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of Glasgow

Towards an Enhanced Understanding of Suicide Risk in Men

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Degree of Doctor of Philosophy

Psychological Medicine
Mental Health and Wellbeing
Institute of Health and Wellbeing
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Abstract

Background

Suicide is a major public health concern and continues to be a significant risk for men. It is estimated that 703,000 people die each year by suicide and in 2018 men accounted for over two-thirds of suicide deaths in the UK. Also, suicides in men outnumber women in all countries and in all age groups studied by the Global Burden of Disease Survey (except the 15-19 year group). In Scotland, the highest rates of suicide were among men aged 45-54 in 2020. Recent reviews have highlighted advances in our understanding of risk factors for suicide, however, despite more than fifty years of suicide research, our ability to predict suicide is no better than chance. That is not to say that progress has not been made because it has. For example, there have been several theories of suicide proposed over the past one hundred years, from sociological, biological, and psychological. In a recent review paper, the complexity of suicidal behaviours and the development of suicide risk was outlined, which can be influenced by biology, psychological factors, clinical factors as well as social and environmental factors. Therefore, the overarching aims of this thesis are to investigate: 1) What demographic, clinical and psychosocial factors confer vulnerability for suicidal behaviour in men? 2) What factors differ between men and women regarding suicide risk? 3) Which factors are associated with suicidal thoughts versus suicide attempts in men and women?

Method

This PhD thesis is comprised of 4 empirical chapters. It begins with a systematic review of the literature, conducted to investigate risk factors for suicidal behaviour in men (N = 105 studies). Then secondary data analysis of two large nationally representative datasets was undertaken, to examine sex differences in factors which associated with suicide attempts vs suicidal thoughts and factors associated with method choice. Chapter 3 analysed the Adult Psychiatric Morbidity Survey (APMS) and Chapter 6 analysed the Scottish Suicide Information Database (ScotSID). Then two qualitative studies were undertaken, following the principles

of Interpretative Phenomenological Analysis, to enhance understanding of personal, social, and cultural factors in men who have attempted suicide and the male experience of suicide attempts and recovery.

Results

In the systematic review (Chapter 2), the risk factors with the strongest evidence predicting suicidal behaviour in men were alcohol and/or drug use/dependence; being unmarried, single, divorced, or widowed; and having a diagnosis of depression. In the prospective studies, the most consistent evidence was for sociodemographic factors (19 risk factors), mental health/psychiatric illness (16 risk factors), physical health/illness (13 risk factors), and negative life events/trauma (11 risk factors). There were a small number of psychological factors (6 factors) and characteristics of suicidal behaviour (3 factors) identified. In chapter 3, men were less likely to report suicidal thoughts and attempts, compared to women. More factors differentiated between suicidal thoughts and attempts in women compared to in men; these included hospital admission for mental illness, below degree level qualifications, being single and childhood adversity. In men, factors which significantly differentiated between suicidal thoughts and attempts included self-report of professional diagnosis of mental illness and childhood adversity. Higher levels of social support were associated with being in the suicidal thoughts group versus in the attempts group in men. Chapter 4 revealed the pressure many of the men felt to attain the status of being a “successful man” and failing to do so affected their self-confidence and self-esteem. The prevailing impact of past experiences was also relevant. The build-up to the attempt differed among the participants although several had experienced poor mental health for a prolonged period. Also, various motivational factors emerged such as entrapment, hopelessness or perceived burdensomeness. Chapter 5 explored the suicidal process in men, from suicide attempt to recovery. The findings provide insights into how men cope with suicidal thoughts or negative emotions, often avoiding seeking help and suppressing their emotions. The men’s lives were significantly affected by the attempt, with some stating that they had changed as a person. Importantly, the findings indicate that men do recognise that they need help and can be receptive to help but can feel they need to be approached in the first instance. Finally, chapter 6 demonstrated that men who

died by suicide were more likely to use violent methods compared to women. Also, the influence of other factors such as marital status, employment status, deprivation, place of occurrence at home and suicidal intent provides a more detailed account of the situation individuals were in at the time of the attempt.

Conclusions

This thesis includes one of the first literature reviews of its kind, a systematic review of risk factors for suicidal behaviour in men as well as two qualitative studies and two secondary data analyses. Spanning predisposing factors, such as early life experiences and childhood education, to mental illness and health, the path towards suicide in men is multifaceted and involves a complex interplay of factors. The findings also reveal how many factors have a differential impact on males and females and future research should examine the extent to which these factors influence suicide risk over time. In addition, men's lives can be significantly affected by a suicide attempt, demonstrating the need for support during this vulnerable period. The evidence presented in this research also has important implications for policy and clinical practice.

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List of Publications Arising from this Thesis

Richardson, C., Robb, K.A., McManus, S. and O'Connor, R.C., 2022. Psychosocial factors that distinguish between men and women who have suicidal thoughts and attempt suicide: findings from a national probability sample of adults. *Psychological medicine*, pp.1-9.

Richardson, C., Robb, K.A. and O'Connor, R.C., 2021. A systematic review of suicidal behaviour in men: A narrative synthesis of risk factors. *Social Science & Medicine*, p.113831.

Richardson, C., Dickson, A., Robb, K.A. and O'Connor, R.C., 2021. The male experience of suicide attempts and recovery: an interpretative phenomenological analysis. *International journal of environmental research and public health*, 18(10), p.5209.

Richardson, C., Dickson, A., Robb, K.A. and O'Connor, R.C., 2021. "there is nothing, there is no tomorrow, there's no future here": An Interpretative Phenomenological Analysis of personal, social and cultural factors in men who have attempted suicide. *Crisis*. Manuscript submitted for publication.

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Author's Declaration

"I hereby declare that I am the sole author of this thesis, except where the assistance of others has been acknowledged. It has not been submitted in any form for another degree or professional qualification."

Cara Richardson

December 2021

Chapter 1: Introduction

1.1 General Introduction

This chapter introduces the relevant research, suicide prevention policies and theoretical approaches that underpin this thesis, including suicidal behaviour, help-seeking and protective factors in men. The rationale for this thesis is outlined, which focuses on understanding risk factors for suicidal behaviour in men and gender differences in suicidal behaviour. This chapter ends with an overview of the objectives, structure and key research aims of this thesis.

1.2 Definitions

As the focus of this thesis is on understanding suicide risk in men, it is important from the outset to provide definitions for commonly used terms used throughout this thesis. The terms used in this thesis (Table 1.1) can be understood in line with the definitions provided by (Turecki et al., 2019). Self-harm and non-suicidal self-injury were not included in this thesis as a central tenet of this thesis was to tap into the Gender Paradox of Suicide (Canetto and Sakinofsky, 1998) that men are more likely to die by suicide but women are more likely to attempt suicide.

Table 1.1: Definitions (Turecki et al., 2019)

Term	Definition
Suicide	Intentionally ending one's own life.
Suicidal behaviour	Behaviours that may result in ending one's life, whether fatal or not. This term excludes suicidal ideation.
Suicide attempt	Self-injurious, non-fatal behaviour with inferred or actual intent to die.
Suicidal ideation	Any thoughts about ending one's own life. May be active, with a clear plan for suicide, or passive, with thoughts about wishing to die.

1.3 Suicide

Suicide is a major public health concern (Naghavi, 2019b) and continues to be a significant risk for men, in particular. It is estimated that 703,000 people die each year by suicide (World Health Organisation, 2021b) and in 2018 men accounted for over two-thirds of suicide deaths in the UK (Office for National Statistics, 2019). Also, suicides in men outnumber women in all countries and in all age groups studied by the Global Burden of Disease Survey (except the 15-19 year group) (Naghavi, 2019b). In Scotland, the highest rates of suicide were among men aged 45-54 in 2020 (ScotPHO, 2021). Across 17 countries, Nock et al. (2008) reported that the prevalence of suicidal ideation, plans, and attempts were 9.2%, 3.1%, and 2.7% respectively. The global prevalence of 12-month suicidal ideation and suicide attempts were reported to be 2% and 0.5%, respectively, and it was reported that a higher prevalence of suicidal ideation was found in high-income countries and individuals aged 65 years and over (Cabello et al., 2020). Cabello et al. (2020) found no global differences in suicide attempt prevalence between older and younger-and-middle age adults, which is at odds with previous prevalence studies that did find differences (Borges et al., 2010). Although, it is important to note that globally the majority of suicide deaths occur in low and middle income countries where approximately 84% of the world's population resides (World Health Organisation, 2019). Especially, as this report noted that gender differences in suicide deaths in Bangladesh, China, Lesotho, Morocco, and Myanmar were reversed, with women more likely to die by suicide than men (World Health Organisation, 2019). Suicide cannot be viewed in isolation, it transcends the individual tragedies and impacts upon the wider community, with studies estimating that between 45 and 135 people can be impacted (Berman, 2011, Cerel et al., 2019).

This introduction will set out an overview of previous research into suicide risk in men, from risk factors, help seeking and protective factors to suicide prevention policies and models of suicidal behaviour. This will highlight some of the gaps in our understanding of suicide risk in men which informs the key research aims of this thesis.

1.4 Risk Factors

Recent reviews (Franklin et al., 2017, O'Connor and Nock, 2014, Turecki and Brent, 2016, Turecki et al., 2019) have highlighted advances in our understanding of risk factors for suicide, however, despite more than fifty years of suicide research, our ability to predict suicide is no better than chance (Franklin et al., 2017). That is not to say that progress has not been made because it has. For example, there have been several theories of suicide proposed over the past one hundred years, from sociological (Durkheim, 1897), biological (Oquendo et al., 2014) and psychological (O'Connor and Kirtley, 2018) standpoints. In a recent review paper, Turecki et al. (2019) outlined the complexity of suicidal behaviours and the development of suicide risk, which can be influenced by biology, psychological factors, clinical factors as well as social and environmental factors. Predisposing factors (distal or diathesis) and precipitating factors (proximal, triggering or stress) can interact and suicide risk is the result of a complex interplay of these factors (Turecki et al., 2019), which can be present at different times in an individual's life. Developmental factors also play a role as Turecki et al. (2019) note that the former factors can also be mediated by other factors such as impulsivity or anxious personality traits.

Understanding what influences the transition from suicidal thoughts to attempts is crucial as Nock et al. (2008) found that approximately 60% of transitions occur in the year of the first onset of suicidal ideation. Turecki et al. (2019) outlined the importance of understanding risk factors for suicidal behaviour but they recognise the difficulties in disentangling the relative influences of these factors across the suicide spectrum. The risk of acting on suicidal thoughts can increase depending on the frequency of suicidal ideation, the degree of suicidal intent and content of suicidal ideation (i.e., having a plan) (Turecki et al., 2019). The sensitivity, specificity of predictive value of suicide risk factors is crucial for translation to suicide risk prevention in clinical practice and policy. Identifying risk factors with adequate predictive power beyond a mental illness approach, such as deprivation, can provide more of a picture of the person's life at the time of their suicide attempt. Previous research has recommended the types of research that would provide more accurate predictions such as prospective

studies, blinded assessments to reduce bias and the use of an adequate sample size due to the low base rate of suicide and suicide attempts in the general population (Haney et al., 2012).

In their review of the developments and challenges in suicide research, O'Connor and Portzky (2018a) detailed some key recommendations for research that have been considered in the development of this thesis. It was noted that there needs to be more of a focus on suicide deaths, to gain a more accurate picture of an individual's life before they died by suicide (O'Connor and Portzky, 2018). Thence this thesis includes one of the first research studies to have access to the Scottish Suicide Information Database (ScotSID) and will be able to investigate sex differences in suicide methods and psychosocial factors associated with method choice. Other widely cited reviews, such as Franklin et al. (2017), who reviewed 50 years of research on risk factors for suicidal thoughts and behaviours, noted various concerns with suicide risk factor research. First, many studies used different measures and definitions of risk factors which made synthesis difficult. Second, risk factors were often considered in isolation and the interactions between risk factors were not analysed. Third, despite over 50 years of research, prediction is only slightly better than chance, highlighting the need for more research to address these concerns. The next section provides an overview of previous research investigating risk factors which confer vulnerability for suicidal behaviour in men. Risk factors are considered as characteristics of the person or their environment that increase their likelihood of experiencing suicidal ideation, suicide attempts or death by suicide. Whilst vulnerability is considered as groups that may have heightened suicide risk e.g., psychiatric inpatients or those who have experienced childhood sexual abuse.

1.5 Suicidal Behaviour in Men

1.5.1 Biology

There is debate over whether men are more biologically predisposed to suicidal behaviour than women, due to greater pain tolerance and reduced fear of dying (Witte et al., 2012). Engaging in self-injurious behaviour may increase pain tolerance and decrease pain sensitivity (Law et al., 2017), and this link with suicide may increase with greater levels of pain persistence (Koenig et al., 2016).

To date, biological markers have been weakly associated with suicidal behaviour (Chang et al., 2016), however, there are some factors which merit more investigation such as stress and testosterone levels. The impact of stress on suicidal behaviour has also been examined (Thomas et al., 2021a), with specific biomarkers classed as stress mediators (e.g. cortisol, immune markers) shown to have been associated with suicidal behaviours. However, it is not clear whether these differ in men and women. Serotonergic changes have also been noted in depression and suicide (Underwood et al., 2018) and this has found to independent of sex. Although some studies have questioned the impact of serotonin on suicide risk (Mann, 2021) and suggest that it may have a secondary effect compared to neurotrophic abnormalities (Karege et al., 2005, Dwivedi et al., 2003, Banerjee et al., 2013), abnormalities in the acquired stress response (Steinberg and Mann, 2020, Rizk et al., 2018) or inflammation (Serafini et al., 2020).

A recent review (Lengvenyte et al., 2021) noted that testosterone levels, both high and low levels, may be linked to suicidal behaviour in men although the current evidence is predominantly based on small sample sizes and cross sectional study designs. This review also found that there is a potential for a genetic predisposition for suicidal behaviour but there has yet to be genes identified with large effects (Lengvenyte et al., 2021). Environmental factors can also impact upon genes and gene expression, in line with the diathesis-stress model, such that if adversity occurs during a critical developmental stage or in an individual with a genetic predisposition negative coping strategies can emerge, such as impulsivity (Lengvenyte et al., 2021). It is important to note that none of these emerging

factors has been translated into changes in clinical practice but point to useful avenues for investigation.

1.5.2 Sociodemographics

Deeper exploration of demographic and social factors can aid understanding of the situations where people live and work. The impact of occupation on suicide rates is an important consideration. Indeed, a recent review on physician suicide found that there was a significantly higher risk of suicide in female physicians compared to females in general whereas, in men, suicide risk was significantly lower in male physicians compared to males in general (Duarte et al., 2020b). This also supports the findings of a similar review by Lindeman et al. (1996).

Another occupation group identified as a particular at-risk group is farmers. In a recent study of farmers in the United States (81% male) the only factor which emerged as a risk factor for suicide was self-blame (particularly regarding coping) (Bjornestad et al., 2021). This demonstrates the need for more mental health related public health programmes to improve or provide more information on mental health literacy and coping strategies. This job role can present unforeseen challenges, often not seen in other industries, for example issues with debt, dealing with the deaths of animals and crop failures which could then be compounded by negative coping strategies (Bjornestad et al., 2021, Perceval et al., 2019, Guha and Das, 2022). The impact of living a rural area can also impact mental health and coping strategies, due to poor access to mental health services, stigma and services not adequately designed to meet their needs (Gunn and Hughes-Barton, 2022, Perceval et al., 2019). There is also the possibility of increased access to and familiarity with lethal means, such as firearms (Steck et al., 2020).

Consideration of occupation status is an important addition to suicide prevention strategies and can aid understanding of some of the contextual factors associated with suicidal behaviour in men and women.

Lifetime suicide risk has also been shown to be over two-fold higher in lesbian, gay and bisexual people compared to heterosexual peers; and lifetime suicide attempts are particularly high in gay and bisexual men (over 4 times higher) (King et al., 2008). Twelve-month prevalence of depression and anxiety disorders, as well as alcohol and other substance dependence, are also elevated in lesbian, gay and bisexual people. It is likely that such studies are under-estimates of the prevalence, as sexualities can at times be hidden, leading to underrepresentation of LGBTQ+ individuals classified as such in coroner's records of suicide. Thence the authors recommend that LGBTQ+ individuals be deemed a high-risk group in suicide prevention efforts, particularly due to the increased prevalence of mental illness and suicide attempts in these populations.

Miranda-Mendizabal et al. (2019) conducted a large systematic review that investigated gender differences in suicidal behaviour in adolescents and young people. They found that females exhibited an increased risk for suicide attempts whereas males presented an increased risk for suicide death. Mental illness or substance use disorder and exposure to interpersonal violence were associated with increased risk for suicidal behaviour in both groups. However, risk factors for suicide attempts in females included eating disorders, posttraumatic stress disorder, being a victim of dating violence, symptoms of depression, interpersonal problems, and previous abortion. Whereas in males, risk factors for suicide attempts included behaviour or conduct problems, hopelessness, parental separation or divorce, suicidal behaviour in a close friend and access to means. With respect to suicide deaths in males, drug abuse, externalising disorder, and access to means emerged as risk factors. Surprisingly, it was clear from the review that there was no evidence for protective factors in the 12-26 age group, such as social, peer or community support, being associated with suicide attempts or suicide death, which is important to consider further, particularly in younger age groups.

1.5.3 Gender Paradox

The Gender Paradox of Suicide (Canetto and Sakinofsky, 1998) is a well-established finding, in Western contexts, that women are more likely to attempt

suicide, but men are more likely to die by suicide. Gender in this thesis is considered in accordance with Crawford (2011) where gender is defined as “whatever a culture at a particular time in history describes as feminine and masculine”. Gender is a feature of society rather than a characteristic of the person (Crawford, 2011). Connell (2002), Connell (2020), Connell (2005), Connell and Messerschmidt (2005) describe the process of becoming a man as a process of creative development, with different types of masculinities emerging, constructed through everyday practices and relationships. These local masculinities compete for power and normative status, the dominant masculinity is “hegemonic” (Connell and Messerschmidt, 2005).

Disentangling the influence of risk factors across the suicide spectrum in men versus women enables the identification and treatment of individuals at risk of dying by suicide. It is also known that the time taken to transition from thinking about suicide to acting on these suicidal thoughts can be shorter in men (Schrijvers et al., 2012), highlighting the need to broaden understanding of this transition. The temporal influence of risk factors has been noted (Schrijvers et al., 2012), with risk factors often being present in females in the middle of the suicidal process (during the ideation to action formation stage), as this tends to be longer and can often result in suicidal ideation. Whereas in males, many risk factors were present at the end of the suicidal process which can have a shorter duration and lead to death by suicide. Although, previous research has noted that men may be less likely to disclose their suicidal thoughts and when they do, they are less likely to be heard (Dahlen and Canetto, 2002). It may also be that due to the different nature of male and female friendships, women have more social and emotional support available to them than men, therefore they may feel more supported (Canetto, 2017). Gendered stigma in relation to suicidal behaviour is also relevant here; men may feel there is stigma in regard to them experiencing suicidal thoughts whereas women may feel stigma in regard to the act of taking their own life (Deluty, 1989, McAndrew and Garrison, 2007, Canetto, 1993, Canetto, 2017, Dahlen and Canetto, 2002). The perpetration of these gendered stigmas may reinforce the Gender Paradox of Suicide (Canetto and Sakinofsky, 1998). Help-seeking can also differ between males and females, with males viewing this more negatively and as a sign of weakness (Schrijvers et al., 2012). Many factors will

overlap across genders but understanding the differential impact of risk factors should inform the tailoring of treatment and prevention strategies to individuals.

Suicide risk in men is a complex issue, encompassing various factors throughout their lives, from early childhood experiences to mental illness and negative life events. Previous systematic reviews have investigated suicide in male and female physicians (Duarte et al., 2020b, Lindeman et al., 1996), gender differences in suicidal behaviour in adolescents and young people (Miranda-Mendizabal et al., 2019), risk factors for suicide in prisoners (Fazel et al., 2008), mental disorders, suicide and self-harm in lesbian, gay and bisexual people (King et al., 2008), signs of suicide in men (Hunt et al., 2017) and male depressive symptoms concerning violent suicides or suicide attempts (Sørensen et al., 2019). Nonetheless, to date, there has not been a comprehensive systematic review on risk factors for suicidal behaviour in men which is one of the key facets of this thesis (see Chapter 2).

1.5.4 Life Experiences

Previous research has identified a multitude of possible risk factors for suicidal behaviour in men. For example, similar to other areas of mental health, early life experiences are likely to play an important role across the lifespan. Indeed, in a recent study of young Kenyan men, lack of secure early childhood attachment was associated with suicidal ideation (Goodman et al., 2018). Large prospective studies have also reported various factors associated with suicide mortality in men, such as low body mass index (BMI), low cognitive function and mental illness (Osler et al., 2008) as well as social isolation, lack of integration at school and poverty (Rojas and Stenberg, 2010a). This highlights the prevailing impact of early life experiences on suicide risk in men.

The accumulation of negative life events can lead to feelings of being trapped or entrapment (O'Connor and Kirtley, 2018), that there is no escape from life's unsolvable problems. The breakdown of a relationship is a well-known risk factor for suicidal behaviour in both men and women, although the risk is often greater in men (Scourfield and Evans, 2015). This may represent the loss of their only true emotional support (their partner) (Joiner, 2011), they could lose their home and

may also lose access to their children (through custody hearings) (Payne et al., 2008). The loss of a job and the accumulation of debt can also lead to suicidal thinking and behaviours (Liu et al., 2013, Stack and Wasserman, 2007).

1.5.5 Clinical Factors and Emotional Expression

It has also been suggested that although men and women experience emotions in the same way their expression of these emotions can vary (Brownhill et al., 2005). In some men, depression may manifest itself in avoidant, numbing and escape behaviours which may, in turn, lead to aggression, violence and suicidal behaviour (Brownhill et al., 2005). Men may express their emotions in ways different to women which could lead to the underreporting or under detection of male mental illness (Brownhill et al., 2005, Owens et al., 2011, McQueen and Henwood, 2002). For example, they may feel more comfortable describing the physical symptoms of depression, as opposed to emotional symptoms.

A recent systematic review reported that signs of suicidal ideation in men included social withdrawal, anger and reduced problem-solving capacity (Hunt et al., 2017). Signs of suicide attempts were statements of suicidal intent, calmness, anger, apathy, hopelessness, risk-taking and appearing “at peace”. Signs preceding death by suicide included desperation and frustration in the face of unsolvable problems, helplessness, worthlessness, statements of suicidal intent and emergence of a positive mood state. Although important findings, the extent to which these signs are specific to men experiencing current suicidal thoughts and behaviours remains unclear.

There were two symptoms from The Gortland Male Depression Scale (GMDS) that were reported to be associated with violent suicide deaths and attempts (Sørensen et al., 2020): these were overconsumption of alcohol or drugs and suicide attempts among family members. It was also noted that there were no studies that systematically assessed symptoms of male depression in violent suicides or suicide attempts (Sørensen et al., 2020) but this may be an important consideration in regard to how men present with depression.

1.5.6 Masculinity

Representations of the male social role have also received research attention. Do traditional representations of masculinity prevent men from seeking help, as they do not wish to be viewed as vulnerable? Are such representations associated with maladaptive coping styles such as alcohol and drugs, reluctance to seek help and hiding their true emotions (Oliffe et al., 2017, Cleary, 2012). Avoiding being viewed as vulnerable, in the face of difficult emotions or life experiences, may be of central importance to some men, particularly those who have been socialised to adhere to traditional masculine norms such as stoicism (Levant, 1996; New, 2001; Anderson, 2009; Ridge et al., 2011). Men may also feel excluded from society if, for example, they become unemployed, and view this as a personal failure which may lead to helplessness, depression and suicidal ideation (Möller-Leimkühler, 2003). A failure to live up to their self-standards can lead to a feeling of intense shame where suicide feels like the only solution (Rasmussen et al., 2018a, Lee et al., 2017, Adinkrah, 2012).

1.5.7 Personality and Individual Differences

Personality factors and individual differences are important to consider regarding suicide risk in men. Indeed, Dumais et al. (2005) compared men diagnosed with major depressive disorder who died by suicide and living men diagnosed with the condition and the men who died by suicide had higher levels of impulsivity and aggression than the living men. This difference was also impacted with age, as the younger men (aged under 40) who died by suicide displayed more impulsive and aggressive traits (Dumais et al., 2005). McMahon et al. (2018) found that impulsivity was associated with suicidal ideation, not suicide attempts in men, and was not a significant factor in women. This also appears to be relevant in men with mental illness and history of suicidal ideation and attempts as men with schizophrenia (Iancu et al., 2010) and men diagnosed with alcohol dependence (Koller et al., 2002) who scored higher in impulsivity also reported more lifetime suicide attempts compared to the low impulsivity group. Klonsky and May (2015a) reviewed the existing research on impulsivity and concluded that it may be a distal or contributory predictor of suicide and influence the transition from suicidal

thoughts to attempts. Although, as a large proportion of the research utilises a cross-sectional design, large prospective studies are required to examine this association in both men and women (Klonsky and May, 2015a).

1.5.8 Method Choice

Method choice can differ between males and females. This is often viewed through a masculine lens, with death by self-inflicted gunshot and hanging most common in males as surviving a suicide attempt can be feminised, viewed as failing to take their own life (Beautrais, 2002). Women are more likely to die from self-poisoning which has a slower rate of action, hence females usually have more time to be saved (Beautrais, 2002). A “failed” suicide may be viewed as weak and a threat to masculinity whereas a so-called “successful” suicide is viewed as brave and decisive (Canetto and Sakinofsky, 1998). Occupational exposure to lethal means is also relevant, in the military for example (McGlade et al., 2016). Although men and women differ in method choice, it is not clear whether they differ in their intent to die (Denning et al., 2000).

The following section will provide an overview of factors that influence help seeking and are protective against suicidal behaviour in men.

1.6 Help-Seeking and Protective Factors in Men

1.6.1 Men Living in Rural Areas

Understanding the experiences of rural men is also important. Indeed the distress of rural men has been defined as a “silent crisis” (Roy and Knežević Hočevar, 2019, DesMeules et al., 2012) as men report lower rates of depression but have significantly higher rates of suicide than women (Affleck et al., 2018). Recently, Rachel et al. (2020) studied men living in rural locations in Canada, where rates of suicide are higher in rural men compared to rural women, when compared to those living in more urban environments. They found that many men wanted to speak about their mental health, and often spoke to their intimate partners in the first instance. Although in this study only 48% of the men were married demonstrating the need for them to form different social networks or connections which can be difficult in rural locations as for many their spouse or partner is their only source of emotional support (Rachel et al., 2020). Although some men worked towards being able to develop relationships and spaces within their families to be open about their mental health. There were also challenges identified regarding talking to neighbours and the culture around rural men’s mental health. There were concerns regarding gossip, isolation, shame, and fear in rural communities highlighting the need for increased knowledge and acceptance of mental health in these communities (Rachel et al., 2020). Overall, improving emotional literacy and reducing stigma towards mental illness and suicide may work towards enhancing help seeking in rural men, although the issues with accessing health care is still an issue in rural communities. Enhancing the ways in which men can engage with one another to increase their levels of social support, particularly if they are surrounded by men they feel they can relate to (Creighton et al., 2017).

1.6.2 Men in Prison

Several demographic, criminological and clinical factors have been shown to be associated with suicide risk in prisoners (Fazel et al., 2008, Zhong et al., 2021). Indeed, a recent systematic review of 77 studies (Zhong et al., 2021) noted some modifiable risk factors that were associated with suicide risk in prison, including

suicidal ideation whilst in prison, being in a single-cell and a psychiatric diagnosis. Other factors included having no social visits, serving a life sentence, and being convicted of a violent offence (Zhong et al., 2021). This demonstrates the need for access to mental health support, particularly for those who have a previous suicidal history, and for improvements in the prison environment e.g., reducing single cell occupancy.

Experiences of men in prison have also been studied as incarceration can be a high-risk period for poor mental health and suicidal behaviours (Howerton et al., 2007). Indeed, many of the men interviewed by Howerton and colleagues said that they would not seek help if they were experiencing mental distress. They highlighted a fear of being diagnosed with a mental illness, linked to stigma or the fear of having to confront their problems. A lack of trust in authority figures, often stemming from childhood adversity, was also mentioned. These findings highlight the importance of increasing knowledge and acceptability of seeking help for mental illness and suicidal behaviours, particularly in at-risk groups. They also emphasised that many men would seek help from a figure they trusted and respected.

1.6.3 Factors Influencing Healthcare Access

Determining which factors influence help-seeking in males is an important area of research, particularly as men may not seek help until they reach a crisis point. However, one of the challenges, as noted by John et al. (2020), is that males tend to have less contact than females across all healthcare services. Having said that, three-quarters of males who died by suicide had contact with at least one healthcare service in the month before their death in Wales (John et al., 2020). In young men, falling short of self-perceived standards has been shown to be significant, particularly related to fear of being a failure, or fear of being diagnosed with a mental disorder; so this may explain in part, why they are less likely to seek help (Rasmussen et al., 2018c). These explanations, in conjunction with a state of being defeated, can lead to entrapment where suicide is viewed as the only solution to their concerns.

River (2018) proposed that theories of suicidal men's help-seeking should be broadened to encompass different male experiences, beyond avoidance and self-reliance. When they felt they had little to lose, 33% of men interviewed by River (2018) actively sought help. In addition, unsolicited encounters with health services (such as receiving treatment for self-harm injuries) was also shown to trigger help-seeking in 50% of the men. Whilst a further 17% actively avoided seeking help. Person-centred care was particularly valued among men, not solely pathologizing their experiences like mental illness but considering their social, environmental, and personal experiences (River, 2018).

Young men (aged 16-24) are less likely than young women to seek any form of help when experiencing mental distress, particularly lay support (Biddle et al., 2004). Males have also been found to present with higher levels of distress (measured using the GHQ-12) when they consulted a GP for support, compared to females. Although it is important to note that overall, less than one in five young adults with suicidal ideation tend to seek help from their General Practitioner (Biddle et al., 2004). Young men have also been found to be reluctant to seek professional help following a medically serious suicide attempt. For example, Cleary (2017) reported that one-third of men who had been hospitalised following a suicide attempt never presented to psychiatric aftercare and 20% attended for a short period. This also demonstrated that discharge following a suicide attempt is a significant at-risk period for men pointing to a reluctance to seek help, as 48% of men made a subsequent suicide attempt and 12% died by suicide in the 7 years follow up period (Cleary, 2017). Barriers to accessing help can include a lack of knowledge or awareness of mental health symptoms, a reluctance to disclose distress and negative attitudes towards seeking psychiatric help (Cleary, 2017). These findings have also been replicated in a sample of male professional footballers, where shame, stigma and lack of knowledge of mental health and support were important barriers to help-seeking (Wood et al., 2017).

Stigmatising attitudes (either their own or others) can also have a significant impact on help-seeking. Many studies have suggested that women more commonly talk about and seek help for their emotional problems (Murphy, 1998, Canetto and Sakinofsky, 1998, Mościcki, 1994). Women also have a higher likelihood of attending appointments with their doctor, so they are more likely to ask for and

receive help (Beautrais, 2002). Oliffe et al. (2016) reported that males were more likely to report stigmatising attitudes regarding depression in men, compared to females. A greater number of men also indicated embarrassment regarding seeking help for depression, even those who had personal experience of depression and suicide. Experiences of men who lost a male friend, a family member or partner to suicide have also been examined (Oliffe et al., 2020a). In the latter study, men reported that they often felt that their loved ones would hide their suicidal feelings and need for support. There was also a feeling that overall, the deceased could not be helped, that they had previously sought help from social support and medical services but became estranged from these supports before their death. It was also suggested that services were ineffective, due to an overreliance on medication to treat complex suicide risk and mental illness and difficulties accessing mental health support (e.g., due to rurality or long waiting lists) (Oliffe et al., 2020a).

1.6.4 Coping Strategies

Maladaptive coping styles and a reluctance to seek help in times of crisis are factors relevant to increased suicide risk in men. This may be particularly relevant in older and middle-aged men because Canetto (2017) found that adversities due to ageing were not associated with suicide risk but rigid coping styles and hegemonic masculine views linked to suicide were influential. In addition, men tend to use more avoidance-based coping strategies compared to women (Tamres et al., 2002, Woodhead et al., 2014), consistent with societal norms of men hiding their emotions (Helgeson, 2011). It has also been found that even in men with large social networks, loneliness can be a problem due to the different nature of men's friendships (Joiner, 2011). For example, they may not wish to disclose emotional difficulties as this may threaten their masculinity (Cleary, 2012). Finding ways for men to engage with one another, bolster positive coping strategies and recognising that this can be a positive masculine trait (Oliffe et al., 2020a), i.e. they are seeking help to be a good father/role model to their family, can help men seek help before they reach this crisis stage.

1.6.5 Promoting Help-Seeking in Men

A systematic review of behaviour change techniques within interventions to target help-seeking in men concluded that the use of role models was particularly useful in increasing help seeking, perhaps because men can relate to the role model (Sagar-Ouriaghli et al., 2019). Across different studies, such role models engaged in a wide range of activities, including conveying psychoeducational information to improve knowledge of mental health, assisting with recognising, and managing symptoms, active problem-solving tasks, motivation behaviour change, signposting services and building on positive male traits such as responsibility and strength. Indeed recent evidence from Australia found that males attending the early intervention suicide programme named Mates in Construction (MATES) valued the importance of speaking the same language (Ross et al., 2019). The sessions were delivered by men working in the construction industry who had been trained in this intervention and many men responded well to the peer support model as it helped them overcome some of the traditional barriers to help seeking by providing positive stories of accessing help from those in the same industry as them.

So far, this introduction has focused on previous research on suicide prevention in men and the following section will provide an overview of suicide prevention policies. This allows for the exploration of how suicide prevention policies, worldwide and in the UK, consider the life experiences of and factors relevant to men.

1.7 Suicide Prevention Policies

Suicide prevention policies are required to tackle the risk factors for suicidal behaviour and the barriers towards help seeking for mental illness and suicidal behaviour. The following section sets out the agenda for suicide prevention policies worldwide and in the UK.

1.7.1 Worldwide

The World Health Organisation Member States (World Health Organisation, 2013) set out a commitment towards reducing the suicide rates in each member state by one third by 2030. The WHO LIVE LIFE: An implementation guide for suicide prevention in countries (World Health Organisation, 2021a) sets out how countries can introduce and tackle the key priorities in this guideline. Aspects of LIVE LIFE (World Health Organisation, 2021a) that apply to this thesis include the situation analysis which works to understand suicide rates, self-harm, methods used, precipitating or protective factors, legislation, services and resources. The priorities of LIVE LIFE (World Health Organisation, 2021a) do not directly target the reduction of suicidal behaviour in men but the situation analysis, which is being conducted across different cultures and countries, provides a better understanding of factors associated with suicidal behaviour in both men and women and can help tailor more focused suicide prevention efforts.

The next sub-sections will focus on England and Scotland specifically which is relevant to this thesis as factors that distinguish between suicidal thoughts and factors associated with method choice are examined in English and Scottish populations.

1.7.2 England

There are several policy initiatives in England that are relevant to suicide prevention. The most pertinent, though, is the national suicide strategy “Preventing Suicide in England: A cross-government outcomes strategy to save lives” which was published in 2012 and aimed to reduce the suicide rate in the general population by 10% (by 2020/21) and support those bereaved or affected

by suicide (UK Government, 2012). This strategy was updated in 2017 to include self-harm as an issue in its own right. A progress report published in January 2019 highlighted a 9.2% reduction in suicides (compared to 2015 levels) (UK Government, 2019a). The NHS Long-term Plan (published in January 2019) set suicide prevention as a priority over the next 10 years (NHS England, 2019). It solidified the NHS commitment to funding Sustainability and Transformation Partnership (STP) areas, implementing a new Mental Health Safety Improvement Programme, and employing suicide bereavement services across the country. The Cross-Government suicide prevention workplan (January 2019) set out key deliverables and timescales to address the Suicide Prevention Strategy and allocated £57 million for suicide prevention work up to 2023/24 (UK Government, 2019b). Another progress report, published in March 2021, set out additional government support and funding for suicide prevention in light of the additional pressures caused by the COVID-19 pandemic (UK Government, 2021). This included £5 million to support suicide prevention activities carried out by voluntary and community sector organisations over 2021-2022. Provisional data from England in 2020 (Office for National Statistics, 2021) demonstrated that there has been a further reduction in suicide, compared to 2019 levels (4,902 in 2020 compared to 5,316 in 2019); however caution is needed in interpreting these figures. A reduction in registered suicide deaths may also be reflective of pressures on coroners during the COVID-19 pandemic which may cause a delay in the registering of deaths.

Men were identified as an at risk group in this report (UK Government, 2012, UK Government, 2019b) and a key objective in this report was that “Those who work with men in different settings, especially primary care, need to be particularly alert to the signs of suicidal behaviour”. This thesis will address, in part, this objective by analysing risk factors for suicidal behaviour in men and providing the voices of men with lived experience to better understand suicide risk.

1.7.3 Scotland

In Scotland the key premise of the “Suicide prevention action plan: every life matters” (Scottish Government, 2018) is that suicide prevention is everyone’s business, that suicide is preventable and that anyone contemplating suicide or

bereaved by suicide has access to help and support. This extends the work from the 2013-2016 suicide prevention plan and was due to be renewed in 2021. The Scottish government has set a target to reduce the rate of suicide by 20% by 2022 (from a 2017 baseline). To achieve this goal, 10 actions were identified, including setting up and funding a National Suicide Prevention Leadership Group (NSPLG) in September 2018. The aim of the NSPLG is to ensure that timely and effective support for those affected by suicide is available across Scotland by working to develop a Scottish Crisis Care Agreement. Action 7 of the action plan is particularly relevant for this thesis. It states that ‘The NSPLG will identify and facilitate preventative actions targeted ‘at-risk groups’. Indeed, men were identified as an at-risk group in the strategy, particularly middle-aged men, with the recommendation that treatment and prevention efforts are tailored to ensure they are appropriate for at risk groups such as men.

A recent progress report of the Suicide Prevention Action Plan between 2018 and 2020 (Scottish Government, 2021) noted the challenges associated with the COVID-19 pandemic but did note some positive achievements over this period. The report highlights the need for more extensive monitoring and evaluation to understand the extent to which the key actions of “every life matters” are being addressed. The report also outlines the importance of operational and strategic leadership as well as adequate resources (time, personnel and funding) to support the delivery of this action plan (Scottish Government, 2021). This review does have some positive points for the future such as the in depth stakeholder engagement that has been undertaken and the important role of those with lived experience in guiding the delivery of the plan (Scottish Government, 2021).

This thesis includes the voices of men to provide a more rounded account of what suicidal behaviour and recovery means for those who have lived experience of this. This thesis also aims to provide a deeper understanding of suicide risk in men by analysing data from national samples of people at risk of suicide or who have died by suicide.

The next section will provide an overview of the predominant models of suicidal behaviour. Such models are helpful frameworks to consider how different factors can increase or decrease risk of suicide.

1.8 Models of Suicidal Behaviour

Several models of suicidal behaviour have been proposed to aid understanding of the factors that influence suicidal behaviour (Barzilay and Apter, 2014, Turecki et al., 2019) which can also guide research and policy concerning suicide prevention. Many models of suicidal behaviour recognise that there is a complex interplay of factors, including predisposing (otherwise known as distal or diathesis factors) and precipitating factors (otherwise known as proximal, triggering or stress factors) (Turecki et al., 2019). Although this thesis is not modelled on one particular model of suicidal behaviour, considering the predominant models is useful to understand the applications of the findings in this thesis.

The ideation-to-action framework is a recent framework that aims to help disentangle such risk and protective factors. It postulates that the development of suicidal ideation and the transition to a suicide attempt should be understood as separate processes (Klonsky et al., 2018). This is consistent with the leading models such as the Interpersonal Theory (IPT) (Joiner et al., 2009, Joiner, 2007), Integrated Motivational-Volitional (IMV) Model (O'Connor and Kirtley, 2018, O'Connor, 2011) and Three-Step Theory (3ST) (Klonsky and May, 2015b).

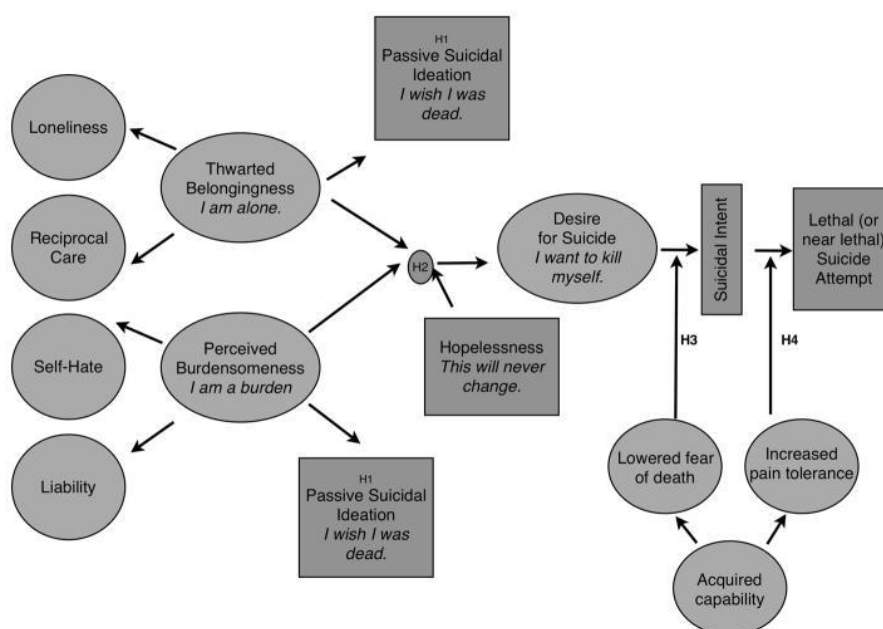
1.8.1 The Interpersonal Theory (IPT)

The Interpersonal Theory (IPT) (Joiner et al., 2009, Joiner, 2007) posits that suicidal behaviour is the result of the interaction between: the desire to die and having the capacity to take one's own life. Two distinct interpersonal psychological states are proposed to contribute to the desire to die, namely perceived burdensomeness (feeling like a burden to other people such as friends and family) and thwarted belongingness (feeling alienated). These factors are posited to lead to the emergence of suicidal ideation but are proposed to be insufficient to account for suicidal behaviour. That is where acquired capacity for suicide comes in, as its presence is key to the transition from suicidal thoughts to suicidal acts. Acquired capacity for suicide, which is defined as a fearless about

pain, injury or death, can be developed through experiencing pain habituating experiences such as self-injury (Joiner et al., 2009, Joiner, 2007).

Various studies have tested the clinical utility of the IPTS (Chu et al., 2017, Ma et al., 2016). Forkmann et al. (2020) examined the facets of the IPTS in a prospective study of adults admitted to a psychiatric hospital because of a suicide attempt or suicidal ideation. Prediction of future suicide attempts in the 12 months follow up period was not influenced by the interaction between thwarted belongingness, perceived burdensomeness and capability for suicide (Forkmann et al., 2020). In a sample of rural veterans only perceived burdensomeness, not thwarted belongingness, predicted suicidal thoughts, plans and attempts (whilst controlling for depression severity) (Compton et al., 2021). The interaction between perceived burdensomeness and thwarted belongingness was also non-significant (Compton et al., 2021). This highlights the importance of the consideration of a range of biopsychosocial factors in evaluating suicide risk (Franklin et al., 2017) and that a one size fits all approach may not be applicable across different cultures or subgroups (Hjelmeland and Knizek, 2019).

