reason for the discrepancy between previous research findings (*women's mental health was more adversely affected by the pandemic)* and the current research findings (*higher prevalence of suicidal thoughts in men during the pandemic*) is that these mental health screening tools are biased towards feminine depressive symptoms (e.g., sadness, crying, loss of appetite) ahead of more masculine depressive symptoms (e.g., anger, irritability, aggression, risk taking; Ogrodniczuk &

Oliffe, 2011). Future research into population mental health could consider employing questionnaires such as the MDRS-22 (Rice, 2011) designed specifically to measure male depression symptoms, alongside traditional measures, to ensure that male mental health problems are not underestimated. Finally, these findings also emphasize the importance of continued monitoring of both mental health difficulties and suicidality within the population during a pandemic. We have learned that the rates of mental health difficulties amongst different demographic groups do not directly translate into the rates of suicidal thoughts and suicide attempts amongst these groups. An in depth understanding of multiple aspects of mental health, wellbeing and suicidality are required to coordinate a well-informed recovery strategy across a population.

Stressors

Prior to this research, several authors proposed that many of the physical, social and economic stressors caused by the pandemic would result in sharp increases in suicidal thoughts and suicide attempts (Sher, 2020; Gunnel et al., 2020), however there was a paucity of evidence to substantiate these claims. This study was among the first to examine the relationship between many pandemic related stressors with both suicidal thoughts and suicide attempts. The findings established which specific pandemic related stressors were related to increased suicidal thoughts and attempts and provided estimates of the strength of these relationships, delivering an enhanced understanding of the key stressors linked to suicidality during the pandemic. These findings have important implications for community recovery and suicide prevention processes as we continue to move through the various stages of this pandemic.

For the purposes of community recovery and suicide prevention, it is important for governments, policy makers and community leaders to be aware of the main drivers of suicidality in the population during the pandemic. Eliminating or decreasing the stressors strongly connected to population suicidality can help decrease the occurrence of future suicidal thoughts and suicide attempts in the population. When contemplating which stressors to prevent, it is important to consider both the extent to which a stressor is linked to suicidality, along with the prevalence of that stressor in the population.

Within the present study, there were two stressors that stood out in terms of the strength of their relationship to suicidal thoughts and suicide attempts. Whilst the prevalence of these stressors was not particularly high (domestic abuse: N = 214, prevalence = 2.1%); food insecurity, N = 354, prevalence = 3.4%), they still affected a significant minority of the population and the severity of their association with suicidal thoughts and suicide attempts warrants serious attention. Furthermore, the degree to which these stressors were associated with suicidality during the pandemic was markedly higher than their associations with suicidality in research conducted prior to the pandemic (Golding, 1999; Nagata et al., 2019), indicating they have become more damaging under pandemic conditions. Therefore, these findings indicate that efforts to decrease domestic abuse and food insecurity could be instrumental in preventing suicide in the later stages of the pandemic. For domestic abuse, governments, healthcare services and communities must consider how to improve detection of domestic abuse during a pandemic, how to ensure that victims can safely access a range of support services (help-lines, websites, women's shelters) and how instances of domestic abuse can be prevented in the first place. More specific ideas for improving the detection of domestic abuse during the pandemic are discussed later in the "future research" section. Regarding food insecurity, increased funding for food banks, the continuation of free school meals during home-schooling and holiday periods, ensuring food supply chains are not disrupted and making sure that quarantined individuals can have food delivered to them could have an important protective effect against suicidality during the later stages of the pandemic.

There were also other stressors that, whilst not as strongly associated with suicidal thoughts and suicide attempts, were much more prevalent in the population. Financial problems (N = 1,602, prevalence = 15.4%), social isolation (N = 3,814, prevalence = 36.8%) and difficulty accessing necessary healthcare (N = 1,652, prevalence = 15.9%) were commonly experienced stressors within the sample and were all moderately associated with suicidal thoughts and suicide attempts. This combination of high prevalence and moderate severity indicates that these stressors meaningfully contributed to the rates of suicidal thoughts and suicide attempts in the population throughout the pandemic. Therefore, preventing or limiting the occurrence of these stressors could confer important protection against suicidal thoughts and attempts. For social isolation, policy makers should be aware of the

consequences of restrictions that result in social isolation and balance this against infection control benefits. Furthermore, healthcare services could consider expanding and adapting the provision of social prescribing services. Social prescribing is a way of linking individuals in primary care settings with activities provided by volunteer and community sector organisations such as gardening, befriending, support groups, cooking, healthy eating tutorials, games or sports (Buck & Ewbank, 2020) and has demonstrated efficacy in improving social connectedness (Kellezi et al., 2019), decreasing loneliness (Polley et al., 2019) and increasing wellbeing (Chatterjee et al., 2017). Whilst lockdown restrictions will limit some of the activities, many of them (befriending, support groups, tutorials, games) are adaptable to an online format and may provide feelings of community connectedness that could combat the negative effects of social isolation.

Regarding healthcare access, whilst it is beyond the scope of this thesis to suggest how healthcare services can improve the accessibility of care during a pandemic, there are other considerations that may help alleviate the distress caused by poor access to necessary healthcare. Past research has indicated that the uncertainty and fear surrounding delays and cancellations in healthcare is a key driver of distress amongst patients (Forner et al., 2021). Therefore, even if healthcare services must delay, cancel or scale down care, engaging in productive communications with patients, allaying some of their fears and providing some form of certainty around their future treatment should be a priority for healthcare services. Similarly, with financial problems, whilst they are somewhat unavoidable during a pandemic, it is important that governments understand the extent to which they impact population suicidality, so this can be factored into decisions that impact the financial wellbeing of the population such as the extension of furlough schemes or the provision of unemployment benefits.