Figure 1.1: The Interpersonal Theory of Suicide



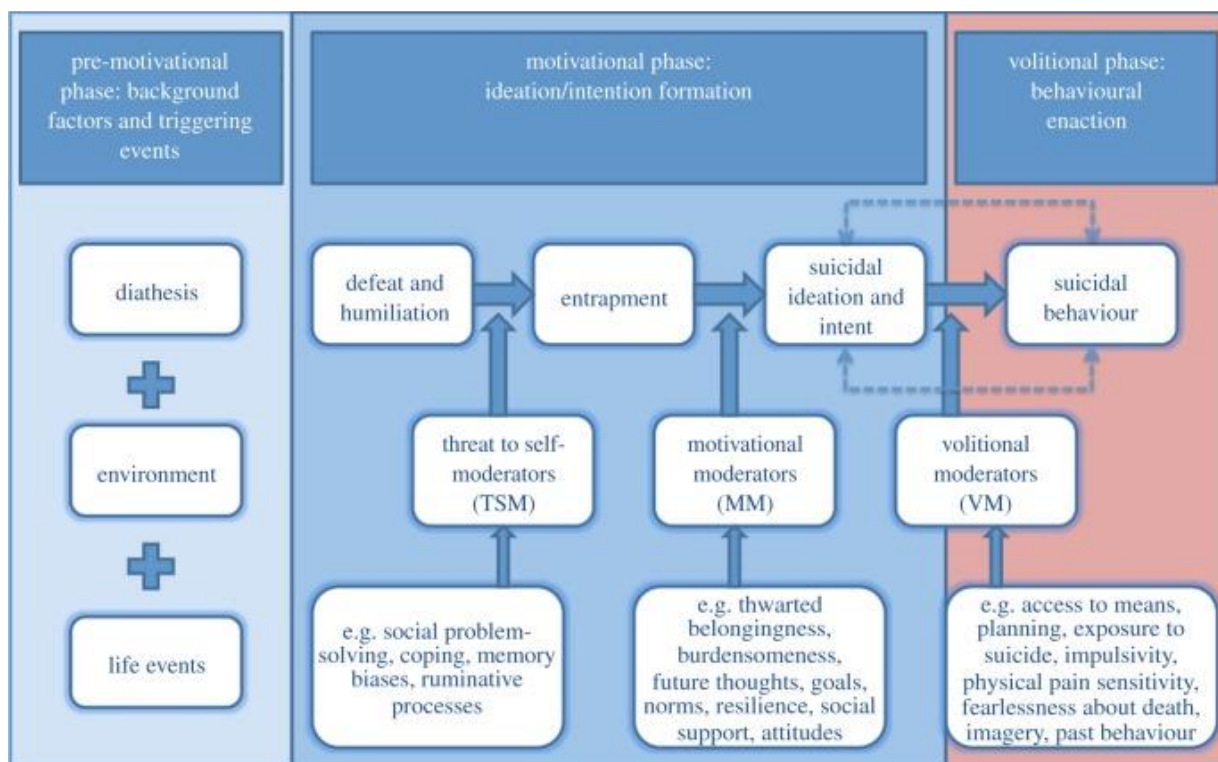
1.8.2 The Integrated Motivational-Volitional (IMV) Model

The Integrated Motivational-Volitional (IMV) Model (O'Connor and Kirtley, 2018, O'Connor, 2011) builds upon the IPTS as it incorporates elements from previous theoretical models and existing empirical elements, such as the diathesis-stress model, to form a three-phase model. This model focuses on three phases: the pre-motivational phase (background factors and triggering events), the motivational phase (the formation of suicidal ideation and intent) and the volitional phase (behavioural enactment). This theory explains that suicidal ideation can arise from feelings of defeat and entrapment, and entrapment can be exacerbated by other factors such as poor problem solving or coping strategies. Examples of volitional moderators that can influence the transition from suicidal ideation to behaviour include access to means, impulsivity and suicide capability. The main assumptions of the IMV model have been confirmed empirically, including the central pathway from entrapment to defeat resulting in suicidal ideation (Lucht et al., 2020, Dhingra et al., 2016, Ordóñez-Carrasco et al., 2020, Stenzel et al., 2020, Zortea et al., 2020b) as posited within the motivational stage. Although some studies (Tucker et al., 2016) have not found that defeat had an indirect effect on suicidal ideation through entrapment suggesting that this pathway to suicidal ideation may not be relevant for everyone. In addition, Stenzel et al. (2020) studied the components of the IMV model using Ecological Momentary Assessment (EMA) and found that defeat predicted entrapment initially but not at the second measurement (approximately 2 hours later). Temporal analysis of models of suicidal behaviour will allow for better prediction of validity and allow for a more accurate evaluation of suicide risk.

A key premise of the IMV model is that volitional phase factors/moderators govern the transition from suicidal thoughts to suicidal acts. In recent years, a series of studies, has supported this premise, finding that the volitional moderators do, indeed, distinguish between those who think about suicide vs attempt suicide (Dhingra et al., 2016), (Branley-Bell et al., 2019, Dhingra et al., 2015). Other factors have been found to be important in the context of the IMV model, such as loneliness which moderated the relationship between defeat and entrapment and entrapment and self-injurious thoughts (McClelland et al., 2021). Attachment style and perceptions of past parenting can also have long lasting impacts and

Zortea et al. (2020b) noted these attachments mediated the relationship between perceptions of past parenting and defeat whilst defeat mediated the association between attachment and entrapment. This study highlighted the importance of self-compassion and resilience, particularly in those with insecure attachment. Another factor emerged in a study of UK adults which highlighted decision avoidance as a motivational moderator in the IMV model (Saint-Cyr et al., 2021). This may be particularly concerning if the individual is also feeling trapped as those who avoid decision-making may experience higher stress levels and poorer wellbeing. Frustrated interpersonal needs have also been found to strengthen the entrapment to suicidal ideation relationship (Ordóñez-Carrasco et al., 2020) supporting the tenets of the IMV model which includes thwarted belongingness and perceived burdensomeness as motivational moderators. Brooding rumination has also been found to strengthen the association between defeat and entrapment, whilst hope weakened this relationship which highlights important areas for intervention (Tucker et al., 2016). Social comparison is also a variable of interest and has been found to mediate the relationship between socially prescribed perfectionism and defeat (Wetherall et al., 2019). Protective factors have emerged in the literature and Rasmussen et al. (2019) found that extraversion, agreeableness and emotional stability were protective for the pre-motivational stage in sexual minority groups. Resilience has also been found to be a significant protective factor, mediating the relationship between defeat and suicidal ideation (Wetherall et al., 2019, Zortea et al., 2020b) and negative social comparisons and entrapment (Wetherall et al., 2019).

Figure 1.2: The Integrated Motivational-Volitional Model of Suicidal Behaviour



1.8.3 The Three-Step Theory (3ST)

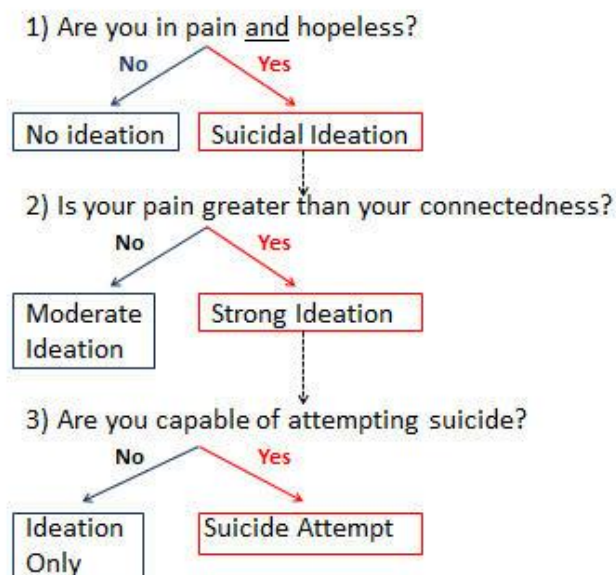
The Three-Step Theory (3ST) (Klonsky and May, 2015b) suggests that suicidal ideation is the result of pain (predominantly psychological pain) and hopelessness. Connectedness to others is an important protective factor against worsening suicidal ideation. The three-step theory also suggests that the progression from suicidal ideation to attempts is influenced by dispositional, acquired, and practical factors. Dispositional factors are predominantly related to genetics such as pain sensitivity, where someone with a low pain sensitivity is proposed to have a higher capacity to take their own life (Barzilay and Apter, 2014) whereas dispositional factors are related to life experiences that expose an individual to pain, fear or death such as self-harm and the death of a friend or family member by suicide. Finally, practical factors are related to access to means e.g., through occupation (in the military) or owning a firearm.

Several studies have examined the reliability and validity of the Three-Step Theory. In a prospective study of adults admitted to psychiatric facilities the first two steps of this theory were fully supported and the third step was partially supported (Tsai et al., 2021). The first step was that the combination of pain and

hopelessness drove suicidal desire, the second step was that connectedness mitigated the impact of pain and hopelessness on suicidal desire and, finally, suicidal desire is impacted by capability. Practical capability predicted which patients with a history of suicide attempts would go on to reattempt in the months following hospital discharge. Although, other measures of acquired capacity, such as dispositional or acquired, demonstrated weaker relationships with suicide attempts (past or future) (Tsai et al., 2021). The Three-Step Theory was also evidenced to be applicable in a student population where 24% of participants reported a suicide attempt(s), and 72.4% reported a lifetime history of suicide ideation. The interaction between pain and hopelessness accounted for 56% of the variance in suicidal desire (Dhingra et al., 2019) whereas connectedness was only partially protective. Suicidal capacity significant distinguished between those who thought about suicide and those who attempted suicide. Daruwala et al. (2021) was noted that certain masculine traits, particularly stoicism, influenced thwarted belongingness and suicidal capability in a sample of veterans. This highlights the importance of considering the context in which suicide prevention strategies are targeted, for example, in this context a strength-based approach that includes positive aspects of masculinity are considered. Emotional dysregulation, known as the inability to regulate negative emotional states, is associated with suicidal desire and capability in undergraduate students (Heffer and Willoughby, 2018). Emotional dysregulation was associated with higher levels of suicidal desire and non-suicidal self-injury, which predicted higher acquired suicidal capacity (Heffer and Willoughby, 2018). Interesting emotional dysregulation was associated with lower acquired capacity for suicide which implies that in this group thoughts of pain and death may be difficult to deal with. This research suggests that emotional dysregulation can lead to two different paths: one where it indirectly affects suicidal capacity through non-suicidal self-injury and another where it is protective against the development of acquired capacity for suicide. The Three Step Theory proposed that hopelessness contributes to suicide risk, but does not consider the context of this. Tucker et al. (2018) noted that interpersonal hopelessness was positively correlated to suicide risk, thwarted belongingness, and perceived burdensomeness. The interaction between the three variables was also significant whereas the interaction between general hopelessness, thwarted belongingness and perceived burdensomeness was

not significant. This demonstrates the importance of considering the nature and context of factors in models of suicidal behaviour.

Figure 1.3: The Three-Step Theory (3ST)



1.8.4 Applicability of the Theoretical Models to Understanding Suicidal Behaviour in Men

Although these models do not address gender specifically, there are aspects of the models that aid our understanding of suicidal behaviour in men.

The Interpersonal Theory (IPT) (Joiner et al., 2009, Joiner, 2007) described the process leading to suicidal behaviour as being categorised by the desire to die and having the capacity to take one's own life. Previous research has found that men with suicidal thoughts and behaviours frequently report difficulties coping with physical and/or mental illnesses or difficult situations in life (Kunde et al., 2018, Kiamanesh et al., 2015, Kizza et al., 2012, Milner et al., 2017a) and this can lead to harmful coping strategies such as alcohol or drug use (Milner et al., 2017a, Cleary, 2012, Creighton et al., 2017). Access to means can be more prevalent in certain occupations, for example, Kunde et al. (2018) examined this in male Australian farmers. This could possibly increase capacity for suicidal behaviour, in line with the Interpersonal Theory (Joiner et al., 2009, Joiner, 2007).

The Integrated Motivational-Volitional (IMV) Model (O'Connor and Kirtley, 2018, O'Connor, 2011) describes three phases which influence the progression from suicidal thoughts to behaviour. This thesis directly addresses factors which distinguish between suicidal thoughts in attempts in Chapter 4, in both males and females. The systematic review in Chapter 2 and the qualitative studies in 4 and 5 uncover factors associated with suicidal behaviour in men which is relevant to the pre-motivational phase of the IMV model (O'Connor and Kirtley, 2018, O'Connor, 2011). Also, given the Gender Paradox of Suicide (Canetto and Sakinofsky, 1998) it is important to understand factors which impact upon the volitional phase (behavioural enactment) particularly as men in Western countries are much more likely to die by suicide than women.

The Three-Step Theory (3ST) (Klonsky and May, 2015b) proposes that suicidal ideation arises from pain (mainly psychological pain) and hopelessness. The 3ST also suggests that the progression from suicidal ideation to attempts is influenced by dispositional, acquired, and practical factors. This thesis aims to understand suicide behaviour from the male perspective, to allow men to share the experiences that are relevant to them particularly regarding the build up to the suicide attempt and their experiences of recovery. Factors influencing the transition from suicidal thoughts to suicide attempts are explored including dispositional, acquired, and practical factors as explained in the 3ST (Klonsky and May, 2015b).

1.9 Overarching Aims and Thesis Structure

The research and theoretical discussions outlined above have detailed a vast array of risk factors that can influence suicidal behaviour in men. To extend our knowledge, this thesis aims to explore three main research questions:

1. What demographic, clinical, and psychosocial factors confer vulnerability for suicidal behaviour in men?
2. What suicide risk factors differ between men and women?
3. Which factors are associated with suicidal thoughts versus suicide attempts in men and women?

The thesis is structured into 7 Chapters: Chapter 1 provides an overview of the foundations and central aims of the thesis. Chapter 2 outlines the systematic review which investigated risk factors for suicidal behaviour in men. Chapter 3 details the investigation of the ideation to action model generally and the differences between males and females. Chapter 4 presents the findings from the qualitative study, focusing on factors leading up to the attempt in men. Chapter 5 presents the findings from the qualitative study, detailing the male experience of suicide attempts and recovery. Chapter 6 presents the analysis of sex differences in suicide methods. Finally, the thesis ends with a general discussion that provides a summary of the findings, implications, and directions for future research.

Chapter 2: A systematic review of suicidal behaviour in men - A narrative synthesis of risk factors

2.1 Abstract

2.1.1 Rationale

Suicides by men outnumber those by women in every country of the world. To date, there has not been a comprehensive systematic review of risk factors for suicidal behaviour in men to better understand the excess deaths by suicide in men.

2.1.2 Objective

The present systematic review seeks to determine the nature and extent of the risk factors to predict suicidal behaviour in men over time.

2.1.3 Methods

A range of databases (CINAHL, PsycINFO, Web of Science Core Collection, Pubmed, Embase, and Psychology and Behavioural Sciences Collection) were searched from inception to January 2020 for eligible articles. The findings were collated through a narrative synthesis of the evidence.

2.1.4 Results

An initial 601 studies were identified. Following the inclusion and exclusion criteria, there were 105 eligible studies (62 prospective and 43 retrospective) identified. Overall, the risk factors with the strongest evidence predicting suicidal behaviour in men were alcohol and/or drug use/dependence; being unmarried, single, divorced, or widowed; and having a diagnosis of depression. In the prospective studies, the most consistent evidence was for sociodemographic factors (19 risk factors), mental health/psychiatric illness (16 risk factors), physical health/illness (13 risk factors), and negative life events/trauma (11 risk factors). There were a small number of psychological factors (6 factors) and characteristics of suicidal behaviour (3 factors) identified. The findings from the

retrospective studies provided further evidence for the risk factors identified in the prospective studies.

2.1.5 Conclusions

This systematic review has highlighted the wide range of risk factors for suicidal behaviour in men, in this review alone 68 different risk factors were identified. Many factors can interact and change in relevance throughout an individual's life. This review has identified extensive gaps in our knowledge as well as suggestions for future research.

2.2 Introduction

Suicide is a major public health concern (Naghavi, 2019b) and continues to be a significant risk for men. Males accounted for over one-third of suicide deaths in the UK in 2018 (Office for National Statistics, 2019). The Gender Paradox Of Suicide (Canetto and Sakinofsky, 1998) is a well-established finding, in Western contexts, that women are more likely to attempt suicide, but men are more likely to die by suicide. Recent reviews (Franklin et al., 2017, O'Connor and Nock, 2014, Turecki and Brent, 2016, Turecki et al., 2019) have highlighted advances in our understanding of risk factors for suicide, however, despite more than fifty years of suicide research, our ability to predict suicide is no better than chance (Franklin et al., 2017). There have been several theories of suicide proposed over the past one hundred years, from sociological (Durkheim, 1897), biological (Oquendo et al., 2014) and psychological (O'Connor and Kirtley, 2018). Turecki et al. (2019) outlined the complexity of suicidal behaviours and the development of suicide risk, which can be influenced by biology, psychological factors, clinical factors as well as social and environmental factors. Even more surprising is that although suicides by men outnumber women in every country in the world, there has not been a systematic review of the extant literature focusing on suicide risk in men.

Nonetheless, previous research has identified several possible risk factors for suicidal behaviour in men. For example, similar to other areas of mental health, early life experiences are likely to play an important role across the lifespan. Indeed, in a recent study of young Kenyan men, lack of secure early childhood attachment was associated with suicidal ideation (Goodman et al., 2018). Large prospective studies have also reported various factors associated with suicide mortality in men, such as low body mass index (BMI), low cognitive function and mental illness (Osler et al., 2008) as well as social isolation, lack of integration at school and poverty (Rojas and Stenberg, 2010a).

It has also been suggested that although men and women experience emotions in the same way their expression of these emotions can vary (Brownhill et al., 2005). In some men, depression may manifest itself in avoidant, numbing and escape behaviours which may, in turn, lead to aggression, violence and suicidal behaviour

(Brownhill et al., 2005). A recent systematic review (Hunt et al., 2017) reported that signs of depression in men included “desperation and frustration in the face of unsolvable problems”, helplessness, worthlessness and statements of suicidal intent. Although important findings, the extent to which these signs are specific to men experiencing current suicidal thoughts and behaviours remains unclear.

Representations of the male social role have also received attention. Do traditional representations of masculinity prevent men from seeking help, as they do not wish to be viewed as vulnerable? Are such representations also associated with maladaptive coping styles such as alcohol and drugs, reluctance to seek help and hiding their true emotions (Oliffe et al., 2017, Cleary, 2012). Men may also feel excluded from society if, for example, they become unemployed, and view this as a personal failure which may lead to helplessness, depression and suicidal ideation (Möller-Leimkühler, 2003). A failure to live up to their own self-standards can lead to a feeling of intense shame where suicide feels like the only solution (Rasmussen et al., 2018a, Lee et al., 2017, Adinkrah, 2012).

The accumulation of negative life events can lead to the feeling of entrapment (O'Connor and Kirtley, 2018) that there is no escape from life's unsolvable problems. The breakdown of a relationship is a well-known risk factor for suicidal behaviour in both men and women, although the risk is often greater in men (Scourfield and Evans, 2015). This may represent the loss of their only true emotional support (their partner) (Joiner, 2011), they could lose their home and may also lose access to their children (through custody hearings) (Payne et al., 2008). The loss of a job and the accumulation of debt can also lead to suicidal thinking and behaviours (Liu et al., 2013, Stack and Wasserman, 2007).

There are also differences in the psychosocial experiences of men and women, for example, caring for children has been found to be a protective factor for young women (Appleby and Turnbull, 1995). Particularly because they are more likely to be the primary caregiver. Many studies have suggested that women are more likely to talk about and seek help for their emotional problems (Murphy, 1998, Canetto and Sakinofsky, 1998, Mościcki, 1994). Women also have a higher likelihood of attending appointments with their doctor, mainly their general practitioner, so are more likely to ask for and receive help (Beautrais, 2002). Thence there are

various protective factors against suicide for women that do not appear to be as equally accessible for men.

Maladaptive coping styles and a reluctance to seek help in times of crisis are factors relevant to increased suicide risk in men. This may be particularly relevant in older and middle-aged men, Canetto (2017) found that adversities due to ageing were not associated with suicide risk but rigid coping styles and hegemonic masculine views linked to suicide were influential. Men tend to use more avoidance based coping strategies compared to women (Tamres et al., 2002, Woodhead et al., 2014), consistent with societal norms of men hiding their emotions (Helgeson, 2011). It has been found that even in men with large social networks, loneliness can be a problem due to the different nature of men's friendships (Joiner, 2011). They may not wish to disclose emotional difficulties as this may threaten their masculinity (Cleary, 2012).

Method choice can differ between males and females. This is often viewed in a masculine lens, with death by self-inflicted gunshot and hanging most common in males. Women are more likely to die from self-poisoning which has a slower rate of action, hence females are more likely to be saved (Beautrais, 2002). A "failed" suicide may be viewed as weak and a threat to masculinity whereas a "successful" suicide is viewed as brave and decisive (Canetto and Sakinofsky, 1998). Although, despite differences in method choice, men and women may not differ in their intent to die (Denning et al., 2000).

There is debate over whether men are more biologically predisposed to suicidal behaviour than women, due to greater pain tolerance and reduced fear of dying (Witte et al., 2012). Occupational exposure to lethal means is also relevant, in the military for example (McGlade et al., 2016). Engaging in self-injurious behaviour may increase pain tolerance and decrease pain sensitivity (Law et al., 2017), and this link with suicide may increase with greater levels of pain persistence (Koenig et al., 2016).

Suicide in men is a complex issue encompassing a wide range of risk factors across the lifespan, from early childhood experiences to mental illness, masculinity, social context, and negative life events. Previous reviews have investigated

suicide in male and female physicians (Duarte et al., 2020b, Lindeman et al., 1996), gender differences in suicidal behaviour in adolescents and young people (Miranda-Mendizabal et al., 2019), risk factors for suicide in prisoners (Fazel et al., 2008), mental disorders, suicide and self-harm in lesbian, gay and bisexual people (King et al., 2008), signs of suicide in men (Hunt et al., 2017) and male depressive symptoms concerning violent suicides or suicide attempts (Sørensen et al., 2019). To our knowledge, there has not been a comprehensive systematic review of risk factors for suicidal behaviour in men. It is also known that the time taken to transition from thinking about suicide to acting on these suicidal thoughts can be shorter in men (Schrijvers et al., 2012), highlighting the need to further understand the factors that affect this transition. Therefore, we conducted such a review to determine the extent and nature of the risk factors that predicted suicidal behaviour in men over time.

2.3 Method

2.3.1 Search Strategy

A literature search was conducted using the following databases (all years): CINAHL, PsycINFO, Web of Science Core Collection, Pubmed, Embase, and Psychology and Behavioural Sciences Collection. The search was originally conducted on 26th March 2019, with no date restriction. The search was then repeated on the 8th of January 2020. Keyword searches including the terms Men or Male AND Suicid* AND risk* OR Risk Factor were employed (Supplementary appendix 1 for search strategy), which generated 26,307 records (22,143 after duplicates were eliminated; Figure 2.1). Articles were refined by language (English). The study selection process involved screening titles in the first instance, followed by reading the abstracts. Finally, 602 full-text reports were screened for eligibility (Figure 2.1).

2.3.2 Eligibility criteria

The inclusion/exclusion criteria are as follows as per the protocol (CRD42019126304):

Inclusion criteria:

1. Contained primary-level research employing a retrospective or prospective research design.
2. Participants were aged over 18 years of age.
3. The sample included participants who experienced suicidal behaviour (suicide attempts or death by suicide).
4. Either male and female results (reported separately) or male-only results in regard to suicide risk and behaviour.
5. Included the association between gender and risk factors, does not solely state male gender as a risk factor.

Exclusion criteria:

1. Participants were under 18 years of age.
2. Cross sectional study design or studies investigating treatment efficacy.

2.3.3 Data extraction

A data extraction sheet was completed for each article that included information such as article identification, methodological aspects, main results, and authors' interpretation of their data (Supplementary Appendix 2).

2.3.4 Quality assessment

After data extraction, all selected studies were assessed for methodological quality using a 9-item index based on a quality assessment tool used by O'Connor et al. (2016). The quality assessment tool was chosen as it has been evidenced in previous published work (Zortea et al., 2021, O'Connor et al., 2016) and provides a suicide specific assessment of study quality which could be edited to account for specific aspects of this review such as gender analysis. Quality assessment was completed by the first author and another member of the research team cross-checked 20% (21) of the papers for inter-rater reliability, with 100% concordance after discussion.

The quality assessment tool was modified to account for both prospective and retrospective studies. Total scores were calculated ranging from 0-13, with a lower score indicative of a higher probability of methodological bias. Classifications of quality were set as follows: 0-2 very low quality; 3-4 low quality, 5-7 reasonable/medium quality; 8-10 good quality; and 11-13 excellent/very good quality. The full quality-assessment tool can be found in supplementary appendix 2. The Preferred Reporting Items for Systematic reviews and Meta-Analyses for Protocols 2015 (Moher et al., 2015) was completed (Supplementary Appendix 3).

2.3.5 Data Analysis and Synthesis

A narrative synthesis was conducted consistent with best practice (Campbell et al., 2020, Johnson and Hennessy, 2019) on reporting a systematic review synthesis (without Meta-Analysis). The studies were grouped by study design, with prospective and retrospective studies being assessed separately, as prospective studies tend to be regarded as being higher quality (Euser et al., 2009). Prospective and retrospective studies also have distinct strengths and weaknesses and can be affected by risk of bias differentially (Euser et al., 2009) so will be considered separately in this review. To facilitate the narrative synthesis, the emergent risk factors were clustered into sociodemographic characteristics, physical health/illness, mental health problems/psychiatric illness, psychological factors, negative life events/trauma, characteristics of suicidal behaviour and other factors (Figure 2.2). The studies were numbered according to the table numbers in Table 2.1 (also see Supplementary Appendices 4 and 5) and the paragraphs are structured in order of the number of supporting studies, starting with the most. The correlation coefficient effect size (Cohen, 2013) was calculated for 40/62 prospective studies and 36/43 retrospective studies due to availability of data (in addition to the effect sizes calculated by the study authors) and were interpreted as $r = .1$ to $.3$: small effect; $r = .3$ to $.5$: intermediate effect; $r = .5$ and higher: strong effect (Supplementary Appendices 4 and 5). Effect sizes were then described in the text of the results for factors that had five or more calculated r values. Male only and gender differences r values were calculated, depending on the availability of the data, using two effect size calculators (Wilson, 2001, Lenhard and Lenhard, 2016). These analyses were to gain a deeper

understanding of the magnitude of effects associated with each risk factor across studies. The results were detailed in terms of whether a risk factor demonstrated a stronger effect in men or women. This is displayed in full in Supplementary Appendices 4 and 5, alongside the effect sizes calculated by the original study authors. This study has also been published (Richardson et al., 2021b). Supplementary Appendices 6 and 7 summarise the number and type of risk factors across low and middle-income countries.

Table 2.1: Study Numbers for Prospective and Retrospective Studies

Study Number	Author (s)
1.	Aaltonen et al. (2019)
2.	Allebeck and Allgulander (1990a)
3.	Allebeck and Allgulander (1990b)
4.	Allebeck et al. (1988)
5.	Allebeck et al. (1987)
6.	Almeida et al. (2016)
7.	Anderson et al. (2008)
8.	Batty et al. (2012)
9.	Batty et al. (2010)
10.	Bjorkenstam et al. (2016)
11.	Brenner et al. (2015)
12.	Burrows et al. (2011)
13.	Crump et al. (2014)
14.	Denney et al. (2009)
15.	Elovainio et al. (2009)
16.	Erlangsen et al. (2004)
17.	Fairweather-Schmidt et al. (2010)
18.	Fukuchi et al. (2013)
19.	Garcy and Vågerö (2013)
20.	Geoffroy et al. (2014)
21.	Gravseth et al. (2010)
22.	Gunnell et al. (2005b)
23.	Gunnell et al. (2002)
24.	Hansson et al. (2019)
25.	Hedna et al. (2018)

26.	Ilgen et al. (2010)
27.	Jee et al. (2011)
28.	Jiang et al. (1999)
29.	Johansson et al. (1997)
30.	Mukamal et al. (2007a)
31.	Kaplan et al. (2007)
32.	Mukamal et al. (2007b)
33.	Kikuchi et al. (2009)
34.	Kosidou et al. (2014)
35.	Kosik et al. (2017)
36.	Lorant et al. (2005)
37.	Magnusson et al. (2006)
38.	Miller et al. (2000)
39.	Monnin et al. (2012a)
40.	Oquendo et al. (2007)
41.	Paffenbarger et al. (1994)
42.	Peters et al. (2018)
43.	Poudel-Tandukar et al. (2011)
44.	Quevedo et al. (2011)
45.	Rojas and Stenberg (2010b)
46.	Rossow et al. (1999)
47.	Rostila et al. (2013)
48.	Sadeh and McNiel (2013)
49.	Shalit et al. (2016)
50.	Skogman et al. (2004)
51.	Smith et al. (2018)
52.	Stenbacka and Jokinen (2015b)
53.	Stenbacka et al. (2014)
54.	Strand and Kunst (2006)
55.	Sun et al. (2012)
56.	Tidemalm et al. (2014)
57.	Tidemalm et al. (2008)
58.	Tsutsumi et al. (2007)
59.	von Borczyskowski et al. (2010)
60.	Weiser et al. (2016)
61.	Yi and Hong (2015)
62.	Yousaf et al. (2005)
63.	Agerbo (2005)
64.	Agerbo et al. (2011)
65.	Altınöz et al. (2019)

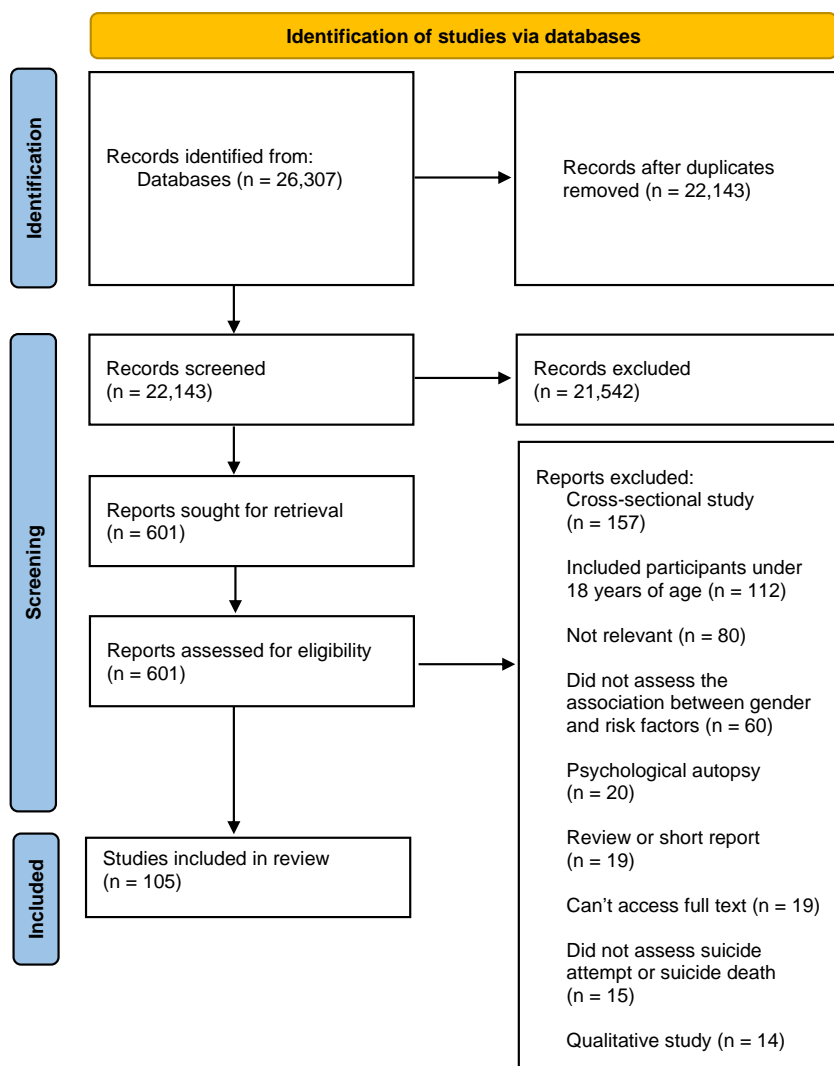
66.	Andrés et al. (2009)
67.	Bae et al. (2015)
68.	Bálint et al. (2016)
69.	Blakely et al. (2003)
70.	Canu et al. (2019)
71.	Castelpietra et al. (2019)
72.	Cibis et al. (2012)
73.	Conner et al. (2001)
74.	Conner et al. (2013)
75.	Dalca et al. (2013)
76.	Dulskas et al. (2019)
77.	Erlangsen et al. (2012)
78.	Forsman et al. (2019)
79.	Fountoulakis et al. (2014)
80.	Gao et al. (2013)
81.	Haglund et al. (2019)
82.	Hempstead et al. (2013)
83.	Henson et al. (2019)
84.	Horwitz et al. (2019)
85.	Ishii et al. (2013)
86.	Kimerling et al. (2016)
87.	Kittel et al. (2019)
88.	Kochanski-Ruscio et al. (2014)
89.	Li (1995)
90.	Lundin et al. (2012)
91.	Mahar et al. (2019)
92.	Mathy et al. (2011)
93.	O'Donnell et al. (2019)
94.	Park et al. (2018)
95.	Patasius et al. (2019)
96.	Phillips and Hempstead (2017)
97.	Robinson et al. (2009)
98.	Salib and Green (2003)
99.	SALIB et al. (2004)
100.	Stickley et al. (2016)
101.	Ursano et al. (2018)
102.	Vasiliadis et al. (2017)
103.	Waern (2003)
104.	Windsor-Shellard and Gunnell (2019)
105.	Yang et al. (2019)

2.4 Results

2.4.1 Data extraction and methodological quality

A keyword search of the databases (outlined above) was conducted, yielding 26,307 records. Following duplicate removal and screening, 105 articles were quality assessed, and included in the final systematic review (Figure 2.1). The individual quality assessment scores are displayed in Supplementary Appendices 4 and 5. The maximum obtainable score was 13. For the 62 prospective studies, the mean score was 7.19 ± 1.19 (range: 5 to 10). In the 43 retrospective studies, the mean score was 7.67 ± 1.64 (range: 5 to 11). Thence the studies were predominantly rated as reasonable/medium quality.

Figure 2.1: Flow Chart of the Selection Process



2.4.2 Study characteristics

In total, 105 studies met the inclusion criteria (Figure 2.1). There were 62 prospective studies (Supplementary Appendix 4) and 43 retrospective studies identified (Supplementary Appendix 5). For the 62 prospective studies, the mean quality assessment score was 7.19 ± 1.19 (range: 5 to 10). In the 43 retrospective studies, the mean quality assessment score was 7.67 ± 1.64 (range: 5 to 11). Thence the studies were predominantly rated as reasonable/medium quality. The prospective studies were conducted in a range of countries (full details in Supplementary Appendix 4); Sweden had the largest number of studies (26 studies), followed by the USA (11 studies), UK (4 studies) and Japan (4 studies). The average follow-up time for the prospective studies was 15 years, ranging from 60 days to 50 years. Most of the retrospective studies (Supplementary Appendix 5) were conducted in the USA (12 studies), UK (6 studies) and Denmark (5 studies). For the retrospective studies, the average study period was 8 years (range: 1-21 years). The participants were from a variety of settings (from general population samples to psychiatric inpatients, see Supplementary Appendices 4 and 5). The majority of studies were conducted in high-income countries, more information can be found in Supplementary Appendices 6 and 7. The number and type of risk factors identified across the prospective and retrospective studies are displayed in Figure 2.2 and Table 2.2 displays risk factors that have been displayed in ≥ 2 studies which was published in a blog by Crudgington (2021).

Figure 2.2: Bubble Chart of Number and Type of Risk Factors Identified Across Prospective and Retrospective Studies

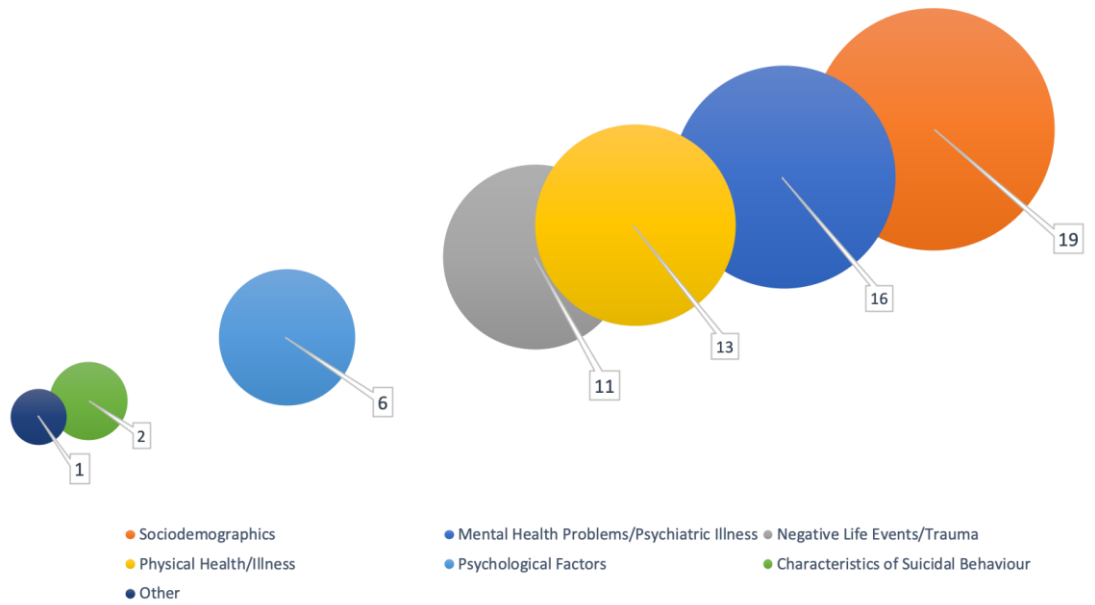


Table 2.2: Key Findings (Risk Factor Reported by ≥2 Studies)

Risk Factor(s)	Prospective studies	Retrospective Studies
Sociodemographics	<ul style="list-style-type: none"> - Marital status: unmarried, divorced, widowed, separated, or single relative to those who are married (8) - Same-sex married relationship (2) - Low levels of education (8) - Low household income as a child (2) - Social material deprivation (3) - Living alone (4) - Short stature among men (2) 	<ul style="list-style-type: none"> - Marital status: unmarried, single, divorced, or widowed (14) - Low level of education (5) - Unemployment (5)
Physical Health and Illness	<ul style="list-style-type: none"> - Being underweight (6) - Obesity in men aged 40-69, and in a general population cohort of men and women (2) - Smoking among a range of populations (5) - Cancer diagnosis (year after as a significant risk period) (2) and poor cancer prognosis (1) - Diabetes (2) 	<ul style="list-style-type: none"> - Cancer diagnosis (5) - Physical health problems (3) - Current smoking (2)
Mental Health Problems/ Psychiatric Illness	<ul style="list-style-type: none"> - Alcohol and/or drug use/dependence (15) 	<ul style="list-style-type: none"> - Alcohol and/or drug use/dependence (9)

	<ul style="list-style-type: none"> - Depression (12) - Any diagnosis of psychiatric disorder (9) -Diagnosis of a personality disorder (5) - Anxiety (5) - Schizophrenia (5) - Bipolar disorder (4) - Neurotic disorder (2) 	<ul style="list-style-type: none"> - Depression (7) - Psychiatric diagnosis (3) - Mental health comorbidities (2)
Psychological factors - personality and individual differences	<ul style="list-style-type: none"> - Low IQ (5) - Poor emotional control (3) 	<ul style="list-style-type: none"> - Impulsive aggression and non-impulsive aggression (2)
Negative Life Events/ Trauma	<ul style="list-style-type: none"> - Adverse childhood experiences (5) - Bereavement (2) - Involvement in criminal activity (2) 	<ul style="list-style-type: none"> - Experiencing a recent crisis (3) - Bereavement (2)
Characteristics of Suicidal Behaviour	<ul style="list-style-type: none"> - History of previous suicide attempts (6) 	<ul style="list-style-type: none"> - Disclosing intent to harm self (3) - Previous suicide attempt or previous self-harm (2)

2.4.3 Risk Factors - Prospective Studies

2.4.3.1 Sociodemographic characteristics

Across eight studies there was evidence that being unmarried, divorced, widowed, separated, or single was associated with a significantly increased risk of suicide death (12, 13, 14, 16, 18, 25, 29, 51) and attempts (25) relative to those who were married. This was evident in general population samples, individuals on antidepressant medication, individuals with prostate cancer and across the lifespan (from 18 to 90+). Two studies found that being in a same sex married relationship

was associated with increased risk of suicide mortality in men (10, 12) in Sweden and Canada, respectively. Male-only effect sizes were calculated for one study (51) and a small effect size was calculated for men who were single, divorced, widowed, or separated. Gender differences effect sizes were calculated for 5 studies (12, 13, 16, 18, 29). Five studies found more of an effect in females who were separated/divorced/widowed/never married, although this was small. A small effect size was found for men who were separated/divorced/widowed/never married in 5 studies, demonstrating more of an effect of marital status in females. Two studies demonstrated more of an effect (small) in men who were never married or unmarried.

Suicide risk was also higher among men with lower levels of education with regards to suicide death (12, 13, 14, 21, 36, 61) and suicide attempts (35). This pattern was evident across a variety of samples (general population, veterans and individuals followed up since birth). Four large general population studies found that being unemployed was associated with increased risk of suicidal death (12, 13, 14) as well as attempts (17). Two studies of Norwegian participants reported a link between low household income as a child and later suicide mortality in men (54, 59). Three studies uncovered a relationship between social and material deprivation and suicidal death (12, 36, 42), such that suicidal behaviours were more common among those living in more deprived areas. Two studies examined large general population samples (12, 42) whilst study 36 examined data from ten European countries.

Living alone was associated with increased suicide death in four studies (1, 12, 24, 43) including a follow-up study of patients first hospitalised for depressive disorder (1), a large sample of Canadian adults (12), individuals with bipolar disorder (24) and Japanese adults aged 40-69 (43). Studies 1, 12, and 24 assessed living arrangements via census data while study 43 obtained this information via self-report. Two studies highlighted an association between having a small circle of friends and risk of suicide in young Swedish male conscripts (3, 4).

Short stature among men may also be a risk factor for suicidal death (27) and suicide attempts (28) evidenced by two different samples, study 27 focused on Korean men and women whereas study 28 reported on a sample of young male

Swedish conscripts. Short stature was a risk factor for suicide mortality in women, but to a lesser extent (27).

Ethnicity and suicide mortality were related in two studies (29, 31). For male veterans, White race was associated with suicide risk (31). Study 29 studied a Swedish population and found an association between ethnicity (defined as being born abroad) and death by suicide in all age groups studied (20-29, 30-49 and 50+). Ten sociodemographic factors were identified from single studies. One study found that homosexuality (defined as “sexual deviations”) was significantly associated with risk of death by suicide, in young Swedish men (2). However, it was difficult to ascertain associations from this study as there were only sixteen participants (0.03% of the sample) who identified as LGBTQ+. Study 54 highlighted an association between low parental education (father and mother) and suicide mortality. Low income was associated with an increased risk of suicidal death in one Canadian census mortality follow up study (12). Living in a small town or rural location was linked to a modest increase in suicide mortality, only in men (13). The highest risk was for men aged 20-29 however risk was higher for females in all age groups. Overcrowding was related to suicide mortality in men of all age groups with the highest risk being in men aged 50+ (29). Renting accommodation was only linked to increased risk of suicide death in men aged 30-49 (29). Male veterans with a high level of education (12 years or over) were significantly more likely to die by suicide than those with less than twelve years of education (31). One study demonstrated a link between high income and suicide death in a sample of men and women first hospitalised for depression and followed up for 24 years (1). Men whose income was in the highest third were more likely than men in the lowest third to die by suicide during the follow-up period, but this risk was marginally larger in women. Study 21 found that receiving disability pension due to schizophrenia was linked to increased risk of suicide death in men however this risk was higher in females. One study found an association between complicating social factors (defined as related to family, work, or economy) and suicidal behaviours (attempts and mortality) in men with bipolar disorder (56).

2.4.3.2 Physical Health/Illness

Being underweight was linked to suicidal attempts (28) and suicide mortality (9, 21, 27, 30, 37), and this was evident across a variety of study populations, from young male Swedish conscripts (9, 28, 37) to large general population samples (21, 27, 30). Two studies (15, 27) also uncovered a link between obesity and higher suicide mortality, in men aged between 40 and 69 (15) and a general population cohort of men and women (27).

Smoking was a risk factor for suicide death (27, 38, 41, 42) as well as attempts (17), across a range of populations including men in their sixties (17), in the general population (27, 42), among university alumni (41) and US army personnel (38). Suicide mortality among cancer patients was investigated in three studies (13, 51, 62). The year after receiving a cancer diagnosis was a significant risk period for cancer patients, as evidenced by two studies (51, 62). Poor cancer prognosis was also a significant risk factor (62). Two large cohort studies identified a relationship between diabetes and increased risk for suicide (8, 13).

There were nine physical health/illness factors identified from single studies. Any form of pain (very mild, mild, moderate, or severe) was significantly related to an increased risk of death by suicide in Japanese men aged 40- to 79-years old (33). Having 3-4 health conditions (defined using ICD codes such as diseases of the respiratory system, diseases of the digestive system) was associated with increased odds of suicide mortality in older Australian men (aged 65-85) (6). Study 61 found that there was a significant link between poor self-rated health and death by suicide. High blood pressure increased risk of suicide mortality among men in one study (27). Study 11 found that men with multiple sclerosis were at increased risk of both suicide attempt and suicide mortality, compared to those without a diagnosis of MS. Somatic disorders, such as cancer, diabetes, heart disease, stroke, COPD, asthma, and spine disorders, were found to increased suicide mortality (13). Study 13 found that, compared to women, suicide risk was higher in men with diabetes, heart disease, and among those who had had a stroke. Having activity limitations was a significant risk factor for suicide death in male veterans in one study (31). Unexplained weight loss was linked to increased risk of suicide mortality in one study of men aged 40-69 years old (15).

2.4.3.3 Mental Health Problems/Psychiatric Illness

Fifteen studies demonstrated an association between alcohol and/or drug use/dependence and suicidal behaviour among men (1, 2, 3, 5, 6, 13, 24, 26, 27, 39, 46, 49, 52, 57, 61). Many studies were conducted with Swedish samples (9 studies), followed by the USA (2 studies), Australia (1 study), Finland (1 study), Korea (1 study) and France (1 study). The majority of studies investigated suicide death whilst one study examined suicide attempts (49), and two studies (46 and 52) investigated both suicide mortality and attempted suicide. The assessment of alcohol and drug use/dependence differed across studies. One study examined current alcohol/drug abuse or dependence (39) whereas most studies focused on data from health records of having alcohol or drug dependence (1, 2, 5, 13, 24, 26, 46, 57). Studies 3 and 27 examined weekly or daily alcohol consumption, and study 3 also examined lifetime use of narcotics. Study 49 focused on cannabis use and study 52 used the terms problem drinking and drug use. Effect sizes for men were calculated for 7 studies (3, 5, 6, 46, 49, 52, 61). A small effect in men was found for alcohol dependence in 3 studies, and 1 study found a medium effect. In addition, a small effect for drug dependence in men was found in 2 studies, and 2 studies found a medium effect in men. History of alcohol abuse in men had a small effect in 2 studies. Cannabis in men use had a small effect and daily cannabis use had a medium effect in 1 study. Gender differences were calculated for 5 studies (5, 13, 24, 27, 57). Alcohol use in men has a small effect in 2 studies and a strong effect in one study. History of alcohol abuse in men had a small effect in one study. Substance use in men had a small effect in 2 studies and a stronger (small) effect in females in 1 study. All but one study demonstrated more of an effect in males, compared to females.

Men with depression were at increased risk of suicidal behaviours in twelve studies (1, 6, 13, 17, 24, 26, 44, 50, 55, 56, 57, 61). Five studies used Swedish samples followed by Australia (2 studies), USA (1 study), Finland (1 study), Korea (1 study), Brazil (1 study), and China (1 study). Many studies examined suicide mortality whilst three studies focused on risk factors for suicide attempts (17, 44, 56). Four studies (6, 13, 15) focused solely on depression diagnosis, two studies used

psychological scales (44, 55, 61), and study 1 assessed both severe depression and psychotic depression. Study 24 assessed depressive episodes in the previous year. Study 49 focused on major depression and depression not otherwise specified, study 56 assessed lifetime depressive episodes and study 57 used the terms bipolar or unipolar disorder and other depressive disorder. Effect sizes for men were calculated for 5 studies (6, 17, 44, 55, 61). A small effect was found in 3 studies. A strong effect was found in 1 study and a small effect was found in 1 study. Gender differences effect sizes were calculated for 4 studies (13, 24, 50, 55). A small effect was found in 2 studies in men and a small effect was found in 2 studies in women. These findings are inconclusive whether this is more of an effect in males or females.

Nine studies demonstrated an association between any diagnosis of a psychiatric disorder or possible mental illness and increased risk of suicide mortality (3, 13, 21, 23, 24, 26, 46, 52, 60) and attempts (46, 52). This was reported from a range of different study samples, predominantly from young male Swedish conscripts (3, 46, and 52).

Diagnosis of a personality disorder was linked to increased risk of suicide death in five studies (2, 3, 4, 13, 57), the majority of which were from studies of young male Swedish conscripts (2, 3, and 4). Whilst the other two studies investigated a general population sample (13) and individuals who have been hospitalised following a suicide attempt (57).

Five studies highlighted an association between anxiety and suicide death (13, 26, 56, 57) and attempts (17, 56). Two studies examined general population samples (13, 17) whilst the other studies investigated veterans (26), patients with bipolar disorder (56), and individuals hospitalised following a suicide attempt (57).

Five studies demonstrated a link between schizophrenia and suicide death (2, 3, 13, 26, 57) and this was from a range of samples, with the majority from young male Swedish conscripts (2, 3).

Four studies linked bipolar disorder to increased risk of suicide mortality (6, 13, 26, 57). All studies examined different populations, elderly men (6), general

population (13), veterans (26), and individuals admitted to hospital following a suicide attempt (57).

Two large studies of young Swedish men found that having a neurotic disorder was associated with an increased risk of suicide mortality (2, 4). Two studies (24, 56) reported that affective episodes in the previous year represented an enhanced risk of suicide mortality (24, 56) and suicide attempts (56) in male bipolar patients, compared to female patients. Studies 24 and 56 highlighted that having psychiatric inpatient care, particularly involuntary care, was linked to increased odds of attempting suicide and suicide mortality during follow-up in male bipolar patients.

There were six mental health/psychiatric illness factors that were identified from single studies. In men who had recently had a baby (30 to 60 days postpartum), all mood disorders were associated with increased risk of suicide attempts (44). The risk was highest for mixed disorders followed by depression. One study of US veterans found that post-traumatic stress disorder was a risk factor for suicide death in men, but this risk was higher in women (26). One study of young male Swedish conscripts reported that being on medication for psychiatric problems was a risk factor for both violent and non-violent suicide attempts (52). Alcohol-related and substance-related mental illness increased odds of death by suicide in a sample of men aged between 65 and 85 (6). Men with bipolar disorder and a comorbid eating disorder were five times more likely to attempt suicide during the follow-up period (56). Study 39 found evidence for the association between current recurrent psychotic syndrome and re-attempts in the two years following a suicide attempt.

2.4.3.4 Psychological Factors - Personality and Individual Differences

Five studies demonstrated a significant association between low IQ and risk of suicide mortality (7, 21, 22, 52) and suicide attempts (28, 52). Most of the evidence was from young male Swedish conscripts (21, 22, 28, 52), where intelligence was measured at conscription (aged 18 or 19 years old). Two studies (7, 34) linked intelligence to suicide mortality (7) and attempts (34). Study 7

reported that low IQ scores at age 13 were associated with an increased risk of suicide mortality in adulthood. On the other hand, study 34 uncovered (in their study of 6146 individuals followed up for 5 years) that school performance and risk of suicide did not differ between genders.

Poor emotional control was also associated with increased risk of suicidal mortality (3, 4, 52) and attempts (52) in three studies of Swedish men conscripted for military service (3, 4, and 52).

Four psychological factors were identified from single studies. One longitudinal study that followed up individuals for 50 years, starting at birth, found that externalising problems (rated by mothers at age 7) were associated with an increased risk of death by suicide in adulthood for men but not women (20). A study of male Swedish conscripts found that poor psychological function capability and poor psychological capability were significant risk factors for later suicide attempts (28). In men discharged from a psychiatric inpatient facility (Study 48), greater inclination towards angry behaviour was linked to an increased likelihood of suicide attempts in the year following discharge from hospital. This pattern appeared to be particularly relevant for men who had been affected by childhood sexual victimisation. One study of young male Swedish conscripts uncovered a significant link between paranoid states and suicide death during the follow-up period (2).

2.4.3.5 Negative Life Events/Trauma

Adverse childhood experiences were associated with suicide death (3, 4, 21, 52) and suicide attempts (17, 52) in five studies with many of the studies investigating young male Swedish conscripts (3, 4, 51).

Across two studies a relationship between bereavement and suicide mortality emerged (16, 47). The highest risk, across age and gender, was for men aged 80+ in the first year of widowhood (16). Death of a sibling was associated with increased risk of suicide, in a large sample of Swedish men and women (47).

Bereavement by suicide, of a parent or sibling, was also associated with increased risk of suicide mortality (16, 47).

Two studies of male Swedish conscripts found an association between involvement in criminal activity and suicidal death (52, 53) and attempts (52).

Nine negative life events/trauma factors were identified from single studies. One study of Japanese men reported an association between low control at work and risk of suicide, the same effect was not found for high demand at work (58). Men with bipolar disorder who endorsed expressing violent behaviour were at increased risk of suicidal mortality and suicide attempts (56). This association was not evident in women. Study 59 found that men affected by parental psychotic or affective disorder were at risk of suicide mortality, although this risk was higher in women in this study. Stressful life events in the past six months were associated with increased risk of suicide attempts at follow up, in all age groups (20s, 40s, and 60s) (17). The highest risk was for men in their sixties. One study found an association between childhood sexual victimisation and suicide attempts, in a sample of recently discharged psychiatric inpatients (48). Aggressive behaviour when angry increased the odds of a suicide attempt particularly in men with a history of sexual abuse or assault (48). Having conduct problems in school was linked to suicide attempts and mortality in young Swedish male conscripts (52), particularly regarding violent suicide attempts. This factor was also added risk for non-violent suicide attempts. Social isolation as a child (age 12-13) remained a significant risk factor for suicide death in men across the adjusted analyses (45). Childhood poverty was linked to suicide mortality in Swedish men in one study (45).

2.4.3.6 Characteristics of Suicidal Behaviour

A history of previous suicide attempts increased the risk of suicide mortality in six studies (1, 5, 24, 50, 56, 60) and suicide attempts in two studies (39, 56). Two studies followed up patients who had been hospitalised following a suicide attempt (39, 50) and three studies examined patients with a diagnosed mental illness (schizophrenia and bipolar disorder respectively) (5, 24, 56). Study 1

investigated suicide risk after first-lifetime psychiatric hospitalisation for depression. A previous suicide attempt, particularly using violent methods, was a risk factor for suicide death (50). One study (60) found that young Israeli men assessed for military service with a psychiatric diagnosis who reported suicidal ideation (without a history of suicide attempts) were at risk of suicide mortality. Male only effect sizes were calculated for 3 studies (50, 56, 60). An intermediate effect size was found in 2 studies and a small effect was found in 1 study. Gender differences were calculated for 3 studies (24, 39, 50) and a small effect was found in 2 studies, indicating more of an effect in females. A small effect was found in 1 study, demonstrating more of an effect in males.

2.4.3.7 Other

One study of young male Swedish conscripts reported a significant relationship between fortuitous psychic disorders and death by suicide during the follow-up period (2).

2.4.4 Risk Factors - Retrospective Studies

Overall, the 43 retrospective studies displayed a similar pattern of risk factors to the prospective studies. The section below displays a narrative synthesis of these findings (also see Supplementary Appendix 5 for the summary table of studies).

2.4.4.1 Sociodemographic characteristics

Fourteen studies reported a link between marital status and suicide risk, specifically being unmarried, single, divorced, or widowed was associated with increased risk of suicidal mortality (63, 64, 66, 68, 69, 85, 87, 89, 92, 94, 98, 99) and attempts (93, 105). Two studies with male-only samples reported being married was a risk factor for suicide mortality (82, 93). Married men were more likely to die by firearm suicide than those who were single (82). Young male veterans who were married did display heightened suicide risk, but this was less than those who were divorced or widowed (93). Male only effect sizes were calculated for 7 studies (63, 69, 87, 92, 93, 94, 105). The majority of studies

demonstrated a small effect for being unmarried, single, divorced or widowed. An intermediate effect was found for widowed men in one study (93) and never married or divorced men in study 94. Gender differences were calculated for 7 studies (63, 66, 68, 89, 92, 98, 99). 4 studies demonstrated a small effect for people who have been widowed and 2 studies demonstrated a small effect for divorced people, indicating a greater effect in females. There as a small effect for those who have never been married/unmarried in 3 studies, demonstrating a greater effect in men. Study 66 also showed a small effect for single people, indicative of a greater effect in females.

Five studies demonstrated a relationship between having a low level of education and suicide mortality (68, 69, 87, 94, 96) in general population samples. A link between unemployment and increased risk of suicide mortality (66, 69, 70, 85) and suicide attempts (79) was reported in five large studies assessing nationwide suicide rates or rates across several countries.

Twelve sociodemographic factors were found from single studies. In male patients with genital system cancer, being white was associated with increased risk of suicide mortality (105). Study 93 reported that, in young male veterans, being black, Hispanic, or "other" was linked to increased risk of suicide attempts compared to those who were white. Having one or no household car access was associated with a small increase in risk of suicide mortality (69). Not being married but living with a partner was associated with increased risk of suicide death in men that was higher than the risk for women (63). Being in a same-sex partnership was associated with increased suicide mortality in men that was substantially higher than the risk for women (92). Study 85 based in Japan reported that male standardised mortality rate (SMR) of suicide was significantly and negatively associated with annual postal savings per person. Men with a low income were more likely to die by suicide than those in the highest income quartile and this risk was higher than in women (66). Study 85 reported that male standardised mortality rate (SMR) of suicide was significantly and positively associated with elderly population rate. Men with low socioeconomic position (defined as an unskilled worker) were more likely to die by suicide than those at a higher level (90), although this risk was slightly higher in women compared to men. One study (100) examined the risk of suicide mortality close to the

individual's birthday. In men, the five-day period before their birthday was associated with significantly increased odds of death by suicide, with the highest risk being on their birthday. Study 90 found that risk of suicide in men increased as their sickness absence from work increased, with men being off work for over sixty-two days, 2.70 times more likely to die by suicide than those with 0-15 days off. This was also higher than the risk found in women. Study 104 reported that men in low skilled occupations were slightly more likely to die by suicide than those in skilled or highly skilled jobs.

2.4.4.2 Physical Health/Illness

Five studies reported an association between cancer diagnosis and suicide mortality (76, 83, 95, 97) and suicide attempts (83, 105). Two studies focused on cancers specific to men (prostate and male genital cancer respectively; 95, 105) while studies 83 and 97 included a mixed sample of patients with various cancer diagnoses, and study 76 assessed colorectal patients. Men diagnosed with cancer with a poor prognosis were at increased risk of suicide mortality, compared to women (95, 97). Specifically, the first 6-12 months following diagnosis was a significant risk period for men (76, 105).

Three studies reported a link between physical health problems and suicide mortality (65, 82, 84). In all three studies, the samples were identified from death records. Study 65 studied elderly individuals, study 82 included men who died by suicide between 2003 and 2009 in New Jersey (USA) and study 84 compared veteran and civilian suicide decedents.

Two studies reported an association between current smoking and suicide death (80, 87), in general population samples.

Four physical health/illness factors were reported from single studies. In a large sample of British adults followed up for 7 years (80), being underweight (BMI less than 18.5) was associated with a substantial increase in the incidence rate ratio of suicide mortality for men (without depression history) compared to women. Type 2 diabetes increased the incidence rates of suicide mortality in men that was

higher than in women (80), but the same effect was not found for suicide attempt. One study of elderly individuals found that arthritis was linked to a moderately increased risk of suicide in men, the same effect was not found in women (102). Study 102 reported that men who had a cerebral vascular incident had increased odds of suicide mortality.

2.4.4.3 Mental Health Problems/Psychiatric Illness

Nine studies reported an association between alcohol or drug use/dependence and suicidal attempts (67, 93) and suicide mortality (75, 77, 81, 87, 88, 96, 103). This association was found across a range of populations including general population samples (67, 77, 87, 96), elderly individuals (103), soldiers/veterans (88, 93), patients discharged from a psychiatric facility (81) and patients with major depressive disorder (75). Five studies (75, 81, 87, 88, 93) examined both alcohol and drug use disorders, one study assessed substance abuse (96) and one study measured alcohol use disorders (103). Study 67 evaluated frequency of alcohol drinking, the quantity of alcohol per drinking session and AUDIT (Alcohol Use Disorders Identification Test) scores. Gender differences effect sizes were calculated for 5 studies (67, 75, 77, 96, 103). 2 studies demonstrated a small effect in females for alcohol use/dependence and 1 study showed a small effect in men. For substance use/dependence 1 study demonstrated a small effect in men whilst one study showed a small effect in females. The findings were mixed with 3 studies displaying a greater effect in females and 2 displaying a greater effect in males. Male only effect sizes were calculated for 5 studies (67, 87, 88, 93, 103). For alcohol use/dependence a small effect size was found in 3 studies and a strong effect was demonstrated in one study. A small effect size was found for substance use/dependence in 3 studies.

Seven studies reported an association between depression and suicide mortality (80, 81, 87, 102, 103) and attempts (88, 93). One study retrospectively analysed patients admitted to hospital following a suicide attempt (88), two studies were case-control studies of elderly individuals who died by suicide (102, 103) and studies 80 and 87 used general population samples. Study 81 assessed suicide

mortality following discharge from a psychiatric facility and study 93 studied young male veterans.

Three studies reported an association between a psychiatric diagnosis and suicide death (71, 96, 102) in individuals prescribed anti-depressants (less than 3 years before suicide death, 71), a general population sample (96), and older adults (102). Study 96 ascertained this information from the National Violent Death Reporting System (NVDRS) where “mental health problem” was listed under important risk factors for suicide whilst study 102 recorded information on anxio/depressive disorders and all other mental disorders from a longitudinal study on the health of the elderly for controls and information from health/death records for cases. Study 71 attained this information from a national database that records data on suicides, diagnoses, and anti-depressant use. Current use of psychiatric medication was a significant risk factor for suicide by poisoning in two studies (71, 78).

Two studies found that mental health comorbidities were a risk factor for suicide death in men (74, 77), in a sample of male veterans (74) and in older adults (77). Suicide risk increased as the number of comorbidities increased (up to 6), and the highest risk was for bipolar disorder with comorbid anxiety (74). Study 77 reported that in men with schizophrenia, the presence of comorbidities was a risk factor for suicide, but this risk was lesser than those with a sole diagnosis of schizophrenia. Anxiety was also a risk factor for suicide mortality in two studies (81, 102) of patients discharged from a psychiatric facility (81) and older adults (102). Two studies reported an association between personality disorders and suicide death (77, 81). This was evidenced in adults aged 50+ (77) and patients discharged from a psychiatric inpatient facility (81). Schizophrenia was a risk factor for suicide death in two studies (77, 81).

Eight mental health/psychiatric diagnosis factors were identified from single studies. Psychotic disorders were a risk factor for suicide mortality in study 81. Men diagnosed with affective disorders were at risk of suicide mortality in one general population study (81). Men who had experienced bad mental health in the past thirty days were more likely to die by firearm suicide than those with good mental health (82). Being in treatment for a mental health problem was a risk

factor for suicide in men, and to a lesser extent in women, aged over twenty-five years old (96). Depressed male suicide cases had a higher likelihood of being diagnosed with Cluster B Disorders compared to controls (living participants with major depressive disorder) (75). One study (77) reported, in a sample of older adults followed up for 16 years, that dementia was a risk factor for suicide mortality in men, but this risk was more than double in women. Comorbidity of schizophrenia and dementia also conferred risk for males but was higher in females. Mental and physical health comorbidities were associated with suicide death in older adults (102), although this was slightly elevated in women. In adults aged 50+ with schizophrenia, a recent admission or discharge from hospital was a substantial risk factor for suicide in men (77).

2.4.4.4 Psychological Factors - Personality and Individual Differences

Two psychological factors were identified from single studies. Study 75 found that both impulsive aggression and non-impulsive aggression discriminated between male depressed suicide completers and controls. The same effect was not replicated in women. Study 75 also found that depressed male suicide cases had a higher likelihood of being characterised as “highly impulsive” compared to depressed living participants (controls).

2.4.4.5 Negative Life Events/Trauma

Three studies found experiencing a recent crisis was a risk factor for suicide death in men recently discharged from psychiatric inpatient care (81), men who died by firearm suicide (82), and young male veterans (93).

Two studies reported that being bereaved by suicide was related to suicide mortality (63, 82). Study 63 reported that having a partner or cohabitee who died by suicide was a significant risk factor for suicide in men, but this was substantially higher than the risk in women. Study 82 found that experiencing a recent death or suicide of a friend or family member was associated with an increased risk of suicide by firearm. Two studies demonstrated a link between conflict with partner or spouse and suicide mortality (82, 96).

Seven factors were identified from single studies. Engaging in violent behaviour in the past year was a significant risk factor for suicide mortality in men however this had a larger effect in women (73). Having a partner or cohabitee who was admitted to a psychiatric facility in the past two years increased risk of suicide in men however this risk was also substantially elevated in women (63). One study (65) reported the association between financial difficulties and suicide death in older adults (aged 65+). Financial difficulties were the most common reason given for suicide in men in this study. Experiencing a job problem significantly increased likelihood of death by firearm suicide (82). One study of veterans (86) stated that military sexual trauma was associated with increased risk of suicide mortality in men. This was also increased in women, and more women experienced military sexual trauma in this sample (21.2% of women compared to 1.1% of men). An argument preceding death was a significant risk factor for suicide death in men (96). This was also significant in women but to a lesser extent. One study (101) of US active-duty soldiers evidenced that having any history of family violence heightened increased odds of a suicide attempt in men. Being a perpetrator was linked to the highest risk compared to being a victim. All measures of family violence conveyed greater risk to men, compared to women.

2.4.4.6 Characteristics of Suicidal Behaviour

Disclosing intent to harm themselves was also a risk factor for death by suicide in three studies, investigating general population samples (96), young male veterans (93), and a male only sample of suicide decedents (82).

Three studies reported that men were more likely to choose lethal or high-risk methods (72, 84, 93), particularly male veterans (84, 93). Study 10 reported that men who died by suicide were more likely to choose high-risk methods compared to women (70% vs 30%). They were also less likely to choose low-risk methods compared to women (30% vs. 70%).

One study highlighted an association between previous suicide attempts and increased risk of later death by suicide (77). Having prior attempts was only a risk

factor for suicide by hanging in men, not the other methods of suicide studied (firearm or poisoning). In a sample of older adults, having previous suicide attempts was linked to substantial risk for suicide mortality in men, particularly in those with a diagnosis of schizophrenia (77). Previous self-harm was also a risk factor for suicide mortality following discharge from a psychiatric facility (81).

2.5 Discussion

This systematic review has highlighted the complexity of assessing risk factors for suicidal behaviour in men; in this review alone, studies identified 68 different risk factors (see Figure 2.2). Numerous factors were uncovered that can interact and change in relevance throughout an individual's life. While many risk factors can increase suicide risk regardless of gender, this review focused on those factors that are associated with suicidal behaviour in men.

2.5.1 Risk Factors for Suicidal Behaviours in Men

Across studies (see Supplementary Appendix 4 and 5), the most consistent evidence was for sociodemographic factors (19 factors), followed by mental health/psychiatric illness (16 factors), physical health/ illness (13 factors), and negative life events/trauma (11 factors). There were a small number of psychological factors (6 factors) and characteristics of suicidal behaviour (3 factors) identified. The paucity of psychological research may be a by-product of the types of studies included in this review. Most studies were large epidemiological designs and as such, they do not tend to routinely assess psychological factors and characteristics of suicidal behaviour. This major weakness needs to be addressed urgently. For the most part, the findings from the retrospective studies (see supplementary appendix 5) provided further evidence for the risk factors identified in the prospective studies. However, there were 18 additional factors identified from single retrospective studies (with the exception of the partner's psychiatric illness, which was present in two studies) that require further investigation.

Across both prospective and retrospective studies, there were risk factors that had a substantial amount of supporting evidence. First, alcohol and drug use/dependence had the most extensive supporting evidence (24 studies) and this is consistent with previous research highlighting these as significant risk factors for suicidal behaviour in men (Holmstrand et al., 2015). What still needs to be understood, though, is whether alcohol/drug use are predisposing factors, coping strategies, or motivating/facilitating factors for suicidal behaviour. Being unmarried, divorced, widowed, or single was a risk factor evident in both the retrospective and prospective studies. Marital status seems to have a differential effect on men compared to women, with several researchers proposing potential explanations for this (Scourfield et al., 2012, Evans et al., 2016, Scourfield and Evans, 2015). Marriage is known to be protective for men, with their partner often being their only source of emotional support (Joiner, 2011). However, it is argued that once this support is removed, men may be less able to cope or reach out for help than women, possibly due to the differential nature of male and female friendships (Joiner, 2011). Relationship difficulties have been noted to increase suicide risk in physicians, with male physicians also exhibiting an overall increased risk of death by suicide compared to females (Duarte et al., 2020a).

Consistent with previous research, depression was identified as a significant risk factor across both prospective and retrospective studies (Woodhead et al., 2014, Brownhill et al., 2005, Ross et al., 2017, Sørensen et al., 2020). Indeed, any diagnosis of mental illness was also a risk factor for men from prospective studies (Holmstrand et al., 2015). Having a low level of education was associated with increased suicidal behaviour across twelve studies, which demonstrates the potentially longer-term impact of childhood experiences. Previous suicide attempts were also a risk factor in eight studies for future suicide attempts and death by suicide however the small effect sizes of these studies demonstrate the need for further research to improve short-term prediction of suicide risk (Ribeiro et al., 2016). Various factors were identified from a single study or a small number of studies, which highlight important areas for future research.

Identifying risk factors for suicidal behaviour in men has important clinical and research implications. A comprehensive overview of risk factors is useful for suicide crisis helplines to identify imminent risk in men and build on established

formulations (Gould et al., 2016). Previous research has identified that many patients attend emergency departments in the year before their death by suicide (43% in a study by Da Cruz et al. (2011)), with those who attend frequently being more likely to present for psychological reasons or self-harm than other attenders. This demonstrates the importance of suicide risk assessments in emergency settings but also in other services such as addiction services and services treating men who may be vulnerable (for example following a divorce). Also, risk assessments and greater awareness of the risk factors for suicide in men may have merit for those working in other settings, such as mental health charities. However, the limitations of suicide risk assessments need to be borne in mind (Zortea et al., 2020a), when used in isolation, particularly regarding their value compared to clinician judgement. Broadening these assessments to incorporate a more comprehensive understanding of risk factors within a theoretical framework (O'Connor and Kirtley, 2018) should guide clinical practice, improve clinician confidence in using the tools and improve identification of at-risk patients particularly for non-psychiatric care providers (Chunduri et al., 2019). Also, since the ability to identify those at risk of dying by suicide continues to be no better than chance (Franklin et al., 2017), this review provides a useful basis for future research by providing a comprehensive profile of risk factors and identifies important research gaps.

2.5.2 Knowledge Gaps and Directions for Future Research

In this review, it was evident how few studies in the male suicide literature had focused on psychological factors, such as personality and individual differences. This is surprising given the recognition that suicide is a behaviour governed, in large part, by psychological processes (O'Connor and Nock, 2014). Indeed, all of the recent theoretical models of suicide have been psychological in orientation (O'Connor and Kirtley, 2018, Williams and Pollock, 2001, Van Orden et al., 2010). Poor emotional control was identified as a risk factor for suicide in three studies of young male Swedish conscripts. Future research should investigate emotional control in more heterogeneous samples to determine whether its relationship with suicide extends to wider male populations. It would also be important to determine the extent to which emotion dysregulation contributes to suicide risk

in men. Low IQ was also identified as a risk factor in five studies, however, given the heterogeneity of populations and measures of IQ, it is difficult to synthesise the findings and to understand the nature of the relationship between IQ and suicide. Also, more work needs to be done to understand the impact of early life circumstances such as poverty and reduced access to education on suicide risk in men. Periods of economic uncertainty have been linked to an increase in male suicidal behaviour (Vandoros et al., 2019), demonstrating the need to uncover the particular aspects contributing to this such as types of employment or personal circumstances (e.g. being the sole earner in a family).

Impulsivity and impulsive aggression were also identified from one study in this systematic review, which is consistent with previous research that has shown that impulsivity can differentiate between those who think about suicide compared to those who attempt suicide in some samples (Gvion and Apter, 2011, Horesh et al., 1997, Klonsky and May, 2010). Future research is needed, however, to determine whether impulsivity and impulsive aggression are more strongly correlated with male versus female suicides. More research on psychological factors could aid in the identification of factors that predispose certain individuals to suicidal behaviour and crucially help to understand how other social or cultural factors impact on men differentially to increase risk. An issue with synthesising the findings from this review irrespective of risk factor was that the studies used many different measures and definitions of factors thereby rendering it difficult to compare studies (Franklin et al, 2018).

There is also a need to examine elements of the male social experience, such as masculinity, which may influence their suicide risk. To this end, self-reliance and shame could be useful avenues for future research as such feelings may prevent men from seeking help in a crisis and may be associated with maladaptive coping styles such as alcohol and drugs (Oliffe et al., 2017, Cleary, 2012). Social perfectionism, defined as a belief that others expect perfection from you, is an established suicide risk factor that may also be linked to the need to be self-reliant and to portray the outward experience of “doing well” (Wetherall et al., 2019). The extent to which this has a differential effect on men compared to women warrants further investigation. Help-seeking in men is also a useful avenue for further investigation, young men are less likely than young women to visit their

general practitioner in general (Beautrais, 2002) and rigid coping styles may prevent men from recognising that they need help (Canetto, 2017). Disclosing emotional difficulties may pose a threat to the outward appearance of masculinity (Cleary, 2012), however the extent to which this relates to help seeking in men requires further investigation.

Method choice can differ between men and women, with death by self-inflicted gunshot and hanging more common in men. A “failed” suicide may be viewed as weak and a threat to masculinity whereas a “successful” suicide is viewed as brave and decisive (Canetto and Sakinofsky, 1998, Chandler, 2019). Despite differences in method choice, men and women may not differ in their intent to die (Denning et al., 2000), which demonstrates that the underlying mechanisms behind method choice require further investigation.

Defeat and entrapment are key features of predominant models of suicidal behaviour such as the Integrated Motivational-Volitional (IMV) model (O'Connor and Kirtley, 2018), yet it remains unclear whether men are differentially affected by such drivers for suicide than women. More generally, the extant male suicide literature is largely comprised of homogenous samples of white heterosexual men thereby demonstrating the need to investigate whether the risk factors identified herein are also important across different sexualities, ethnicities, and socio-economic status.

Alcohol and drug use/dependence were significant factors across both prospective and retrospective studies, however, a useful avenue for further research would be to disentangle the nature of the relationship between alcohol/drug use and suicide risk. For example, it is unclear whether alcohol predisposes an individual to becoming suicidal or if it is used as a coping strategy. Alcohol use can lead to disinhibited thoughts, impaired judgment and impulsivity; these can lead to suicidal thoughts and behaviours, but it can also be used as a way of alleviating the distress associated with being suicidal (Pompili et al., 2010). Alcohol myopia, which can have a narrowing effect on attention, may also affect men by leading to disinhibited behaviour such as aggression (Giancola et al., 2010). Aggression is an established feature of suicidal behaviour, and a suicide attempt may be a bid to direct this aggression on oneself (Martin et al., 2019). Also, by examining

factors specific to the male experience, such as male depression (Sørensen et al., 2019), research can move towards understanding what it means to be a man and experience suicidal thoughts and behaviours. For example, men may express their emotions in ways different to women, which could lead to the underreporting or under detection of male mental illness (Brownhill et al., 2005, Owens et al., 2011, McQueen and Henwood, 2002).

This review also highlights that more work is needed to understand the interactions between risk factors for male suicide and their relevance across the lifespan. Future research could also examine the factors that are relevant for each age group and how these change and evolve throughout their life. Naturalistic real-time monitoring via smartphones is an important new development (O'Connor and Portzky, 2018b, Kleiman and Nock, 2018) and could be used to examine the shift from thinking about suicide to suicidal behaviour in men. As the focus of this review was on identifying risk factors for suicidal behaviour in men, comorbidities and the associations between suicide risk factors were not analysed but this could be an interesting avenue for future research, particularly as previous research has identified a link between physical and mental health multimorbidity and suicidal thoughts (Kavalidou et al., 2017). In addition, the majority of research identified in this review was conducted in high income countries, which highlights an important gap in the literature due to the fact that over 75% of suicides occur in low-middle income countries (Iemmi et al., 2016). Very few studies investigated the impact of culture on risk of engaging in suicidal behaviour; this research gap is also important to be addressed.

2.5.3 Strengths and Limitations

The strengths of this systematic review include a robust search strategy (see Supplementary Appendix 1), not limited by year, and adherence to best practice guidelines (Johnson and Hennessy, 2019). Checks and balances were included to reduce bias in the screening, extraction, and coding processes. The final included articles were screened by multiple reviewers to ensure they were thoroughly assessed. A wide range of risk factors were identified, from sociodemographics to mental illness, although many had relatively small effect sizes, which highlights

the importance of the use of caution when interpreting the findings. The magnitude of effect of risk factors in males and females was also mixed, demonstrating important gaps to be addressed by future research. Both the prospective and retrospective studies (see Supplementary Appendices 4 and 5) included in this review were rated on average reasonable to good quality, with some studies scoring excellent, which demonstrates that the effect sizes were robust and not influenced by lower quality studies (Barker Bausell et al., 2004). The study quality was similar across prospective and retrospective studies, which was unexpected. However, this may have been because many studies were marked down if they did not conduct a power analysis. Indeed, the inclusion of a post-hoc power analysis may have been useful particularly as many studies had very large sample sizes (with low base rates of suicidal behaviour) and marginal effect sizes (Armstrong, 2019, Kim and Seo, 2013). Selection bias may have been an issue (Johnson and Hennessy, 2019), particularly in the case-control studies where the control group was comprised of individuals recruited from hospital samples or individuals with a diagnosed mental illness. The control participants may have had other confounding variables (or risk factors) present that the studies had not taken into consideration (Henderson and Page, 2007). In addition, there were several studies which used data from conscription for military service and matched this to longitudinal general population data. Some factors were only assessed in the conscription sample (in males, not in females) which hindered the gender comparisons.

As we were interested in suicide over time, we focused on prospective and retrospective study designs only. This focus also addressed two of the key research challenges highlighted by O'Connor and Portzky (2018) regarding the need for more investigation into suicide deaths and novel risk factors. Similar to the limitations noted by Hunt et al. (2017), however, the investigation of gender differences was often not the sole purpose of the studies reviewed herein. Indeed, many of the studies solely focused on sociodemographic differences between men and women. There is a need for future research to investigate gender differences across a wide range of factors, particularly psychological factors that are under researched. Also, we recognise that by excluding intervention studies other important research may be excluded and that retrospective studies may be subject to recall bias, particularly in case-control studies (Sedgwick, 2014). Nonetheless, given the

similarity in findings between the prospective and retrospective studies, this bias may be minimal. A key aspect of the search strategy included the term “risk factor” as well as “suicide attempted” and “suicide”, we recognise that important studies may have been missed. In addition, we did not include papers which studied participants who engaged in non-fatal self-harm as the focus of this review was on suicidal behaviour in men, to tap into the Gender Paradox in Suicide (Canetto and Sakinofsky, 1998). Studies were excluded on the basis that the participants had not attempted suicide or died by suicide. Although given the large number of studies identified initially, it was not deemed viable to broaden the search at this time.

2.6 Conclusions

This review is the largest synthesis of the research literature to date on risk factors for suicidal behaviours in men and the findings demonstrate the wide range of risk factors that are associated with male suicide. From predisposing factors, such as early life experiences and childhood education, to mental illness and health, the path towards suicide for men is complex and involves an interplay of factors. There were five risk factors with a particularly high proportion of supporting evidence in this review. Alcohol and drug use or dependence, marital status, depression, level of education and previous suicide attempts were particularly notable risk factors, which may have a differential impact on suicide risk in men. Although many factors are relevant for all genders, by identifying risk factors in men it provides a step forward towards understanding why men are more likely to die by suicide than women.

Chapter 3: Psychosocial Factors that Distinguish Between Men and Women Who Have Suicidal Thoughts and Attempt Suicide: Findings from a National Probability Sample of Adults

3.1 Abstract

3.1.1 Rationale

Previous research has highlighted the importance of understanding which psychosocial factors distinguish between those with suicide thoughts compared to those who attempt suicide.

3.1.2 Objective

This study aims to investigate these distinguishing factors further within an ideation-to-action framework and to explore sex differences in suicide risk.

3.1.3 Methods

Participants (n=7,546, aged 16+) were from the cross-sectional Adult Psychiatric Morbidity Survey (APMS; 2014) of England. Face-to-face and self-completion questionnaires assessed lifetime suicidal ideation, lifetime suicide attempts, demographic characteristics, life experiences, social support, health and mental illness. Multinomial logistic regression examined factors differentiating between those with suicidal ideation only and suicide attempt histories (with or without suicidal ideation) in men and women.

3.1.4 Results

Overall men were less likely to report suicidal thoughts and attempts, compared to women. More factors differentiated between suicidal thoughts and attempts in women compared to in men; these included hospital admission for mental illness, below degree level qualifications, being single and childhood adversity. In men, factors which significantly differentiated between suicidal thoughts and attempts included self-report of professional diagnosis of mental illness and childhood

adversity. Higher levels of social support were associated with being in the suicidal thoughts group versus in the attempts group in men.

3.1.5 Conclusions

This study identified some key differences between men and women in factors associated with suicide attempts compared to suicidal thoughts. The findings support the use of the ideation-to-action framework to investigate sex differences in suicidal behaviour. Future research should examine the extent to which these factors are associated with suicide risk over time.

3.2 Introduction

Suicide remains one of the leading causes of death worldwide, with one person taking their own life every 40 seconds (World Health Organisation, 2019). The WHO estimate that for every person who has died by suicide approximately 20 people have attempted suicide (World Health Organization, 2014). Understanding the factors that may influence the transition from suicidal thoughts to attempts is crucial as it is estimated that almost 30% of people will act on their thoughts of suicide and approximately 60% of those will do so in the year of the first onset of suicidal ideation (Nock et al., 2008). In a recent review, Turecki et al. (2019) outlined the importance of understanding suicide risk factors but recognised the difficulties in disentangling the influence of these factors across the suicidal spectrum, from thoughts to acts of suicide.

The ideation-to-action framework is a recent framework that aims to help disentangle such risk factors. It postulates that the development of suicidal ideation and the transition to a suicide attempt should be understood as separate processes (Klonsky et al., 2018). This is consistent with the predominant models such as the Interpersonal Theory (IPT) (Joiner et al., 2009, Joiner, 2007), Integrated Motivational-Volitional (IMV) Model (O'Connor and Kirtley, 2018, O'Connor, 2011) and Three-Step Theory (3ST) (Klonsky and May, 2015b).

Of course, disentangling the influence of risk factors across the suicide spectrum is important in the identification and treatment of individuals at increased risk of dying by suicide, but there have been few attempts to investigate gender differences in this regard. For example, the time taken to transition from thinking about suicide to acting on these suicidal thoughts may be shorter in men compared to women (Schrijvers et al., 2012). Although, other authors have suggested that men may not act sooner on suicidal thoughts than women; rather it may be that they are less likely to disclose their suicidal thoughts and when they do, they may be less likely to be heard (Dahlen and Canetto, 2002) and have less social and emotional support available to them than women (Canetto, 2017). Gendered stigma in relation to suicidal behaviour is also relevant here: men may feel there is stigma in terms of them experiencing suicidal thoughts whereas women may

feel stigma in regard to the act of taking their own life (Canetto, 2017, Canetto, 1993, Dahlen and Canetto, 2002, McAndrew and Garrison, 2007, Deluty, 1989). The perpetration of these gendered stigmas may reinforce the Gender Paradox Of Suicide (Canetto and Sakinofsky, 1998). Although many factors will overlap across genders understanding the differential impact of risk factors will help inform a more tailored response in terms of treatment and prevention strategies

Furthermore, taking a gendered approach to understanding suicide risk is important because we know that risk varies as a function of gender (Turecki et al., 2019). The Gender Paradox Of Suicide is well-established and postulates that women are more likely to attempt suicide, but men are more likely to die by suicide (Canetto and Sakinofsky, 1998). Also, men who die by suicide outnumber women in almost every country in the world, except in the 15-19 year age group (Naghavi, 2019a). However, there has yet to be a comprehensive systematic review of sex differences in risk factors for suicide or factors which differentiate between thoughts and attempts in men and women.

To address this dearth of evidence, the aim of this study was to further investigate the psychosocial factors that distinguish between those who think about suicide and those who attempt suicide and to explore sex differences in suicide risk.

3.3 Methods

3.3.1 Sample

This study was a secondary analysis of the Adult Psychiatric Morbidity Survey (APMS) 2014 (McManus et al., 2016, McManus et al., 2020). The APMS 2014 is the fourth in a series of surveys which reports the prevalence of both treated and untreated psychiatric disorder in England, in a sample of 7,546 people aged 16 and over. There were 3058 (40.5%) men and 4488 (59.5%) women in this study. Each survey involved interviewing a large, stratified probability sample of the general population, covering people living in private households. Interviewers visited the address to identify private households with at least one resident aged 16 or over, one person per household was interviewed (if consent was given) to

reduce the burden on the household and to ensure privacy for the interviews (Byron et al., 2016). Face-to-face and self-completion measures were employed. The response rate was 57% and those who did not take part either refused participation or contact could not be established (McManus et al., 2020, McManus et al., 2016). Those who did not participate were more likely to be younger and men and that this was addressed by calibration weighting designed to ensure the sample profile was representative of the English household population aged 16 years and over (McManus et al., 2020, McManus et al., 2016).

In the current study, first phase interviews were included, which involved an initial interview with the whole sample including self-reports of health service diagnosis. Full details of the methodology have been described elsewhere (McManus et al., 2016, McManus et al., 2020). NHS Digital granted permission for use of the data reported herein.

3.3.2 Measures

A wide range of variables were included, spanning sociodemographic characteristics, life experiences, as well as indicators of physical and mental health. Demographic characteristics of the sample can be found in Supplementary Appendices 8-12.

3.3.2.1 Suicidal history

The following items related to suicidal thoughts and attempts were asked: “Have you ever thought of taking your life, even though you would not actually do it?” and “Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?” (McManus et al., 2016, McManus et al., 2020). For the purposes of this study a new variable was created which classified participants as either having no suicidal history, suicidal thoughts only or a suicide attempt(s) (with or without reported suicidal thoughts) history. Help-seeking following a suicide attempt was also included. Participants were asked whether they sought help from anyone, a friend, a family member, a neighbour, GP/Family doctor, at hospital, someone else or a mental health professional. Descriptive statistics for

the suicidal behaviour and help-seeking can be found in (Appendix 10-11 and Table 1).

3.3.2.2 Sociodemographic characteristics

The following sociodemographic variables were included.: sex (binary coded: male or female), de-facto marital status (same-sex couple, divorced or separated, widowed, single and married or cohabitating), age (continuous variable) and ethnicity (Mixed/multiple ethnicities/other ethnic groups, Asian/Asian British, Black/African/Caribbean/Black British or White). Sex was binary coded (male or female) in the APMS dataset (McManus et al., 2016, McManus et al., 2020) as participants were only presented with a binary option, which likely corresponded with their sex. Therefore, the term sex is used in this paper, although given this is a survey participants were able to self-report as they choose. Ethnicity was based on those used in the latest Census and the Office for National Statistics (ONS) questions for use in national surveys (McManus et al., 2016, McManus et al., 2020). Employment status was coded as either employed (including working in a family business); unemployed (and therefore looking and available for work); or economically inactive (including those who are unable to work due to disability or illness, students, retired, or looking after the home). Rurality was coded into three categories: village, hamlet, and isolated dwellings; town and fringe; urban. Quintile of the indices of multiple deprivation (QIMD) is an area-level indicator with a low score indicating less deprivation and a high score indicating higher levels of deprivation (McLennan et al., 2019). Highest educational qualification was coded as: no qualifications, below university degree level qualifications (e.g. CSE/O Level/GCSE/A Levels/Higher Educational Qualification) and degree level qualification.

3.3.2.3 Life Experiences

Life events variables selected for this analysis were childhood adversity (assessed using 12 items) and trauma (assessed using 21 items) (McManus et al., 2016, McManus et al., 2020). Childhood adversity (minimum score: 0, maximum: 12) and trauma (minimum score: 0, maximum score: 21) were computed as continuous

variables, summing the number of types of childhood adversity or trauma experienced. Examples of the childhood adversity items include before age 12 - 'did not have a safe place to stay' and before 12 - 'were ill but no one took you to the doctor?'. The trauma variables included: 'experienced sexual abuse at any time of your life' and 'experienced being homeless at any time in your life'.

Social support was assessed using the 7-item Social Support Networks (IMSR) questionnaire (Brugha et al., 1987). All items began with the stem 'people I know -' followed by: 'do things to make me happy' and 'make me feel loved'. Participants could respond with: not true; partly true or certainly true. A continuous variable was computed for total social support score (minimum score: 0, maximum score: 21) by adding together each participant's scores on the seven social support items.

3.3.2.4 Health

One question from the 12-Item Short Form Survey (SF-12) examined "health in general" (Ware Jr and Gandek, 1998) with the response options: excellent, very good, good, fair, or poor. Smoking history was recorded as never smoked or ever smoked. Multimorbidity was calculated as a continuous variable counting the number of health conditions participants reported anytime in adulthood. Thirty-six health conditions were covered, including: cancer, diabetes, epilepsy/fits, migraine or frequent headaches, dementia or Alzheimer's disease, cataracts/eyesight problems, ear/hearing problems, stroke, heart attack/angina, high blood pressure, bronchitis/emphysema, asthma, stomach ulcer/digestive problems, liver problems, bladder problems/incontinence, infectious disease, arthritis, bowel/colon problems and skin problems. The minimum reported health conditions were 0 and the highest number of health conditions reported was 14.