In addition to preventing the occurrence of these stressors, these findings can also help outreach and support structures identify individuals that have been particularly impacted by the pandemic. Community outreach structures could specifically target individuals who were exposed to domestic abuse, food insecurity, social isolation, financial problems or difficulty accessing healthcare. Mental health services, charities and religious groups that provide support to communities, should consider linking up with women’s shelters, food banks and reaching out to

individuals known to be living alone. They could also liaise with healthcare services, to identify patients that had healthcare delayed or cancelled, along with organisations such as the citizens advice bureau or job centres that encounter individuals experiencing financial difficulties. Reaching out and providing support to the individuals that have experienced some of the stressors strongly linked to suicidal thoughts and suicide attempts, may help lessen the detrimental impacts of these stressors and help protect against increased suicidality in the population.

Protective Factors

This thesis demonstrated that hope, resilience and pandemic acceptance all weakened the relationship between pandemic stress and suicidal thoughts. A deeper understanding of the factors that weaken the relationship between pandemic stress and suicidal thoughts can inform ways to help communities withstand and bounce back from the difficulties imposed by the pandemic. Consideration should be given as to how these factors can be instilled and improved within communities most impacted by the pandemic.

Firstly, these traits can be developed through the availability of online mental health interventions. Previous work has established that mental health interventions delivered online can lead to significant improvements in mental health symptoms. For example, SilverCloud, a platform that hosts a variety of mental health programmes available on computers and mobile phones, has demonstrated efficacy in improving depression and anxiety symptoms (Andrews et al., 2018) and decreasing stress (Palacios et al., 2018). Chapter 5 discussed how hope, resilience and acceptance are modifiable constructs that can change over time, with positive psychology exercises leading to increases in hope (Huffman et al., 2014), “resilience training” resulting in improved resilience (Joyce et al., 2018) and acceptance-base interventions improving participant’s acceptance of their reality (Wicksell et al., 2008).

Taking this into account, one effective way to increase hope, resilience and acceptance within communities during the pandemic, could be to make these interventions available through online platforms. At the time of writing, the Aneurin Bevan Health Board in Wales has already taken the step of offering free access to online courses and education modules designed to improve mental wellbeing (Melo,

2021). Providing online modules focusing on improving hope, resilience and acceptance, may help decrease the prevalence of suicidal thoughts in the population throughout the difficulties associated with the COVID-19 pandemic. Furthermore, this research also identified that certain demographic groups were more likely to experience suicidal thoughts and attempt suicide. Extra efforts should be made to signpost and encourage engagement with these online interventions within these groups (e.g., young people, those exposed to domestic abuse, food insecurity, social isolation, etc).

Additionally, these findings also have implications for the way in which governments, media outlets, healthcare services and other organisations communicate with the public throughout the pandemic. During the pandemic, governments, public health officials and media outlets have delivered vital information to the public about COVID-19 and the associated rules and restrictions (Hyland-Wood et al., 2021). These communications have a large influence on the attitudes and emotions the public have towards the pandemic (Hyland-Wood et al., 2021) and it is worth considering how these messages can be framed in ways that could inspire hope, encourage resilience and foster a more accepting attitude towards the pandemic. Previous research into public health messaging has suggested that the way messages are framed have a substantial impact on the attitudes, emotions and behaviours of the recipient (Nabi & Myrick, 2018; Yan et al., 2012). For example, gain-framing, framing a statement in a way that highlights the positive outcome (e.g., lives can be saved) is more likely to evoke feelings of hope and self-efficacy compared to loss-framing, framing a statement in a way that highlights the negative outcome (e.g., people will die; Nabi & Myrick, 2018). Framing messages in ways that are likely to inspire hope, encourage resilience and foster more accepting attitudes towards the pandemic may help communities and individuals withstand and bounce back from some of the negative consequences of the pandemic.

Furthermore, there are ways in which journalists can help encourage hope, resilience and acceptance in communities during the pandemic. After the Rwandan civil war, journalists played a vital role in promoting unity and reconciliation by focusing on stories that promoted hope and by implementing solution focused journalism (McIntyre & Sobel, 2018). Solution focused journalism focuses on presenting effective solutions to the problems presented in news stories (McIntyre,

2019). Recent evidence has demonstrated how articles that identify effective solutions to the issues discussed, result in less negative and more hopeful attitudes toward the problem compared to articles where no solution or ineffective solutions are discussed (McIntyre, 2019). Journalists and media outlets that highlight stories with potential to inspire hope, resilience or acceptance whilst also placing an emphasis on solution focused journalism, could play an important role in helping communities withstand some of the difficulties and challenges imposed by the pandemic. Indeed, it would be interesting for future research to investigate whether solution focused journalism could inspire hope and help protect against suicidal thoughts over the course of the pandemic. Research could investigate whether individuals exposed predominantly to solution focused journalism around topics related to the pandemic (e.g., news on COVID-19 variants, rules and restrictions, vaccines, changes in COVID-19 case numbers, etc), had improved levels of hope and a lower prevalence of suicidal thoughts relative to a group exposed exclusively to journalism around the same topics, that offered no or ineffective solutions.