3.3.2.5 Mental Health and Wellbeing

Two questions assessed the lifetime presence of any eight common mental disorders (phobia, panic attacks, post-traumatic stress disorder, depression, post-natal depression, nervous breakdown, obsessive compulsive disorder and seasonal

affective disorder). With one question covering whether the participant thinks they have had each disorder and the other whether the participant reports being told by a professional that they have it. This was coded as “not applicable”, “yes” or “no”. Although, it is important to note that the words ‘mental illness’ are not used with participants, the question used was: ‘Now please look carefully at this card. Do you think that you have ever experienced any of these?’. A binary variable (yes/no) also classified whether participants reported having been admitted to hospital or a ward specialising in mental health (lifetime).

3.3.3 Statistical Analysis

Prevalence estimates were generated using frequencies and cross-tabulations. Binomial logistic regression analysis was conducted to determine the odds of reporting lifetime suicidal thoughts and attempts by comparing men and women (Table 3.1). Women were the reference category in this analysis.

Separate multinomial univariate logistic regression analyses were conducted for each of the variables to inform the selection of items for inclusion in the multivariate analyses. The focus of this analysis was on suicidal thoughts vs suicide attempts (Supplementary Appendix 13). The following variables were included in the univariate analysis: age, marital status, ethnicity, education, employment, QIMD, rurality, health in general, multimorbidity, smoking history, self-diagnosis of mental illness, professional diagnosis of mental illness, admission to hospital or ward specialising in mental health, childhood adversity, trauma, and social support. Suicidal thoughts were the reference category, thence the analysis did not include participants with no suicidal history. Then the file was split by sex and the analysis was repeated for men and women (Supplementary Appendices 14 and 15).

Odds ratios (OR) and 95% CIs are reported. A risk factor was deemed to be significant if the p-value was $<.01$ to account for multiple comparisons. All analyses were conducted using SPSS 25.

3.4 Results

3.4.1 Suicidal History

Overall, 484 (6.4%) participants reported suicide attempts, 929 (12.3%) reported suicidal thoughts only and 6133 (81.3%) reported no suicidal history (Table 3.1). Among men, 147 (4.8%) reported suicide attempts, 348 (11.4%) reported suicidal thoughts only and 2563 (83.8%) reported no suicidal history (Table 3.1). Among women, 337 (7.5%) reported suicide attempts, 571 (12.9%) reported suicidal thoughts only and 3570 (79.5%) reported no suicidal history (Table 3.1).

In the binary logistic regression (Table 3.1) men were less likely to report suicidal thoughts only (OR [95% CI] =.86 [.75, 1.00], $p < .05$) and suicide attempts (OR [95% CI] = .62 [.51, .76], $p < .0001$) than women.

Table 3.1: Prevalence of Self-reported Lifetime Suicidal Thoughts and Attempts by Sex

	Prevalence N (%)	Sex Differences OR (95% CI)
No Suicidal History		
Men	2563 (83.8%)	Reference category
Women	3570 (79.5%)	
All	6133 (81.3%)	
Suicidal Thoughts Only		
Men	348 (11.4%)	.83 [.72, .96]*
Women (reference category)	571 (12.9%)	
All	929 (12.3%)	
Suicidal Attempts (with or without thoughts)		
Men	147 (4.8%)	.61 [.50, .74]**
Women (reference category)	337 (7.5%)	
All	484 (6.4%)	

* $p = .01$

** $p < .0001$

3.4.2 Participant Characteristics

There were 3058 (40.5%) men and 4488 (59.5%) women in this study. Participants in the 35-54 age group (relative to other age groups) accounted for the highest proportion of people in both the suicidal thoughts (n=379, 5.0%) and suicide attempts (n=194, 2.6%) groups. Compared to those in the other marital status categories, single people also accounted for most people in the suicidal thoughts (n=186, 11.7%) and suicide attempts (n=273, 17.2%) groups. The majority of participants were white (90.3%). The highest proportion in the suicidal thoughts group (n=470, 6.2%) and suicide attempts group (n=252, 3.3%) has below degree level qualifications. The majority of participants in both groups were employed: suicidal thoughts (n=571, 7.6%) and suicide attempts (n=227, 3.0%). Area level deprivation (QIMD) was fairly evenly distributed across the suicidal thoughts and attempts groups. The majority of participants lived in urban settings: suicidal thoughts (n=761, 10.1%) and suicide attempts (n=419, 5.6%). Full demographic characteristics, health and psychosocial factors by suicidal history and help-seeking following a suicide attempt for the overall sample and in men and women can be found in Supplementary Appendices 8-12.

3.4.3 Factors Associated with Suicide Ideation vs. Attempts

The full table detailing the multivariate multinomial univariate logistic regression for variables distinguishing between suicidal thoughts and attempts (overall and in males and females) can be found in Supplementary Appendices 13-15.

3.4.3.1 Sex Differences

The findings in Table 3.2 detail the differences in risk and protective factors for suicidal behaviour in men and women (see Supplementary Appendices 13 and 14) for the full multivariate multinomial logistic regression of variables distinguishing between participants by suicidal history and sex). Ethnicity did not significantly differentiate between suicidal thoughts and attempts in males and females (Supplementary Appendices 14 and 15). The age of respondents also did not significantly differentiate between suicidal thoughts and attempts in males and

females, but older age was associated with lower levels of suicide attempts in women (Supplementary Appendix 15) and low levels of thoughts and attempts in men (Supplementary Appendix 14).

3.4.4 Suicidal Thoughts vs Suicide Attempts in Women

3.4.4.1 Risk Factors and Context in Women

Factors which significantly distinguished between suicidal thoughts to suicide attempts in women (Table 3.2 and Supplementary Appendix 15), in the multivariate model, were hospital admission for mental illness (OR [95% CI] = 6.11 [3.40, 10.98], $p < .0001$), self-report of professional diagnosis of mental illness (OR [95% CI] = 2.02 [1.25, 3.26], $p = .004$), below degree level qualifications (OR [95% CI] = 1.90 [1.28, 2.82], $p = .001$), being single (OR [95% CI] = 1.71 [1.18, 2.46], $p = .004$) and childhood adversity (OR [95% CI] = 1.25 [1.12, 1.39], $p < .0001$).

3.4.4.2 Protective Factors in Women

None of the factors distinguished between females in the suicidal thoughts and suicide attempts groups (Table 3.2 and Supplementary Appendix 15).

3.4.5 Suicidal Thoughts vs Suicide Attempts in Men

3.4.5.1 Risk Factors and Context in Men

In the multivariate model, a self-reported professional diagnosis of mental illness (OR [95% CI] = 2.72 [1.48, 5.00], $p = .001$) and childhood adversity (OR [95% CI] = 1.28 [1.10, 1.49], $p = .001$) significantly differentiated between suicidal thoughts and attempts in men (Table 3.2 and Supplementary Appendix 14).

3.4.5.2 Protective Factors in Men

Among men, higher levels of social support (OR [95% CI] = .91 [.86, .96], $p=.001$) were associated with a reduced odds of reporting a suicide attempt compared to those with suicidal thoughts only (Table 3.2 and Supplementary Appendix 14).

Table 3.2: Multivariate multinomial logistic regression of variables distinguishing between participants who reported suicidal thoughts vs those who reported suicide attempts by sex

Model Variables	Overall		Males		Females	
	Fully Adjusted OR	P value	Fully Adjusted OR	P Value	Fully Adjusted OR	P Value
Sociodemographics						
Age	.71 [.59, .86]	<.0001	-	-	-	-
Sex						
Male	.73 [.55, .95]	.02	-	-	-	-
Female (ref)	-	-	-	-	-	-
Marital Status						
Same-sex couple	-	-	-	-	-	-
Divorced or separated	1.26 [.90, 1.77]	.19	.68 [.38, 1.23]	.20	1.44 [.96, 2.15]	.19
Widowed	.89 [.50, 1.58]	.69	.91 [.34, 2.43]	.85	.65 [.34, 1.24]	.19
Single	1.36 [1.01, 1.84]	.04	1.14 [.73, 1.79]	.56	1.71 [1.18, 2.46]	.004
Married or cohabitating (ref)	-	-	-	-	-	-
Ethnicity						
Mixed/multiple ethnicities/other ethnic groups	-	-	-	-	-	-
Asian/Asian British	-	-	-	-	-	-
Black/African/Caribbean/black British	-	-	-	-	-	-
White (ref)	-	-	-	-	-	-
Education						
No qualifications	2.43 [.98, 6.03]	.06	3.28 [.86, 12.44]	.08	1.35 [.41, 4.53]	.62

Below degree level qualifications	1.63 [1.18, 2.25]	.003	1.36 [.82, 2.24]	.24	1.90 [1.28, 2.82]	.001
Degree level qualification (ref)	-	-	-	-	-	-
Employment						
Economically inactive	.98 [.73, 1.31]	.87	1.21 [.76, 1.94]	.41	.81 [.57, 1.16]	.25
Unemployed	.92 [.53, 1.62]	.78	1.51 [.64, 3.59]	.35	.71 [.35, 1.42]	.33
In employment (ref)	-	-	-	-	-	-
QIMD						
34.17 -> 87.80 most deprived	1.58 [1.03, 2.42]	.04	1.59 [.83, 3.06]	.16	1.78 [1.06, 3.00]	.03
21.35 -> 34.17	1.27 [.82, 1.95]	.27	.92 [.47, 1.77]	.79	1.66 [.98, 2.81]	.06
13.79->21.35	1.12 [.73, 1.73]	.61	1.06 [.55, 2.03]	.87	1.24 [.72, 2.11]	.44
8.49 -> 13.79	.80 [.50, 1.25]	.31	.71 [.36, 1.39]	.31	.86 [.50, 1.51]	.61
0.53 -> 8.49 least deprived (ref)	-	-	-	-	-	-
Rurality						
Village, hamlet and isolated dwellings	.77 [.44, 1.33]	.35	.94 [.44, 1.99]	.87	.68 [.34, 1.35]	.27
Town & fringe	.97 [.65, 1.46]	.89	.95 [.51, 1.79]	.88	1.00 [.61, 1.64]	.99
Urban (ref)	-	-	-	-	-	-
Health						
Current Health in general (SF1)	.92 [.81, 1.03]	.16	.97 [.80, 1.17]	.76	.90 [.78, 1.04]	.15
Multimorbidity (since age 16)	1.10 [1.04, 1.17]	.001	1.06 [.97, 1.16]	.22	1.07 [1.00, 1.15]	.04
Smoking history						
Ever smoked	.77 [.58, 1.03]	.07	1.01 [.64, 1.58]	.98	.70 [.49, .98]	.04
Never smoked (ref)	-	-	-	-	-	-
Mental Health and Wellbeing						
Self-diagnosis - self report of having ever had any of 8 CMD						
Yes	.60 [.37, .97]	.04	.43 [.22, .84]	.01	.71 [.38, 1.33]	.28
No (ref)	-	-	-	-	-	-
Ever diagnosed with any of 8 CMD						
Yes	2.27 [1.54, 3.37]	<.0001	2.72 [1.48, 5.00]	.001	2.02 [1.25, 3.26]	.004
No (ref)	-	-	-	-	-	-
Ever admitted to hospital or ward specialising in mental health						
Yes	4.54 [2.93, 7.03]	<.0001	.79 [.32, 1.97]	.62	6.11 [3.40, 10.98]	<.0001

No (ref)	-	-	-	-	-	-
Life Experiences						
Childhood Adversity	1.23 [1.13, 1.34]	<.0001	1.28 [1.10, 1.49]	.001	1.25 [1.12, 1.39]	<.0001
Trauma	1.05 [1.01, 1.10]	.01	1.03 [.97, 1.10]	.36	1.06 [1.004, 1.12]	.04
Social Support Score	.98 [.94, 1.02]	.25	.91 [.86, .96]	.001	1.02 [.97, 1.07]	.53

*Suicidal thoughts were the reference category

3.4.5 Post Hoc Analysis

In response to a comment from a reviewer, post-hoc analyses were conducted to examine sex differences in the childhood adversity and trauma variables (Supplementary Appendix 16).

Regarding childhood adversity (before 18) men were more likely to have experienced ‘an adult in your life hit, beat, physically hurt you (other than smacking)’ (OR [95% CI] = 1.42 [1.23, 1.63], $p < .0001$). Women were more likely to experience ‘got scared or felt really bad because adult in your life called you names, said mean things to you, or said they didn’t want you’ (OR [95% CI] = .72 [.61, .84], $p < .0001$).

Men were more likely to experience the following childhood adversity (before 12) variables: ‘went to school in clothes that were dirty, torn, didn’t fit because no clean ones available’ (OR [95% CI] = 1.33 (1.19, 1.50), $p < .0001$) and ‘went hungry because no one got your meals ready or there was no food in the home’ (OR [95% CI] = 1.33 [1.17, 1.51], $p < .0001$). There were no childhood adversity (before 12) variables that women were more likely to experience.

In regard to the trauma variables, men were more likely to experience: ‘serious illness or injury at any time in your life’ (OR [95% CI] = 1.54 [1.39, 1.70], $p < .0001$), ‘serious assault to yourself at any time in your life’ (OR [95% CI] = 1.30 [1.09, 1.56], $p = .003$), ‘being made redundant or sacked from your job at any time in your life’ (OR [95% CI] = 2.49 [2.25, 2.74], $p < .0001$), ‘looking for work without success for more than 1 month at any time in your life’ (OR [95% CI] = 1.97 [1.77, 2.20],

$p < .0001$), 'major financial crisis, equivalent to loss of 3 months income at any time in your life' (OR [95% CI] = 1.71 [1.50, 1.97], $p < .0001$), 'trouble with police involving court appearance at any time in your life' (OR [95% CI] = 5.43 [4.37, 6.75], $p < .0001$), 'time in prison on remand or serving a sentence at any time in your life' (OR [95% CI] = 6.64 [4.03, 10.95], $p < .0001$), 'violence at work at any time in your life' (OR [95% CI] = 2.47 [1.89, 3.25], $p < .0001$) and 'being expelled from school at any time in your life' (OR [95% CI] = 1.88 [1.40, 2.52], $p < .0001$).

Women were more likely to experience 'separation due to marital difficulties, divorce or steady relationship breakdown at any time in your life' (OR [95% CI] = .80 [.72, .88], $p < .0001$), 'violence in the home at any time in your life' (OR [95% CI] = .39 [.32, .47], $p < .0001$), 'sexual abuse at any time in your life' (OR [95% CI] = .28 [.22, .36], $p < .0001$) and 'running away from home at any time in your life' (OR [95% CI] = .72 [.58, .90], $p = .003$).

The new childhood adversity and trauma variables were then entered into the multivariate analysis investigating sex differences in factors associated with suicidal thoughts vs suicide attempts, but none emerged as significant.

3.5 Discussion

The research aims were met with significant sex differences identified, highlighting important risk, context, and protective factors in those with a history of suicidal thoughts versus suicide attempts. Specifically, this study investigated the factors differentiating between individuals who had attempted suicide compared to those who had thought about suicide. Women reported more suicidal thoughts and attempts compared to men, consistent with the Gender Paradox of Suicide (Canetto and Sakinofsky, 1998). More factors differentiated between suicidal thoughts and attempts in women and these included hospital admission for mental illness, below degree level qualifications, being single and childhood adversity. In men, factors which significantly differentiated between suicidal thoughts and attempts included self-report of professional diagnosis of mental illness and childhood adversity. Higher levels of social support seem to protect

against suicide attempts in men, as those in suicidal thoughts group reported higher levels of social support than those who had attempted suicide.

Mental illness emerged as an important factor in this study, with a professional diagnosis having a higher odds ratio of distinguishing between suicidal thoughts and attempts in men relative to women. This may reflect men having a higher threshold of perceived severity of mental illness before they seek help, compared to females (Freeman et al., 2017) such that the former may only seek help when they are in crisis. Nonetheless, these findings suggest that those with a mental illness diagnosis are more at risk of acting on their thoughts of suicide compared to those without.

Men and women differed in their risk factor profiles. A history of hospitalisation for mental illness was a significant risk factor in women, which supports previous research recommending suicide risk evaluation after psychiatric discharge (Forte et al., 2019, Vuagnat et al., 2020, Walter et al., 2019). A higher proportion of women in this sample sought help from a hospital (78 women vs 31 men) or mental health professional (11 women vs 4 men) following a suicide attempt, which may also account for this finding. Indeed, Reynders et al. (2015) noted that people with a history of suicidal thoughts and attempts were less likely to seek mental health support and men in this group were more likely to experience self-stigma whereas women were more likely to experience shame (compared to those with no suicidal history). This could potentially be linked to past negative experiences of help-seeking for suicidal thoughts or behaviour, either professionally or from friends and family. Callear et al. (2014) also noted the impact of stigma on reducing help-seeking intentions among those experiencing suicidal thoughts and behaviours, as well as poor suicide literacy which demonstrates that more work is needed to improve knowledge of suicide in the community and help tackle stigmatising attitudes. Many barriers towards help seeking exist for those struggling with suicidal thoughts or behaviours including lack of knowledge of where to seek help, being afraid to ask for help, long waiting times, personal or family responsibilities, lack of availability of mental health care in their area and affordability of care (Pagura et al., 2009).

Level of education was only a significant risk factor in women, which could be understood as part of a larger picture of socioeconomic disparities and early life experiences (Lorant et al., 2021). It is often theorised that female suicides are precipitated by interpersonal problems (e.g. relationship issues) and male suicides are more linked to impersonal problems like financial issues (Canetto, 2008, Kposowa, 2001). Although it is important to consider the impact of sociodemographic disadvantage on suicide risk in women, particularly as previous research has noted that employment is a protective factor for both men and women (Canetto, 2008). Considering the broader life circumstances of men and women may provide a more accurate portrayal of the factors contributing to their suicidal distress. Despite some gender differences, common features emerged across men and women: the pervasive impacts of mental illness, hospitalisation, and adverse life experiences. Taken together, these findings highlight the importance of a personalised approach to suicide risk assessment and prevention (Graney et al., 2020), that each individual has different stressors in their life which may be impacting their mental health and wellbeing, and in turn, their suicide risk.

This study has extended the extant literature on the differences between those who think about suicide and those who attempt suicide. The differences in risk profiles identified by men and women provide a deeper insight into what these participants have experienced (Appendix 15), with women more likely to experience relational trauma and violence or sexual abuse at home whereas males were more likely to experience violence at work specifically or in general and neglect. Historic risk factors such as childhood trauma have been studied previously (Burke et al., 2018) consistent with many of the predominant theories of suicidal behaviour. Such existing theories can be used as a framework to understand the emergence of suicidal behaviour but more needs to be done to understand the application of such models to explain sex and gender differences in suicide. Indeed, it has been proposed in the Fluid Vulnerability Theory that such pre-existing risk factors have a higher likelihood of differentiating between individuals who think about suicide and those who attempt suicide as these individuals can be described as having “chronic” suicide risk which persists over time (Bryan and Rudd, 2016, Zatti et al., 2017). This is also consistent with acquired capability component of the Interpersonal Theory (Joiner et al., 2009,

Joiner, 2007), Three-Step Theory (Klonsky and May, 2015b) and the pre-motivational stage of Integrated Motivational-Volitional Model (O'Connor and Kirtley, 2018). In the present study, childhood adversity was a risk factor for both males and females, these findings reinforce the long-term effects of early childhood experiences which may also impact upon social, mental health and emotional outcomes in adulthood (Haahr-Pedersen et al., 2020).

Some protective factors also emerged from this study. Social support was only protective in men, with high levels being associated with a reduced likelihood of suicide attempts. This is consistent with previous research showing that men may benefit from community social support more than women (Šedivy et al., 2017). This may further reinforce the fact that men benefit from feeling valued by their peers, that they have a positive impact on their life (Richardson et al., 2021a).

3.5.1 Strengths and Limitations

This sample, the Adult Psychiatric Morbidity Survey, is large, nationally representative of the adult population in England, and is well suited to addressing our study aims. The APMS samples participants from the general population, rather than patient lists or established panel samples. This allows for the examination of the “treatment gap” as it will include people with mental health problems but who are not actively involved in treatment. The sample is also well stratified in terms of area level deprivation and allows for a range of individuals to be included.

Participants' likelihood and willingness to report suicidal history can be affected by various factors including data collection methods (Turecki et al., 2019). The APMS 2014 dataset includes both self-report and interview administered surveys. It was decided in this study to analyse the self-report data on suicidal history as this method of data collection yields higher levels of suicide attempts and ideation as participants tend to feel more comfortable disclosing previous suicidal behaviour in self-report questions compared to face-to-face completion. Although the self-report questions may lead to the underreporting of suicidal thoughts,

behaviours, and associated risk factors, particularly in men, due to stigma or a pressure to answer the questions in a certain way.

A limitation of this study, like other such research detailed by Nock et al. (2016) is that it is difficult to ascertain whether these risk factors influence the probability of the outcome variables (suicidal ideation or attempts) or whether these are consequences of the attempt itself. Also, due to the nature of this study design, some factors may have occurred after rather than before the attempt and it is difficult to ascertain whether both the outcome and risk factors are caused by another factor which hasn't been adjusted for in this dataset. This study also predominantly assesses distal risk factors measuring lifetime prevalence and was unable to include more specific risk factors such as access to lethal means and exposure to suicide which may have a more significant influence on the transition from thoughts to attempts. Nonetheless, the findings from this study are valuable for targeting groups in need. In addition, the cross-sectional nature of this study is a limitation as it means that we cannot comment directly on the extent to which these variables predict the transition from suicidal thoughts to attempts over time. In addition, the sample was predominantly white and there were a small number of same-sex couples which may influence the lack of significant findings across different ethnicities and sexualities (see Appendix 1 for more information). The data analysed in this paper are limited by having binary coded sex variables (male or female); as a result, it was not possible to conduct analyses of different genders.

Finally, the suicide questions used in this dataset ("Have you ever thought of taking your life, even though you would not actually do it?" and "Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?") are potentially leading questions and may be gendered. For example, in Anglo culture self-poisoning as a suicide method can be stigmatised as it is viewed as feminine (Canetto and Sakinofsky, 1998, Canetto, 2017). In countries, like Britain, where male suicides outnumber female suicides there can be assumptions that suicide attempts are feminine, due to the notion of having "failed" to take one's own life (Canetto and Sakinofsky, 1998, Canetto, 2017). Thence this may have affected the likelihood of men disclosing their previous suicidal behaviour.

3.5.2 Knowledge Gaps and Directions for Future Research

An issue with researching factors which distinguish between suicidal thoughts and attempts is knowing when the transition from thoughts to action will occur or how this transition will happen (Bryan and Rudd, 2016). It is important to consider the timing of risk factor measurement to determine the exact impact of these variables (Bryan and Rudd, 2016), which is an important area for future research.

As we found here, and as Mars et al. (2019) also noted, the effect sizes of identified factors are often small and have not been replicated. As a result, it is unclear how robust some of the findings are and it demonstrates the need for further research. Also, future research should consider other risk factors that have not been investigated within the context of the ideation to action framework. For example, differences in the neural response to the threat of death, bodily harm or illness may differ in individuals who attempted suicide compared to those who thought about suicide. Previous research Weinberg et al. (2017) has identified that this was blunted in those who have attempted suicide, which requires further examination.

Future research should also examine the impact of stigma on self-disclosure of mental illness and suicide in men and women, particularly as this study found that women were more likely to report suicidal thoughts and attempts. As well as understand the ways in which men and women feel comfortable talking about their suicidal history and mental illness to limit the reinforcement of this gendered stigma regarding the Gender Paradox of Suicide (Canetto, 1997, Canetto, 1993, Canetto, 2008, Canetto and Sakinofsky, 1998, Deluty, 1989, McAndrew and Garrison, 2007).

3.6 Conclusions

Distinguishing between suicidal ideation and suicide attempts is an area of both clinical and theoretical importance and this study has uncovered some important distinguishing factors. Sex differences were also examined in this study, as women

reported more suicidal ideation and suicide attempts in the APMS dataset than men. The findings suggest that a history of hospitalisation for mental illness was associated with being in the suicide attempt group in both males and females, highlighting the potential need for monitoring of risk following discharge. The long-term impact of life experiences such as childhood adversity should also be considered as suicide risk factors. Future research should aim to build on these findings, particularly prospectively assessing the progression from ideation to attempts in real time.

Chapter 4: “there is nothing, there is no tomorrow, there’s no future here”: An interpretative Phenomenological Analysis of personal, social and cultural factors in men who have attempted suicide

4.1 Abstract

4.1.1 Rationale

Suicide is a major public health concern and male suicides outnumber women in all countries and all age groups.

4.1.2 Objective

This present study explored the psychosocial factors that contributed to men attempting to take their own life.

4.1.3 Method

Men (n=12) participated in semi-structured face-to-face interviews which were subjected to Interpretative Phenomenological Analysis (IPA).

4.1.4 Results

Three master themes were identified: 1) “predisposing factors” 2) “situational factors associated with the attempt” and 3) “motivational factors”.

4.1.5 Conclusions

The findings reveal the pressure many of the men felt to attain the status of being a “successful man” and failing to do so affected their self-confidence and self-esteem. The prevailing impact of past experiences was also relevant. The build-up to the attempt differed among the participants although several had experienced poor mental health for a prolonged period of time. Also, various motivational factors emerged such as entrapment, hopeless or perceived burdensomeness. The theoretical and clinical implications of this study will also be discussed.

4.2 Introduction

Suicide is a major public health concern and was among the ten leading causes of death in eastern Europe, central Europe, western Europe, central Asia, Australasia, southern Latin America, and high income North America between 1990 and 2016 (Naghavi, 2019b). Male suicides also outnumber women in all countries and all age groups as highlighted by the Global Burden of Disease Survey (except the 15-19 year group where rates were higher in females) (Naghavi, 2019b). The journey towards attempting to take one's life is complex and requires understanding beyond biological or psychological factors (Turecki et al., 2019). Examining social and environmental elements in conjunction with other key factors as a more holistic perspective/person in context approach can provide a richer context regarding what the individual was experiencing prior to and at the time of attempting to take their life.

Previous qualitative research has examined the male experience in relation to suicidal behaviours, with various themes emerging. Emotional suppression and a reluctance to seek help to adhere to traditional masculine norms of strength and self-reliance were common (Kunde et al., 2018, Kiamanesh et al., 2015, Cleary, 2012). Many men even struggled to identify that they were in distress (Cleary, 2012). Although men and women may experience mental illness, i.e. depression, in the same way, their outward expression may differ (Danielsson and Johansson, 2005). Men may be more likely to display numbing, avoidant and escape behaviours (Brownhill et al., 2005). Men and women can also describe their experiences of depression differently, men appear to be more comfortable describing their physical distress, as opposed to emotions (Danielsson and Johansson, 2005). Difficulties coping with physical and/or mental illnesses or difficult situations in life was prevalent across various studies (Kunde et al., 2018, Kiamanesh et al., 2015, Kizza et al., 2012, Milner et al., 2017a) and this can lead to harmful coping strategies such as alcohol or drug use (Milner et al., 2017a, Cleary, 2012, Creighton et al., 2017).

Work pressures were significant, often tied to their identity as a man (Kunde et al., 2018, Milner et al., 2017a). Access to means is also an issue in certain occupations, for example, Kunde et al. (2018) examined this in Australian farmers.

Difficulties in the family or romantic relationships were prevalent (Milner et al., 2017a, Perceval et al., 2018, Shiner et al., 2009). Men may feel a sense of shame due to a perceived failure in their romantic relationship (Kölves et al., 2011). Marriage may be more protective for men, compared to women, preventing them from engaging in risky behaviours as well as offering emotional support (Scourfield and Evans, 2015).

Differences across cultures and age groups have been examined, concerning how men understand their suicidal thoughts and behaviours as well as how they view others who are experiencing this. Suicide can be viewed as a legitimate way of taking control of their situation and showing strength, particularly if they perceive themselves to not have lived up to societal expectations such as achieving success in work, education or in their personal life (Meissner et al., 2016, Kizza et al., 2012, Kiamanesh et al., 2014, Apesoa-Varano et al., 2018, Rasmussen et al., 2018a, Adinkrah, 2012). These struggles are also relevant in the transition from adolescence to adulthood, which can lead to feelings of defeat and shame (Meissner et al., 2016, Rasmussen et al., 2014b, Rasmussen et al., 2018b, Andoh-Arthur et al., 2018, Rasmussen et al., 2018a, Bantjes et al., 2017). Feelings of entrapment can arise and for many, the only way of coping is anger in the face of seemingly unbearable emotions or life circumstances (Rasmussen et al., 2014b). The need to escape is also relevant for men (Kiamanesh et al., 2015, Rasmussen et al., 2018b, Cleary, 2012, Rasmussen et al., 2014a) with suicide being viewed as the only option.

The present study aims to gain a deeper understanding of the factors that lead men to attempt to take their own life. By interviewing men with a history of suicidal thoughts and behaviours it allows for the exploration of the personal, social, and cultural elements that drove them to engage in suicidal behaviours. Interpretative Phenomenological Analysis (IPA) puts the individual at the centre of the interview, focusing on what experiences are significant to them and allows for a more in-depth understanding of how participants interpret and comprehend their own experiences (Spiers and Smith, 2019) and consequential behaviours.

4.3 Method

4.3.1 Sampling

A convenience sample of twelve men who had attempted suicide in the past five years was recruited through social media adverts (Twitter, Facebook, Gumtree, University website) from the general population. Suicide attempt was defined as a non-fatal, self-directed self-harming episode associated with at least some evidence of suicide intent (O'Connor et al., 2013). Inclusion criteria were identifying as male; at least 18 years old; having attempted suicide in the last five years and being competent in English. Exclusion criteria were being imminently suicidal (i.e., a person stating that they intended to kill themselves within the next few hours), experiencing a psychotic episode at the time of recruitment and having a suicide attempt more than five years ago. Thirty-one men were screened for eligibility over the telephone and twelve met the eligibility criteria for participation. The men who were not eligible to participate in this study were excluded for the following reasons: they had not attempted suicide, or their suicide attempt was more than five years ago. Participants were aged between 19 and 49 years ($M=33.8$, $SD=9.8$); and were from Scotland (UK). Five men had attempted suicide in the last year. The age at which participants first thought about suicide ranged from 12 to 44 years ($M = 19.9$, $SD = 9.5$) and the age when they first attempted suicide varied between 12 and 44 years ($M = 23.8$, $SD = 8.8$). In this study the men used a variety of suicide methods, 4 men engaged in self-poisoning, 4 men engaged in self-injury/cutting, 2 men attempted to jump from height, and 2 men used multiple methods including self-poisoning hanging, self-injury/cutting and putting himself at risk e.g. walking in front of vehicles. Further details on participants' demographic information and suicidal history can be found in Supplementary Appendix 17.

4.3.2 Procedure and Interview

Ethical approval for the study was obtained from the relevant ethics committee of the College of Medical, Veterinary and Life Sciences (MVLS) at the University of Glasgow (application No 200180116; Supplementary Appendix 18). Potential participants contacted the author via text, telephone call, email or social media

and scheduled an eligibility screening phone call. Before the telephone call, the information sheet, and a support sheet, with a list of organisations to contact if participants wish to seek support (for example Samaritans, Breathing Space and SAMH), was emailed to all potential participants. The potential participants were also given the opportunity to ask any questions about the study during the phone call.

Following telephone screening, and if the eligible participants were still interested in participating in the study, a face-to-face interview was arranged at their convenience. Participants were provided with an information sheet and consent form to seek informed consent (Supplementary Appendix 19 and 20). Semi-structured interviews were conducted by the first author either at the Suicidal Behaviour Research Lab or Scottish Association for Mental Health (SAMH) offices. The interviews were audio-recorded and lasted between 25 and 67 minutes ($M = 44.1$ minutes). No one else was present besides the interviewer and participant. All participants were offered £30 compensation for their time. A brief interview schedule was created based on the overall aim of the study (Supplementary Appendix 19). This began with “Tell me about your most recent experience of attempting to take your own life”. Relevant topics were then explored with follow up questions such as “How did that make you feel?” and “What was going through your mind at that time?”. This semi-structured process helped the interviewer guide the participant through the process, without asking leading questions. The interviewer also used some reflection and probing techniques (such as “You mentioned... can you tell me a bit more about that?”). A risk assessment was conducted after the interviews to ensure participant’s safety, this included clinical measures of psychological distress and suicidal intent. No participants’ indicated distress followed in the interviews. The transcripts were not shared with the participants prior to or following the analysis. The participants all opted into being sent the study following publication. The focus of this paper is on factors leading up to the attempt, other themes such as “Changed but Still Vulnerable” and “Altered Sense of Self”, were also identified from this data which are included elsewhere (Chapter 5) and Richardson et al. (2021a).

4.3.3 Analysis

The interviews were analysed using Interpretative Phenomenological Analysis (IPA) (Smith, 2009, Smith and Shinebourne, 2012). IPA is a detailed examination of the human lived experience and is concerned with each participant's lived experience of a specific event (phenomenology), their attitudes towards the event, and the significance placed on this and their account of this experience (idiographic account) (Smith and Shinebourne, 2012). Due to the in-depth nature of IPA, a small sample size is advised. The process of conducting an IPA involves hermeneutics, it is a deeply interpretative process, and the preconceptions of the researcher are considered during analysis.

The steps detailed by Smith and Shinebourne (2012) were undertaken which included (1) the close, line by line analysis of the experiential claims, concerns and understandings of each participant; (2) the identification of the emergent patterns (i.e. themes) within this experiential material, emphasising both convergence and divergence, commonality and nuance, usually first for single cases, and then subsequently across multiple cases. Then, (3) the development of a “dialogue” between the researchers, their coded data, and their psychological knowledge, about what it might mean for participants to have these concerns, in this context, leading in turns to the development of more interpretative account; (4) the development of a structure, frame or gestalt which illustrates the relationships between themes. Following this, (5) the organisation of all of this material in a format which allows for analysed data to be traced through the process, from initial comments on the transcript, through initial clustering and thematic development, into the final structure of themes; (6) the use of supervision, collaboration, or audit to help test and develop the coherence and plausibility of the interpretation. Finally, (7) the development of a full narrative, evidenced by a detailed commentary on data extracts, which takes the reader through this interpretation, usually theme-by-theme, and is often supported by some form of visual guide (a simple structure, diagram or table) and (8) reflection on one's perceptions, conceptions and processes.

4.3.4 Research Team and Reflexivity

The interviews were conducted by the first author, who is a female PhD student who has a first degree in psychology. The study was supervised by the co-authors: the second author is an IPA expert; the third author is a health psychology researcher, and the fourth author is a health psychologist who has been researching suicide for more than 20 years. A sample of the transcripts was sent to the supervisors for independent analysis as well as discussion and agreement on themes. The first author also sought credibility checking from a supervisor regarding interview coding. There was no relationship established between the researcher and participants before the commencement of the study. The only information disclosed to the participants about the research was the institutional affiliation and that she was conducting a study on risk factors for suicidal behaviour in men. There were no characteristics of the interviewer reported.

4.4 Results

4.4.1 Overview

Three master themes were identified which related to the male experience of factors leading up to a suicide attempt. This will be explored alongside the related sub-themes (Table 4.1) and each theme will be supported by a verbatim quote from the interview transcripts. Minor edits were made to the quotes, translating regional dialect whilst retaining the original terms used in brackets. Samples of the anonymised interview transcripts can be found in Supplementary Appendix 21.

Table 4.1: Major themes and related sub-themes

Major Themes	Sub-themes		
Predisposing Factors	Social Expectations of Being a Man	Aspects of Self	Past Experiences
Situational Factors Associated with the Attempt	Emotions/Mind-Set	Situation	Accumulation of Stressful Life Events
Motivational Factors	Entrapment	Perceived Burdensomeness	Hopelessness

4.4.2 Predisposing Factors

4.4.2.1 Social Expectations of Being a Man

A pressure to live up to expectations, either their own or those of other people, was highlighted by nine participants. The need to be viewed as successful was important for participants, tied to their feeling of being a successful man. The notion that disclosing negative emotions is an un-masculine act was relevant here:

“because before that came I wouldn’t (wouldnae) tell anybody how I felt...and that would build up, the rage, the anger, the drink and it would lead to suicide attempt because you feel you can’t (cannae) talk to anybody about it. You always go to I need to be the man of the team, I can’t be showing any emotion in that”

James (31) makes a choice not to share his emotions. There is a build-up, a gradual, mounting and accumulation of pent-up emotion with no point of release. Then he states that he “can’t talk to anybody about it”, he has gone beyond a point of sharing with others now and there is no one in the world he can vocalise this with. Intense isolation or loneliness is evident here. “Always go” suggests an automatic, default position of externally appearing strong, expression of emotion

is perceived as a weakness. He is unable to expose his vulnerabilities and external appearance supersedes his internal vulnerabilities. There is a sense of protection of masculine identity at any cost.

The younger interviewees (under 30) in this study particularly struggled with the expectations of what it means to be a man and what they thought they would have achieved by that point in their life. Blair (28 years) provided an example from when he relocated to start a new job:

“emm... I so everything was just I think it was just the expectation on me moving there and thinking to myself well I’ve made this choice to come here I gave up a partner, I gave up you know a job I gave up everything to move across like this is all on me I need to make this work ...”

It is with bated breath that Blair feels the pressure to ensure that he has made the “right” choice. Stating that it is “on me” represents a weight on his shoulders, he feels like it is his sole responsibility to make this work. There is a sense that he is unsure of his decision, affirming that he “gave up everything” suggests a sense of fear that he may not be able to make this work. He feels he is responsible for his own success but lacks confidence in his ability to be successful.

4.4.2.2 Aspects of Self

Many of the participants (n=10) reported certain personal aspects of themselves that could often lead to negative emotions, situations, or thoughts about the future. Liam’s (40 years) account reflects the complexity of his emotional and mental state:

“I have... ehh no self-esteem and no self-confidence... it’s something that I’ve battled with... all my life ... ehh and I know part of that is caused by my anxiety and depression ... but I’ve never... I’ve never... I’ve never been very good at listing my... positive qualities and my achievements... whereas ehhh... if I was to list all the bad things... I could write a huge list... and it’s it’s something that I have struggled with... and and I still am struggling with it”

There is an overwhelming feeling of ongoing, arduous struggle to recognise positive personal qualities. “Battling with” suggests an inner conflict where his automatic thoughts are to be self-critical. Although, he recognises the personal damage that this causes and the need to recognise positive qualities, they do not come naturally to him. The list suggests a mental catalogue, a register of perceived flaws which he can check off with ease while the record of positive qualities remains slim and inaccessible.

Many of the participants expressed a tendency to focus on negative aspects of themselves or their situation in life, or the need to hide how they are truly feeling:

“I would ehh I was never really good at showing like girlfriends how I felt about them... or anything like that... I would tell them... I would do stuff... I would do big gestures... all that sort of stuff like that... but I was never really... I was always quite cold... folk have said that a few times...that you’re quite cold... you know... you can do these things... you can buy things... you can do nice things... because I’ve done plenty of nice things for folk you know... but you’re a bit 2D you’re a bit flat ...That’s exactly what I was...it was all surface rubbish... but nothing really you know... never really had a deep connection with folk... so that’s... you know a better way of putting it”

Describing himself as “quite cold” is suggestive of feeling emotionless, his relationships appear superficial and distant. There is a sense of numbness and detachment here. Being described as “a bit flat” suggests being monotonous and lifeless further reinforced by “surface rubbish”, he feels unable to bond with others. Never really fitting in or being in a union with anyone.

4.4.2.3 Past Experiences

Previous experiences, such as childhood adversity and bereavement, appeared to have had a lasting impact on many of the men interviewed (n=10). A traumatic bereavement as a teenager left Liam (40 years) struggling to cope:

“I think I’m... the main factor was that I lost my dad so young... I find myself being the man of the house... I tried to grow up maybe a wee bit too quick... and

so I tried to... hide things... and I got... really good at hiding things... and I technically am still good at hiding things... and I say to people... ehh I suffer from anxiety and depression and they're like really? You? I never thought... and I'm like yeah... but that's because I've just got so used to hiding it"

Liam automatically stepped into his father's role, perhaps in a way to adopt his father's identity of being strong. In a way he was attempting to replicate that hard external presence when in reality he was a boy grieving the loss of his father. He detailed that he "got really good at hiding things", over time he concealed more and more of himself and his emotions. There was a gradual loss of identity and control. We question whether he is really concealing his emotions? Or is this more about loss of identity or resuming an almost unexpected or forced identity by stepping into an unexpected and premature male role? He almost feels lost inside.

William (38 years) also reflected on his childhood experiences:

"yeah... so I'm the youngest of three... I'm quite different from them... from my brothers... so they were treated the same... but in a way that was quite beneficial for them to just... they could also shrug off that, they're not as sensitive and not as... you know... emmm.... Yeah but it just didn't work with me...so my friends were... I just looked for friends who spoken to me the same way my parents did and it sort of...so I also had a circle of people around me, just telling me that I wasn't good enough"

Describing himself as "quite different" from his brothers reflects the isolation and separateness he was feeling at the time, and still does. The way he was treated during his childhood and adolescence led to him seeking similar relationships as an adult. Entrapment is clear when he states that there were a "circle of people around me", he was surrounded with no escape. The connotations of circle suggest a perfect loop with no beginning or end, the cycle was difficult to break.

4.4.3 Situational Factors Associated with the Attempt

4.4.3.1 Emotions/Mind-Set

The build-up to participants' suicide attempt was characterised by various experiences and emotions which were specific to each of the participants. Eight participants expressed their cognitions prior to the attempt, this included a disregard towards their own life, emotional self-restriction, and internalised anger:

“emm I've definitely like before I was like a talkative person or more of an outgoing person but now I'm like the opposite now and I just don't really like talk I seldom talk or if I talk it's like emm like when I talk I don't feel like my voice is getting heard so I just like don't really talk as well especially round my friends, even when my friends are there and I'm talking but I don't seem to hear myself like like I don't seem to feel like I'm there kind of thing so”

Gary (28 years) described a process of self-restriction in several ways, referring to his past self in a more positive manner (“before I was like a talkative person or more of an outgoing person”). He suggests that he feels invisible, that his contributions are not valued or rejected by others, so he retracts. Feeling rejected and lacking confidence in his own contributions; they are perceived by him to be meaningless or worthless. He is slowly changing his personality and looking inwardly (“I'm the opposite now”), as opposed to expressing himself the way he did in the past.

For Stephen (45 years) his build-up was characterised by unavoidable suicidal thoughts:

“emm so that was... nineteen so...so probably back in two thousand and sixteen...emm where I was constantly had emm feelings of suicide... and I was putting myself... at risk emm... sleeping rough and just having constant thoughts of suicide... emmm yeah and I just basically didn't want to be here anymore.... I didn't want to be here in this world so...”

Stephen describes a situation of helplessness, his suicidal thoughts plaguing his mind. Unable to escape, he resorts to risky behaviours, perhaps in order to feel something (other than his emotional turmoil) or to signal to others the pain he is going through. He may also feel more comfortable displaying physical struggles/distress than emotional distress (by sleeping rough) so this may be his way of signalling to those around him that he needs help. He states that he “didn’t want to be here” as opposed to wanting to die, perhaps there is a temporal element here as he does not want to be in this space and time, he is in.

4.4.3.2 Situation

The situation participants were in, either emotionally, physically or generally in life, was also relevant in ten interviews. Blair (28 years) described the process in which he became more and more isolated as his mental health worsened:

“emm... so it was yeah it kinda affecting the health side of things that way emm mental aspect of shutting myself off to people of not wanting to talk I would hardly try to talk to people back home... emm I would just sit and watch TV and just put myself in a worse position by being more lonely than I should have been... didn’t reach out to anybody who kept saying to me that I could do”

Blair details a process of self-isolation and emotional restriction, “shutting off” evokes notions of closing parts of himself off from the world. He is restricting the part of himself that needs help to protect his vulnerability. A sense of withdrawal peppers all the above quotes. It seems that there is a conscious process of gradually retreating from social encounters due to a feeling of worthlessness, invisibility, and lack of meaningful contribution to social encounters/interactions. The inability or capability to share these vulnerabilities with others compounds this further.

William (38 years) also felt excluded from others, perhaps linked to similar feelings in childhood:

“ yeah... I feel like I’ve had a mind-set where it’s just, I’m not allowed to do those things or like it’s not even a question of I’m not allowed to, it’s of course I

don't get in, because I'm me... so if people are going to a festival I just automatically assume that I'm not going... yeah, I just assume well I'm not going because that's not the type of thing I do, it's not the... whereas I'd actually really like to...but I just... well it's, you don't, so it keeps me in my box...it keeps me in my space”

The feeling of isolation or separateness from others is echoed in the last sentence “it keeps me in my box... it keeps me in my space”. He feels or puts himself at a distance from other people, there is a separation of his personal space. Possibly keeping a lid on his emotions, he feels a lack of freedom to be open and honest. This is safer than engaging with others in his mind as this could leave him open to rejection, something he has experienced in the past. Stating “that's not the type of thing I do” reflects the image he has of himself; he is not worthy of enjoyment or friendship.

4.4.3.3 Accumulation of Stressful Life Events

Many participants (n=11) described a build-up of stressful life events that at times became unbearable. Liam (40 years) detailed the impact of his mental illness on his wider life and emotional state:

“ehhh... because of my depression or my anxiety and depression I can't manage my money properly... I pretend I do but I don't...and I'm in.... eh debt...not... hundreds of thousands of pounds of debt but...ehh enough debt that it's it's causing me to worry...and with the sort of dual trigger of having anxiety and depression ... you know it can... I worry about the past and I worry about the future in equal measure so...”

There is reference to pretending, that these men are portraying and projecting themselves in a way which conceals their vulnerabilities. The “dual trigger” image suggests that if one bullet doesn't end him, the other will. He is in a predicament with no escape route. This is particularly linked to the motivations participants detailed prior to their suicide attempt.

William (38 years) describes the slow build-up of negative experiences that led to his eventual suicide attempt:

“ehh I just that... I don't know... it it it happened over years you know what I mean...and that's the thing... it wasn't one day and then I changed my mind, it was just... a good two and a bit decades of just shit...like I don't think I was born with it...I mean maybe I was and maybe I wasn't I mean that's what research is for but I just don't feel that I feel like it was environmental rather than just me...it just wouldn't stop”

William is clear that there was not one single “cause” of his suicide attempt, the accumulation of events throughout his life weighs heavy on him and it has felt like there has been no escape from this. He is clear that events in his life led to his suicide attempt, not personal or emotional issues. Stating “it just wouldn't stop” highlights the entrapment he felt, feeling unable to escape from these negative experiences.

4.4.4 Motivational Factors

4.4.4.1 Entrapment

Entrapment was a theme across 7 interviews, feeling that there was no way out of a situation or no change of a situation improving. Stephen (45 years) details his experiences:

“I just didn't want to be in this... it was just mental torture...because I couldn't stop my mind racing and I didn't, I... and ehh one of the things... because I was stuck in a psychiatric ward I was never very happy there and I was under section so I wasn't allowed out and I used to abscond a lot and run away and hide in the woods so at risk, in sleeping bags, sleeping in freezing temperatures and then I got pulled back into the hospital, they'd confirm it and then I was just a vicious circle”

The phrase "mental torture" evokes feelings of being brutal, relentless, and unable to tolerate. His mind is racing, and he is experiencing a loss of control and

helplessness. In conjunction with the psychiatric care he was receiving, which he felt he had no control over, his only option was to escape and put himself in harmful situations perhaps to feel something. He was stuck in a "vicious cycle", unable to communicate his distress.

Robert (49 years) also felt trapped by the constant negative experiences he was facing:

“I’m like that this is the ongoing things that are happening and then see after that I just... I was using expressions like I’m done, that’s me absolute done and eh I don’t want to see anybody again eh and I was thinking to myself just slip away for a wee while and nobody knows where I am ... I think the worst really low that that I’m thinking eh nobody gives a shit about me you know what I mean and something... Why are we getting all these problems? What is this cloud over us all the time? ...we’re better off no being here you know... so things that wording that I’d heard being used but never used myself you know”

Robert is questioning his life and current situation; he feels there are no positive aspects or sees no improvements in the future. The term “slip away” reflects his view of himself and the impact he has on other people’s lives, they almost will not even notice if he is no longer there. This has connotations of gradually vanishing out of sight, perhaps he feels invisible to others. This also may relate to how he views his death, a way to leave this world without others noticing. Using definitive statements like “I’m done” reflects his certainty that he sees no way out of his current situation.

4.4.4.2 Perceived Burdensomeness

Being self-sufficient regarding several aspects of their life held central importance to many men (n=7), particularly avoiding being a burden to others.

“that everybody you know would be better off if I wasn’t about really that they would get on alright without me being here because I was just a drain on them ... yeah because of emmm well because of well one because the only thing that I felt that I was worthwhile was emm being was in my job...emmm I was working

so I was earning so that wasn't so bad I felt you know I felt that gave me something worthwhile"

Having a job and earning money is tied to his self-esteem and self-worth, he felt like he was not providing anything "worthwhile" to his friends and family members lives. Mark (45 years) does not value himself as a person without his job, he feels like "everybody you know would be better off" suggesting that he has no value. He is gradually losing the energy to fight. There are also links to sewage ("drain on them"), he perhaps feels like he is toxic to others.

Robert (49 years) felt like he could only deal with his problems on his own:

"I think it's like sometimes you like you'll talk to somebody and they'll have their own issues in life... and that's the last thing they want to do is hear about mine... and I think that's part of the build-up... of the overload is thinking you're a burden because you tend to just say... you tend to think about that person oh what (wit) ehh they've they've had a bad year or she's had a bad year or something like that so you know I'm not going to (no gonnae) pester them and I'm no do you know what I mean? That's...that's just the way I think"

Robert is acutely aware of other people, and this also contributes to the "overload" he was feeling. He does not recognise himself as someone worthy of help, he does not want to be an inconvenience ("pester") to anyone.

4.4.4.3 Hopelessness

Many men (n=7) had been in states of poor mental health or negative situations for a considerable period leaving them feeling that there was no hope of improvement.

"just that there's nothing... not that I'm not feeling anything that there is nothing, there is no tomorrow, there's no future here...there's no point planning anything because it's worthless and there's just nothing, like the void you know"

The “void” highlights the emptiness William (38 years) felt, leading him to feel despondent towards his life. He did not see the worth of looking to the future, highlighting a sense of hopelessness or emptiness.

Gary (28 years) also felt hopeless when reflecting on his life:

“hmm so I was being so I’ve had like emm I’ve always thought like that there’s no hope at all like I try like I do give things a chance and then emm it just ends up not working out or not emm not going the way it it’s supposed to go...”

Previous disappointments have plagued Gary’s life, to protect himself, he has adopted a negative outlook in general. He mentions that situations or experiences don’t go the way “it’s supposed to go”, holding himself to high expectations may lead to feelings of defeat where a state of hopelessness is protective against this.

4.5 Discussion

In this study, the factors leading up to a suicide attempt were explored, from a male perspective. The themes detailed in this paper should not be considered in isolation; they are interconnected and can be present at different points prior to attempting to take their own life. Being at a point in their life where they feel they are not living up to social expectations can evoke feelings of hopelessness. Also, the prevailing impact of past experiences and difficulties in their current life situation could lead to feelings of entrapment compounded by a fear of being a burden to others which impacts help seeking.

The notion of what it meant to be a successful male was particularly relevant, evoking elements of traditional masculine norms. Some men viewed themselves as a failure if they did not achieve these markers. The findings are in line with previous research by Kiamanesh et al. (2015) which demonstrated that many men had a façade they felt they had to maintain, such as being successful in work, study, finances or emotional relationships, and prior to their attempt, they felt this façade was crumbling. Having a fear of failure, of not living up to these standards, also highlights elements of perfectionism (Kiamanesh et al., 2014, Rasmussen et al., 2018a). Likewise, the build-up of this pressure was exasperated as many held that view that disclosing emotions was a threat to their masculinity (Cleary, 2012). This had an impact on their self-esteem and self-worth, some experienced a rejection of self or were extremely self-critical (Rasmussen et al., 2018a). An accumulation of negative emotions in combinations with harmful coping strategies (Kunde et al., 2018), such as alcohol abuse, was also relevant. These coping strategies, particularly related to escaping or numbing their negative emotions, can leave men being socially isolated and increase their vulnerability for suicidal behaviour (Oliffe et al., 2012).

Past experiences, such as sudden bereavement, has an impact. One participant highlighted the death of his father, as a teenager, and detailed the pressure he felt to step up to this role despite being a child himself evoking a sense of a loss of childhood. This is congruent with work by Cleary (2012) who noted gender-specific emotional expression, particularly in some social locations (for example, at home with this family). Another area that was explored with the mindset

participants were in or their emotions before the attempt. Some felt a disregard for their own life, or a feeling of internalised anger (Rasmussen et al., 2014b). Some viewed their past selves more positively, feeling lesser than due to the difficulties they have faced. There was also a strong notion of separateness from others (Cleary, 2012), perhaps as a protective strategy to avoid rejection or due to their mental illness. Experiences of depression and anxiety were also prevalent throughout the transcripts and how participants described their experience was in line with previous research. Many men described that they would hide how they were feeling or try to escape from their current circumstances which would lead to a build-up of anger (Brownhill et al., 2005). Some men engaged in strategies that aligned with their masculine notions of strength such as self-medication with alcohol or drugs, finding a way to “battle” their depression or engaging in risky behaviours (Creighton et al., 2017).

Many had been in stressful periods of their life for a significant amount of time which at times felt unbearable. The present is difficult but there are also worries about the past and future. This led to a vicious cycle where many felt there was no escape from their current circumstances and suicide was viewed as a viable escape (Kiamanesh et al., 2015). Also, the notion that they were unable to find a way to communicate their distress (Kiamanesh et al., 2015) so by engaging in harmful behaviours that reflected the only way he could communicate his emotional pain by putting himself in physical pain or danger. The feeling of being hopeless, either about their current situation or future, was echoed throughout the interviews, leading many to feel despondent about their life and there was a sense of total defeat (Kiamanesh et al., 2015). Being self-sufficient and avoiding being a burden to others held central importance. Not fulfilling this role, such as no longer earning money led to a feeling of shame (Andoh-Arthur et al., 2018). This is in line with the Integrated Motivational Volitional Model (IMV) (O'Connor and Kirtley, 2018) which proposes that both defeat and entrapment can lead to suicidal ideation then volitional moderators can cause the shift from ideation to action.

4.5.1 Clinical Implications

Experiences of anxiety and depression were present in the interviews however some studies report lower rates of depression in men, compared to women, which may be due to the use of generic diagnostic tools which are not sensitive to depression in men (Olfiffe and Phillips, 2008). Men may also feel reluctant to express concerns about their mental health due to a fear of being viewed as vulnerable (Olfiffe and Phillips, 2008). It is known that men and women may similarly experience depression, but it is their outward expression that can differ. By utilising tools such as The Male Depression Scale (MDRS-22) (Rice et al., 2013) which includes domains such as anger, aggression, distraction and avoidance, it may provide a more accurate of the male experience (Olfiffe et al., 2016). There is also a need to move beyond solely mental illness factors when assessing suicide risk, many of the men interviewed had experienced difficult situations in their life before their suicide attempt (such as unemployment) thence taking a more holistic approach is important. Considering how emotions and experiences are interconnected, particularly in relation to the male identity and difficulties with speaking out. The expression of distress may manifest in terms of life experiences and behaviours, as opposed to outward displays of emotions, which may be useful to inform future support.

4.5.2 Reflexivity

The following section is relevant for both chapter 4 and 5. Whilst conducting the interviews the safety of participants was vital. There is a robust body of research showing that there is no evidence of negative impact on participants' wellbeing when they are asked about suicidal feelings, thoughts, and behaviours, and that talking about suicide may in fact reduce, rather than increase suicide ideation (Dazzi et al., 2014, Lakeman and FitzGerald, 2009, Mathias et al., 2012, Omerov et al., 2014, Reynolds et al., 2006). The potentially sensitive nature of the research topic was acknowledged, and participants were advised that they do not have to answer any questions they do not wish to. Before the interview, participants were provided with a support sheet including contact information for Breathing Space, Samaritans, and the local Accident and Emergency Department. They were also told that they can take a break during the interview if necessary,

and that they can withdraw at any time without providing a reason. There were individuals trained in ASIST (Applied Suicide Intervention Skills Training) present at the SAMH offices and the I was Mental Health First Aid trained. Some individuals were emotionally affected by the interviews, and it was ensured they were debriefed and had access support.

Conducting these interviews emphasised how important it is to follow safety procedures when interviewing potentially vulnerable participants, particularly regarding sensitive topics such as suicidal thoughts and behaviours. Utilising supervision has been an important tool to reflect on and learn from these experiences. Reflecting on positions of power during the interviews was also an important aspect of my learning experience. Grounding myself to understand the power I held during the interviews allowed me to comprehend how participants felt during the interviews. Also, being trained in Mental Health First Aid increased my confidence in screening participants over the phone for eligibility for the study and in the risk assessment procedures. Being a female researcher interviewing men on a very sensitive, and sometimes stigmatising, topic was an important journey for me. The power dynamic, on both sides, elucidated some interesting reflections. There were times I felt vulnerable entering a space with a man I had only spoken to over the telephone but the men themselves must have also felt vulnerable talking to me particularly as some of them had never talked about their mental health or suicidal history before. Many of the men discussed notions of masculinity or feeling the need to fulfil a certain role as a man so I feel being a female researcher was a strength as they may have felt the pressure to upkeep this persona in front of a male researcher.

4.5.3 Strengths and Limitations

It is important to take into consideration the limitations of this study when interpreting the findings. This sample includes Scottish men, who are predominantly white and have survived a suicide attempt, thence the findings may not be generalizable to other genders, ethnicities or those who have died by suicide. The sample is broad in terms of age group which allows for a range of perspectives to be included in this study. There is a potential for bias to be introduced into the sample, particularly as participants were compensated for

their time in this study. For example participants may have felt that they have to adjust their answers to meet the researcher's aims or participants may have been more likely to participate regardless of the potential risk to their mental health (in talking about these difficult topics) (Bentley and Thacker, 2004).

The idiographic process of IPA allowed for the interviews to be guided by participants, following the topics that were significant to everyone. The qualitative studies in Chapters 4 and 5 were conducted considering publishing guidelines and quality indicators for qualitative research (Elliott et al., 1999, Lester and O'Reilly, 2021, Nizza et al., 2021). The four quality indicators from Nizza et al. (2021) were adhered to. Firstly, a compelling and unfolding narrative was detailed throughout, starting with factors leading up to the suicide attempt (chapter 4) and the male experience of suicide attempts and recovery (chapter 5). The data was focused on the individual's experience and their conceptualisation of their own experience. Thirdly, I engaged in close line by line reading and analysis of the transcripts and crosschecked the themes and analysis with the co-authors (an example of an anonymised transcript can be found in Supplementary Appendix 22). Convergence and divergence were attended to, with the participant's accounts compared and contrasted throughout.

Each participant's account may be subject to memory biases, for example recalling negative events more readily than positive events. In line with Emslie et al. (2006) it was possible to identify an adequate sample of men who were able to talk about their life experiences, mental illness, and suicide which demonstrates that men are willing to talk about their thoughts and feelings. Thence the depiction that men who experience depression are silent, is not wholly accurate. The current study extends the existing literature by uncovering the life experiences of men who attempted to take their own life and identified certain stressors (or risk factors) that may have precipitated their suicidal behaviour.

4.6 Conclusions

Overall, this study provides an insight into the process that leads men to attempt to take their own life. From predisposing factors that led men to feel vulnerable or that they had no chance of a better life to situational and motivational factors that encompassed their mindset at the time. By providing men with a clear means of accessing support and recognising specific factors that may lead men to feel vulnerable may help to halt the progression from ideation to action.

Chapter 5: The Male Experience of Suicide Attempts and Recovery - An Interpretative Phenomenological Analysis

5.1 Abstract

5.1.1 Rationale

Suicidal behaviour is a complex phenomenon, its aetiology spans biological, psychological, environmental, social, and cultural facets. Men's deaths by suicide outnumber women in every country in the world.

5.1.2 Objective

This study explored the male experience of suicide attempts and recovery as well as factors which may be protective for men.

5.1.3 Methods

Men (n=12) participated in semi-structured face-to-face interviews which were subjected to Interpretative Phenomenological Analysis (IPA).

5.1.4 Results

Four master themes were identified: 1) "characteristics of attempt/volitional factors"; 2) "dealing with suicidal thoughts and negative emotions" 3) "aftermath" and 4) "protective factors".

5.1.5 Conclusions

The findings provide insights into how men cope with suicidal thoughts or negative emotions, often avoiding seeking help and suppressing their emotions. The men's lives were significantly affected by the attempt, with some stating that they had changed as a person. Importantly, the findings indicate that men do recognise that they need help and can be receptive to help but can feel they need to be approached in the first instance. The theoretical and clinical implications of this study are discussed, including help-seeking, emotional expression, the long-term impact of suicide attempt as well as the applied contribution to established theories.

5.2 Introduction

Suicidal behaviour is a complex phenomenon, its aetiology spans biological, psychological, environmental, social and cultural facets (Turecki et al., 2019, Scourfield et al., 2012). Male deaths by suicide outnumber those by women in every country in the world (Kisa and Collaborators, 2019). The Gender Paradox of Suicide describes the fact that women are more likely to attempt suicide, but men are more likely to die by suicide (Canetto and Sakinofsky, 1998). There have been several potential explanations proposed to account for this, including that men may experience or display signs of mental illness differently to women, such as displaying more aggressive or avoidant behaviours (Sørensen et al., 2019), which then may predispose them to self-injurious or risky behaviours. How men cope with difficult life events such as relationship breakdown or unemployment is also relevant (Scourfield and Evans, 2015), similarly linked to engaging in risky behaviours. Moreover, differences in method of suicidal behaviour among men and women may have an influence, for example men are more likely to use more lethal methods such as firearms (McGlade et al., 2016). A “failed” suicide may be viewed as weak and a threat to masculinity whereas a “successful” suicide is viewed as brave and decisive (Canetto and Sakinofsky, 1998). However, despite the difference in methods, men and women may not differ in terms of suicidal intent (Denning et al., 2000).

Men may also have difficulties recognising that they are in distress and misinterpret changes in their thoughts and behaviour. Player et al. (2015) explained that men may not make the connection between their mood, behaviours, and suicide risk. Previous research has also identified particular barriers towards seeking help, among young men, including a fear of being diagnosed with a mental illness, feeling there is “no room for weakness” and intense shame (Rasmussen et al., 2018c). This may manifest itself as masking emotions and withdrawal from relationships before their death either to protect themselves from being rejected or protect their partner/family member from the pain of losing them to suicide (Rasmussen et al., 2018c). Danielsson and Johansson (2005) also found that men often felt more comfortable describing symptoms of mental illness in terms of physical symptoms as opposed to emotional symptoms.

Methods of support particularly relevant to men who had survived a suicide attempt, include distraction as well as practical, emotional and professional support (Player et al., 2015). Providing men with practical support, particularly managing a crisis, may halt the progression from suicidal ideation to behaviour (Player et al., 2015). An enhanced understanding of the male experience of suicidal thoughts and behaviours can also aid support networks in responding to the needs of their loved ones (Fogarty et al., 2018). Fear of being a burden to friends or family and being isolated from others have also been identified as barriers to seeking help in men (Shand et al., 2015). By having support from other people they trust, respect and feel they can relate to, men may feel listened to and more likely to access help and support on their terms (Shand et al., 2015). Reminders of the impact that their death would have on their family may also be significant (Player et al., 2015, Shand et al., 2015).

The present study aims to explore the male experience of suicide attempts and recovery. By interviewing men with a history of suicidal thoughts and behaviours it allows for the exploration of the antecedents of their suicide attempt and the impact thereafter. The factors that may be protective for men in suicidal crisis are also explored.

5.3 Method

5.3.1 Sampling

A sample of twelve men who had attempted suicide in the past five years was recruited through social media adverts (Twitter, Facebook, Gumtree and University website). Attempted suicide was defined as having engaged in a non-fatal, self-directed self-harming episode associated with at least some evidence of suicide intent (O'Connor et al., 2013). Inclusion criteria were identifying as male; at least 18 years old; having attempted suicide in the last five years; and being competent in English. Exclusion criteria were being imminently suicidal (i.e., a person stating that they intended to kill themselves within the next few hours); experiencing a psychotic episode at the time of recruitment; and having a

suicide attempt more than five years ago. 31 men were screened for eligibility over the telephone and 12 met the eligibility criteria for participation. Participants were aged between 19 and 49 years ($M=33.8$, $SD=9.8$), and were from Scotland (UK). Among the 12 participants, five men had attempted suicide in the last year. The age at which participants first thought about suicide ranged from 12 to 44 years ($M = 19.9$, $SD = 9.5$) and the age when they first attempted suicide varied between 12 and 44 years ($M=23.8$, $SD=8.8$). Further details on participants' demographic information and suicidal history can be found in Supplementary Appendix 17. This study has also been published (Richardson et al., 2021a). The study participants and interview schedule are the same as that used in Chapter 5, which provides further information regarding questions and additional themes identified.

5.3.2 Procedure and Interview

Ethical approval for the study was obtained from the ethics committee of the College of Medical, Veterinary and Life Sciences (MVLS) at the University of Glasgow (reference: 200180116, Supplementary Appendix 18). Potential participants contacted the author via text, telephone call, email or social media and scheduled an eligibility screening phone call. Before the telephone call, the information sheet, and a support sheet, with a list of organisations to contact if participants wished to seek support (for example Samaritans, Breathing Space and Scottish Association for Mental Health) was emailed to all potential participants. The potential participants were also given the opportunity to ask any questions about the study during the phone call.

Following telephone screening, and if the eligible participants were still interested in participating in the study, a face-to-face interview was arranged at their convenience. Semi-structured interviews were conducted by the first author either at the Suicidal Behaviour Research Lab or Scottish Association for Mental Health (SAMH) offices (Supplementary Appendix 21). The interviews were audio-recorded and lasted between 25 and 67 minutes ($M=44.1$ minutes). No one else was present besides the interviewer and participant. All participants were offered £30 compensation for their time. A brief interview schedule was created based on

the overall aim of the study. This began with “Tell me about your most recent experience of attempting to take your own life”. Relevant topics were then explored with follow up questions such as “How did that make you feel?” and “What was going through your mind at that time?”. This semi-structured process helped the interviewer guide the participant through the process, without asking leading questions. The interviewer also used some reflection and probing techniques (such as “You mentioned... can you tell me a bit more about that?”). A risk assessment was conducted after the interviews to ensure participants’ safety, this included clinical measures of psychological distress and suicidal intent. No participants’ indicated distress followed in the interviews. The transcripts were not shared with the participants prior to or following the analysis. The participants all opted into being sent the results from the study following publication. The focus of this paper is on attempts and recovery, other themes, such as “social expectations of being a man”, were also identified from this data which are included in another paper (in preparation) and chapter 4.

5.3.3 Analysis

The interviews were analysed using Interpretative Phenomenological Analysis (IPA) (Smith, 2009, Smith and Shinebourne, 2012). IPA is a detailed examination of the human lived experience and is concerned with each participant's lived experience of a specific event (phenomenology), their attitudes towards the event, and the significance placed on this and their account of this experience (idiographic account) (Smith and Shinebourne, 2012). Due to the in-depth nature of IPA, a small sample size is advised. The process of conducting an IPA involves hermeneutics, it is a deeply interpretative process, and the preconceptions of the researcher are considered during analysis. The steps detailed by Smith and Shinebourne (2012) were undertaken which is fully explained in Chapter 4.

5.3.4 Research Team and Reflexivity

The interviews were conducted by the first author, who is a female PhD student who has a first degree in psychology. The study was supervised by the co-authors: the second author is an IPA expert; the third author is a health psychology

researcher, and the fourth author are a health psychologist who has been researching suicide for more than 20 years. A sample of the transcripts was sent to the supervisors for independent analysis as well as discussion and agreement on themes. The first author also sought credibility checking from a supervisor regarding interview coding. There was no relationship established between the researcher and participants before the commencement of the study. The only information disclosed to the participants about the research was the institutional affiliation and that she was conducting a study on risk factors for suicidal behaviour in men. There were no characteristics of the interviewer reported.

5.4 Results

5.4.1 Overview

Four master themes were identified, related to the male experience of suicide attempts and recovery. These will be explored alongside the related sub-themes (Table 5.1) and each theme will be supported by a verbatim quote from the interview transcripts. Minor edits were made to the quotes, translating regional dialect whilst retaining the original terms used (in brackets).

Table 5.1: Major themes and related sub-themes

Major Themes	Sub-themes		
Characteristics of Attempt/Volitional Factors	Change in Thinking	Unplanned	Lived Experience
Dealing with Suicidal Thoughts/Negative Emotions	Avoidance	Seeking Help	No Way Out
Aftermath	Changed but Still Vulnerable	Altered Sense of Self	
Protective Factors	Importance of Talking	Importance of Relationships	

5.4.2 Characteristics of Attempt/Volitional Factors

5.4.2.1 Change in Thinking

All the men (n=12) interviewed described how in the lead up to the attempt they experienced a shift in their pattern of thinking, that once they had decided that they were going to take their own life there was nothing that was going to stop them:

"and that was the first thing that I thought because I thought right that's going to be the sharpest thing that'll do the job... umm, I was thinking... I wasn't thinking rationally in that side but in the in the mechanics of doing it... I was sort of thinking ehh very clear...and methodical in that way...and... the feelings and things they were just all over the place...I wasn't thinking clearly"

In the face of chaotic and difficult emotions and feelings, Liam (40 years) perhaps found it easier to focus on how he would take his own life. Looking for something to “do the job” he views it as a simple process, possibly finding a sense of comfort or resolution. He expresses a disconnect between his thinking and emotions, unable to reconcile his chaotic emotions he switches to a methodical mind-set to navigate his way out of his situation.

Graham (36 years) describes a change where prior to his attempt he would never allow himself to seriously consider taking his own life:

“... something broke and that before I never would have allowed myself to consider it and the moment that I did consider it and make my peace with it and decide to do it was suddenly like after that it kept being a really really close thing... and that was the biggest the biggest change that once you’ve accepted it once it’s very easy to get back to that point whereas before that had always been like a barrier...”

The mention of something that “broke” suggests a separateness from his own mind, he is unaware of how or why this shift in thinking happened. Becoming at peace with the decision to take his own life, reaching acceptance of this inevitability, resulted in the path from suicidal thoughts to behaviours being reached quicker as the “barrier” is no longer there for him.

5.4.2.2 Unplanned

The attempt being unplanned was evident across half of the interviews (n=6).

“I don’t think it I don’t think it was as planned as... as like say for example today’s interview you know it was like... I would say you get up in the morning...and then I just felt horrible all day... I can just remember feeling ehheh no interested in anything at all apart from this thought of... emmm just getting rid of myself basically”

Robert (49 years) mentions that his attempt was unplanned up until that day where he could not face his negative emotions and situations any longer. The phrase “getting rid of myself” demonstrates how negative his self-perception was at the time, wishing to dispose of himself like you would a piece of rubbish (garbage).

This is also present in Liam’s (40 years) account:

“I wouldn’t say it was a properly planned attempt... it was a sort of spur of the moment decision because my mood had... dropped so low... and it I just wasn’t thinking clearly”

Elements of impulsivity are prevalent here, clouded by low mood and irrational thinking Liam felt the only way of improving his low mood is to escape the situation by taking his own life. Describing his mood as “dropping so low” suggests elements of being out of his control, he is unsure how to pick this up again.

5.4.3 Lived Experience

Many participants (n=10) had previous experience of suicidal behaviour, either themselves or through friends/family members. Bereavement by suicide was also present, the lasting impact of losing a family member to suicide was significant to participants.

5.4.3.1 Previous Suicidal Behaviour

One of Liam’s (40 years) suicide attempts was characterised by stressful life events and alcohol use:

“I had moved down for a job...I was far away from family, friends...and... I was having a bad time...and ehhh I had had ehh it was a very surreal one because I had had a weird funny dream that I had tried to slash my wrists in the bathroom ...and then woke up the next morning and walked in and... there was every sharp knife that I owned in the bathroom...and there’s the various things sticking into

the floor...and I was like right that wasn't a dream then...and again I had been drinking for that one"

Feelings of dissociation are present here; he was unaware of his actions at first (perhaps due to alcohol) and was surprised when he realised what was happening. Being in a dream-like state perhaps was his way of dissociating from the situation he was in.

For James (31 years) self-harm was a way of distracting himself from the mental turmoil he was facing:

"I used to harm myself quite a lot, I used to get kitchen knives. This sounds mental but this was just what I don't, I couldn't (couldnae) take the pain inside my head (heid)... that's the way I can explain it... it's like wee cars crashing about and the only way to relieve that was to cut myself... and I used to cut my face, cut my neck...cut my arms, for that two minutes it took the pain away from my head (heid)"

The analogy of "wee cars crashing about" represents how chaotic his thoughts were, unbearable to stop or comprehend whilst also causing damage to his mental health and wellbeing. It was easier for him to cope with the physical pain of self-harm as opposed to the mental pain which was incomprehensible to him.

5.4.3.2 Death of a Loved One

Experiences of bereavement was something that permeated through the participant's lives. The death of his brother is something that Stephen (45 years) has struggled to come to terms with:

"yeah... emm yeah because I think we were quite similar because I was was really close to be brother and always looked up to him... I always thought he was he was brilliant... really funny and laughing... so yeah there was that comparison thing well if he's away then why should I be here, you know what I mean?"

He holds his brother in such high esteem that he almost feels that because his brother has passed away, he no longer deserves to be alive. He lists all of his brother's positive qualities, perhaps he feels like he does not measure up to his brother in this way.

Other participants have been impacted by suicide attempts among friends or family members:

“emm I told you that my friend died a few days ago...he killed himself ... it's ok umm ... yeah umm so yeah that's it but emm he was actually the one person that I didn't actually see the signs I didn't know he was suicidal ... a bit tough but it's sort of made me realise how much suicide affects other people... umm so yeah umm if that makes sense?”

The shock of losing a friend to suicide who displayed no prior warning signs may actually be protective for Sam (19 years) as he has witnessed first-hand the impact this has on those around them.

5.4.4 Dealing with Suicidal Thoughts and Negative Emotions

5.4.4.1 Avoidance

Avoidance was a strong theme throughout the interviews with 11 men endorsing this sub-theme. This was significant in many ways; it was used as a coping strategy (e.g. through alcohol use) and as a method to conceal their emotional pain from others.

“if I think about me... the spider comes in and it grows arms and legs and I've got big problems in my head (heid) that aren't really there in life... but my head (heid) makes them up...and that's my head (heid) talking to me, trying to get me to go the other way and it's just about talking about it, trying to skelp it out the way so aye that keeps me going”

James (31 years) describes feeling out of control, with something other than himself taking over his mind and controlling his actions. He is describing a separate entity to himself, taking over his body (the host), clouding his judgements and taking over his actions, for which he has no control. The spider also has connotations of a fearful image, something to be afraid of. This reflects his perceived inability to cope with his low self-esteem, in combination with his mental illness. Perhaps the only way for him to prevent this happening is to avoid these thoughts altogether?

His chaotic lifestyle at the time led Stephen (45 years) to choose solitude:

“it was just to try and just to try and get away because I was just I didn’t want to be around anymore and I just wanted to be by myself...I didn’t want... I found it difficult to engage with people and ... I was just my head was just ... just a complete mess”

He had difficulties understanding what was happening in his own life, and head, that he could not maintain social interactions with others. His head is “a complete mess” highlighting the extent of the troubles he was facing, there were no positive aspects. This also emphasises how disorganised and chaotic his thoughts were at the time.

5.4.4.2 Seeking Help

Eight men spoke of the recognition that they required help, concerning their mental health as well as other difficult situations in their life, but there were also barriers to this. Stephen (45 years) was desperate for help and tried many avenues:

“I mean I used to do everything I started to go to church because I was just so desperate to... and then I started so I was thinking about that and then I was I was scared about going to hell and ... just it was running away was like a safety net...you know I was really suicidal there was something I don’t know what it was but something that kept me alive”

Here, Stephen reports a powerful, instinctual will to stay alive, but he was limited in not knowing where to seek help. The mention of “going to hell” demonstrates the gravity of the predicament he was in, that he felt he had sinned or had done something wrong that he deserved to go to hell. This could also be wrapped up in self-stigmatising attitudes of suicide and suicidal behaviours. Going to church and seeking a higher power to rescue him from his fate that he feels he cannot escape from himself. He may feel condemned in a sense, that he is being punished in life but also risks punishment in death, there is no escape from his pain and suffering.

James (31 years) was concerned that seeking help would reflect badly on him, that he would be seen as a failure:

“I knew I could get clean and sober and it was just the fear holding me back of going and getting help... I didn't (didnae) want to go... and say you know I've failed, I've picked up drink, but you've no failed... it's the way your brain works... and you're letting them win again, you've just got to fight it... because once you're in the door for a week or two you start to feel better again”

Despite feeling capable of overcoming his addiction, James (31 years) still felt fear regarding seeking help. He internalised failure regarding using alcohol and drugs again as he viewed it as a personal choice rather than a feature of his addiction. He talks about his brain as if it is separate from himself, something to “fight”, that he does not feel like he is control of.

5.4.4.3 No Way Out

A feeling of having reached their limit, regarding various aspects of their life, was apparent in nine interviews. Many felt that they had struggled too long, and it was futile and inescapable. For Blair (28 years), fear of being viewed as a failure led to him to seek a way out of this situation:

“... emm it was the pressure and the expectation that I probably put on myself rather than everybody else doing it... thinking there was no way out or if I went

home I would be a failure so then rather than being a failure I I wanted to just end it... ill just stop everything...just kind of yeah just have it stop because it was just getting too much”

The internalised pressure to keep the façade of coping and the intense fear of failing (either in his own eyes or those of others) led to him feeling like the only option was to end his life. In his eyes, seeking help or moving back home was not an option, leading to intense feelings of entrapment.

Seeking help was not seen as an option for Mark (45 years), he felt like he had made up his mind:

“but how do you talk to somebody?... when you don’t really you really don’t want to talk to somebody... when all you want to do is that... I feel... I feel, I know this sounds bad... I feel like... if you’re picking the phone up to talk to somebody it’s a bit... you’re no really...you’re not necessarily going to do it... That’s... you’re wanting to be talked out of it...which it think is a different thing to actually going through with it... this is me... this is...when I was in that mood... nobody would have talked me out of it... because I have that focus and that...and that single-mindedness... can’t be talked off the ledge that sort of thing you know”

The definiteness of Mark’s statement demonstrates his state of mind at the time that he “can’t be talked off the ledge” and that he cannot escape his suicidal thoughts. He also doubts those who do seek help, regarding the severity of their intention, this judgement he holds of others may have held him back from recognising that he may have needed and deserved help himself.

5.4.5 Aftermath

5.4.5.1 *Changed but Still Vulnerable*

Following the attempt, the realisation that they have survived the attempt can be puzzling for some (n=8). Mark (45 years) felt the suicide attempt had altered his sense of self, and his outlook on life had changed:

“I feel better in myself... I feel fragile... I don't feel... perfect... by any manner of means I'm not I'm not fixed...and I know I'm not fixed... I know I'm not right emm fragile from the point of view that... emm I can just go back into myself...and just bury myself back into myself again...and be quite introverted... I know I could quite easily slip back into that...If I don't work on it and deal with it ... and cope with it”

It is clear that Mark also does not feel whole again following his suicide attempt, he feels different from the person he was before the attempt. Fragility is a clear notion throughout his interview, his life shattered before and after the attempt in different ways, and he is working towards building himself back up again. The isolation may feel protective as he is still feeling too "fragile" to fully face the world. He uses the term "fixed" to represent a state of being he feels he has not regained since his suicide attempt, but he is unclear exactly what it means to be "fixed". There is an element of unpredictability here and struggling to retain control. This notion of control is temporal and precarious. It requires constant attending to and 'work' to maintain his position. There is a vulnerability here.

Blair (28 years) felt like a different person, following his attempt:

“it just ehh it kinda put me in a very... it weakened by mind-set and my mental state in total because even now sometimes like I doubt myself when about a year or just over a year ago emm I would never have done that before I would have went to a challenge head on thinking I can get this done easy...this is not a problem whether I would wing it or not is different but I was still getting through

it and like I say it used to be it used to be really put myself as one of the best at what I done”

Blair compares his current self to a past self he holds in higher regard. He viewed himself as impermeable and able to take on any challenge. The suicide attempt tested this and left him feeling lesser than before (“weakened”).

5.4.5.2 *Altered Sense of Self*

Many men (n=8) struggled to come to terms with the fact they attempted to take their own life, their capacity to do so was a shock to many. William (38 years) did not feel like the problems he was facing was worthy of feeling suicidal:

“I find it embarrassing... yeah...like I don’t have the right... to to do these sorts of things, they’re for really ill people, they’re for people who have real problems and I don’t have them so therefore I’m not entitled to do something like that and... god it is difficult...sorry... and so I’m embarrassed that I I thought I had the right to do that when it’s for someone else”

Internalised stigma is prevalent across William’s quote, he compares himself to others and judges himself for feeling suicidal. To him, the issues he was facing were insignificant compared to other people and in his mind, he did not qualify as “really ill”. There is a focus here on physical illness being genuine in a way that he does not perceive his mental health to be. Feeling like he doesn’t have the right to do that is an interesting expression, perhaps he doesn’t even feel worthy of taking his own life.

Embarrassment was a key theme demonstrated by Mark (45 years):

“it’s that whole train of mayhem that led to that...I think that’s where that sort of embarrassment comes from... emm and the fact you shouldn’t (shouldnae) be doing that... do you know you know that way... how did you get to that?... that’s just embarrassing that you did that... you complete idiot... I think I’m just a bit

hard on myself... saying that I'm an idiot... so I think it... you know it's all that kind of stuff so... I think it just... I get embarrassed...because of that"

Again, he also feels that engaging in suicidal behaviours is something he "shouldn't" be doing. He blames himself for letting his problems push him that far, however "that whole train of mayhem" suggests a powerful force out with his control entering his life, which is at odds with the sole blame he puts on himself. He mentions feeling embarrassed perhaps due to showing weakness or not coping with his struggles.

5.4.6 Protective Factors

To a lesser extent, the men also detailed factors which had a protective impact for them or provided them with some comfort or support during difficult periods in their life.

5.4.6.1 Importance of Talking

Many of the men (n=10) felt so isolated in the run-up to and following their suicide attempt. As they often did not know how to or did not recognise that they could receive help, having someone approach them first would have been a useful step forward. Blair (28 years) felt that speaking to someone would help him to see the bigger picture:

"if somebody had spoke then probably yeah... emm... because that distracts you from that thought and you start talking about something else... emm... apart from that probably not much emm unless there was honestly somebody there... ehh but yeah just... having a distraction to take you away from it so you don't think of... just doing it or you know what can be from somebody else to try to reiterate that you've got somebody else to live for or something else to live for...definitely"

Blair was so consumed by his negative thoughts at the time that having someone there for comfort and to help him recognise the positive aspects of his life would

have been valuable. He emphasises the need for a distraction, to provide a release or escape from his suicidal thoughts at the time.

James (31 years) emphasises that speaking about problems can often put them into perspective, they are not as severe as previously thought:

“go and speak to somebody... because your problems aren’t as big as your head (heid) is making them out to be ... they seem big at the time, they probably are real but they’re not as big, you can always overcome a problem... when you’re no here you can’t (cannae) ... and that problems probably nothing to that other person, or whatever you’ve got”

Ruminative thoughts can often lead to the problem itself and the anxiety around the issue intensifying. James recognises that by talking about issues it can lessen this and may not appear as severe to the other person, something that he was afraid of.

5.4.6.2 Importance of Relationships

Social connections and relationships with others were an important protective factor for many men (n=9), particularly feeling valued:

“well I’m quite glad... that I’m still here from that perspective... especially because I can see that... it’s not (no) just... which is you know it’s not (no) about I can see your worth because...you need me... but at least somebody needs me...I can see that folk actually need me about”

Mark (45 years) is now able to recognise that he does have a positive impact on other people’s lives and is relied on. He can see more clearly that "folk actually need me about", he is worthy of life and meaningful relationships. He also feels like his life has a purpose and a meaning.

James (31 years) credits his relationship with his partner as being a central protective factor in his life:

“and I feel like I never get a break but aye I rely on her for emotional side of things... maybe a bit too much because I need to realise maybe what it’s like to be myself because I’ve never been myself... I’ve always been drunk/intoxicated (mad wae it) when I’ve been by myself... or if I’ve had a partner, they’ve left me, I’ve always went back the way... I’ve never been long enough sober to go like right you don’t need to go back the way you can move forward without anybody in your life ... yes (aye) touch wood that doesn’t (doesnae) happen”

Having never learnt to be alone, due to his addiction, his entire recovery is based upon his relationship with his partner. To him, his hope for a good life rests on this relationship being successful. There is almost a fear of being alone, he does not know how to live alone and sober reflected in “touch wood that doesn’t happen”. There is a disconnect between his sober and intoxicated self.

5.5 Discussion

The factors contributing to the decision to take their own life differed among the men interviewed however certain sub-themes and risk factors prevailed across the interviews. There was a notable shift in their pattern of thinking to single mindedness, that once they had decided to take their own life nothing could stop them. By diverting their mind to the mechanics of attempting to take their own life it perhaps provided some solace in the face of sometimes chaotic emotions or situations. There was a sudden sense of clarity following a period of cognitive and emotional chaos. The need for help and support was recognised by the interviewees, although some did not know where to access this and did not wish to be viewed as vulnerable or a failure. Also, some participants felt they had struggled for so long and felt that they could no longer continue to live in their current circumstances.

The key themes identified in this chapter, and in chapter 4, further illuminate the risk factors identified in the systematic review (chapter 2). Prolonged periods of poor mental health or difficult life circumstances prior to the suicide attempt were evident with many of the men experiencing depression, anxiety or substance

use problems (Cleary, 2012, Scourfield et al., 2012). This is consistent with the Integrated Motivational Volitional (IMV) model (O'Connor and Kirtley, 2018) as many men expressed that they had reached their limit, contributing to a sense of entrapment where they felt suicide was the only option. Also, the discussion of methods may reflect the masculine notion of having an outward display of strength and the desire to avoid being viewed as weak due to a “failed” suicide attempt (Canetto and Sakinofsky, 1998). This also highlights the importance of attempting to identify potentially vulnerable groups of men before the point at which they've expressed suicidal ideation or plans.

Lived experience of suicide and self-injurious behaviours were prevalent, with some men also being affected by the suicidal behaviour of their loved ones. This is consistent with Chapter 2 and the repeated suicide attempts may be a signal to others that they need help, that they feel unable to express. Repeated suicide attempts may also increase likelihood of using more lethal methods, due to familiarity and increased pain tolerance (O'Connor and Kirtley, 2018). Alcohol or drug use was also a common coping strategy, and this was present both before their suicide attempt and after (Cleary, 2012, Oliffe et al., 2017, Monnin et al., 2012b), so it is both a risk factor for suicidal behaviour (as identified in chapter 2) and something that can increase vulnerability to suicide in men, for example through increased likelihood of engaging in risky taking behaviours. The coping strategies detailed were consistent with Rasmussen et al. (2018c), Cleary (2017), as many men felt they had to avoid these thoughts altogether perhaps due to a fear of what they could be capable of (attempting to take their own life). This may also be linked to the notion of self-reliance, many recognised that they did need help but were reluctant or fearful to admit this or did not want to be viewed as a failure (Rasmussen et al., 2018c). The men also expressed a feeling of pressure, to live up to what they felt was a successful male, and a failure to do so resulted in intense feelings of shame (Rasmussen et al., 2018a, Lee et al., 2017, Adinkrah, 2012).

The prevailing impact of the suicide attempt was significant, a notion of fragility emanated from the transcripts, with some of the men no longer feeling whole again after their attempt and feeling afraid of going back to that ‘dark’ place once more. In terms of protective factors, many men were so isolated in the run-up to

and following their suicide attempt that having someone approach them in the first instance would be a useful step forward. In particular. It seems that they were often unsure how to reach out for help or even recognise that they were worthy of help. Social connections and relationships with others were important protective factors for many men, particularly feeling valued (Player et al., 2015, Shand et al., 2015).

5.5.1 Clinical Implications

The findings of this study have some significant clinical implications. Firstly, the findings indicate the difficulties that men experience following their suicide attempt, describing themselves as “fragile” or “in shock” demonstrating the significant impact this has on the lives and the need for support during this vulnerable period. By recognising these experiences, it may be possible to better identify those at risk of attempting suicide, particularly because men may not readily discuss emotional problems. Many of the men recognised that they needed help but were either unable to reach out for help or did not know where to seek help. This highlights that men may be ready to seek help and would benefit from friends/family or support services approaching them in the first instance. Also, previous research (Sørensen et al., 2019, Brownhill et al., 2005) has identified that men may display signs of mental illness differently to women. Many men engaged in avoidant behaviour, recognising that this is a common strategy or manifestation of mental illness in men is a useful step forward in the identification and treatment of men at risk of dying by suicide.