These findings also have theoretical implications. Whilst the protective factors examined in this research (hope, social connectedness, resilience, acceptance) had previously been shown to protect against mental health difficulties in the face of adversity, no research had investigated whether their protective effects applied within the context of a pandemic. Previously, hope had shown to protect against suicidal thoughts in individuals who had experienced difficult internal (depression, rumination) or external (sexual assault) experiences (Chang et al., 2015; Tucker et al., 2013; Uncapher et al., 1998). Similarly, resilience had also demonstrated an ability to protect against suicidal thoughts in individuals who experienced violent abuse (Nrugham et al., 2010), depression (Min et al., 2015) and anxiety (Min et al., 2015). This research built upon these findings, demonstrating that the protective nature of hope and resilience extended to the context of the pandemic, providing further evidence that both hope and resilience are important protective factors against suicidal thoughts across a wide range of difficult circumstances and experiences.

Conversely, this research also showed that social connectedness, a factor previously shown to protect against depression and suicidality in individuals experiencing stress (Pidgeon et al., 2014) and moral-injury (Kelley et al., 2019), did not buffer the relationship between pandemic stress and suicidal thoughts. This

should not be taken as evidence that social connectedness does not protect against suicidal thoughts but rather that its protective power weakens or disappears under pandemic conditions. As discussed in chapter 6, it is likely that the restrictions on in-person socialisation may have been more difficult for individuals with higher social connectedness, subsequently undermining some of the protective effects of social connectivity.

Finally, this research provided the first examination of whether acceptance of one's reality could provide a protective buffer against suicidal thoughts. Whilst previous research had established that acceptance of one's difficult reality (e.g., chronic pain, workplace stress), could protect against decreased quality of life (Poppe et al., 2012), PTSD symptoms (Wu et al., 2009), decreased emotional wellbeing (Kuba & Schiebe, 2017) and depression (Weiss et al., 2013), research had not investigated whether acceptance of reality could help protect against suicidal thoughts. This research has provided initial evidence that acceptance of a difficult reality can protect against suicidal thoughts during exposure to high pandemic stress, opening the door for future research to further investigate acceptance as a protective factor against suicide.

Taking a broader perspective, this research also highlights the advantages of focusing on both risk and protective factors for suicidal thoughts and suicide attempts. A sole focus on risk factors can tacitly fuel a narrative that humans are vulnerable beings, whose wellness is dependent on the avoidance of all stressors and ills. This can prevent us from attaining a more complete understanding of vulnerability to suicidal thoughts. Focusing on both the risk and protective factors for suicide has the advantage of producing a more comprehensive understanding of how we can prevent suicidality during the pandemic (through both decreasing stressors and enhancing protective factors) as well as moving the narrative away from illness avoidance, towards one that acknowledges the human capacity to withstand and bounce back from difficulties.

Challenges and Limitations

Whilst the main methodological limitations of this research were discussed across chapters 5 and 6, this section considers the more general challenges and limitations within this thesis and reflects on how this affected the research.

Uncertainty and Time Pressure

One major challenge facing this thesis was the uncertainty experienced after the initial plans were disrupted by the pandemic. Eighteen months into the thesis, the COVID-19 pandemic resulted in the suspension of the original research plans. During the following five months, there was uncertainty concerning the future of this thesis. These months were spent planning and negotiating with the NHS in Wales around ways to complete the original research relating to the RoSP, as well as engaging in a separate "Wales Wellbeing" research project that investigated the wellbeing of the Welsh population during the pandemic. Once it became clear that the research involving the RoSP was no longer possible, it was decided that the second part of the thesis would use the "Wales Wellbeing" research platform to research factors modifying suicidal thoughts and suicide attempts during the pandemic.

During this period, the loss of time spent contingency planning for the RoSP research added significant time pressure on this research. The main consequence of this uncertainty and time pressure was that it prevented the completion of longitudinal research. By the time it was decided to use the "Wales Wellbeing" platform for the second part of this thesis, it was too late to go back and include the variables of interest (e.g., pandemic stressors, protective factors, suicidal thoughts, suicide attempts) within the earlier "Wales Wellbeing" survey and there was not enough time to conduct further follow-up studies. Therefore, this research could only analyse the results from one survey and had to use a cross-sectional design. As highlighted earlier, the lack of longitudinal data was a key limitation of the research presented in chapters 5 and 6. The cross-sectional design limited the inference of directional, causal relations between key variables (e.g., pandemic stressors, protective factors) and suicidal thoughts and suicide attempts. Future research should consider using longitudinal designs to further investigate the nature of the relationship between key pandemic stressors, protective factors and suicidal thoughts and suicide attempts.

Lack of Resources

The second challenge facing this research was the limited resources available due to the research budget being spent on the first part of the thesis. This impacted the research in two ways. Firstly, given the costs associated with random sampling

techniques (Emerson, 2015), the survey had to rely on convenience sampling methods to recruit participants. The use of convenience sampling often attracts volunteers already interested in the topic, meaning that the sample cannot be considered representative of the wider population (Pierce et al., 2020b). In this research, it resulted in an underrepresentation of men, younger adults (aged 16-24) and older adults (aged 75+) relative to the demographics of the Welsh population (Welsh Government, 2019), which limited the generalisability of the findings.

Secondly, as participants could not be paid for their completion in the research, there were concerns about how to avoid the typically high rates of attrition encountered in volunteer-based online research (Ward et al., 2017). Previous research has demonstrated that survey length is an important predictor of participant dropout in volunteer-based online surveys (Hoerger, 2010; Galesic, 2006). Therefore, to maximise participant retention, this study used shortened versions of the measures of suicidal thoughts, suicide attempts, hope, social connectedness, resilience and acceptance. This impacted the study as these shortened measures typically have weaker reliability and validity compared to their longer-form counterparts. For example, consider the Three-Item Loneliness Scale (TILS; Hughes et al., 2004) used to measure social connectedness. Whilst the TILS has previously demonstrated acceptable rates of internal reliability, discriminant and convergent validity (Hughes et al., 2004), these rates are slightly weaker than those reported in its longer-form counterpart, the 20-item Revised-UCLA Loneliness Scale (Russell, 1996). Using shortened measures like the TILS introduced additional noise into the data, making it harder to accurately determine the true relationship between the constructs under investigation.

Future Research

This final section considers the next steps for this research. These paragraphs review the three main strands of this research and consider the questions and future directions for each one.

Demographics

One of the unexpected findings in this thesis was that men were more likely to experience suicidal thoughts compared to women. Given that UK women typically report more past year suicidal thoughts compared to men (McManus et al., 2014) and

early research indicated that the pandemic had more adversely impacted the mental health of women (Pierce et al., 2020a; Xiong et al., 2020), this finding was surprising. There are a few potential reasons why this discrepancy was found. As highlighted earlier, it is possible that the research investigating gender differences in mental health throughout the pandemic used screening measures that underestimated male mental health symptoms (Ogrodniczuk & Oliffe, 2011). Conversely, it may have been that the sample of men recruited for this research via convenience sampling, was not representative of men in the Welsh population, leading to an overestimation of suicidal thoughts in men. Alternatively, this discrepancy could be genuine, with the pandemic having a more detrimental impact on the mental health of women but causing a sharper increase in suicidal thoughts for men. The precise reason behind this discrepancy has important implications for population wellbeing and recovery strategies and it is important for future research to clarify this discrepancy. Future research, using a representative sample and questionnaires that measure both male and female mental health symptoms (Ogrodniczuk & Oliffe, 2011; Rice, 2011) should monitor rates of mental health symptoms, suicidal thoughts and suicide attempts to further investigate whether this discrepancy is genuine.

The other striking finding concerned the rates of suicidal thoughts and suicide attempts in young adults (16-24). The prevalence of suicidal thoughts and attempts in 16-24 year olds was markedly higher than pre-pandemic rates (McManus et al., 2014), with over 30% experiencing suicidal thoughts and 5.5% attempting suicide during the pandemic. The most touted explanations for this elevated suicidality in younger adults include the notion that younger adults were more impacted by the restrictions on socialising (Beam & Kim, 2020), that younger adults experienced higher rates of unemployment and financial distress (Varma et al., 2021), that younger adults experienced more educational disruption (d'Orville, 2020) and that younger adults tend to have lower levels of resilience (Ong et al., 2006). Future research needs to establish precisely why young adults seem to be particularly vulnerable to suicide during the pandemic. Future qualitative studies should recruit a diverse range of young adults across the UK and attempt to reach an in-depth understanding of their experiences during the pandemic and the key factors that caused distress or contributed towards suicidality.

Pandemic Stressors

This research provided initial information about which of the many difficulties caused or exacerbated by the pandemic (e.g., food insecurity, social isolation), were related to suicidal thoughts and suicide attempts. However, the cross-sectional nature of this research limited the inference of directional causal relationships between the stressors and suicidal thoughts and attempts. Without conducting longitudinal research, it is difficult to establish whether a certain stressor (e.g., financial problems) caused increased suicidality or whether increased suicidality caused financial problems. Additionally, there could be confounding variables (e.g., depression, IQ) that independently influenced both the likelihood of experiencing stressors and the likelihood of experiencing suicidal thoughts and attempts. Therefore, an important next step for this research will be to investigate whether these stressors played a causal role in the development of suicidal thoughts and suicide attempts. Longitudinal research, examining whether the prevalence of these stressors at baseline can predict suicidal thoughts and suicide attempts at a later stage, whilst controlling for potential confounding factors, will provide a better understanding of whether these pandemic stressors caused individuals to experience suicidal thoughts and attempt suicide.

In addition, perhaps the most striking finding was the extent to which experiencing domestic abuse during the pandemic was related to suicidal thoughts (OR = 4.76) and suicide attempts (OR = 11.49). This was much larger than the relationship reported in a pre-pandemic meta-analysis (Golding, 1999), indicating that the pandemic exacerbated the already strong relationship between domestic abuse and suicidal thoughts and attempts. As discussed in chapter 5, this was likely caused by the lockdown restrictions leading victims to feel trapped with their abuser and unable to escape. Unfortunately, this increased need for effective identification and provision of support to victims of domestic abuse during the pandemic was coupled with a decreased opportunity for healthcare services to identify domestic abuse. This is because a large proportion of healthcare was delivered remotely, limiting opportunities to disclose domestic abuse to healthcare professionals (Keynejad et al., 2021).

It is therefore important for future research to investigate how current domestic abuse screening procedures in healthcare settings can be adapted to

pandemic conditions that restrict face-to-face contact with patients. Keynejad et al. (2021) made several helpful suggestions regarding ways to improve the detection of domestic abuse during the pandemic. Firstly, telephone or video consultations should always check if anyone else is in the room and whether it's safe to talk. Secondly, clinicians should use closed "yes" or "no" questions to stop the content of the conversation being understood by others in the room. Thirdly, clinicians should agree a safe word with patients that will allow for safe termination of calls if they are interrupted and arrange how this will be followed up. Finally, clinicians should also routinely communicate to patients that domestic abuse is a justification for breaking lockdown rules. Future research could investigate whether training clinicians in ways to effectively screen for domestic abuse during pandemic conditions leads to more effective identification of domestic abuse, compared to clinicians conducting their assessment as usual.