In the months and years following the suicide attempt, many men struggle to come to terms with the fact they had attempted to take their own life and felt different to (lesser than) ‘the man’ they were before the attempt. This fragility also conferred risk for future suicide attempts. It also altered their self-image, challenging their view of themselves as well as the notion of the type of person who attempts to take their own life, which is consistent with previous research (Sweeney et al., 2015). Finding ways to bolster their self-esteem and self-image should be an integral aspect of their recovery.

5.5.2 Directions for future research

The depth of the interviews has given rise to some important recommendations for future research. Firstly, many of the men mentioned that their suicide attempt was unplanned and that they experienced a change in thinking to single-mindedness in the lead up to their suicide attempt. This would be a particularly interesting area for future Ecological Momentary Assessment (EMA) studies whereby men with notable suicide risk factors, for example recent divorce, unemployment, mental health or addiction problems, are followed up over a longer-term period to help understand the process whereby the onset of suicidal thinking and this change in thinking occurs. Due to the risk in this population, extensive safeguarding would need to present. In addition, future qualitative research could investigate the facilitators of social bonds in men, and what circumstances are needed to enhance open communication about emotions.

5.5.3 Strengths and limitations

The strengths and limitations of this study are similar to those referenced in chapter 4 due to the same dataset being used. The qualitative studies in Chapters 4 and 5 were conducted and published taking into account publishing guidelines and quality indicators for qualitative research which is described in detail in chapter 4 and the discussion (Elliott et al., 1999, Lester and O'Reilly, 2021, Nizza et al., 2021). This chapter provides an in-depth, holistic account of the male experience of suicide attempts and factors that they have identified as protective in the months or years following their suicide attempt. This is a holistic approach to suicide prevention as participants were identifying factors or experiences that were important to them, rather than being guided by the researcher. The process of conducting an IPA study recognises the researcher's own thoughts and constructions of the data thence credibility checks were introduced whereby another member of the researcher team would code the transcripts and these would be compared to ensure the themes identified were comparable and that the quotes matched the themes . Another strength of IPA is the examination of cognition and language, the way a participant talks about a subject provides a unique insight into how they feel about it. The experiences of the men participating in the interviews were considered, as consent wasn't a singular

process, this was considered throughout the interview with the interviewer checking if the men were ok to talk about certain subjects and checking throughout if they were ok to continue.

Due to the large amount of data generated from the interviews the entirety of the themes is not presented in this paper, they have been split into two studies. Thence the current study provides a snapshot of the men's experiences. The sample consisted of predominantly white Scottish men, so it is recognised that the findings may not be generalisable to other genders, ethnicities or those who have died by suicide. It is acknowledged that the views of the men may have changed since the suicide attempt. Self-selection is also relevant as this study only includes the accounts of men who agreed to be interviewed and have their experiences shared.

5.6 Conclusions

This study explored the suicidal process in men, from suicide attempt to recovery. The findings provide insights into how men cope with suicidal thoughts or negative emotions, often avoiding seeking help and suppressing their emotions. The men's lives were significantly affected by the attempt, with some stating that they had changed as a person. Importantly, the findings indicate that men do recognise that they need help and can be receptive to help but can feel they need to be approached in the first instance. This offers an encouraging potential opportunity for support networks and clinical services caring for vulnerable men.

Chapter 6: Investigating sex differences in factors associated with suicide method: a national cohort study

6.1 Abstract

6.1.1 Objective

Sex differences in suicide rates and methods of death vary across countries and age groups. This study aims to explore (i) the differences in methods of suicide in men and women and (ii) the psychosocial factors associated with method choice in men and women.

6.1.2 Methods

The Scottish Suicide Information Database (ScotSID) included 8284 suicide deaths in Scotland from January 2009 to October 2019. ScotSID also records sociodemographic characteristics, details related to the suicide event and mental illness diagnosis. Data were analysed using univariate and multivariate logistic regression analyses.

6.1.3 Results

There were 6103 (73.7%) male and 2181 (26.3%) female suicide deaths, with an average age of 44 years. Hanging accounted for a large proportion (46.3%) of the deaths, followed by self-poisoning (30.4%). Men were less likely to use all self-poisoning substances than women, apart from gases and vapours. Men (79.5%) were more likely to use violent methods compared to women (20.5%). More factors differentiated between violent and non-violent methods in men. Having a suicide death classed as self-harm (as opposed to undetermined intent) and greater affluence (higher SIMD score) were associated with violent methods in men and women. In men, students, those with independent means, no occupation, or a person with a disability and those in management positions or officer roles in the armed forces had a reduced likelihood of using violent methods. Dying by suicide at home and being divorced was linked to a reduced likelihood of using violent means in both men and women. Being widowed was associated with reduced odds of violent methods in men.

6.1.4 Conclusions

The findings were consistent with previous research showing that men who died by suicide were more likely to use violent methods compared to women. Also, the influence of other factors such as marital status, employment status, deprivation, place of occurrence at home and suicidal intent provides a more detailed account of the situation individuals were in at the time of the attempt. Future research should extend the findings of this study to gain a deeper understanding of the factors associated with method choice in individuals with different sociodemographic profiles.

6.2 Introduction

6.2.1 Overview

Chapter 6 is the final results chapter in this thesis and contributes to the understanding of suicide risk in men and sex differences in factors associated with suicidal behaviour. The Scottish Suicide Information Database (ScotSID) is analysed to investigate sex differences in factors associated with suicide method.

It is well established that sex differences in suicide rates and methods exist across countries and age groups (Ahn et al., 2012, Yip et al., 2000, Turecki et al., 2019). Indeed, a recent systematic review (Cano-Montalbán and Quevedo-Blasco, 2018) concluded that, in Europe and the United States, men are more likely than women to die by suicide, whereas women and young people attempt suicide with greater frequency; with the former being more consistent with the Gender Paradox of Suicide (Canetto and Sakinofsky, 1998). Sex differences in suicide methods also tend to be more distinct in high-income countries (Kumar et al., 2017, Ahn et al., 2012). For example, men in high-income countries tend to use more violent means of suicide (such as hanging or firearms) whereas self-poisoning is more common among women (Bille-Brahe and Jessen, 1994, Värnik et al., 2008, Fisher et al., 2015, Tsirigotis et al., 2011, Kölves et al., 2018, Värnik et al., 2009, Mergl et al., 2015). Risk factors have also been found to differ between men and women according to methods used, indeed understanding such patterns represents an important avenue for suicide prevention research (Fisher et al., 2015, Callanan and Davis, 2012, Fekete et al., 2005, Kölves et al., 2018).

6.2.2 Access to Means

Access to means could be one contributing factor to the sex differences in suicide rates in high-income countries. In a sample of over 2,000 individuals who died by suicide in the United States, men predominantly died by use of firearms or hanging whereas women used a wider range of methods including self-poisoning, firearms, hanging, and carbon monoxide poisoning (Fisher et al., 2015). Recently, an Australian study of trends in suicide characteristics over 13 years (2000-2013)

highlighted the various factors that can influence suicide methods such as socio-cultural acceptability as well as physical and cognitive availability (Kölves et al., 2018). Although, it is important to note that those in occupations with greater access to firearms, drugs or carbon monoxide are more likely to use these methods to take their own lives, irrespective of gender (Milner et al., 2017b). In another study, Denning et al. (2000) concluded that despite men and women often differing in terms of the lethality of their methods of suicide, there was no difference in their intentions to die. On the other hand, Persett et al. (2021) noted that those who used violent methods, compared to self-poisoning, had higher scores of suicidal intent but both groups scored similarly on suicidal ideation and hopelessness suggesting the need to investigate other contributing factors.

6.2.3 Mental Illness

Examining the association between choice of suicide means and prior psychiatric illness is an important area of research to inform clinical interventions. Although previous research has noted that this may be linked to access to means (medication) rather than a diagnosis of mental illness (Currie et al., 2021, Callanan and Davis, 2012) as self-poisoning deaths are higher in those with both physical and mental illness (Nock et al., 2006). Greater access to medication for all medical conditions may therefore be an important factor for consideration and This highlights the importance of assessing suicide risk in individuals with mental and physical illness who may have greater access to medication.

6.2.4 Case Fatality and Lethality of Suicide Methods

Understanding the case fatality of substances used in self-poisoning is an important consideration for prescribers and regulators. Indeed, Hawton et al. (2019), Miller et al. (2020) have stressed the need for caution when prescribing opiates and barbiturates. These drugs can play an important role in pain management, insomnia and anxiety treatment but caution needs to be exercised, particularly in those at risk of self-harm or suicide (Hawton et al., 2019). With regards to toxicity, Ferrey et al. (2018) noted that there was little difference in the toxicity of mood disorder drugs whereas in antipsychotics clozapine was

significantly more toxic than other drugs. Case fatality is also an important consideration amongst other methods. For example, Thomas et al. (2021b) noted that 91% of those who used firearms died in their first suicide attempt, compared to 49% for suffocations, 30% for gas, 2% for drugs, none for sharp instruments and 5% for other methods. It is often understood that men choose more violent methods than women thence the case fatality rate is higher.

Previous research has also found that men who attempted suicide had higher perceived lethality and medical lethality compared to women (Conner et al., 2019), even in cases of self-poisoning (Choo et al., 2019, Cibis et al., 2012, Choi et al., 2021). Finally, although Wang et al. (2020) found that suicide rates were increasing in both sexes and those aged 20-64 in the United States, there is a clear need to investigate other psychosocial factors underpinning this difference in lethality.

6.2.5 Aims

This study extended previous research by investigating two aims in a large sample of Scottish individuals who have died by suicide over ten years. Firstly, it explored (i) the differences in methods of suicide in men and women and secondly (ii) the psychosocial factors associated with method choice in men and women.

6.3 Methods

6.3.1 Sample

The Scottish Suicide Information Database (ScotSID) is a national database that holds information on all individuals who die in Scotland from definite or probable suicide (ScotPHO, 2019). The database is constructed by linking routine administrative data. The database is held by the Information Services Division of NHS National Services Scotland (ISD) which is part of Public Health Scotland. Approval for use of the data was given by the Electronic Data Research and Innovation Service (eDRIS). The database includes information from each individual's National Records of Scotland (NRS) death record (e.g. date of death,

age, sex, cause of death) which is linked to a range of routine health records which are held by ISD. Causes of death were coded according to the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) (National Records of Scotland, 2017).

In addition to demographic information, the database includes details related to the suicide event, A&E attendances, psychiatric outpatient appointments and attendances, general acute inpatient and daycare, maternity inpatient and daycare, mental health inpatient and daycare, prescriptions and Scottish drug misuse database.

There were 8284 individuals in the ScotSID dataset, covering suicide deaths in Scotland from January 2009 to October 2019. Almost three-quarters of those who died by suicide were recorded as male (73.7%; 6103) and 2181 (26.3%) as female. The average age was 43.79 years (SD= 16.48).

The authors would like to acknowledge the support of the eDRIS Team (National Services Scotland) for their involvement in obtaining approvals, provisioning, and linking data and the use of the secure analytical platform within the National Safe Haven.

6.3.2 Variables

6.3.2.1 Sociodemographic characteristics and details relating to suicide event

The following variables were obtained from the deaths dataset: age, sex, marital status, employment status, place of occurrence (death), Scottish Indices of Multiple Deprivation (SIMD) and rurality. The variables were coded according to the predefined ScotSID categories provided by ISD. Ethnicity was unable to be included in this analysis as there was a large amount of missing data (83.9%).

Age was coded categorically: 5-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74 and 75+. Sex was classified in this dataset as male or female. Marital status was coded as “single”, “married”, “widowed”, “divorced” and “not known”. The

employment status categories were: “students, independent means, no occupation, a person with a disability”, “employees, apprentices, armed forces - other ranks”, “managers, superintendents, armed forces- officers”, “foremen”, “self-employed - with employees” and “self-employed - without employees”. Scottish Index of Multiple Deprivation (SIMD) was coded as most deprived (ranked 1) to least deprived (ranked 10) (Scottish Government, 2020b). SIMD was treated as a continuous variable in this analysis. This index records the extent to which an area is deprived across seven domains: income, employment, education, health, access to services, crime and housing (Scottish Government, 2020b).

Probable suicide deaths were coded as intentional self-harm or events of undetermined intent. Place of death was coded as home, farm, mine/quarry, sport/recreation area, street/highway, public building, residential institution (institutionalised, lives in a children’s home, lives in a residential home, lives in a welfare home or lives in accommodation with resident warden), other unspecified place and unspecified. Violent vs nonviolent methods of death were coded as per Stenbacka and Jokinen (2015a). Self-poisoning was classified as a non-violent method and hanging, strangulation and suffocation, drowning and submersion, firearm/handgun, exposure to smoke, fire and flames or contact with steam, hot vapours or hot objects, contact with a sharp or blunt object, falling, jumping or pushed from a high place or falling, lying or running before or into a moving object, crashing of a motor vehicle and other unspecified events were classified as violent methods. Other unspecified events were coded as undetermined or missing data.

6.3.2.2 Mental Illness

Mental illness was coded using ICD 10 Chapter V Mental and behavioural disorders (F00-F99) (World Health Organization, 1993) and determined from the Mental Health Inpatient and Day Case dataset (condition at discharge). Mental illness conditions were coded as individual binary variables (labelled as either "diagnosis" or "no diagnosis" for each condition). Mental illness variables used in this study were mood disorders, disorders of adult personality and behaviour, mental and behavioural disorders due to psychoactive substance use, schizophrenia,

schizotypal and delusional disorder and neurotic, stress-related and somatoform disorders.

6.3.3 Statistical analysis

Cause of death for men and women were reported with frequencies (Aim 1, Supplementary Appendix 23). In order to protect the anonymity of individuals included in this dataset, only percentage frequencies are presented throughout this chapter.

To address Aim 2 a univariate logistic regression analysis was conducted to examine sex differences in violent vs non-violent methods with females set as the reference variable. See Supplementary Appendix 24 for more information.

To determine the association of other psychosocial factors with violent vs non-violent methods (Aim 2) separate univariate logistic regression analyses were conducted for each variable (age, sex, marital status, employment status, mental illness, place of occurrence, SIMD, urban-rural code and suicidal intent); non-violent deaths was set as the reference category. Those variables that were significant in the univariate analyses ($p < .05$) were then included in the multivariate analyses (Aim 2, Supplementary Appendix 25 and 26).

Due to male sex emerging as a risk factor in the multivariate logistic regression examining factors associated with violent vs non-violent methods (Supplementary Appendix 25), sex differences in psychosocial factors were examined (Table 6.1). Separate univariate regression analyses were conducted (with non-violent methods as the reference category). The significant variables from the univariate analyses were incorporated into the multivariate model for males and females (Table 6.1). Descriptive statistics can also be found in Supplementary Appendix 27.

Finally, self-poisoning variables were analysed using univariate logistic regressions to investigate sex differences in what substance was ingested (Aim 1, Supplementary Appendix 28).

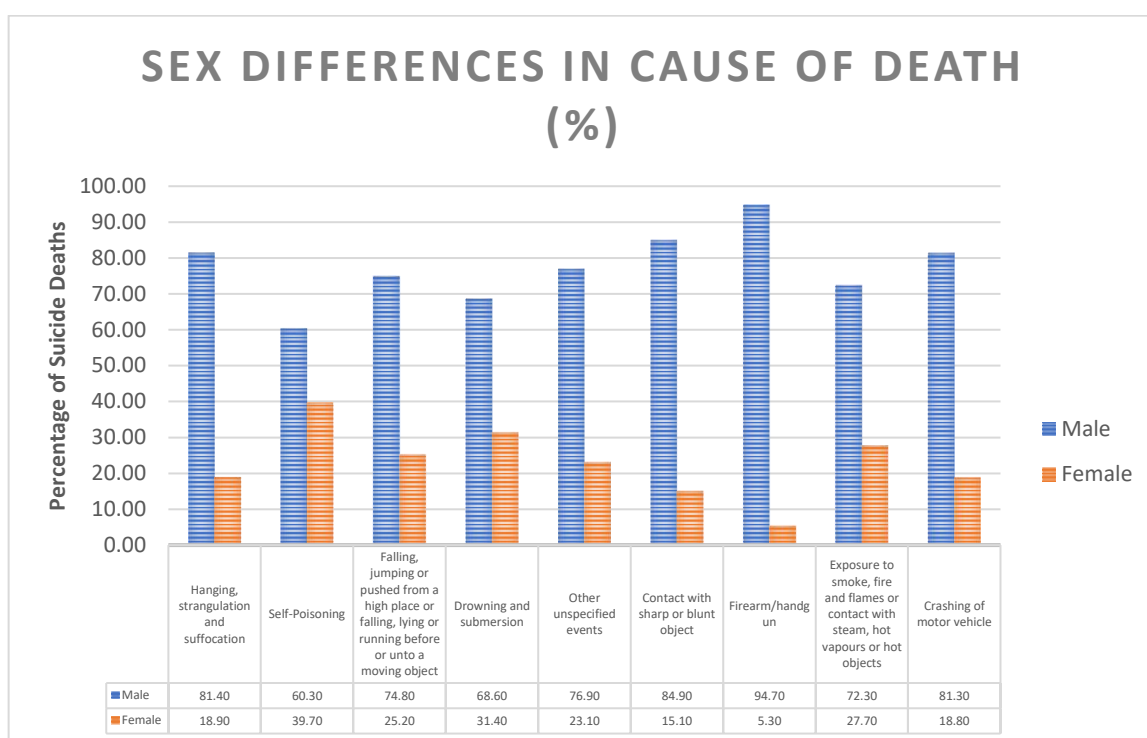
Odds ratios (OR) and 95% CIs are reported. As this is an exploratory analysis, the level of significance was set at $p < .05$ throughout. All analyses were conducted using SPSS 25. Syntax for the coding and data analysis can be found in Appendix 29.

6.4 Results

6.4.1 Sex differences in cause of death

To address Aim 1, sex differences in cause of death were examined (Figure 6.1). Overall hanging, strangulation and suffocation accounted for the largest proportion of deaths in both men (81.4%) and women (18.9%) (Supplementary Appendix 23). Self-poisoning also accounted for a large proportion of deaths in men (60.3%) and women (39.7%). Men had a higher likelihood of using violent methods (OR [95% CI] = 2.53 [2.28, 2.81], $p < .0001$) compared to women. Overall, the largest sex differences in suicide deaths were in firearm/handgun use (94.7% in men and 5.3% in women) and contact with a sharp or blunt object (84.9% in men and 15.1% in women).

Figure 6.1: Sex differences in cause of death



6.4.2 Sex differences in psychosocial factors associated with violent vs non-violent methods

The following section relates to Aim 2. Descriptive statistics can be found in Supplementary Appendices 26 and 27.

In the fully adjusted model investigating factors associated with method choice (Table 6.1), seven factors were significant in males. The death being classified as self-harm (OR [95% CI] = 13.81 [11.80, 16.17], $p < .0001$) and increased SIMD score (more affluence) (OR [95% CI] = 1.04 [1.02, 1.07], $p = .003$) were associated with violent methods in men. Being widowed (OR [95% CI] = .64 (.43, .93), $p = .02$), divorced (OR [95% CI] = .69 [.55, .87] $p < .001$), students, independent means, no occupation, a person with a disability (OR [95% CI] = .66 [.56, .77], $p < .0001$), managers, superintendents, armed forces- officers (OR [95% CI] = .65 [.47, .92], $p = .01$) and place of occurrence being at home (OR [95% CI] = .40 [.34, .47], $p < .0001$) were associated with reduced likelihood of violent methods in men.

Four variables retained significance in the multivariate model in women (Table 6.1). Intent classified as self-harm (OR= 8.52 [6.69, 10.86], $p < .0001$) and increased SIMD score (less deprivation) (OR = 1.05 [1.01, 1.10], $p = .008$) were associated with violent methods in females. Place of occurrence at home (OR= .49 [.39, .61], $p < .0001$) and being divorced (OR [95% CI] = .71 [.52, .97], $p = .03$) were associated with reduced likelihood of using violent methods in females

Table 6.1: Multivariate logistic regression examining the association of psychosocial factors and characteristics of the suicide attempt with violent vs non-violent methods in men and women

Factor	Males				Females			
	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value	OR(95% CI)	P-value	Adjusted OR (95% CI)	P-value
Age								
5-14	2.38 [.44, 12.87]	.32	9.87 [.90, 107.99]	.06	1.36 [.47, 3.89]	.57	1.40 [.30, 6.49]	.67
15-24	1.34 [.91, 1.97]	.14	1.38 [.86, 2.22]	.18	1.47 [.99, 2.41]	.13	1.58 [.82, 3.04]	.17
25-34	.90 [.63, 1.29]	.59	.91 [.59, 1.40]	.67	1.04 [.66, 1.65]	.89	1.01 [.56, 1.83]	.97
35-44	.69 [.48, .97]	.03	.80 [.53, 1.22]	.30	.88 [.57, 1.38]	.59	.81 [.46, 1.42]	.45
45-54	.81 [.57, 1.15]	.24	.85 [.57, 1.29]	.45	.83 [.53, 1.29]	.41	.65 [.38, 1.13]	.13
55-64	.94 [.65, 1.36]	.73	.90 [.59, 1.37]	.61	.83 [.52, 1.32]	.43	.66 [.38, 1.16]	.15
65-74	.84 [.56, 1.28]	.42	.97 [.61, 1.53]	.90	.85 [.50, 1.43]	.54	.60 [.33, 1.08]	.09
75+ (ref)	-	-	-	-	-	-	-	-
Marital Status								
Not known	.51 [.22, 1.14]	.10	.42 [.14, 1.29]	.13	1.42 [.47, 4.29]	.54	.60 [.12, 3.00]	.54

Single	.76 .87]	[.66,	<.0001	1.02 [.84, 1.23]	.88	1.01 [.82, 1.25]	.90	.99 [.74, 1.33]	.96
Widowed	.61 .83]	[.45,	.001	.64 [.43, .93]	.02	.66 [.47, .93]	.02	.77 [.50, 1.19]	.24
Divorced	.52 .63]	[.43,	<.0001	.69 [.55, .87]	.002	.61 [.47, .80]	<.0001	.71 [.52, .97]	.03
Married (ref)	-	-	-	-	-	-	-	-	-
Employment Status									
Students, Independent Means, No Occupation, A Person with a Disability	.56 .54]	[.49,	<.0001	.66 [.56, .77]	<.0001	.81 [.67, .97]	.02	.92 [.73, 1.15]	.45
Self-employed - without employees	1.29 1.68]	[.99,	.06	1.19 [.88, 1.61]	.27	1.29 [.81, 2.06]	.28	1.11 [.65, 1.89]	.45
Managers, Superintendents, Armed Forces-Officers	.92 1.23]	[.69,	.57	.65 [.47, .92]	.01	1.27 [.82, 1.98]	.27	1.13 [.68, 1.86]	.64
Foremen	1.45 2.65]	[.80,	.22	1.60, .79, 3.21]	.19	1.16 [.56, 2.38]	.59	1.35 [.58, 3.11]	.48
Self-employed - with employees	1.05 1.61]	[.69,	.81	.87 [.54, 1.41]	.58	1.16 [.56, 2.38]	.69	1.25 [.55, 2.84]	.60
Employees, Apprentices, Armed Forces - Other Ranks (ref)	-	-	-	-	-	-	-	-	-
Mood disorders	1.31 2.55]	[.67,	.43	-	-	1.13 [.61, 2.11]	.69	-	-
Disorders of adult personality and behaviour	.70 2.80	[.18,	.61	-	-	2.31 [.82, 6.52]	.11	-	-
Mental and behavioural disorders due to	.86 1.64]	[.45,	.65	-	-	.80 [.34, 1.90]	.62	-	-

psychoactive substance use									
Schizophrenia, schizotypal and delusional disorder	1.25 [.54, 2.90]	.60	-	-	.98 [.40, 2.43]	.97	-	-	
Neurotic, stress-related and somatoform disorders	.61 [.26, 1.46]	.27	-	-	2.22 [.70, 7.11]	.18	-	-	
Place of Occurrence									
Home	.57 [.50, .66]	<.0001	.40 [.34, .47]	<.0001	.55 [.46, .67]	<.0001	.49 [.39, .61]	<.0001	
Farm, Mine/Quarry, Place of Industry	1.23 [.69, 2.21]	.49	.90 [.46, 1.78]	.77	11.06 [1.47, 83.36]	.02	8.56 [.98, 74.64]	.05	
Sport/Recreation Area, Street/Highway, Public Building	.97 [.70, 1.34]	.86	.77 [.52, 1.14]	.20	2.27 [1.21, 4.27]	.01	1.80 [.87, 3.74]	.12	
Residential Institution	2.79 [.66, 11.90]	.17	1.00 [.23, 4.46]	1.00	-	-	-	-	
Other Unspecified Place (ref)	-	-	-	-	-	-	-	-	
SIMD Decile (continuous)	1.08 [1.06, 1.11]	.04	1.04 [1.02, 1.07]	.003	1.10 [1.06, 1.13]	<.0001	1.05 [1.01, 1.10]	.008	
Urban-Rural Code									
Urban	1.19 [1.04, 1.36]	.01	.96 [.81, 1.14]	.64	1.31 [1.07, 1.60]	.008	1.06 [.84, 1.35]	.62	
Rural (ref)	-	-			-	-			
Intent									
Self-Harm	10.92 [9.50, 12.56]	<.0001	13.81 [11.80, 16.17]	<.0001	7.66 [6.13, 9.56]	<.0001	8.52 [6.69, 10.86]	<.0001	
Undetermined intent (ref)	-	-	-	-	-	-	-	-	

Note: reference category: non-violent methods

6.4.3 Sex differences in self-poisoning

Due to the large proportion of men and women who died by self-poisoning, sex differences in substances ingested were assessed (Table 6.2 and Supplementary Appendix 28). Men were less likely to use other and unspecified drugs, chemicals, medicaments and biological substances, narcotics and psychodysleptics, anti-epileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, non-opioid analgesics, antipyretics and antirheumatics and drugs acting on the autonomic nervous system. The only substances men were more likely to use, compared to women, were gases and other vapours.

Table 6.2: Univariate logistic regression of sex differences in self-poisoning

Primary Cause of Death (Self-Poisoning)	OR (95% CI)	p-value	Men (% of total)	Women (% of total)
Exposure to gases and vapours	2.33 [1.47, 3.69]	<.0001	<5%	<5%
Narcotics and psychodysleptics (hallucinogens)	.53 [.47, .61]	<.0001	8.3%	5.1%
Other and unspecified drugs, chemicals, medicaments and biological substances	.65 [.52, .81]	<.0001	<5%	<5%
Anti-epileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs	.38 [.32, .45]	<.0001	<5%	<5%
Non-opioid analgesics, antipyretics and antirheumatics	.36 [.27, .48]	<.0001	<5%	<5%
Drugs acting on the autonomic nervous system	.26 [.17, .40]	<.0001	<5%	<5%
Pesticides	.72 [.07, 7.89]	.78	<5%	<5%
Alcohol	.29 [.08, 1.06]	.06	<5%	<5%

Note: reference category: female

6.5 Discussion

This study investigated sex differences in suicide methods and explored various facets of this including the differences in suicide methods between men and women, the use of violent vs non-violent methods and whether other psychosocial factors are associated with method choice.

Men were more likely to use violent methods compared to women in this study. There were also more variables that differentiated between violent and non-violent methods in men in this study. Living in an area with less socioeconomic deprivation was associated with violent methods in both men and women which is surprising given previous research has found that deprivation (such as unemployment) is a risk factor for death by suicide in men and women (Borrell et al., 2020) and suicide and assault in Scottish men (Moore et al., 2020). More research is needed to uncover the mechanisms of this association. Marital status was associated with reduced likelihood of violent methods in men and women, with being divorced being significant in men and women and widowed being significant in men. Previous research has demonstrated the elevated suicide risk in individuals who are separated or divorced in both men and women (Omary, 2021, Kposowa et al., 2020, Kyung-Sook et al., 2018), particularly those who are middle aged (Næss et al., 2021).. Unmarried men (Nie et al., 2021, Kyung-Sook et al., 2018) and women (Kyung-Sook et al., 2018) have also displayed elevated suicide risk. There is a smaller literature base on differences in methods according to marital status but Bond et al. (2021) noted that there were no differences in marital status between suicide decedents who died by firearm or hanging. Thence more research is needed to uncover the impact of marital status on violent vs non-violent means of suicide.

Employment status was significant in this analysis and two employment status variables (students, independent means, no occupation, a person with a disability and managers, superintendents, armed forces- officers) were linked to a reduced likelihood of violent methods in men. This may point to the protective influence of higher levels of education against suicide in men (Guseva Canu et al., 2021).

Previous research (Li et al., 2020) has highlighted risk and protective factors related to suicides in the student population, but there is a need for further research to understand differences in method choice in this population. This is also of central importance to men, given previous research which has noted the significance of occupation as a risk factor for male suicide (Guseva Canu et al., 2021) and the need for workplaces to provide mental health support particularly in high-stress occupations such as first responders (Olliffe et al., 2021b). Occupation also needs to be considered within the social context in which men live. Indeed, recent research noted that men in a male-dominated workforce had a higher suicide risk than men in female-dominated jobs (Milner and King, 2019). The gendered norms, environment, attitudes towards help-seeking, and mental health in these workplaces need to be considered (Milner and King, 2019) and mental health and suicide prevention awareness campaigns could be useful to break down these barriers and stigma.

The characteristics of the suicide death can provide a more detailed picture of the situation individuals were in at the time of the attempt. A suicide death classified as self-harm, as opposed to undetermined, was more likely to be classified as a violent death in men and women. This finding has been reported previously (Xianyun et al., 1989, Zhang and Xu, 2007), particularly in China, where suicidal intent explained suicide rates to a greater extent than gender differences. Deaths that happened at home were also associated with a reduced likelihood of being by violent methods, once again, further investigation into why this is the case is needed. This is also concerning as there are reduced opportunities for intervention at home. Overall, the findings demonstrate that, in both men and women, no mental illness variables were associated with violent methods; method choice was associated with sociodemographics, place of occurrence and suicide death classed as self-harm.

Understanding differences in what men and women ingest in self-poisoning deaths is important for suicide prevention efforts. In this sample, over ten years in Scotland, self-poisoning accounted for the second largest proportion of the deaths in this sample in men and women (second to hanging). Men and women differed significantly in the substances used. The only substance men were more likely to use than women was gases and other vapours in this study which is consistent with

previous research (Burnett et al., 2021, Martínez-Rives et al., 2021). In addition, there were five substances that men were less likely to use in self-poisoning deaths than women, which may suggest that women utilised a larger range of substances. This is also in line with previous research that women may be more likely to use a variety of suicide methods (Tsirigotis et al., 2011) thence the use of multiple substances is an important consideration particularly as women may be more likely to attempt suicide than men (Canetto and Sakinofsky, 1998). Importantly, in a recent qualitative study of survivors of a suicide attempt by self-poisoning the participants believed that this method had a higher likelihood of death, they would not suffer, and the predominantly female sample found it easy to access chemical agents (Pires et al., 2021). In addition, Pires et al. (2021) reported that none of the women considered the health risks if they survived which demonstrates the need for suicide prevention strategies to consider monitoring commonly used substances to provide education on potential adverse effects, as well as targeting misinformation (particularly online) on rates of action of certain substances.

6.5.1 Clinical Implications

This study has some important clinical implications. The frequencies of methods of suicide among men and women have been outlined, which highlight how common hanging and self-poisoning are in suicide deaths in Scotland.

In self-poisoning deaths, women had a higher likelihood of using a range of substances than men, including non-opioid analgesics, antipyretics and antirheumatics, anti-epileptic, sedative-hypnotic, antiparkinsonian and psychotropic drugs, narcotics and psychodysleptics (hallucinogens), drugs acting on the autonomic nervous system and other substances. The only substance men had a higher likelihood of using, compared to women, was gases and other vapours. Narcotics and psychodysleptics had the highest percentage of use in this study, in both men and women, which is in line with Hawton et al. (2019) which further stresses the need to be cautious when prescribing dihydrocodeine, tramadol and codeine. In particular, reduction of packet sizes and prescribing for a shorter period of time (e.g. providing service users with a week's worth rather

than a month's worth of medication) can be effective in reducing suicide by self-poisoning (Sarchiapone et al., 2011).

The large number of substances identified in this study highlights the important role of primary care physicians in suicide risk assessment, particularly in instances where certain medications are being prescribed. Indeed, a recent systematic review of 44 studies (from 2000 to 2017) concluded that visits to primary care were highest in the year before suicide with an average rate of contact of 80% (Stene-Larsen and Reneflot, 2019). This is also important as the place of occurrence at home was associated with a reduced likelihood of using violent methods. This may point to self-poisoning being used in these instances and this is particularly concerning due to the potential ease of access (i.e., prescribed medication) and the reduced opportunities for intervention.

The role of clinicians in determining access to means when assessing suicide risk is also recognised, particularly regarding firearm ownership (Stanley et al., 2017). The number of individuals who used firearms was relatively low although this may be more relevant for those in rural farming communities where access to firearms may be more prevalent (Stark et al., 2006a, Stark et al., 2006b, Behere et al., 2020). Suicide by hanging was also a common method in men, which is concerning due to the reduced opportunities for intervention (Sabrinskas et al., 2021, Gunnell et al., 2005a) highlighted the importance of education and policy in regard to hanging suicides and attempts in controlled environments (such as inpatient psychiatric facilities), improved medical management and aftercare of suicide attempts by hanging and responsible media portrayal of hanging suicides (either fictional or celebrities). Thence safety planning may have a role here and previous research has demonstrated the effectiveness in reducing and mitigating suicide behaviour in clinical practice, but not suicidal ideation (Nuij et al., 2021).

6.5.2 Strengths and Limitations

This study is one of the first to comprehensively examine, over ten years, sex differences in suicide rates in Scotland and the factors associated with method

choice. It included all suicide deaths in Scotland and all age groups; therefore, it is nationally representative.

Due to the nature of this dataset, which includes information derived from health records, missing data were an issue and there were also concerns about the reliability of some of the data. This reflects the environment where the data is inputted, such as in A&E, where time is limited particularly for clinicians inputting patient data during a consultation. This is a common issue in large studies containing healthcare data, particularly where data linkage is involved (Wordsworth et al., 2018, Kaplan et al., 2014). It is recommended that this dataset requires a systematic approach and extensive data cleaning to ensure accuracy and a step forward for this dataset could be the standardisation of data cleaning and coding steps to ensure replicability (Wordsworth et al., 2018).

Certain facets were missing from this dataset, such as sexual orientation and gender identity. These are important limitations due to the elevated risk of suicide and self-harm in the LGBTQ+ community (Sidaros, 2017). Going forward it is recommended that sexuality and gender identity are collected in coroners reports (and their equivalents) as it could aid targeted suicide prevention efforts (Haas et al., 2019). It is recognised that there are challenges associated with collecting sexuality and gender identity in coroners reports such as relying on information from informants which could be impacted by bias (Haas et al., 2019). As ethnicity was also missing from this analysis (due to a large amount of missing data), it was not possible to investigate any differences as a function of ethnicity. The self-poisoning variables were broad terms and were not able to be explored further to understand whether a substance was prescribed vs non-prescribed which would have provided a more useful picture of the person's death and the circumstances around their death. Also, it was not possible to know the exact substance an individual used to take their own life, for example gases and other vapours is a broad term and it would have been useful to elucidate this further.

It is recognised that 77% of suicides globally occurred in low and middle-income countries in 2019 (World Health Organisation, 2021b) and the majority of deaths by suicide among women also occur in low and middle-income countries. Thence the findings from this study are not generalisable to other cultures or countries.

Method choice can also differ in LMIC with pesticide poisoning a common method in Asia which is concerning due to ease of access (Arafat et al., 2021). This highlights the importance of context when researching sex differences in suicide.

6.6 Conclusions

This study has identified important differences in method choice between males and females and advanced our understanding of the psychosocial factors associated with these differences. Men were more likely to use violent methods in this population. Uncovering specific methods used, particularly over ten years as used in this study, can monitor prevalent trends and guide suicide prevention efforts. Also, the influence of other factors such as sociodemographics, place of occurrence and suicidal intent classed as self-harm provides a more detailed account of the situation individuals were in at the time of the attempt. The findings point to the environments and social contexts in which individuals live, as an explanation of method choice. Future research should aim to extend the findings of this study to gain a deeper understanding of factors that influence method choice to help identify men and women at risk of suicide.

Chapter 7: Discussion

7.1 General Overview

This general discussion chapter presents a summary of the main findings from the systematic review, qualitative and quantitative studies contained within this thesis. The findings are considered in terms of their theoretical and clinical applications, and recommendations for future research are also provided. Critical analysis of the findings is also presented. Risk factors for suicidal behaviour in men (including mental illness and alcohol and/or drug use) are identified as well as certain subgroups of men that are particularly vulnerable to suicide (including those who have recently attempted suicide, experienced a recent unemployment and those who are recently divorced). The findings of this thesis are summarised and interpreted in line with the three overarching aims presented in the introduction: 1) What demographic, clinical and psychosocial factors confer vulnerability for suicidal behaviour in men? 2) What factors differ between men and women regarding suicide risk? 3) Which factors are associated with suicidal thoughts versus suicide attempts in men and women? The findings of this thesis highlight the large number of risk factors that contribute to suicidal behaviour in men, from demographic factors to clinical and psychosocial factors. Factors that differentiate between those with suicidal ideation and those who have attempted suicide have also been examined, as well as sex differences. The qualitative studies outline the male experiences of factors leading up to a suicide attempt and recovery, demonstrating the prevailing impact of a suicide attempt on their life. Finally, the ScotSID study investigates differences in method choice among males and females, as well as the factors associated with violent vs non-violent methods. The limitations of these studies are discussed and directions for future research are presented.

7.2 Summary of Key Findings

Overall, this thesis supports previous research of the nature and type of suicide risk factors in men and provides context to the situations whereby men may be vulnerable to suicide. The systematic review provides an overview of what we do

know from the research that from predisposing factors, such as early life experiences and childhood education, to mental illness and health, the path towards suicide for men is complex and involves an interplay of factors. Also, there were some risk factors with a particularly high proportion of supporting evidence identified in this thesis (particularly chapter 2): alcohol and drug use or dependence, marital status, depression, any diagnosis of mental illness, level of education and previous suicide attempts. This review also provided some important recommendations for future research such as more investigation into psychological factors in men.

The male experience is transient, ever changing and there are different reasons why men take their own life or attempt to take their own life. In the interviews analysed for this thesis (chapters 4 and 5) this was often environmental or situational factors (they wished to escape the seemingly unescapable). There was a build-up of different life events and if someone had asked them if they were ok sooner their suicidal ideation may not have worsened. There is a need to recognise that features like safe housing and a stable job are also a part of suicide prevention as many of the men were struggling with difficult or stressful life situations. Men may not seek help until they are in crisis so how they are discharged from hospital and followed up with is important - many felt fragile after they had attempted suicide.

The findings of this thesis also support previous research that, in western countries, men were more likely to use violent methods (chapter 6). Although, women were more likely to attempt suicide than men (chapter 3), so it is possible that men maybe are more likely to die on the first attempt and there is a need to work towards identifying men before they reach that point. Men that attend A&E with physical injuries or injuries as a result of consuming alcohol, drugs or engaging in risky behaviours may benefit from a psychological assessment or access to support. Men dealing with depression or a suicidal crisis may engage in risky behaviour or display aggression or angry behaviour that will not be recognised in typical clinical assessment tools.

Current theoretical models do not distinguish between different ages, cultures, sexualities, genders for which the journey towards suicidal behaviour may be

different and more work is needed to recognise this diversity of experience. The suicidal journey can differ for men (some have a short time between thinking and acting on their suicidal thoughts, while others can struggle for a long time). Undertaking longitudinal research with men or Ecological Momentary Assessment studies whereby how men are feeling can be tracked in real-time, can provide a more accurate picture of this suicidal process and opportunities for intervention.

Table 7.1: Key Findings

Chapter	Study	Novel Findings
2	A systematic review of suicidal behaviour in men: A narrative synthesis of risk factors	This review is the largest synthesis of the research literature to date on risk factors for suicidal behaviours in men and the findings demonstrate the wide range of risk factors that are associated with suicidal behaviour in men. Overall, the risk factors with the strongest evidence predicting suicidal behaviour in men were alcohol and drug use or dependence, marital status (unmarried, single, divorced, or widowed), depression, level of education (high school or below) and previous suicide attempts.
3	Psychosocial Factors that Distinguish Between Men and Women Who Have Suicidal Thoughts and Attempt Suicide: Findings from a National Probability Sample of Adults	Overall men were less likely to report suicidal thoughts and attempts, compared to women. More factors differentiated between suicidal thoughts and attempts in women compared to men; these included hospital admission for mental illness, below degree level qualifications, being single and childhood adversity. In men, factors which significantly differentiated between suicidal thoughts and attempts included self-report of professional diagnosis of mental illness and childhood

		adversity. Higher levels of social support were associated with being in the suicidal thoughts group versus in the attempts group in men.
4	“there is nothing, there is no tomorrow, there’s no future here”: An Interpretative Phenomenological Analysis of personal, social, and cultural factors in men who have attempted suicide	This study identified three key themes that affected men before they attempted to take their own life. The impact of poor mental health conferred vulnerability for suicidal behaviour in men and many also felt a pressure to exhibit an outward display of masculinity, to appear strong amidst the difficulties they were facing. The themes also demonstrate the need for a person-centred approach, to consider the entirety of the male experience, beyond a mental illness approach to suicide.
5	The Male Experience of Suicide Attempts and Recovery - An Interpretative Phenomenological Analysis	The findings of this study illustrate the wide-ranging effects of a suicide attempt on men. The men noted a feeling of single-mindedness, that once they had decided to take their own life there was nothing that could stop them. Also, some participants felt they had struggled for so long and felt that they could no longer continue to live in their current circumstances. A feeling of vulnerability was evident throughout the interviews, with many being concerned that they may return to the same place in their mind again. Social connections with others were protective and many men were open to seeking help but were unsure how to access it or fearful of admitting this.
6	Investigating sex differences in factors associated	There were 6103 (73.7%) male and 2181 (26.3%) female suicide deaths, with an average age of 44 years. Hanging accounted for a large

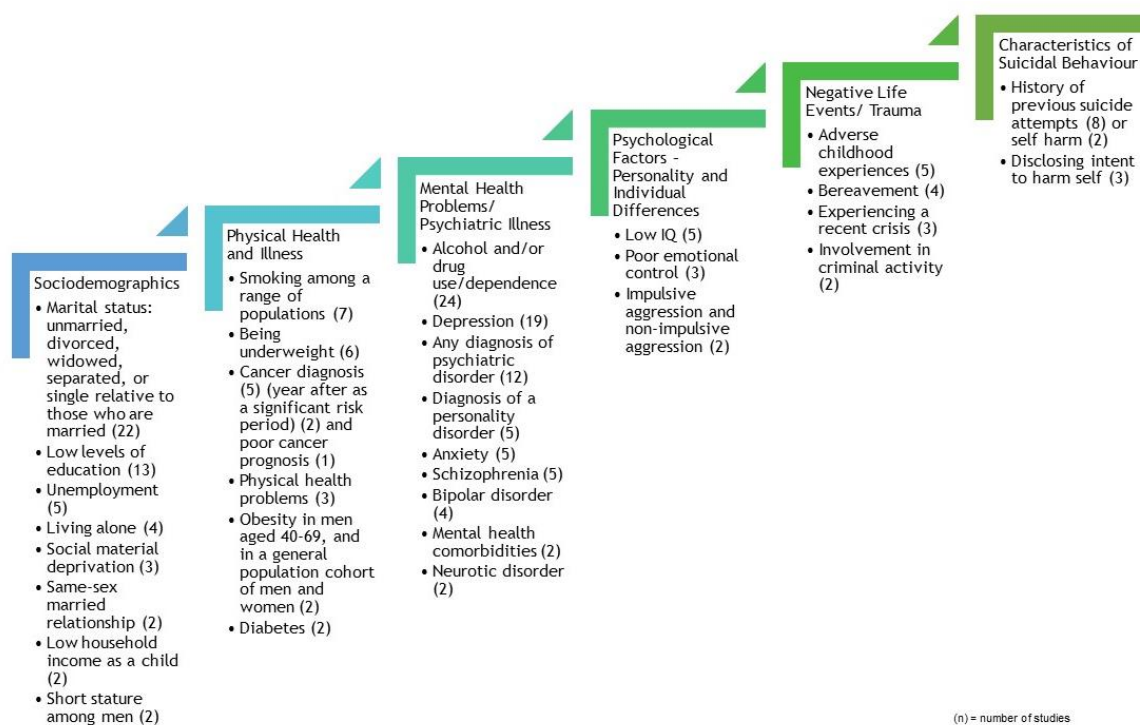
with suicide method: proportion (46.3%) of the deaths, followed by a national cohort study self-poisoning (30.4%). Men were less likely to use all self-poisoning substances than women, apart from gases and vapours. Men (79.5%) were more likely to use violent methods compared to women (20.5%). More factors differentiated between violent and non-violent methods in men. Having a suicide death classed as self-harm (as opposed to undetermined intent) and greater affluence (higher SIMD score) were associated with violent methods in men and women. In men, students, those with independent means, no occupation, or a person with a disability and those in management positions or officer roles in the armed forces had a reduced likelihood of using violent methods. Dying by suicide at home and being divorced was linked to a reduced likelihood of using violent means in both men and women. Being widowed was associated with reduced odds of violent methods in men.

7.2.1 What demographic, clinical and psychosocial factors confer vulnerability for suicidal behaviour in men?

This question was addressed throughout the thesis, using a wide range of data and datasets as outlined earlier. Understanding risk factors for suicidal behaviour in men was a central aim of this thesis. To this end, this thesis addressed a major gap in the literature in Chapter 2 by conducting the first systematic review of risk factors for suicidal behaviour in men. This was the largest synthesis of risk factors for suicidal behaviour in men, to date, with 105 studies and 68 different risk factors identified. Overall, the risk factors with the strongest evidence predicting suicidal behaviour in men were alcohol and drug use or dependence, marital status

(being divorced, single, unmarried, or widowed), depression, level of education (highest level: high school or below), and previous suicide attempts.

Figure 7.1: Risk Factors in Men Reported by ≥ 2 Studies (Chapter 2)



In Chapter 3, the risk factors for suicidal behaviour in men were examined through the lens of the ideation-to-action framework. Factors that significantly differentiated between suicidal thoughts and attempts in men included self-report of professional diagnosis of mental illness and childhood adversity. Higher levels of social support were associated with reduced odds of transition from suicidal thoughts to attempts in men.

The voices of men with lived experience are also included in this thesis (Chapters 4 and 5). Through detailed interviews, it was possible to better understand the build-up to and the wide-ranging impact of a suicide attempt. Various factors emerged from these interviews including notions of adhering to traditional conceptualisations of masculinity and societal expectations of being a man, aspects of self (such as low self-esteem and self-confidence) and past experiences ranging from childhood to adulthood. Men who had experienced recent negative life events, such as unemployment or divorce, were also identified as being

vulnerable to suicide in these interviews. These chapters provide an insight into the process that leads men to attempt to take their own life and how they cope and recover following a suicide attempt. From predisposing factors that led men to feel vulnerable or that they had no chance of a better life to situational and motivational factors that encompassed their mindset at the time. By providing men with a clear means of accessing support and recognising specific factors that may lead men to feel vulnerable may help to halt the progression from ideation to action. Also recognising that the time following a suicide attempt (particularly the first weeks/months) are a particularly vulnerable time for men and they may require extra support from family/friends or clinical services.

Finally, in Chapter 6, one of the first studies to use the Scottish Suicide Information Database (ScotSID) for research purposes was described. It examined factors potentially associated with method choice in males and females. The findings were clear: males were more likely to use violent methods, compared to females. Factors associated with violent methods use in men included suicide death classed as self-harm (as opposed to undetermined intent) and greater affluence (higher SIMD score) were associated with violent methods in men. Whilst, students, those with independent means, no occupation, or a person with a disability and those in management positions or officer roles in the armed forces had a reduced likelihood of using violent methods. Dying by suicide at home and being divorced or widowed was linked to a reduced likelihood of using violent means in men. The findings of this chapter highlight the importance of considering a broad range of clinical, demographic, and situational factors in regard to suicide risk, particularly marital status, employment status, deprivation, place of occurrence at home and suicidal intent.

7.2.2 What factors differ between men and women regarding suicide risk?

The findings from chapter 6, which studied individuals in Scotland who died by suicide over a ten-year period, demonstrate that men were more likely to use violent methods than women. There were factors associated with method choice which may deepen understanding of the situation individuals were in at the time of the attempt. Living in an area with less socioeconomic deprivation was linked

to increased likelihood of using violent methods in both men and women, which is a surprising finding considering previous research particularly linking deprivation with suicide risk in men (Borrell et al., 2020, Moore et al., 2020). Marital status was also associated with reduced likelihood of using violent methods in both men and women, with being divorced being significant in men and women and widowed being significant in men. The mechanisms of this association are not yet fully understood with previous research noting elevated suicide risk in men and women who are separated or divorced (Omary, 2021, Kposowa et al., 2020, Kyung-Sook et al., 2018, Næss et al., 2021) but there is a smaller literature base on differences in suicide methods according to marital status (Bond et al., 2021).

Employment status was significant in this analysis and two employment status variables (students, independent means, no occupation, a person with a disability and managers, superintendents, armed forces- officers) were linked to a reduced likelihood of violent methods in men. This may point to the protective influence of higher levels of education against suicide in men (Guseva Canu et al., 2021).

A suicide death classified as self-harm, as opposed to undetermined, was more likely to be classified as a violent death in men and women. Deaths that happened at home were also associated with a reduced likelihood of being by violent methods, once again, further investigation into why this is the case is needed. This is also concerning as there are reduced opportunities for intervention at home.

7.2.3 Which factors are associated with suicidal thoughts versus suicide attempts in men and women?

Chapter 3 investigated the factors differentiating between individuals who had attempted suicide compared to those who had thought about suicide. Women reported more suicidal thoughts and attempts compared to men, consistent with the Gender Paradox of Suicide (Canetto and Sakinofsky, 1998). More factors differentiated between suicidal thoughts and attempts in women and these included hospital admission for mental illness, below degree level qualifications, being single and childhood adversity. In men, factors which significantly

differentiated between suicidal thoughts and attempts included self-report of professional diagnosis of mental illness and childhood adversity. Higher levels of social support seem to protect against suicide attempts in men, as those in suicidal thoughts group reported higher levels of social support than those who had attempted suicide. Despite some gender differences, common features emerged in men and women: the pervasive impacts of mental illness, hospitalisation, and adverse life experiences. Taken together, these findings highlight the importance of a personalised approach to suicide risk assessment and prevention (Graney et al., 2020), that each individual has different stressors in their life which may be impacting their mental health and wellbeing, and in turn, their suicide risk.

7.3 Clinical Implications

In this section, some clinical implications related to the findings of the present thesis are presented (Table 7.2).

Table 7.2: Clinical Implications

Chapter	Study	Clinical Implications
2	A systematic review of suicidal behaviour in men: A narrative synthesis of risk factors	- There is a need to move beyond a solely mental illness-focused assessment of suicide risk. Considering biological, mental illness, social, cultural, and environmental risk factors in conjunction provides a more accurate picture of men's lives and risk of suicide.
3	Psychosocial Factors that Distinguish Between Men and Women Who Have Suicidal Thoughts and Attempt	- Hospitalisation for mental illness confers a significant risk for suicidal behaviour in both males and females, highlighting the need for monitoring of risk following discharge. - The pervasive impact of life experiences such as childhood adversity and trauma should also be considered.

	Suicide: Findings from a National Probability Sample of Adults	
4	<p>“there is nothing, there is no tomorrow, there’s no future here”: An Interpretative Phenomenological Analysis of personal, social, and cultural factors in men who have attempted suicide</p>	<ul style="list-style-type: none"> - There were many risk factors present in the men’s lives including severe mental illness, social isolation, substance use and unemployment demonstrating the need for a holistic approach to assessing suicide risk in men. - The expression of distress may manifest itself in terms of life experiences and behaviours such as risk-taking, as opposed to outward displays of emotions; these should be incorporated into suicide risk screening. - Many men also spoke of the impulsive nature of their suicide attempt, often not thinking the action through and getting to a point where they felt like suicide was the only option. This highlights the need to identify men at risk of suicide before they have reached this crisis point.
5	<p>The Male Experience of Suicide Attempts and Recovery - An Interpretative Phenomenological Analysis</p>	<ul style="list-style-type: none"> - The findings indicated the difficulties that men experience following their suicide attempt, describing themselves as “fragile” or “in shock” demonstrating the significant impact this has on their lives and the need for support during this vulnerable period. - Many of the men recognised that they needed help but were either unable to reach out for help or did not know where to seek help. This highlights those men may be ready to seek help and would benefit from friends/family or

	<p>support services approaching them in the first instance.</p> <ul style="list-style-type: none"> - De-stigmatising men’s mental illness and male suicidal behaviour as well as affirming that it is ok to seek help, from professionals or peers, are central to effective male suicide prevention efforts. - The importance of speaking the same language regarding having someone to relate to and someone who understood the industry was highlighted, men may feel more comfortable disclosing emotional distress to someone they feel they can relate to. Services also need to be adaptive to the specific needs of patients, regardless of gender. - It is known that men and women may similarly experience depression, but it is their outward expression that can differ. By utilising tools such as The Male Depression Scale (MDRS-22) (Rice et al., 2013) which includes domains such as anger, aggression, distraction and avoidance, it may provide a more accurate of the male experience. - The importance of speaking the same language regarding having someone to relate to and someone who understood the industry was highlighted, men may feel more comfortable disclosing emotional distress to someone they feel they can relate to. Services also need to be adaptive to the specific needs of patients, regardless of gender.
<p>6 Investigating gender differences in</p>	<ul style="list-style-type: none"> - Narcotics and psychodysleptics had the highest percentage of use in this study which

<p>factors associated with suicide method: a national cohort study</p>	<p>demonstrates the need for caution when prescribing these substances.</p> <ul style="list-style-type: none"> - This study is consistent with previous research (Geulayov et al., 2018) that identified the case fatality rates of temazepam and zopiclone/zolpidem as drugs of concern. Particularly as insomnia is a known risk factor for suicide (Anna Karin et al., 2021; Malik et al., 2014; Pigeon, Pinguart, & Conner, 2012), other non-pharmacological options should be considered. - The large number of substances identified highlights the important role of primary care physicians in suicide risk assessment, particularly in instances where certain medications are being prescribed.
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7.3.1 What demographic, clinical and psychosocial factors confer vulnerability for suicidal behaviour in men?

The systematic review (Chapter 2) identified many risk factors but five had a significantly high proportion of supporting evidence in men. These were alcohol and drug use or dependence, marital status, depression, level of education and previous suicide attempts. This demonstrates the need to move beyond a solely mental illness focused assessment of suicide risk. Considering biological, mental illness, social, cultural, and environmental risk factors in conjunction provides a more accurate picture of the men's lives.

Throughout both qualitative chapters (3 and 4), the journey towards suicidal behaviour emerges, with the men often struggling with difficult life circumstances and mental illness for many years. This is compounded by the notion of failing to live up to their own or other's standards (Oliffe et al., 2021a). Many men also spoke of the impulsive nature of their suicide attempt, often not thinking the action through and getting to a point where they felt like suicide was the only

option which has also been found in previous qualitative work (Olfiffe et al., 2021a). This has important clinical implications and highlights the need to identify men at risk of suicide before they have reached their crisis point. Experiences of anxiety and depression were present in the qualitative interviews however other studies report lower rates of depression in men, compared to women, which may be due to the use of generic diagnostic tools which are not sensitive to depression in men (Olfiffe and Phillips, 2008). Men may also feel reluctant to express concerns about their mental health due to a fear of being viewed as vulnerable (Olfiffe and Phillips, 2008). The latter is important, as although men and women may similarly experience depression, their outward expression may differ. By utilising tools such as The Male Depression Scale (MDRS-22) (Rice et al., 2013) which includes domains such as anger, aggression, distraction and avoidance, we may provide a more accurate account of the male experience (Olfiffe et al., 2016).

Many of the men interviewed in Chapters 4 and 5 had experienced difficult situations in their life before their suicide attempt (such as unemployment) thence taking a more holistic approach is important. Considering how emotions and experiences are interconnected, particularly concerning the male identity and difficulties with speaking out. This almost forms part of a learned experience, in childhood, where the men are taught through their interactions and relationships with others that there are acceptable and unacceptable ways of expressing emotion (River and Flood, 2021). For example, expressing feelings of sadness may be viewed as less masculine compared to anger and acts of violence (River and Flood, 2021).

There were many risk factors present in men's lives including severe mental illness, social isolation, substance use and unemployment demonstrating the need for a holistic approach to assessing suicide risk in men (Olfiffe et al., 2020b, Olfiffe et al., 2021a). The expression of distress may manifest in terms of life experiences and behaviours such as risk-taking, as opposed to outward displays of emotions, which may be useful to inform future support. It is also noted that healthcare use may differ between males and females, that generally females are more likely to seek professional help for mental illness compared to males and even in the context of attending Accident and Emergency males are more likely to attend for a physical health problem than mental health problem (King et al., 2017). This

highlights the importance of enhanced screening for suicide risk in all healthcare settings, to identify those at risk who may not be presenting as or disclosing that they are at risk (King et al., 2017).

The findings also indicate the difficulties that men experience following their suicide attempt, describing themselves as “fragile” or “in shock” demonstrating the significant impact this has on their lives and the need for support during this vulnerable period. This has been noted in previous research (Oliffe et al., 2021a) that the experiences of men following a suicide attempt can vary, from some being definite that they will never attempt to take their own life again to others feeling less confident and those who view suicide as an inevitability. By recognising this vulnerability following a suicide attempt, it may be possible to better identify those at risk of attempting suicide, particularly because men may not readily discuss emotional problems. Many of the men recognised that they needed help, but they were either unable to reach out for help or did not know where to seek help. Engaging in avoidant behaviour was also common and recognising that this is a common strategy or manifestation of mental health problems in men is a useful step forward in recognising when men may be struggling with poor mental health or suicidal thoughts and behaviour. This study did demonstrate that men were open to seeking help or did recognise that they needed help but there are also complex reasons why males who are currently seeking help may decide to take their own lives. It is also known that a large proportion of men can be in contact with mental health services in the weeks/months before their death, and a recent study noted that men who died by suicide had felt let down by mental health services highlighting an overreliance on medication disregarding their current emotional and personal circumstances (Oliffe et al., 2020b). A recent study of 1907 Australian men (Seidler et al., 2021) noted that the dropout rate from mental health treatment was 44.8% with 26.6% accessing therapy once and never returning. Reasons for dropout were a lack of connection with the therapist and feeling that they were not progressing in therapy. Predictors of dropout included younger age, being unemployed, identifying with traditional masculine norms, the presence of certain therapist engagement strategies and whether the men felt emasculated (Seidler et al., 2021). Considering this, when trying to engage men in mental health treatment is

crucial, particularly as many of the men in the qualitative studies felt they needed help but did not know where to go or felt afraid to reach out in the first instance.

In terms of taking this work forward and incorporating this in clinical assessment, incorporating questions about various aspects of men's lives into suicide risk screening is also of vital importance; engaging in risky behaviour, violence, alcohol misuse can be outward expressions of suicidal despair and can increase capacity for suicide (King et al., 2017). Assessment of social and emotional functioning and coping following difficult life events such as unemployment or relationship breakdown should also be considered as part of a suicide risk assessment (King et al., 2017). A systematic review of 37 studies (Seidler et al., 2016) reported that adherence to masculine norms such as stoicism can prevent men from seeking help for depression. Men may also struggle to recognise and communicate that they are experiencing depression. Internalised stigma may also inhibit help-seeking and encourage the use of maladaptive coping strategies. The authors recommended tailored interventions for men, such as CBT, which includes problem-solving tools and targets men's strengths to encourage long-term behavioural change (Seidler et al., 2016). Importantly, when men do seek help, services need to be sensitive to men's needs (Seidler et al., 2016). De-stigmatising men's mental illness and male suicidal behaviour as well as affirming that it is ok to seek help, from professionals or peers, are central to effective male suicide prevention efforts (Olfiffe et al., 2020b). Education is also important, to demystify men's understanding (and clarifying misunderstandings) of treatments and interventions available to them (Olfiffe et al., 2020b). Chandler (2021) also noted that simply encouraging men to talk is not enough, we need to recognise the social and cultural contexts in which men live. Social isolation is also an issue for men. Gender-sensitive peer and professional services, collaborative care model and community-based efforts are recommended (Seidler et al, 2016). Evidence from the MATES programme in Australia, which trains workers in the Construction field to enhance mental health and suicide prevention literacy, demonstrated that this helped tackle mental health stigma and break down barriers to help seeking (Ross et al., 2019). The importance of speaking the same language in regard to having someone to relate to and someone who understood the industry was highlighted, men may feel more comfortable disclosing emotional distress to someone they

feel they can relate to (Ross et al., 2019). Services also need to be adaptive to the specific needs of patients, regardless of gender (King et al., 2017).

7.3.2 What factors differ between men and women regarding suicide risk?

Chapter 6 has some important clinical implications. Prevalent methods among males and females have been uncovered, particularly hanging and self-poisoning (which has been examined in greater detail in this study).

In self-poisoning deaths, women had a higher likelihood of using a range of substances than men, including non-opioid analgesics, antipyretics and antirheumatics, anti-epileptic, sedative-hypnotic, antiparkinsonian and psychotropic drugs, narcotics and psychodysleptics (hallucinogens), drugs acting on the autonomic nervous system and other substances. The only substance men had a higher likelihood of using, compared to women, was gases and other vapours. Narcotics and psychodysleptics had the highest percentage of use in this study, in both men and women, which is in line with Hawton et al. (2019) which further stresses the need to be cautious when prescribing dihydrocodeine, tramadol and codeine.

The large number of substances identified in this study highlights the important role of primary care physicians in suicide risk assessment, particularly in instances where certain medications are being prescribed. This is also important as the place of occurrence at home was associated with a reduced likelihood of using violent methods. This may point to self-poisoning being used in these instances and this is particularly concerning due to the potential ease of access (i.e., prescribed medication) and the reduced opportunities for intervention.

The role of clinicians in determining access to means when assessing suicide risk is also recognised, particularly regarding firearm ownership (Stanley et al., 2017). The number of individuals who used firearms was relatively low although this may be more relevant for those in rural farming communities where access to firearms may be more prevalent (Stark et al., 2006a, Stark et al., 2006b, Behere et al., 2020). Thence safety planning may have a role here and previous research has

demonstrated the effectiveness in reducing and mitigating suicide behaviour in clinical practice, but not suicidal ideation (Nuij et al., 2021).

Gender differences in methods may also reflect the perceived availability of treatment (Tsirigotis et al., 2011). When women experience suicidal behaviour, they may look inwards and view this as personal leading them to seek professional help whereas men may view their distress as a result of experiences (e.g. social or economic problems) leading them to deny their depression and engage in potentially harmful coping strategies (such as alcohol) (Tsirigotis et al., 2011, Cibis et al., 2012). These pain habituating experiences in men may increase their familiarity with and likelihood to use violent means (Burke et al., 2018). The idea of a survived suicide attempt as less masculine may also influence the choice of methods leading to more violent methods with reduced opportunities to be saved (Stefanello et al., 2008, Tsirigotis and Gruszczyński, 2009, Canetto, 1997). This demonstrates the importance of identifying those at risk before they have reached the point where they have decided that a suicide attempt is their only option.

7.3.3 Which factors are associated with suicidal thoughts vs. suicide attempts in men and women?

The findings from Chapter 3 present important findings on factors that differentiate between those who think about suicide vs those who attempt suicide. Sex differences were also examined. More factors differentiated between suicidal thoughts and attempts in women and these included hospital admission for mental illness, below degree level qualifications, being single and childhood adversity. In men, factors which significantly differentiated between suicidal thoughts and attempts included self-report of professional diagnosis of mental illness and childhood adversity. Higher levels of social support seem to protect against suicide attempts in men, as those in suicidal thoughts group reported higher levels of social support than those who had attempted suicide. Continued monitoring and treatment of mental illness remains of central importance for mitigating suicide risk. The prevailing impact of life experiences such as childhood adversity and trauma should also be considered.

7.4 Policy Implications

This thesis has important policy implications. The WHO LIVE LIFE suicide prevention strategy (World Health Organisation, 2021a) highlighted the importance of investigating precipitating or protective factors for suicidal behaviour. This is a central theme throughout this thesis from the systematic review which identified 68 different risk factors, the adult psychiatric morbidity survey study which investigated the difference between those who think about suicide vs attempt suicide, the qualitative study which explored factors leading up to a suicide attempt and finally the ScotSID study which examined factors associated with violent means of suicide. Protective factors were also identified in this thesis, including social connections and the importance of talking emphasised in the qualitative interviews. In England, the Cross-Government suicide prevention workplan (January 2019) identified pre-pandemic risk factors in vulnerable groups, which included middle-aged men, and this recognised that the COVID-19 pandemic may exacerbate already existing risk factors (UK Government, 2019b). As Chandler (2021) noted we need to consider the environment in which men live, as many factors are social e.g. unemployment, the recession which is difficult for men to change on their own. A key premise of the “Suicide prevention action plan: every life matters” (Scottish Government, 2018) is targeting at-risk groups including middle-aged men and those affected by poverty, social exclusion and deprivation. This is also key to this thesis. Scotland’s every life matters strategy was originally meant to expire in 2021 but has been extended by 12 months to prepare the groundwork for the next long-term strategy and action plan, due for publication in September 2022.

7.4.1 Policy Recommendations Based on the Factors Identified in the Systematic Review (Chapter 2)

It is important to recognise that we, as researchers or clinicians, cannot completely erase vulnerability for suicidal behaviour but we can provide support, education and interventions that can help those in crisis, and hopefully help people before they reach a crisis point. A recent systematic review which examined suicide prevention strategies over a 10 year period noted that no one

strategy stood out as more effective and that due to heterogeneity of strategies and assessment measures it was difficult to provide definitive conclusions (Zalsman et al., 2016). Although, progress has been made in recent years and restricting access to lethal means has been evidenced as being effective (Zalsman et al., 2016). Table 7.3 will describe the policy recommendations of the results chapters of this thesis, formatted according to the domains of risk factors in Chapter 2.

Table 7.3: Policy Recommendations

Risk Factors	Policy Recommendation (s)
Sociodemographics	<p>Recognition of the prolonged impact of early life adversity in men.</p> <p>The transition from childhood to adolescence is also important:</p> <ul style="list-style-type: none"> - Include a broader range of topics in the Personal and Social Education (PSE) classes in school and provide young people with an opportunity to suggest topics important to them. - Potential topics could include healthy relationships and consent, mental health, and wellbeing, gender, and sexuality. <p>Provide areas for men to engage with others and promote positive notions of masculinity perhaps through shared interests such as football.</p> <p>Provide support for men going through difficult life events e.g., marriage breakdown. Taking into account the priorities of LIVE LIFE (World Health Organisation, 2021a) a holistic approach to the analysis of suicide deaths at a national and</p>

international level is recommended, taking into account the current research that is applicable to that context and listening to the voices of men with lived experience. In this thesis the men often struggled with difficult periods in their life for a long time (e.g. unemployment, divorce, poor mental health) which led to poor coping strategies. The situation the men were living in at the time needs to be considered.

More investment in communities to promote social cohesion and healthier lifestyles.

Recognition that risk factors can change and develop throughout a man's life. Tailored suicide prevention strategies/interventions throughout the lifespan are recommended.

- Promoting resilience in school through education, guidance, and support (particularly around coping strategies)

Physical Health/Illness

Consider screening for suicide risk if men attend health care settings for physical health problems. Men may be more comfortable seeking help or talking about physical health problems.

Support for men impacted by physical health conditions is recommended, particularly if this is a new diagnosis or limits their daily life.

**Mental Health Problems/
Psychiatric Illness**

Recognise that men may manifest depression differently, particularly in General Practice.

More research is needed on psychological factors in men e.g., aggression, impulsivity, fearlessness about death and pain tolerance.

Promote emotional literacy, how to build resilience, how to bolster self-esteem and mental health education in schools.

Alcohol and or/drug misuse were prominent risk factors identified in the systematic review, this should be included in clinical assessments and more infrastructure/treatment is needed for men struggling with addictions.

Psychological

The systematic review (Chapter 2) highlighted that there was a lack of research on psychological factors in men although in the qualitative study (Chapter 4) it was noted that the attempt was unplanned in half of the men. A greater understanding of the role of impulsivity in men is needed and it is important to reach out to men before they reach a crisis point, which may be before they seek help.

**Negative Life Events/
Trauma**

The interview study in Chapter 4 demonstrated that many participants (n=11) described a build-up of stressful life events that at times became unbearable. This included mental illness, loneliness, and isolation. The recommendations in the “sociodemographics” section are relevant here: providing areas for men to come together that is not framed as a solely mental health approach.

The systematic review (Chapter 2) also identified adverse childhood experiences, bereavement and involvement in criminal activity as significant risk factors highlighting the need for more

infrastructure in place to support men going through difficult life events.

Characteristics of Suicidal Behaviour

Previous suicide attempts are a known risk for death by suicide, in Chapter 5 the men detailed their feelings of vulnerability following their suicide attempt. This is a crucial period for men, in which they need support.

Men were more likely to use violent methods of suicide which are detailed in Chapter 6 highlighting those men who work in areas with access to lethal means e.g., construction, military and farmers could be the target of future suicide prevention campaigns. Also hosting these campaigns in the workplace with someone they feel they can relate to could aid engagement.

7.4.2 Policy Recommendations in the Context of the COVID-19 Pandemic

The COVID-19 pandemic has produced unprecedented public health challenges, particularly in the area of suicide prevention. As Gunnell et al. (2020) notes those with previous experience of suicidal crisis and mental illness required further support, particularly in the context of services moving online and hospitals being overwhelmed. Having clear assessment and care pathways are crucial, as some service users may struggle with the changing nature of their care. We have often seen that men may not seek help until they are in crisis (as noted in chapter 4) and with hospitals being overwhelmed due the impact of COVID-19 and mental health services being stretched this has put men particularly at risk. Increased awareness of the availability of support is crucial as well as more practical support such as unemployment and financial help may be particularly beneficial for men (Gunnell et al., 2020), as chapter 4 noted that this can often precede suicide attempts in men. In April 2020 the Scottish Government introduced the “Clear Your Head” mental health and wellbeing campaign to work towards reducing stigma and encouraging access to mental health support (Scottish Government,

2020a). The pandemic has also increased isolation for many people and this isolation could exacerbate other known risks for suicide such as alcohol consumption (Gunnell et al., 2020) which has been highlighted throughout this thesis as a risk factor for men. Access to means is also an issue, due to pharmacies potentially providing larger amounts of prescribed medication to lessen footfall (Gunnell et al., 2020). Monitoring this has been particularly important over the last two years and chapter 6 noted that men and women who died by self-poisoning used both prescribed and non-prescribed substances. Sales restrictions and messaging around prescribed medication has been extremely important. Living in unprecedented times and the 24-hour news cycle can increase fear and anxiety as well as sensationalist headlines regarding suicide statistics during the pandemic, media outlets following existing COVID-19 and suicide reporting guidelines are crucial (Gunnell et al., 2020). A recent review from (Scottish Government, 2021) supported the role of stakeholder engagement in informing suicide prevention policies, the qualitative interviews (chapters 4 and 5) have provided additional risk factors not identified in chapter 2, such as the prolonged period of vulnerability following a suicide attempt, which could only have been discovered by talking to the men themselves. This demonstrates the need for support and follow up for men who have attempted suicide. Overall, the pandemic has exacerbated existing gaps in services and for men providing a clear access to support, beyond solely mental health support, has been of central importance.

7.5 Reflexivity and Research Practices

7.5.1 Theoretical Implications

Considering the applications of the findings of this thesis to the existing theoretical models of suicidal behaviour helps contextualise the results and provide a deeper understanding of the suicidal process.

7.5.1.1 What demographic, clinical and psychological factors confer vulnerability for suicidal behaviour in men?

The systematic review (Chapter 2) has highlighted the importance of considering past behaviour in terms of suicide risk, which is consistent with the IMV model (O'Connor and Kirtley, 2018). Previous suicide attempts are a significant risk factor for future suicidal behaviour. This review also demonstrated the need to examine elements of the male social experience, such as masculinity, which may influence their suicide risk. To this end, self-reliance and shame could be useful avenues for future research as such feelings may prevent men from seeking help in a crisis and may be associated with maladaptive coping styles such as alcohol and drugs (Olliffe et al., 2017, Cleary, 2012). Social perfectionism, defined as a belief that others expect perfection from you, is an established suicide risk factor that may also be linked to the need to be self-reliant and to portray the outward experience of “doing well” (Wetherall et al., 2019). The extent to which this has a differential effect on men compared to women warrants further investigation. Help-seeking in men is also a useful avenue for further investigation, young men are less likely than young women to visit their general practitioner in general (Beautrais, 2002) and rigid coping styles may prevent men from recognising that they need help (Canetto, 2017). Disclosing emotional difficulties may pose a threat to the outward appearance of masculinity (Cleary, 2012), however, the extent to which this relates to help-seeking in men requires further investigation.

In Chapter 4, prolonged periods of poor mental health or difficult life circumstances before the suicide attempt were evident (Cleary, 2012, Scourfield et al., 2012) which is consistent with the Integrated Motivational Volitional (IMV) model (O'Connor and Kirtley, 2018). Many men expressed that they had reached their limit, contributing to a sense of entrapment where they felt suicide was the only option. Also, the discussion of methods may reflect the masculine notion of having an outward display of strength and the desire to avoid being viewed as weak due to a “failed” suicide attempt (Canetto and Sakinofsky, 1998). This also highlights the importance of attempting to identify potentially vulnerable groups of men before the point at which they've expressed suicidal ideation or plans.

Many men had gone through stressful periods of their life for extended periods, which at times, felt unbearable (Chapter 5). This led to a vicious cycle where many felt there was no escape from their current circumstances and suicide was viewed as a viable escape (Kiamanesh et al., 2015). Also, the notion that they were unable to find a way to communicate their distress (Kiamanesh et al., 2015) which can lead to harmful behaviours that reflected the only way he could communicate his emotional pain. The feeling of being hopeless, either about their current situation or future, was echoed throughout the interviews, leading many to feel despondent about their life and there was a sense of total defeat (Kiamanesh et al., 2015). Being self-sufficient and avoiding being a burden to others held central importance. Not fulfilling this role, such as no longer earning money led to a feeling of shame (Andoh-Arthur et al., 2018). This is in line with the Integrated Motivational Volitional Model (IMV) (O'Connor and Kirtley, 2018) which proposes that both defeat and entrapment can lead to suicidal ideation then volitional moderators can cause the shift from ideation to action. Connectedness was also important in this study, with many men detailing the importance of talking and relationships with others, which may be an important buffer for future suicidal behaviour (Klonsky and May, 2015b). This information could also be used to provide an update to the IMV model (O'Connor and Kirtley, 2018) as all of the men did not display the same pathway to suicidal behaviour. For example, some men struggled with difficult life experience, suicidal thoughts and behaviours for many years whereas others had a short time frame from the onset of suicidal ideation to them attempting to take their own life. Taking into account the temporal influences and the build-up of suicidal capacity over time could be an important addition to the IMV model.

7.5.1.2 What factors differ between men and women regarding suicide risk?

The findings of the ScotSID study (Chapter 6) have important theoretical implications, suicidal intent was associated with violent methods which may increase capacity to take one's life. This is in line with previous theoretical models of suicidal behaviour (Joiner et al., 2009, Joiner, 2007, O'Connor and Kirtley, 2018, O'Connor, 2011, Klonsky and May, 2015b). In this study, men were more likely to use violent methods than women so existing theoretical methods may need to take

into consideration the differential suicidal trajectories across genders, age, and cultures.

7.5.1.3 Which factors are associated with suicidal thoughts vs. suicide attempts in men and women?

Chapter 3 has taken steps forward in understanding the differences between those who think about suicide and those who attempt suicide and has mapped this onto existing theories. Historic risk factors such as childhood trauma have been studied previously (Burke et al., 2018) consistent with many of the predominant theories of suicidal behaviour. Such existing theories can be used as a framework to understand the emergence of suicidal behaviour but more needs to be done to understand the application of such models to explain sex and gender differences in suicide. Indeed, it has been proposed in the Fluid Vulnerability Theory that such pre-existing risk factors have a higher likelihood of differentiating between individuals who think about suicide and those who attempt suicide as these individuals can be described as having “chronic” suicide risk which persists over time (Bryan and Rudd, 2016, Zatti et al., 2017). This is also consistent with acquired capability component of the Interpersonal Theory (Joiner et al., 2009, Joiner, 2007), Three-Step Theory (Klonsky and May, 2015b) and the pre-motivational stage of Integrated Motivational-Volitional Model (O'Connor and Kirtley, 2018). In the present study, childhood adversity was a risk factor for both males and females, these findings reinforce the long-term effects of early childhood experiences which may also impact upon social, mental health and emotional outcomes in adulthood (Haahr-Pedersen et al., 2020).

7.5.2 Ethical Issues

In conducting the qualitative study, the safety of participants was paramount. The procedures are detailed in Chapters 3 and 4. It is worth re-stating here that there is no evidence of negative impact on participants' wellbeing when they are asked about suicidal feelings, thoughts, and behaviours, and that talking about suicide may reduce, rather than increase suicidal ideation (Dazzi et al., 2014, Lakeman

and FitzGerald, 2009, Mathias et al., 2012, Omerov et al., 2014, Reynolds et al., 2006). In the present study, the potentially sensitive nature of the research topic was discussed with participants, and participants were advised that they do not have to answer any questions they do not wish to. Before the interview, participants were provided with a support sheet including contact information for Breathing Space, Samaritans, and the local Accident and Emergency Department. They were also told that they can take a break during the interview if necessary and that they can withdraw at any time without providing a reason. There were individuals trained in ASIST (Applied Suicide Intervention Skills Training) present at the SAMH offices and I was Mental Health First Aid trained. Some individuals became emotional during the interviews, but they were debriefed and reminded of supports that they could access.

Conducting the qualitative studies emphasised how important it is to follow safety procedures when interviewing potentially vulnerable participants, particularly regarding sensitive topics such as suicidal thoughts and behaviours. Utilising supervision has been an important tool to reflect on and learn from these experiences. Reflecting on positions of power during the interviews was also an important aspect of my learning experience. Grounding myself to understand the power I held during the interviews allowed me to comprehend how participants felt during the interviews. Also, being trained in Mental Health First Aid increased my confidence in screening participants over the phone for eligibility for the study and the risk assessment procedures.

Being one of the first researchers to use the Scottish Suicide Information Database (ScotSID) highlighted some ethical issues, particularly protecting the anonymity of the individuals in the dataset (ScotPHO, 2019). Due to the nature of the data, individuals who had died by suicide, informed consent could not be sought so it was important to adhere to the rules and procedures set out by the Information Services Division of NHS National Services Scotland (ISD). The data was approved for use by ISD as well as the data outputs/analysis.

7.6 Strengths and Limitations

For this PhD thesis, it was decided to conduct a mixed-method approach as quantitative methods are the dominant method within suicide research (Scourfield, 2005, Canetto and Cleary, 2012, Cleary, 2012) and it was felt that having a mixed-methods approach would help illuminate the voices of men who have experienced suicidal thoughts and behaviours. Qualitative work can complement quantitative research by contextualising and exploring at a deeper level the findings from quantitative studies (Toomela, 2007, Chandler, 2012). Gaps in our knowledge can also be addressed through qualitative research (O'Connor and Portzky, 2018) as it puts the individual at the centre of the analysis, exploring suicidal behaviour from their perspective. Suicidal behaviour does not occur in isolation, considering the social and cultural contexts are of central importance which is a strength of qualitative research (Hjelmeland and Knizek, 2010). Qualitative work can also provide rich data about the psychological mechanisms involved in the suicidal process which are guided by the perceptions, understanding and experiences of those who have lived through suicidal thoughts and behaviour aiding the development of theories and hypotheses to be tested in future quantitative and qualitative work (Elliott et al., 1999, Hjelmeland and Knizek, 2010, Ojagbemi, 2017). It is important to recognise the merits and contributions of both quantitative and qualitative methods (Fitzpatrick, 2011, Kral, 2019) and that reliance on one research method would provide an incomplete picture of suicidal thoughts and behaviours which are complex (Shneidman, 1993, Leenaars, 2002, Scourfield, 2005, Hjelmeland and Knizek, 2010, Canetto and Cleary, 2012, Cleary, 2012, Bantjes and Swartz, 2017). Some criticisms of quantitative work are that it produces fragmented lists of facts that do not tap into the underlying psychological processes (Toomela, 2007, Hjelmeland and Knizek, 2010) whereas qualitative work, on the other hand, can provide insight into the psychological process but often relies on small sample sizes limiting the generalisability of the findings (Leenaars, 2002, Fitzpatrick, 2011). Quantitative methods can achieve validity, reliability and generalisability that cannot be replicated by qualitative work (Noble and Smith, 2015). This demonstrates the value of a mixed-methods approach, particularly in males who are known to participate to a lesser extent than females in scientific research.

It is recognised that there are limits to secondary data analysis, as I relied on cross-sectional data from the Adult Psychiatric Morbidity Survey (APMS). A limitation of this study (Chapter 3), like other such research detailed by Nock et al. (2016) is that it is difficult to ascertain whether these risk factors influence the probability of the outcome variables (suicidal ideation or attempts) or whether these are consequences of the attempt itself. Also, due to the nature of this study design, some factors may have occurred after rather than before the attempt and it is difficult to ascertain whether both the outcome and risk factors are caused by another factor which hasn't been adjusted for in this dataset. However, a strength of this thesis is the use of the Scottish Suicide Information Database (ScotSID) which contains information relating to all suicide deaths in Scotland over ten years. This data has predominantly been used for local and national suicide prevention reports, thence Chapter 6 provides a unique insight into gender differences in methods of suicide and factors associated with violent vs non-violent deaths. Another strength of this thesis is the use of Interpretative Phenomenological Analysis (IPA) which allowed for an in-depth understanding of the personal, social, and cultural elements that led to suicidal behaviours in men. How men coped with and adapted to life following a suicide attempt was also explored, which is a relatively under-researched area. This systematic review is also the largest (to date) of risk factors for suicidal behaviour in men.

The qualitative studies in Chapters 4 and 5 were conducted and published considering of publishing guidelines and quality indicators for qualitative research (Elliott et al., 1999, Lester and O'Reilly, 2021, Nizza et al., 2021). The introduction sections in Chapters 4 and 5 set out my theoretical orientation and personal aspirations for the studies, noting that I am exploring the male experience of factors leading up to a suicide attempt and the impact this had on their lives in the months and years after. The sample is described in detail in the Methods section and the summary table of participant information (Appendix 15). The chapters are grounded in examples, with 2 quotes presented for each theme, and provide a range of quotes to illustrate the range of men's experiences included in these chapters. The data and analysis were subject to credibility checks as a sample of the transcripts was sent to the supervisors for an independent analysis. The themes were also discussed among the co-authors. The first author also sought credibility checking from a supervisor regarding interview

coding. Chapters 4 and 5 provide a coherent account of the suicidal process in men, from factors leading up to the attempt to how men cope and recover following a suicide attempt. The research goals have been met in this study: investigating the male experience of suicide attempts and recovery, interviewing men who have recently attempted to take their own life and recruiting a sample of men with a range of experiences. The goal of this paper is to be accessible to all readers, from both academic and non-academic backgrounds, by providing quotes and trying to avoid jargon (particularly in the results section) I feel I have achieved this.

Although, the findings of this thesis need to be considered in the context of the limitations. The systematic review identified a large number of studies (105) and there was considerable heterogeneity of effect size measures used, resulting in a narrative synthesis of results (as opposed to a meta-analysis). It is recommended that future research aims to conduct a meta-analysis of risk factors for male suicidal behaviour, particularly due to some factors exhibiting small effect sizes and the large number of factors that have been identified. The systematic review search included “risk factor” as a search term which may have resulted in some important studies being missed. Also, many studies included in the review were conducted in high-income countries which limits the generalisability of the results and should be a focus of future research. Future research should also aim to explore gender differences in suicidal behaviour (in a systematic review or meta-analysis) as many factors may be relevant for both males and females thence more systematic analysis of this is needed.

A limitation of the Adult Psychiatric Morbidity Survey (APMS) is the cross-sectional nature of the data, thence the factors related to suicidal thoughts and behaviour reflect how participants feel then (when they were interviewed) and can’t predict suicide risk over time. In addition, there was a relatively small number of participants who reported suicidal thoughts and behaviours (concerning the full sample). There were 485 (6.4%) participants who reported suicide attempts only and 952 (12.6%) participants reported suicidal thoughts only.

A limitation of the qualitative studies is that the sample includes Scottish men, who are predominantly white and have survived a suicide attempt, thence the

findings may not be generalizable to other genders, ethnicities or those who have died by suicide. The sample is fairly broad in terms of the age group which allows for a range of perspectives to be included in this study. Each participant's account may be subject to memory biases, for example recalling negative events more readily than positive events.

Due to the nature of the data in the Scottish Suicide Information Database (ScotSID) study, which includes information linked from health records, missing data was an issue as well as data inputted incorrectly. This reflects the environment where the data is inputted, such as in A&E, where time is limited. More clarification on the purpose and intended use of this data may help remedy this issue. There were also certain facets missing from this dataset, such as sexual orientation, which is important due to the elevated risk of suicide in the LGBTQ+ community (Sidaros, 2017).

7.7 Directions for Future Research

7.7.1 What demographic, clinical and psychosocial factors confer vulnerability for suicidal behaviour in men?

In the systematic review (chapter 2), it was evident how few studies in the male suicide literature had focused on psychological factors, such as personality and individual differences. This is surprising given the recognition that suicide is a behaviour governed, in large part, by psychological processes (O'Connor and Nock, 2014). Indeed, all the recent theoretical models of suicide have been psychological in orientation (O'Connor and Kirtley, 2018, Williams and Pollock, 2001, Van Orden et al., 2010). Poor emotional control was identified as a risk factor for suicide in three studies of young male Swedish conscripts. Future research should investigate emotional control in more heterogeneous samples to determine whether its relationship with suicide extends to wider male populations. It would also be important to determine the extent to which emotion dysregulation contributes to suicide risk in men. Low IQ was also identified as a risk factor in five studies, however, given the heterogeneity of populations and measures of IQ, it is difficult to synthesise the findings and to understand the

nature of the relationship between IQ and suicide. Also, more work needs to be done to understand the impact of early life circumstances such as poverty and reduced access to education on suicide risk in men. Periods of economic uncertainty have been linked to an increase in male suicidal behaviour (Vandoros et al., 2019), demonstrating the need to uncover the particular aspects contributing to this such as types of employment or personal circumstances (e.g. being the sole earner in a family).

Impulsivity and impulsive aggression were also identified from one study in this systematic review, which is consistent with previous research that has shown that impulsivity can differentiate between those who think about suicide compared to those who attempt suicide in some samples (Gvion and Apter, 2011, Horesh et al., 1997, Klonsky and May, 2010). Future research is needed, however, to determine whether impulsivity and impulsive aggression are more strongly correlated with male versus female suicides. More research on psychological factors could aid in the identification of factors that predispose certain individuals to suicidal behaviour and crucially help to understand how other social or cultural factors impact on men differentially to increase risk. An issue with synthesising the findings from this review irrespective of risk factor was that the studies used many different measures and definitions of factors thereby rendering it difficult to compare studies (Franklin et al, 2018).

There is also a need to examine elements of the male social experience, such as masculinity, which may influence their suicide risk. To this end, self-reliance and shame could be useful avenues for future research as such feelings may prevent men from seeking help in a crisis and may be associated with maladaptive coping styles such as alcohol and drugs (Oliffe et al., 2017, Cleary, 2012). The extent to which this has a differential effect on men compared to women warrants further investigation. Help-seeking in men is also a useful avenue for further investigation, young men are less likely than young women to visit their general practitioner in general (Beautrais, 2002) and rigid coping styles may prevent men from recognising that they need help (Canetto, 2017). Disclosing emotional difficulties may pose a threat to the outward appearance of masculinity (Cleary, 2012), however the extent to which this relates to help seeking in men requires further investigation. Masculinity, or more specifically toxic masculinity, is often

discussed in regards to the high male suicide rates compared to women but avoiding these phrases are recommended (Wilson et al., 2021, Rice et al., 2021) as it could lead to shame and self-stigma amongst men and boys. There are also positive aspects of masculinity, such as being healthy and autonomous, which may encourage help-seeking in men (Rice et al., 2020).

Method choice can differ between men and women, with death by self-inflicted gunshot and hanging more common in men. A “failed” suicide may be viewed as weak and a threat to masculinity whereas a “successful” suicide is viewed as brave and decisive (Canetto and Sakinofsky, 1998, Chandler, 2019). Despite differences in method choice, men and women may not differ in their intent to die (Denning et al., 2000), which demonstrates that the underlying mechanisms behind method choice require further investigation.

Defeat and entrapment are key features of predominant models of suicidal behaviour such as the Integrated Motivational-Volitional (IMV) model (O'Connor and Kirtley, 2018), yet it remains unclear whether men are differentially affected by such drivers for suicide than women. More generally, the extant male suicide literature is largely comprised of homogenous samples of white heterosexual men thereby demonstrating the need to investigate whether the risk factors identified herein are also important across different sexualities, ethnicities, and socio-economic status.