Protective Factors

Similar to the future directions suggested for the pandemic stressors research, further investigations need to establish the directional relations between the various protective factors, pandemic stress and suicidal thoughts. To establish whether a protective factor (e.g., hope) actively protects against the development of future suicidal thoughts and behaviours under conditions of pandemic stress, longitudinal research should investigate whether hope can moderate the relationship between pandemic stress at baseline and future suicidal thoughts. Only once research has established that these protective factors actively prevent against the development of suicidal thoughts, can these factors be considered as targets for interventions.

If future research can establish that these protective factors actively weaken the relationship between pandemic stress and suicidality, the next step will be to investigate whether interventions that aim to increase hope, resilience and acceptance can decrease vulnerability to suicidality. Ideally a randomised control trial would allocate participants to either an intervention designed to improve hope, resilience and acceptance (the "protective factors" intervention) or a control intervention. Prior to the intervention, immediately after the intervention and six months after the intervention, participants would provide information about their current levels of hope, resilience, acceptance, the current stressors they are experiencing and the presence of any suicidal thoughts or suicide attempts. The analysis would then

examine (1) whether the “protective factors” group showed more improvements in hope, resilience and acceptance relative to the control group, (2) whether overall rates of suicidal thoughts and attempts were lower in the “protective factors” group relative to the control group and (3) whether the relationship between stress and suicidality was weaker in the “protective factors” group relative to the control group.

Conclusion

This thesis aimed to conduct exploratory work identifying some of the key factors influencing suicidal thoughts and suicide attempts during the COVID-19 pandemic. More specifically, this thesis aimed to examine the demographic groups most vulnerable to suicidal thoughts and attempts during the pandemic, to identify the pandemic related stressors strongly linked to suicidal thoughts and attempts and to investigate the factors protecting individuals from suicidal thoughts during the pandemic.

The research into demographic factors demonstrated that age, gender and socioeconomic status all predicted the presence of suicidal thoughts throughout the pandemic, with young adults, males and lower socioeconomic groups at heightened vulnerability to suicidal thoughts. For suicide attempts, only age was a significant predictor, with younger adults more likely to attempt suicide compared to older adults. The research relating to the pandemic stressors found that domestic abuse, food insecurity, difficulty accessing healthcare, relationship problems, social isolation, financial problems, redundancy, increased caring responsibilities, major COVID-19 symptoms and bereavement were associated with suicidal thoughts during the pandemic. Similarly, domestic abuse, food insecurity, redundancy, financial problems, difficulty accessing healthcare, social isolation and relationship problems were associated with suicide attempts. Finally, the research into protective factors found that hope, resilience and pandemic acceptance significantly weakened the relationship between pandemic stress and the presence of suicidal thoughts.

Prior to this research, key authors had speculated that many of the difficulties imposed by the pandemic would result in increased suicidality in the general population and issued calls for vigilance in understanding and preventing suicide during these uncertain times (Sher, 2020; John et al., 2021; Appleby, 2021; Pirkis et al., 2021). This research has played an important role in enhancing our understanding

of the factors influencing suicidal thoughts and attempts during the pandemic and the findings carry important implications for suicide prevention. The research into demographic groups and pandemic stressors has provided important information about the groups particularly vulnerable to suicidal thoughts and attempts during the pandemic, providing information that can be used to help outreach and support structures provide targeted support to communities. The research into pandemic stressors has provided governments, policy makers and community leaders with an enhanced understanding of the key stressors that need to be addressed to facilitate effective community recovery and suicide prevention. Finally, the research into protective factors has highlighted how hope, resilience and acceptance of the pandemic, can help protect against suicidal thoughts in the face of high pandemic related stress and has encouraged community leaders to think about how these traits can be instilled, inspired and developed within the population.

Whilst these findings have provided a valuable initial exploration of the key factors influencing suicidal thoughts and suicide attempts during the COVID-19 pandemic, they have also raised important questions for future research. Some of the important priorities for future work include, unearthing the key drivers of suicidal thoughts and suicide attempts in young adults during the pandemic, establishing the nature of the relationship between pandemic stressors, protective factors, suicidal thoughts and suicide attempts and investigating whether interventions designed to increase hope, resilience and acceptance can decrease vulnerability to suicidal thoughts and suicide attempts. A continued effort to enhance our understanding of the factors influencing suicidality during the pandemic is imperative to constructing effective community recovery and suicide prevention strategies throughout the various stages of the pandemic and beyond.

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Appendix A

Assessment as Usual Interview

GIG CYMRU NHS WALES | Bwrdd Iechyd Prifysgol Aneurin Bevan University Health Board

Name:		**D.O.B:**	
Address:			
Date of Assessment:			
Place of Assessment:			
Assessor(s):			
Designation of Assessor(s):			
Referrer:	**Name:**	☎	
	Address:		
Source of Information/ Contributors	☐ **Service User** ☐ **Referrer** ☐ **Past Notes** ☐ **Family / Carer** ☐ **Other:**		
Present at Assessment:			
Advocacy Needs:			
Communication Needs:			
GP Surgery:			

Issues of confidentiality & consent have been explained:	☐ **Yes** ☐ **No** ☐ **N/A**
Consent to approach Carer:	☐ **Yes** ☐ **No** ☐ **N/A**
Consent to approach Next of Kin:	☐ **Yes** ☐ **No** ☐ **N/A**
Consent to approach Advocate:	☐ **Yes** ☐ **No** ☐ **N/A**

Consent to share information form completed:	☐ **Yes** ☐ **No** ☐ **N/A**
Are there any immediate issues / decisions requiring an assessment of mental capacity?	☐ **Yes** ☐ **No**

Known to CMHT? ☐ **No** ☐ **Yes - if Yes which team:**
Epex number: **Any Epex warnings:**
Date and time of admission:
Reason for admission:
Medical treatment to date: *Including parvolex, scans, prescribed medication, dose, frequency, duration and last GP review.*
Reason for referral to Liaison Mental Health:

<u>Client's perspective of problems:</u> *(Includes personal circumstances, child protection concerns, recent and historical difficulties, etc)*

Referral to Child Care Social Services: ☐ **Yes** ☐ **No** **Date:** **Completed by:**
<u>Mental health history:</u> *(Includes previous contact with services, DSH, family history)*
<u>Alcohol use:</u> **<u>Substance use:</u>** **<u>Client's view of alcohol / substance use and motivation to change:</u>**
<u>Forensic history:</u> *(Includes recent arrests, any homicidal ideas or plans, access to weapons, prison history, bail conditions, probation officer details, if appropriate)*

Mental State Examination and / or other relevant assessment	
<u>Appearance and Behaviour:</u> **How client presented including dress, posture, movement disorder, eye contact, level of cooperation, etc.**	

<u>Speech:</u> **Quantity, speed and spontaneity, volume, content, evidence of formal thought disorder**	
<u>Mood:</u> **Subjective and objective account, evidence of diurnal variation in mood, anhedonia, tearfulness; future outlooks (positive / negative); what gives pleasure; guilt and worthlessness**	
<u>Thought:</u> **Any delusions, paranoia or ideas of persecution, suicidal or homicidal ideas**	
<u>Perception:</u> **Auditory / visual / olfactory hallucinations, and other perceptual abnormalities**	
<u>Cognition:</u> **Awareness and alertness of surroundings and stimuli, orientation, attention and concentration, memory**	
<u>Insight:</u> **Awareness of the problem**	
Does the person require a further cognitive assessment?	☐ **Yes** ☐ **No**

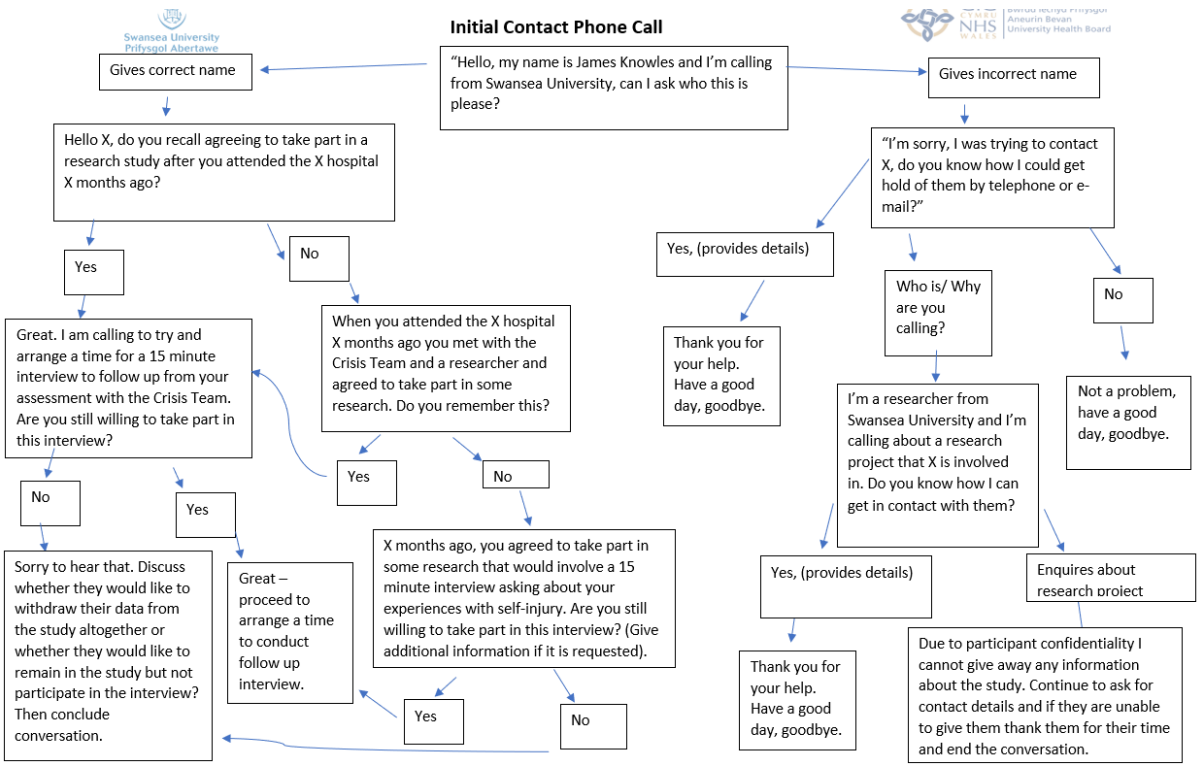
Appendix B

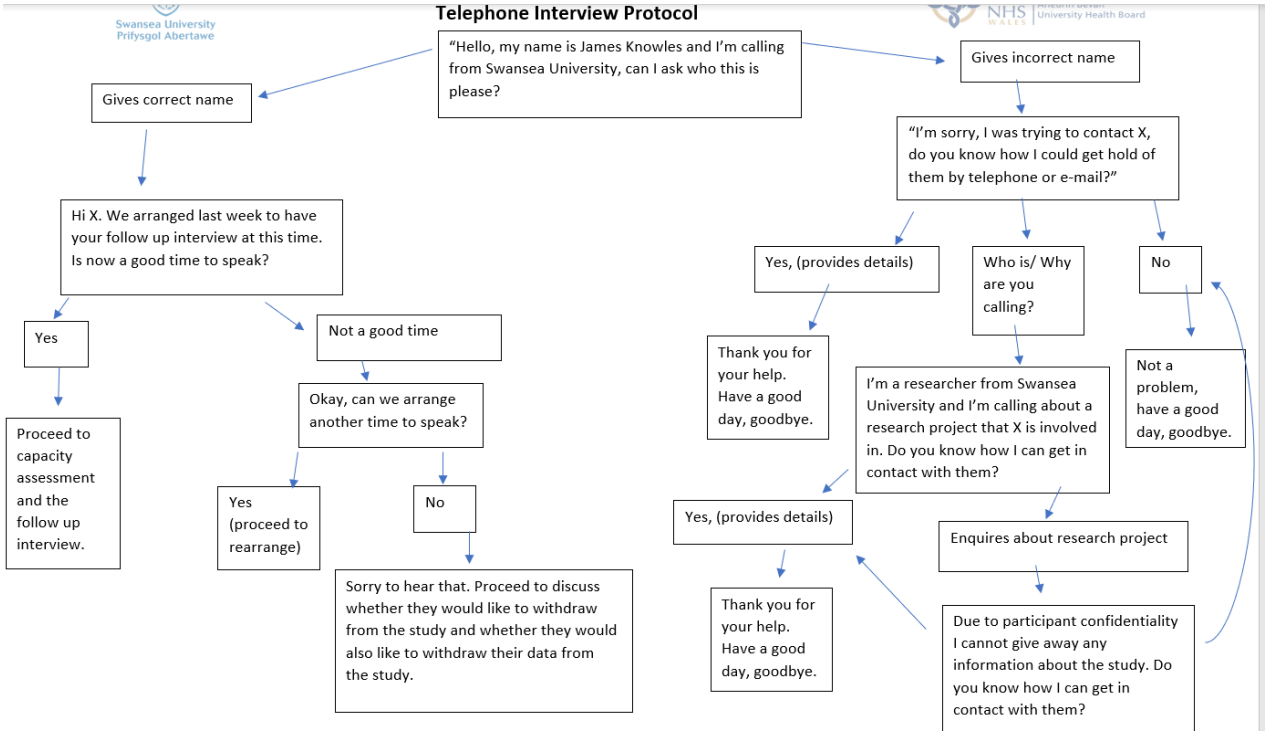
RoSP Follow-Up Interview

Initial Contact

The participant was contacted the week prior to their follow up interview by telephone. This phone call sought to make contact with the individual, remind them of the study they agreed to take part in and identify an appropriate time to call and interview them over the next week.

Please see a structure of the "Initial Contact" phone call in the flow diagram below. If it was not possible to make initial contact with the participant via the telephone, an "Initial Contact" e-mail was sent out in order to make contact with the individual, remind them of the study they agreed to take part in and identify an appropriate time to call and interview them over the next week.





A Modified Version of the Self-Injurious Thoughts and Behaviours Interview – Short Form

Three months ago, when you attended the XXXXX Hospital, you had an assessment with the Mental Health Team. The purpose of this interview is to see how you have been since that assessment and to ask about whether you have experienced any difficulties with self-harm or suicidal thoughts or behaviours since that initial assessment.

Before we begin, I need to clarify a few things:

1. If I am worried about your safety or the safety of others, I will contact the Home Treatment Team.
2. If you don't like any questions, just let me know and we can skip onto the next one.
3. Capacity: Check understanding of the research and interview process.
4. Are you happy to answer a few questions?
5. Are you currently receiving care from any mental healthcare service?
6. These questions ask about your thoughts and feelings of suicide and self-

injurious behaviours. Please listen carefully and respond as accurately as you can. Do you have any questions before we begin?

Suicide Attempts

1. In the past three months, have you made an actual attempt to kill yourself in which you had at least some intent to die? *We will refer to this as a suicide attempt.*

2. How many suicide attempts have you made in the past three months?

3. When was the last time you made a suicide attempt?

For each attempt:

4. What method did you use?

5. What injuries did you have as a result of this attempt?

6. What treatment did you require as a result of this attempt?

7. On a scale of 0-4, to what extent did you want to end your life?

8. On a scale of 0-4, to what extent did you think the attempt would end your life?

Non-Suicidal Self-Injury (NSSI)

9. In the past three months, have you engaged in any NSSI (Have you deliberately hurt yourself without the intention to die)?

10. How many times have you engaged in NSSI in the past three months?

11. When was the last time you engaged in NSSI?

12. What methods have you used when you engaged in NSSI?

13. What injuries did you have as a result of the NSSI?

14. Have you had to receive medical attention for harm caused by NSSI over the past three months? If so, what treatment was required?

Thoughts of Non-Suicidal Self-Injury (NSSI)

15. Over the past three months, have you ever had thoughts of purposely hurting yourself without wanting to die (e.g., cutting or burning)?

16. During how many separate times in the past three months have you thought about engaging in NSSI?

17. When was the last time you thought about engaging in NSSI?

18. On a scale of 0 to 4, at the worst point, how intense were your thoughts about engaging in NSSI?

Suicidal Ideation

19. Over the past three month, have you had thoughts of killing yourself?

20. How many separate times in the past three months have you had thoughts of killing yourself?

21. When was the last time you had thoughts of killing yourself?

22. On a scale of 0-4, at the worst point how intense were your thoughts of killing yourself?

Suicide Plan

23. In the past three months, have you made a plan to kill yourself?

24. How many separate times in the past three months have you made such a plan?

25. When was the last time you made a plan to kill yourself?

26. On a scale of 0 to 4, at the worst point, how seriously did you consider acting on the plan?

27. When you've had a plan what method did you think of using?

Conclusion of Interview & Debrief

Thank you so much for your time, your patience and your honesty. It is really appreciated. This study is trying to improve the assessment process for individuals who attend hospital with self-harming or suicidal thoughts and behaviours. Your participation with this research has been really helpful and we are grateful for your time. More information about the study can be found on the debrief form you were given when we last met. If you are currently experiencing any distress there are some free services available, would you like me to send the details through?

Appendix C

Follow up Interview: Handling Distress Protocol

Before the interview starts:

1. The interviewer will have done a brief capacity assessment.

2. Participants will be asked what level of treatment they are at (e.g., Home Treatment Team or Psychiatric Hospital). This will later guide who is contacted should there be any concerns.

3. Participants will be thanked for agreeing to take part in the interview and the researcher will explain how this research is being used to help A&E services improve their risk assessment procedures. The researcher will state how their participation is an important contribution to this area.

4. Participants will be informed that all information shared during the interview is confidential and will not be shared outside the research team unless the interviewer has reason to believe that their safety or the safety of others is at risk. At this point, the relevant Home Treatment Team or Psychiatric Hospital will be contacted. Potential risk should always trump confidentiality, and this will be made clear to the participant at multiple stages (consent form, participant information sheet, start of the phone call).

Distress During the Interview

If a participant expresses verbal distress or discomfort after being asked a particular question during the interview, the researcher will respond by asking them if they would like to skip the question and move onto the next one.

If this happens on more than one occasion, the participant will be reminded that they are free to withdraw from the interview at any time with no negative consequences. The researcher will then ask them if they would like to continue with the interview. If the participant would like to withdraw from the interview, they will be thanked for their participation, be given a brief verbal debrief for the study and if necessary (see below), they will be referred to various helpful services. They will

then be asked if they would like to withdraw all their data from the study, or whether they would only like to withdraw from the interview.

If the participant would like to continue with the interview, the interview will continue as normal. If the participant continues to express distress at the questions, the researcher will respond by asking them if they would like to skip the question and move onto the next one.

When to Signpost Participants to Supportive Services

If a participant verbally indicates that they are experiencing some level of distress, discontent or difficulty with their mental or emotional state but they give no indication of there being any threat to the safety of themselves or to others, the researcher must signpost the participant to some supportive services.

For example:

- They express that they are struggling with thoughts around self-harming behaviour.
- They request help to deal with their mental or emotional state.
- They express difficulties coping with events in their life.
- They express a need for additional support.

If these circumstances occur, the researcher will:

- Wait until the interview has concluded and thank the participant for their help and their efforts in the process.
- The researcher will then inform the participant that there are various free services available to them that may be able to assist with their current difficulties and proceed to ask if they want details about these services.
- If the participant would like to hear these details, the researcher will give them details of the following services:
    - C.A.L.L.
    - Samaritans
    - GP out of hours
    - Gwent Drug and Alcohol Service

- If the participant would not like to hear these details, the researcher will inform them that these numbers are on the original debrief form that was given to them and can be found online. The researcher will then end the interview in the manner described in the telephone interview protocol.

When to Contact the Relevant Home Treatment Team or Psychiatric Hospital

If a participant gives any verbal indication that their safety or the safety of another person is at risk, the researcher must inform the relevant Home Treatment Team or Psychiatric Hospital.

For example:

- The participant indicates that they have non-imminent plans to end their own life.
- The participant indicates that they feel unable to keep themselves (or others) safe.
- The participant discloses that they are repeatedly engaging in behaviours that threaten the safety of themselves or others (e.g., are repeatedly taking overdoses of dangerous medication).
- The participant indicates that they have immediate plans to behave in a way that will threaten their own life or the life/lives of others.
- The participant indicates that they have plans to attempt suicide that day.

If these circumstances occur, the researcher will:

- Wait until the interview has concluded and thank the participant for their help and their efforts in the process. The interviewer will then state:

> *"based on the information you have provided, I have concerns about your current safety/the safety of those around you and therefore I am going to contact the [relevant service] so that they are aware of this information and can provide you with the appropriate support".*

- If the participant complains about this decision, the interviewer will reiterate that they are really concerned about their safety and that they are going to have to get them some extra support. They will then reassure the participant that this is being done in order to provide appropriate support to them. The

interviewer will then end the interview and will then proceed to contact the relevant team.

- The Home Treatment Team are aware of this protocol and have agreed to act as the point of contact if there are concerns about the safety of the participant. After the interviewer has passed on all the relevant information and concerns about the participant to the Home Treatment Team, the Home Treatment Team will assess the risk and act according to their existing protocols.