Alcohol and drug use/dependence were significant factors across both prospective and retrospective studies, however, a useful avenue for further research would be to disentangle the nature of the relationship between alcohol/drug use and suicide risk. For example, it is unclear whether alcohol predisposes an individual to becoming suicidal or if it is used as a coping strategy. Alcohol use can lead to disinhibited thoughts, impaired judgment, and impulsivity; these can lead to suicidal thoughts and behaviours, but it can also be used as a way of alleviating the distress associated with being suicidal (Pompili et al., 2010). Alcohol myopia, which can have a narrowing effect on attention, may also affect men by leading to disinhibited behaviour such as aggression (Giancola et al., 2010). Aggression is an established feature of suicidal behaviour, and a suicide attempt may be a bid to direct this aggression on oneself (Martin et al., 2019). Also, by examining

factors specific to the male experience, such as male depression (Sørensen et al., 2019), research can move towards understanding what it means to be a man and experience suicidal thoughts and behaviours. For example, men may express their emotions in ways different to women, which could lead to the underreporting or under detection of male mental illness (Brownhill et al., 2005, Owens et al., 2011, McQueen and Henwood, 2002).

This review also highlights that more work is needed to understand the interactions between risk factors for male suicide and their relevance across the lifespan. Future research could also examine the factors that are relevant for each age group and how these change and evolve throughout their life. Naturalistic real-time monitoring via smartphones is an important new development (O'Connor and Portzky, 2018b, Kleiman and Nock, 2018) and could be used to examine the shift from thinking about suicide to suicidal behaviour in men. Understanding the temporal influence of risk factors across the lifespan is vital, two men could appear (on paper) with the same risk factors, but one will go on to take their own life and one won't, understanding this difference will be an important step forward in the field.

In addition, the majority of research identified in this review was conducted in high income countries, which highlights an important gap in the literature due to the fact that over 75% of suicides occur in low-middle income countries (Iemmi et al., 2016). Very few studies investigated the impact of culture on risk of engaging in suicidal behaviour; this research gap is also important to be addressed.

Previous research has identified different factors leading up to the suicide attempt in men (Meissner et al., 2016, Kizza et al., 2012, Kiamanesh et al., 2014, Apesoa-Varano et al., 2018, Rasmussen et al., 2018a, Adinkrah, 2012) and the current thesis has investigated this in a sample of 12 men aged between 19 and 49. As the sample investigated in this study are predominantly white heterosexual men there is a need for greater understanding of the factors leading up to the attempt in different age groups, cultures and sexualities.

In chapter 5 the months and years following a suicide attempt were highlighted as a particularly vulnerable period for the men, with many stating that they felt

“fragile” and that they were concerned about returning to that negative time of their life again. A deeper exploration of what would help men in this “fragile” period following a suicide attempt is recommended for future research.

7.7.2 What factors differ between men and women regarding suicide risk?

An issue with researching factors which distinguish between suicidal thoughts and attempts is knowing when the transition from thoughts to action will occur or how this transition will happen (Bryan and Rudd, 2016). It is important to consider the timing of risk factor measurement to determine the exact impact of these variables (Bryan and Rudd, 2016), which is an important area for future research.

As we found here, and as Mars et al. (2019) also noted, the effect sizes of identified factors are often small and have not been replicated. As a result, it is unclear how robust some of the findings are and it demonstrates the need for further research. Also, future research should consider other risk factors that have not been investigated within the context of the ideation to action framework. For example, differences in the neural response to the threat of death, bodily harm or illness may differ in individuals who attempted suicide compared to those who thought about suicide. Previous research Weinberg et al. (2017) has identified that this was blunted in those who have attempted suicide, which requires further examination.

7.7.3 Which factors are associated with suicidal thoughts vs. suicide attempts in men and women?

Chapter 6 was the first to use the Scottish Suicide Information Database (ScotSID) for research purposes and highlights the need for more real-time monitoring of national suicide statistics to allow for the monitoring of trends, such as methods and place of occurrence, to guide suicide prevention strategies. This dataset is comprehensive and provides details of psychiatric diagnosis and treatment, attendances at the emergency department and general hospital attendances, prescriptions and data related to drug and alcohol misuse (e.g. illicit drug profile and contact with services).

Monitoring trends over time, for example age, gender, and suicide method, can provide a well-rounded picture of the situation individuals were when they took their own life, which can inform policy and practice. During 2020 suicide deaths in Scotland decreased slightly (Public Health Scotland, 2021) but alcohol deaths increased (National Records of Scotland, 2021), this is an interesting finding which may reflect coping strategies used during the pandemic or previous addictions/dependencies being heightened due to the stress of the pandemic. The ScotSID dataset could be used to investigate this further by uncovering whether alcohol was a primary or secondary cause of death in suicide deaths since 2020 and comparing this to pre-pandemic levels. In the current thesis it was not possible to learn the exact name of self-poisoning variables (e.g. narcotics), it would be useful if further research would be able to understand the differences between prescribed vs. non-prescribed drugs in relation to death by suicide in Scotland.

7.8 Conclusions

Overall, this thesis contributed five studies to the literature on male suicidal behaviour. Three studies extended the existing research on risk factors for suicidal behaviour whereas one of the qualitative studies provided insights into how men cope with and adapt to life following a suicide attempt. The ScotSID study investigates factors associated with method choice in males and females. Spanning predisposing factors, such as early life experiences and childhood education, to mental illness and health, the path towards suicide in men is complex and involves a complex interplay of factors. The findings also reveal how many factors have a differential impact on males and females and future research should examine the extent to which these factors influence suicide risk over time. In addition, men's lives can be significantly affected by a suicide attempt, demonstrating the need for support during this vulnerable period. The evidence presented in this research also has important applications for policy and clinical practice.

Appendices

Appendix 1 - Search Strategies

CINAHL

1. (MH "Men")
2. (MH "Male")
3. TI (men or male) AND AB (men or male)
4. S1 OR S2 OR S3
5. (MH "Suicidal Ideation") OR (MH "Suicide, Attempted") OR (MH "Suicide+")
6. (MH "Injuries, Self-Inflicted") OR (MH "Self-Injurious Behavior") OR (MH "Risk for Self-Mutilation (NANDA)") OR (MH "Self Mutilation Risk (Saba CCC)") OR (MH "Self-Mutilation Restraint (Iowa NOC)")
7. TI ((suicid* OR "self-harm" OR "self harm" OR self injury OR self mutilation OR selfinjurious behavio* OR self-injurious behavio*)) OR AB ((suicid* OR "self-harm" OR "self harm" OR self injury OR self mutilation OR selfinjurious behavio* OR self-injurious behavio*))
8. S5 OR S6 OR S7
9. (MH "Risk Taking Behavior+") OR (MH "Risk for Injury (NANDA)") OR (MH "Suicide Risk (Saba CCC)") OR (MH "Self Mutilation Risk (Saba CCC)") OR (MH "Risk Factors+")
10. TI (("risk factor" OR risk* OR contributing factors OR predisposing factors)) OR AB (("risk factor" OR risk* OR contributing factors OR predisposing factors))
11. S9 OR S10
12. S4 AND S8 AND S11

PsycInfo

1. DE "Human Males" OR DE "Brothers" OR DE "Fathers" OR DE "Husbands" OR DE "Male Criminals" OR DE "Sons" OR DE "Widowers" DE "Human Males"
2. TI (men or male) AND AB (men or male)
3. S1 OR S2
4. DE "Attempted Suicide" OR DE "Suicidal Ideation" OR DE "Suicide" OR DE "Assisted Suicide" OR DE "Self-Injurious Behavior" OR DE "Head Banging" OR DE "Self-Inflicted Wounds" OR DE "Self-Mutilation" OR DE "Suicidology" OR DE "Psychological Autopsy"
5. TI (suicid* OR "self-harm" OR "self harm" OR self injury OR self mutilation OR selfinjurious behavio* OR self-injurious behavio*) OR AB (suicid* OR "self-harm" OR "self harm" OR self injury OR self mutilation OR self inflicted injuries* OR self-injurious behavio*)
6. S4 OR S5
7. DE "Risk Factors"
8. TI ("risk factor" OR risk* OR contributing factors OR predisposing factors) OR AB ("risk factor" OR risk* OR contributing factors OR predisposing factors)
9. S7 OR S8

10.S3 AND S6 AND S9

Web of Science Core Collection

1. TS="men"
2. TS="male"
3. #1 OR #2
4. TS=suicid*
5. TS=self-harm
6. TS=self-injurious behavio*
7. TS=self injury
8. TS= self mutilation
9. #4 OR #5 OR #6 OR #7 OR #8
10. TS=risk*
11. TS=risk factor*
12. #10 OR #11
13. #3 AND #9 AND #12

Pubmed:

1. "Men" [mh]
2. "Male" [mh]
3. Men [tiab] OR Male[tiab]
4. #1 OR #2 OR #3
5. self harm [mh]
6. suicid* [mh]
7. self mutilation [mh]
8. self inflicted injuries [mh]
9. self injurious behav* [mh]
10. (suicid*[tiab] OR self harm [tiab] OR self-harm [tiab] OR self injury [tiab] OR self mutilation [tiab] OR self inflicted injuries [tiab] OR self injurious behavi*[tiab])
11. #5 OR #6 OR #7 OR #8 OR #9 OR #10
12. Risk [mh]
13. Risk factor [mh]
14. Predisposing factor [mh]
15. ("risk factor"[tiab] OR risk* [tiab] OR contributing factors [tiab] OR predisposing factor [tiab])
16. #12 OR #13 OR #14 OR #15
17. #4 AND #11 AND #16

Embase:

1. Male/
2. Male.ti or male.ab
3. 1 or 2
4. exp suicidal behavior/ or exp suicide/ or exp suicidal ideation/ or exp suicide attempt/
5. exp automutilation/

6. (suicid* or "self-harm" or "self harm" or self injury or self mutilation or selfinjurious behavio* or self-injurious behavio*).ti. or (suicid* or "self-harm" or "self harm" or self injury or self mutilation or selfinjurious behavio* or self-injurious behavio*).ab.
7. 4 or 5 or 6
8. exp risk factor/ or exp risk/
9. ("risk factor" or risk* or contributing factors or predisposing factors).ti. or ("risk factor" or risk* or contributing factors or predisposing factors).ab.
10. 8 or 9
11. 3 and 7 and 10
Exclude medline records

Psychology and Behavioural Sciences Collection:

1. (SU "Men")
2. (SU "Male")
3. TI (men or male) OR AB (men or male)
4. S1 OR S2 OR S3
5. SU suicid*
6. SU self harm
7. SU self injury
8. SU self injurious behavio*
9. SU self mutilation
10. TI (suicid* OR "self-harm" OR "self harm" OR self injury OR self mutilation OR selfinjurious behavio* OR self-injurious behavio*) OR AB (suicid* OR "self-harm" OR "self harm" OR self injury OR self mutilation OR selfinjurious behavio* OR self-injurious behavio*)
11. S5 OR S6 OR S7 OR S8 OR S9 OR S10
12. SU "risk"
13. SU risk factor
14. TI ("risk factor" OR risk* OR contributing factors OR predisposing factors) OR AB ("risk factor" OR risk* OR contributing factors OR predisposing factors)
15. S12 OR S13 OR S14
16. S4 AND S11 AND S15

Appendix 2 - Data Extraction and Quality Assessment Tool

Data Extraction Sheet

Title:	
Authors:	
Journal:	Year:
Keywords:	
Aims:	
Study Design:	

Sample:

N:	Mean age:	Country:	Gender: M =	F =
Sample:		Suicide Death/Suicide Attempt?:		
		Number of Controls:		
Inclusion criteria:				
Exclusion criteria:				

Measures:

<i>Suicidality:</i>
What was measured? (Constructs):
Instrument:
(1) Self-administered or (2) Experimenter Administered?:
<i>Other Measures</i>
Personality measures?:
Other measures (psychophysiological, genetic, medical, etc):
Any additional confounding variables?:

Results:

Main findings:
Is there any evidence of relationship? () Yes / () No
If yes, what is the evidence?:
Findings separated by gender:
Does the relationship remain when other variables are controlled for?:
Author's Interpretations:
Author's Limitations:
Reviewers' Limitations:
Funding source (e.g. pharma):

Other comments:

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Quality Assessment Framework

	Criteria/Rate	0	1	2	Current Study
1.	Design	Cross-sectional	Case-control	Prospective, Randomised Controlled Trials.	
2.	Was the number of participants calculated in advance for statistical power?	No	Yes	-	
3.	Statistical Power	No mention of a power calculation	Power calculation reported, but sufficient power not achieved	Power achieved	
4.	Suicidal Behaviour Assessment	Non-validated scale; Self-report; Single question.	Hospital admission for suicide attempt; items from validated diagnostic / rating scale	Clinical interview; full validated scale (e.g. ISAS, SITBI, DSHI)	
5.	Sample Suicidal Behaviour	Mixed group of suicidal and non-suicidal self-harming participants	Homogenous groups of either suicidal individuals	-	
6.	Gender Analysis	Non-validated scale; Self-report; Single question	Validated scale/instrument	-	
7.	Appropriate Choice of Comparison Group	No group free from self-harm. <i>E.g. includes self-harm ideators, those who have previously self-harmed or no comparison group.</i>	One case group with no personal history of suicidal thoughts or behaviours.	-	
8.	Confounding Variables <i>(Will require some judgement on behalf of the rater as studies will have done this to differing degrees)</i>	No attempt to control for confounding factors in recruitment or analyses.	Accounts for basic confounding variables either during recruitment or analysis. E.g. age, gender.	Accounts for basic and additional confounding variables either during recruitment or analysis. [e.g. medication use/substance abuse, physical health, comorbid psychiatric conditions (depression, etc.)].	

9.	Can the results be generalized outside the study context?	No	Yes	-	
Total:					

Appendix 3 - PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	38
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	38-39
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	42-44
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	44
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	45
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	45
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	45
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Appendix 1
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	45-47
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	45-47
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	45-47
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	46-47
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	46-47

Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	46-47
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Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	46-47
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	46-47
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	50
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Appendix 4-5
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Appendix 4-5
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	50-67
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Appendix 4-5
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	67-72
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	72-73
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	73
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	In the published paper

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

Appendix 4 - Summary Table for Prospective Studies

S N ¹	Author (s)	Sample	Study Design	Population	Measure of Suicide	Length of Follow-Up	Death by Suicide or Suicide Attempt		Main Findings	Main Findings Effect Size <i>r</i> (95% CI)	Q A ²
							N	%			
106	Aaltonen et al. (2019)	N= 56,826 Mean = not reported % male: 44.3%	Cohort	Psychiatric Inpatients (first admission) in Finland	Suicide death	24 years (max)	Men: 1609 Women: 978	Men: 6.4% Women: 3.1%	Depression (severe without psychotic symptoms [AHR=1.19 (95% CI=1.08-1.30)] and psychotic depression [AHR=1.45 (95% CI=1.30-1.62)]) Comorbid alcohol dependence [AHR=1.26 (95% CI=1.13-1.41)] Suicide attempt (at baseline [AHR=2.00 (95% CI=1.70-2.36)] and during previous 4 years [AHR=2.12 (95% CI=1.79-2.51)]) Upper secondary education [AHR=1.13 (95% CI=1.01-1.26)] Income (highest third) [AHR=1.17 (95% CI=1.02-1.34)] Living alone [AHR=1.17 (95% CI=1.04-1.30)]	Insufficient data	6
107	Allebeck and Allgulander (1990a)	N = 50,465 Mean = not reported Range = 18-20 % male = 100%	Cohort	Swedish men conscripted for compulsory military training	Suicide death	14 years	247	Overall: 0.5% Percentage of suicides (in relation to deaths overall): 36.2%	Neurotic disorders (<i>p</i> <.001) Personality disorders (<i>p</i> <.001) Sexual deviations (<i>p</i> =.04) Alcohol dependence (<i>p</i> =.02) Drug dependence (<i>p</i> =.001)	Insufficient data to make a comparison	6
108	Allebeck and Allgulander (1990b)	N = 50,465 Mean = not reported Range = 18-20 % male = 100%	Cohort	Swedish men conscripted for compulsory military training	Suicide death	14 years	247	Overall: 0.5% Percentage of suicides (in relation to deaths overall): 36.2%	Psychiatric diagnosis at conscription [OR=0.93 (95% CI=0.63-1.36)] Psychiatric diagnosis in inpatient care [OR=11.32 (95% CI=8.31-15.42)] Contact with police or child welfare authority [OR=1.48 (95% CI=1.09-2.01)] Run away from home (more than once) [OR=1.01 (95% CI=0.49-2.07)] Truancy [OR=1.32 (95% CI=0.96-1.81)]	Male only: Psychiatric diagnosis at conscription <i>r</i> = 0.02 [0.01, 0.03] Psychiatric diagnosis in inpatient care <i>r</i> = 0.56 [0.55, 0.57] Contact with police or child welfare authority <i>r</i> = 0.11 [0.10, 0.12] Run away from home (more than once) <i>r</i> = .006 [-0.003, 0.02]	7

¹ Study Number (SN)

² Quality Assessment (QA)

									<p>Small number of personal friends - 1-2 [OR=1.83 (95% CI=1.22-2.73)] - 0 [OR=2.91 (1.31-6.50)]</p> <p>High weekly alcohol consumption -101-250g [OR=1.07 (95% CI=0.74-1.56)] - >250g [OR=1.55 (95% CI=0.92-2.63)]</p> <p>Father used alcohol often [OR=1.30 (95% CI=0.81-2.09)]</p> <p>Used narcotics many times [OR=1.31 (95% CI=0.75-2.30)]</p> <p>Low level of emotional control (rating 1-5) - 3 [OR=1.40 (95% CI=0.91-2.15)] - 1-2 [OR=1.71 (95% CI=1.08-2.71)]</p> <p>Schizophrenic psychoses [OR=13.3 (95% CI=8.2-21.6)]</p> <p>Unspecified psychoses [OR=8.9 (95% CI=4.7-17.1)]</p> <p>Neurotic disorders [OR=9.3 (95% CI=6.5-13.4)]</p> <p>Personality disorders [OR=3.2 (95% CI=2.3-4.5)]</p> <p>Alcohol dependence [OR=4.3 (95% CI=2.9-6.5)]</p> <p>Drug dependence [OR=3.6 (95% CI=2.0-6.3)]</p>	<p>Truancy $r = .08$ [0.07, 0.09]</p> <p>Small number of personal friends - 1-2 [$r = 0.16$ (0.15, 0.17)] - 0 [$r = 0.28$ (0.27, 0.29)]</p> <p>High weekly alcohol consumption -101-250g [$r = 0.02$ (0.01,0.03)] - >250g [$r = 0.12$ (0.11, 0.13)]</p> <p>Father used alcohol often [$r = 0.07$ (0.06, 0.08)]</p> <p>Used narcotics many times [$r = 0.07$ (0.06, 0.08)]</p> <p>Low level of emotional control (rating 1-5) - 3 [$r = 0.09$ (0.08, 0.10)] - 1-2 [$r = 0.15$ (0.14, 0.16)]</p> <p>Schizophrenic psychoses [$r = 0.58$ (0.57, 0.59)]</p> <p>Unspecified psychoses [$r = 0.52$ (0.51, 0.53)]</p> <p>Neurotic disorders [$r = 0.52$ (0.51, 0.53)]</p> <p>Personality disorders [$r = 0.31$ (0.30, 0.32)]</p> <p>Alcohol dependence [$r = 0.37$ (0.36, 0.38)]</p> <p>Drug dependence [$r = 0.33$ (0.32, 0.34)]</p>	
109	Allebeck et al. (1988)	N = 50,465 Mean = not reported Range = 18-20 % male = 100%	Cohort	Swedish men conscripted for compulsory military training	Suicide death	14 years	247	Overall: 0.5% Percentage of suicides (in relation to deaths overall): 36.2%	<p>Neurotic disorder ($p < .001$)</p> <p>Personality disorder ($p < .001$)</p> <p>Poor emotional control [<i>relative risk</i> (RR, 95% CI)= 1.41 (1.22-1.64)]</p> <p>Contact with police or child welfare authority [RR= 1.45 (1.17-1.81)]</p> <p>Small number of personal friends [RR=1.32 (1.15-1.51)]</p> <p>Misconduct in school [RR=1.41 (1.14-1.71)]</p> <p>Father heavy drinker [RR=1.20 (1.03-1.41)]</p> <p>Broken home [RR=1.24 (1.02-1.50)]</p>	Insufficient data to make a comparison	6

									Low intellectual capacity [RR=1.06 (1.00-1.14)]		
110	Allebeck et al. (1987)	N = 96 Mean = not reported Range = 20-69 % male = 50%	Case control	Individuals with schizophrenia who died by suicide (Sweden)	Death by suicide	-	-	-	Living alone [RR=0.9 (0.3-3.2)] History of alcohol abuse [RR=2.5 (0.5-11)] History of previous suicide attempts [RR=3.2 (0.9-11)] Documented suicidal thoughts [RR=1.2 (0.4-4.2)]	Male only Living alone: $r = -0.02$ [-0.30, 0.26] History of alcohol abuse: $r = 0.17$ [-0.12, 0.44] History of previous suicide attempts: $r = 0.26$ [-0.03, 0.52] Documented suicidal thoughts: $r = 0.26$ [-0.03, 0.52] Gender differences: Living alone - $R = 0.04$ [-0.30, 0.37] History of alcohol abuse - $R = 0.19$ [-0.16, 0.50] History of previous suicide attempts - $R = -0.56$ [-0.78, -0.21] Documented suicidal thoughts - $R = -0.45$ [-0.71, -0.08]	6
111	Almeida et al. (2016)	N= 38170 Mean = not reported Range = 65-85 % male = 100%	Cohort	Community sample (Australia)	Suicide death	Up to 15 years	69	0.2%	Bipolar disorder (SHR= 7.82, 95% CI = 3.08, 19.90), Depressive disorders (SHR= 2.26, 95% CI = 1.14, 4.51) Alcohol [OR=4.75 (3.47-6.49)] and substance-induced disorders [OR=1.68 (1.24-2.27)] Diseases affecting 3 or more health systems (SHR for 3-4 health systems = 6.02, 95% CI = 2.69, 13.47; SHR for ≥5 health systems=11.18, 95% CI =4.89, 25.53)	Differences between suicide attempt group and general population: Bipolar disorder: - $R = 0.15$ [0.13, 0.16] Depressive disorders: - $R = 0.15$ [0.14, 0.17] Alcohol related disorders: - $R = 0.11$ [0.10, 0.13] Substance related: - $R = (0.051$ [0.04, 0.06] Health systems affected by disease: 3-4 - $R = -0.01$ [-0.02, 0.003] >5	7

										- R= 0.04 [0.03, 0.05]	
112	Anderson et al. (2008)	N= 21,809 Mean = not reported % male = 50.9%	Cohort	General population (Sweden)	Suicide death	40 years	129	0.59%	Low IQ [OR(95% CI)= 1.57 (0.94-2.62)] Medium IQ [OR(95% CI) = 1.04 (0.65-1.66)] Low school grades at age 13 - Mathematics [OR(95% CI)= 1.54 (0.87-2.71)] - English [OR(95% CI)= 1.63 (0.86-3.11)] - Mean school grade (low) [OR(95% CI)=1.56 (0.90-2.71)]	Male only: Low IQ [r = 0.12 (0.11, 0.13)] Medium IQ [r = 0.01 (-0.003, 0.02)] Low school grades at age 13 - Mathematics [r = 0.12 (0.11, 0.13)] - English [r = 0.13 (0.12, 0.14)] - Mean school grade (low) [r = 0.12 (.11, 0.13)] Gender differences: Low IQ - R= 0.09 [-0.06, 0.23] Medium IQ: - R= -0.05 [-0.19, 0.10] Low school grades at age 13: - R= 0.10 [-0.05, 0.24] Mathematics - R= 0.03 [-0.11, 0.18] English - R= 0.14 [-0.01, 0.28]	8
113	Batty et al. (2012)	N= 1,329,525 Mean = not reported Range = 30-95 % male = 63.7%	Cohort	General population (Korea)	Suicide death	14 years	472 (389 in men and 83 in women)	0.04%	Impaired glucose/prediabetes [HR(95% CI)= 1.24 (1.95-4.16)] Study-detected diabetes [HR(95% CI)=2.85 (1.85-4.16)] Existing diabetes [HR(95% CI)=2.55 (1.30-5.00)]	Gender differences: Impaired glucose/prediabetes: - R= 0.01 [0.003, 0.01] Study-detected diabetes - R= 0.01 [0.001, 0.02] Existing diabetes - R= 0.07 [-0.01, 0.02]	8
114	Batty et al. (2010)	N= 1,133,019 Mean = 18 % male	Cohort	Large cohort of Swedish men born between 1950 and	Suicide death	Mean follow-up: 23 years	18,277	1.6%	Underweight BMI [HR(95% CI)=1.12 (1.07-1.18)]	Male only: Underweight BMI: 2,018/97754 Normal BMI: 14493/904,972 Comparison:	8

		= 100%		1976 (conscripted for military service)						R= 0.01 [0.009, 0.013]	
115	Bjorkenstam et al. (2016)	Cases : 6456 Contr ols: 1181 723 Mean = not reported Range = 18-50+ % male = 50%	Case control	Same-sex married men and women compared to different-sex married men and women in Sweden	Suicide death	Up to 25 years	Men Same sex married: 9 Differed-sex married: 599	-	Being in a same sex partnership [adjusted IRR (95% CI)=2.3 (1.2-4.8)]	Gender differences: Being in a same sex partnership: $r = 0.01$ [-0.05, 0.08]	8
116	Brenner et al. (2015)	Cases : 29,617 Contr ols: 296,164 Mean = 46.3 % male = 66.9%	Case control	Swedish MS patients compared to people without MS in the general population	Suicide death and attempted suicide	-	Suicide death: 114 Suicide attempt: 423	Suicide death: 0.4% Suicide attempt: 1.4%	Multiple sclerosis [attempted suicide: adjusted HR(95% CI)=2.18 (1.97-2.43), completed suicide: adjusted HR(95% CI)=1.87 (1.53-2.30)]	Multiple sclerosis (gender differences): Suicide attempts: $R = -0.02$ [-0.06, 0.02] Suicide death: $R = -0.04$ [-0.11, 0.03]	8
117	Burrows et al. (2011)	N = 2,685,400 Mean = not reported Range = 25-85+	Cohort	General population (Canada)	Suicide death	10.6 years	3,110	0.12%	Separated/divorced/widowed [adjusted HR(95% CI)=1.37 (1.11-1.69)] Never married [aHR(95% CI)=1.50 (1.26-1.79)] Common law marriage (same sex partnership) [aHR(95% CI)=1.31 (1.14-1.49)] Living alone [aHR=1.40 (1.22-1.62)] Educational attainment: - No high school diploma [aHR(95% CI)=1.56 (1.36-1.79)] - High school diploma [aHR(95% CI)=1.36 (1.20-1.55)] Low income (income inadequacy) - Quintile 1 [aHR(95% CI)=1.49 (1.31-1.69)] - Quintile 2 [aHR(95% CI)=1.25 (1.10-1.41)] - Quintile 3 [aHR(95%	Gender differences: Separated/divorced/widowed: - $R = -0.017$ [-0.20, -0.13] Never married: - $R = 0.04$ [0.02, 0.07] Common law marriage (same sex partnership): - $R = 0.01$ [-0.02, 0.04] Living alone: - $R = -0.03$ [-0.06, 0.002] High school diploma: - $R = 0.02$ [-0.01, 0.05] Low income (income inadequacy): - Quintile 1 (poorest): $r = -0.11$ [-0.14, -0.08] - Quintile 2: $r = 0.02$ [-0.01, 0.05] - Quintile 3: $r = 0.04$ [0.01, 0.07]	8

									<ul style="list-style-type: none"> CI)=1.15 (1.02-1.30)] - Quintile 4 [aHR(95% CI)=1.15 (1.03-1.30)] Not in the labour force [aHR(95% CI)=1.50 (1.34-1.68)] Unemployed [aHR(95% CI)=1.48 (1.31-1.67)] Social deprivation: <ul style="list-style-type: none"> - Highest [aHR(95% CI)=1.12 (0.99-1.27)] - Second highest [aHR(95% CI)=1.05 (0.93-1.18)] - Middle [aHR(95% CI)=1.09 (0.97-1.22)] - Second lowest [aHR(95% CI)=1.07(0.95-1.20)] Material deprivation: <ul style="list-style-type: none"> - Highest [aHR(95% CI)=1.02 (0.90-1.15)] - Second highest [aHR(95% CI)=1.04 (0.92-1.17)] 	<ul style="list-style-type: none"> - Quintile 4: $r= 0.06$ [0.03, 0.09] Not in the labour force: <ul style="list-style-type: none"> - $R= -0.17$ [-0.20, -0.14] Unemployed: <ul style="list-style-type: none"> - $R= 0.03$ [-0.002, 0.06] material deprivation: <ul style="list-style-type: none"> - Highest: $r= 0.05$ [0.01, 0.08] - Second highest: $r= 0.04$ [0.01, 0.07] - Middle: $r= -0.01$ [-0.04, 0.02] - Second lowest: $r= -0.01$ [-0.04, 0.02] social deprivation: <ul style="list-style-type: none"> - highest: $r= -0.07$ [-0.10, -0.04] - Second highest: $r = -0.01$ [-0.4, 0.02] 	
118	Crump et al. (2014)	<p>N = 7140 589</p> <p>Mean = not reported</p> <p>Range = 18.75 +</p> <p>% male = 49.1%</p>	Cohort	General population (Sweden)	Suicide death	8 years	8721	0.1%	<ul style="list-style-type: none"> Unmarried [aHR(95% CI)=1.75 (1.64-1.86)] Never married [aHR(95% CI)=1.80 (1.67-1.94)] Divorced [aHR(95% CI)=1.75(1.61-1.90)] Widowed [aHR(95% CI)=1.55 (1.34-1.80)] Education level: <ul style="list-style-type: none"> - Compulsory high school or less (<9 years): aHR(95% CI)=1.46 (1.35-1.57) - Practice or some theoretical: aHR(95% CI)=1.32(1.23-1.42) Unemployed [aHR(95% CI)=1.66 (1.54-1.78)] Income: <ul style="list-style-type: none"> - Second quintile: aHR(95% CI)= 1.11 (1.02-1.20) - Third quintile: aHR(95% 	<p>Gender differences:</p> <p>Unmarried: men: $r= -0.02$ [-0.04, -0.001]</p> <p>Never married: $r= -0.06$ [-0.08, -0.04]</p> <p>Divorced, $r= -0.07$ [-0.09, -0.05]</p> <p>Widowed: $r= -0.12$ [-0.14, -0.10]</p> <p>Education level: <ul style="list-style-type: none"> - Compulsory high school or less (<9 years): $r= 0.07$ [0.05, 0.09] - Practical or some theoretical: $r= -0.02$ [-0.04, 0.003] </p> <p>Unemployed: $r = -0.06$ [-0.08, -0.04]</p> <p>Income: <ul style="list-style-type: none"> - Second quintile:, $r= 0.003$ [-0.02, 0.02] </p>	8

								<p>CI)=1.05 (0.97-1.15)</p> <p>- Lowest quintile: <i>aHR</i>(95% CI)=1.15 (1.05-1.26)</p> <p>Living in a small town/rural location</p> <p>- Medium sized towns: <i>aHR</i>(95% CI)=1.05 (0.98-1.13)</p> <p>- Small sized towns/rural : <i>aHR</i>(95% CI)=1.14(1.06-1.22)</p> <p>Any psychiatric disorder [<i>aHR</i>(95% CI)=12.19 (11.31-13.13)]</p> <p>Alcohol use [<i>aHR</i>(95% CI)=4.15 (3.95-4.95)]</p> <p>Substance use [<i>aHR</i>(95% CI)=4.42 (3.95-4.95)]</p> <p>Schizophrenia [<i>aHR</i>(95% CI)=3.99 (3.39-4.70)]</p> <p>Bipolar disorder [<i>aHR</i>(95% CI)=3.87 (3.30-4.54)]</p> <p>Depression [<i>aHR</i>(95% CI)=15.54 (14.37-16.80)]</p> <p>Anxiety disorders [<i>aHR</i>(95% CI)=2.83 (2.53-3.16)]</p> <p>Personality disorders [<i>aHR</i>(95% CI)=3.41 (2.95-3.94)]</p> <p>Somatic disorders:</p> <p>- Cancer [<i>aHR</i>(95% CI)=1.60 (1.44-1.78)]</p> <p>- Diabete [<i>aHR</i>(95% CI)= 1.37 (1.22-1.54)]</p> <p>- heart disease [<i>aHR</i>(95% CI)=1.23 (1.10-1.38)]</p> <p>- stroke [<i>aHR</i>(95% CI)=1.60 (1.38-1.86)]</p> <p>- COPD [<i>aHR</i>(95% CI)=2.05 (1.74-2.41)]</p> <p>- Asthma [<i>aHR</i>(95% CI)=1.44 (1.16-1.80)]</p> <p>- Spine disorders [<i>aHR</i>(95% CI)=1.67 (1.49-1.87)]</p>	<p>- Third quintile: <i>r</i>= -0.07 [-0.09, -0.05]</p> <p>- Lowest quintile: <i>r</i>= 0.002 [-0.02, 0.02]</p> <p>Living in a small town/rural location:</p> <p>- Medium-sized towns: <i>r</i>= -0.02 [-0.04, -0.003]</p> <p>- Small sized towns/rural : <i>r</i>(= 0.10 [0.08, 0.12]</p> <p>Any psychiatric disorder: <i>r</i> = -0.16 [-0.18, -0.14]</p> <p>Alcohol use: <i>r</i> = 0.02 [0.004, 0.05]</p> <p>Substance use: <i>r</i> = -0.07 [-0.09, -0.05]</p> <p>Schizophrenia: <i>r</i> = -0.01 [-0.03, 0.01]</p> <p>Bipolar disorder: <i>r</i> = -0.08 [-0.11, -0.06]</p> <p>Depression: <i>r</i> = -0.14 [-0.16, -0.12]</p> <p>Anxiety disorders: <i>r</i> = -0.13 [-0.16, -0.11]</p> <p>Personality disorders: <i>r</i> = -0.09 [-0.12, -0.07]</p> <p>Somatic disorders:</p> <p>- Cancer: <i>r</i> = -0.01 [-0.03, 0.01]</p> <p>- Diabetes: <i>r</i> = 0.03 [0.01, 0.05]</p> <p>- Heart disease: <i>r</i> = 0.05 [0.03, 0.07]</p> <p>- Stroke: <i>r</i> = 0.02 [0.003, 0.05]</p> <p>- COPD: <i>r</i> = -0.03 [-0.05, -0.01]</p> <p>- Asthma: <i>r</i> = -0.06 [-0.08, -0.03]</p> <p>- Spine disorders: <i>r</i> = -0.06 [-0.08, -0.04]</p>	
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119	Denney et al. (2009)	N = 1,055,943 Mean = not reported % male: 46.4%	Cohort	US adults	Suicide death	Maximum 16 years	-	-	Divorced or separated [HR=1.39] Widowed [HR=1.60] Education level: - High school [HR=1.40] - Less than high school [HR=1.47] Unemployed [HR=1.38]	Insufficient data	9
120	Elovainio et al. (2009)	N = 18,784 Mean = not reported Range = 40-69 % male = 100%	Cohort	London based male government employee	Suicide death	38 years	56	0.3%	Obesity [aHR(95% CI)=2.48 (1.04-5.92)] Unexplained weight loss [aHR(95% CI)=5.58 (2.37-13.13)]	Insufficient data	9
121	Erlangsen et al. (2004)	N= 1,978,527 Mean = not reported Range = 50-80+ % male = 46.4%	Cohort	The entire Danish population aged 50 during 1994-1998	Suicide death	5 years	2,323	0.1%	Being widowed Recent loss of a partner Widowed since beginning of the study (by age) - 50-64: relative risk (RR(95% CI)= 2.4 (1.7-3.5)) - 65-79: RR(95% CI)=2.7 (2.1-3.3) - 80+: RR(95% CI)=3.8 (3.0-4.8) First year of widowhood (by age): - 50-64: RR(95% CI)=6.1 (3.1-12.3) - 65-79: RR(95% CI)=10.1 (6.9-14.7) - 80+: RR(95% CI)=15.5 (10.2-23.6) Following years of widowhood (by age): - 50-64: RR(95% CI)= 4.7 (2.4-9.4) - 65-79: RR(95% CI)=3.4 (2.0-5.7) 80+: RR(95% CI)=8.5 (5.4-13.3)	Gender differences Widowed since beginning of the study: 50+: - R = -0.02 [-0.06, 0.02]	9
122	Fairweather-Schmidt et al. (2010)	N= 6,666 Mean = not reported	Cohort	General population (Australia)	Suicide attempt	5 years	226	3.4%	By age: Depression and Anxiety: - 40s: OR(95% CI)=1.14 (1.02-1.26) Not in the labour force:	Male only: By age: Depression and Anxiety: - 40s [r = 0.04 (0.02, 0.06)]	6

		Range = 20-69 % male = 48.6%							- 40s: OR(95% CI)=4.08 (1.68-6.48)	Not in the labour force: - 40s [r =0.36 (0.34, 0.38)]	
123	Fukuchi et al. (2013)	N= 47,604 Mean = 51.6 % male = 48.7%	Cohort	General population (Japan)	Suicide death	18 years	146	0.4%	Widowed or divorced [aHR(95% CI)=2.84 (1.37-5.90)] Unmarried [aHR(95% CI)=1.56 (0.67-3.64)]	Gender differences: Widowed or divorced: - R = -0.13 [-0.14, -0.12] Unmarried: - R = 0.04 [0.03, 0.05]	9
124	Garcy and Vägerö (2013)	N= 3,424,550 Mean = not reported Range = 25-60 % male = 51.6%	Cohort	General population (Sweden)	Suicide death	10 years	5,717	0.2%	Unemployment [aHR(95% CI)=1.63 (1.37-1.95)]	Gender differences: Unemployment: - R = 0.16 [0.13, 0.18]	9
125	Geoffroy et al. (2014)	N= 12399 Mean = not reported % male = not reported	Cohort	General population (Britain)	Suicide death	50 years	44	0.4%	Externalising problems: HR=2.96, 95% CI 1.03-8.47, ptrend=0.050 Number of emotional adversities (i.e. parental death, neglected appearance, domestic tension, institutional care, contact with social services, parental divorce/separation and bullying):graded association with risk of suicide (ptrend=0.033); the highest (HR=3.12, 95% CI 1.01-9.62)	Insufficient data	8
126	Gravseth et al. (2010)	N = 610,359 Mean = not reported % male = 51.2%	Cohort	General population (Norway)	Suicide death	20 years	1406	0.2%	Birth order: - Second: aHR(95% CI)=1.18 (1.02-1.37) - Third: aHR(95% CI)=1.23 (1.04-1.47) - Fourth: aHR(95% CI)= 1.10 (0.86-1.40) - Fifth or higher: aHR(95% CI)=1.28 (0.97-1.68) Maternal marital status: - unmarried both at birth and at age 18: aHR(95%	Gender differences Birth order: Second: - R = 0.03 [0.02, 0.03] Third: - R = 0.03 [0.03, 0.04] Fourth: - R = 0.03 [0.03, 0.04] Fifth or higher: - R = 0.04 [0.02, 0.05]	8

								<p>CI)=1.19 (0.71-2.00)</p> <p>- divorced at age 18: <i>aHR</i>(95% CI)=1.56 (1.34-1.82)</p> <p>- widowed at age 18: <i>aHR</i>(95% CI)=1.20 (0.84-1.71)</p> <p>- not married at birth, married at age 18: <i>aHR</i>(95% CI)=2.01 (1.39-2.91)</p> <p>- dead at age 18: <i>aHR</i>(95% CI)=2.01 (1.39-2.91)</p> <p>Parental disability:</p> <p>- maternal and/or parental disability: <i>aHR</i>(95% CI)=1.23 (1.03-1.46)</p> <p>- father's identity unknown, no maternal disability: <i>aHR</i>(95% CI)=1.25 (0.92-1.70)</p> <p>Parental suicide [<i>aHR</i>(95% CI)=1.62 (1.00-2.60)]</p> <p>Low intellectual performance (score 1-9):</p> <p>- 8: <i>aHR</i>(95% CI)=1.06 (0.78-1.44)</p> <p>- 7: <i>aHR</i>(95% CI)=1.02 (0.80-1.31)</p> <p>- 4: <i>aHR</i>(95% CI)=1.19 (0.98-1.44)</p> <p>- 3: <i>aHR</i>(95% CI)=1.10 (0.88-1.37)</p> <p>- 2: <i>aHR</i>(95% CI)=1.46 (1.04-2.05)</p> <p>Mental health conscript (any impairment) [<i>aHR</i>(95% CI)=1.82 (1.46-2.26)]</p> <p>Underweight BMI [<i>aHR</i>(95% CI)=1.28 (1.03-1.60)]</p> <p>Low level of education [<i>aHR</i>(95% CI)=2.00 (1.70-2.35)]</p> <p>Disability pension (with schizophrenia) [<i>aHR</i>(95% CI)=3.00 (1.87-4.82)]</p>	<p>Maternal marital status:</p> <p>Unmarried both at birth and at age 18:</p> <p>- $R = 0.03$ [0.01, 0.06]</p> <p>Divorced at age 18:</p> <p>- $R = 0.03$ [0.03, 0.04]</p> <p>Widowed at age 18:</p> <p>- $R = 0.03$ [0.01, 0.05]</p> <p>Not married at birth, married at age 18:</p> <p>- $R = 0.03$ [0.02, 0.04]</p> <p>Dead at age 18:</p> <p>- $R = 0.05$ [0.02, 0.07]</p> <p>Parental disability:</p> <p>Maternal and/or paternal disability:</p> <p>- $R = 0.03$ [0.03, 0.04]</p> <p>Father's identity unknown, no maternal disability:</p> <p>- $R = 0.03$ [0.02, 0.04]</p> <p>Parental suicide:</p> <p>- $R = -0.003$ [-0.006, 0.001]</p> <p>Intellectual performance (no data available for females):</p> <p>8:</p> <p>- Males: 56/22146</p> <p>- Females:</p> <p>7:</p> <p>- Males: 97/36798</p> <p>- Females:</p> <p>4:</p> <p>- Males: 131/15017</p> <p>- Females:</p> <p>3:</p> <p>- Males: 131/29670</p> <p>- Females:</p> <p>2:</p> <p>- Males: 89/15017</p> <p>Mental health conscript (any impairment):</p>	
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									<ul style="list-style-type: none"> - Males: 111/13660 - No data available for females <p>BMI conscript (no data available for females):</p> <p><18.5 (underweight):</p> <ul style="list-style-type: none"> - Males: 89/18102 - Females: <p>>30 (obese):</p> <ul style="list-style-type: none"> - males: 17/7664 - Females: <p>Education level (upper secondary education not completed at age 19 years):</p> <ul style="list-style-type: none"> - $R = 0.03$ [0.027, 0.034] <p>Disability pension:</p> <p>DP with schizophrenia:</p> <ul style="list-style-type: none"> - $R = 0.05$ [-0.01, 0.10] <p>DP with other psychiatric diagnoses:</p> <ul style="list-style-type: none"> - $R = 0.02$ [-0.01, 0.04] 		
127	Gunnell et al. (2005b)	<p>N = 987,308</p> <p>Mean = not reported</p> <p>% male = 100%</p>	Cohort	Young Swedish men conscripted for military service (Sweden)	Suicide death	5-26 years	2811	0.28%	<p>Low level of intelligence:</p> <p>Logic test score:</p> <ul style="list-style-type: none"> - 1: $aHR(95\% CI) = 1.78$ (1.48-2.14) - 2: $aHR(95\% CI) = 1.55$ (1.34-1.79) - 3: $aHR(95\% CI) = 1.55$ (1.34-1.79) - 4: $aHR(95\% CI) = 1.27$ (1.11-1.45) <p>Linguistic test score:</p> <ul style="list-style-type: none"> - 1: $aHR(95\% CI) = 1.54$ (1.25-1.89) - 2: $aHR(95\% CI) = 1.51$ (1.31-1.76) - 3: $aHR(95\% CI) = 1.16$ (1.02-1.32) - 4: $aHR(95\% CI) = 1.08$ (0.96-1.21) <p>Spatial test score:</p> <ul style="list-style-type: none"> - 1: $aHR(95\% CI) = 1.38$ (1.12-1.71) 	Insufficient data	8

									<ul style="list-style-type: none"> - 2: <i>aHR</i>(95% CI)=1.17 (1.00-1.38) - 3: <i>aHR</i>(95% CI)=1.22 (1.06-1.39) - 4: <i>aHR</i>(95% CI)=1.09 (0.96-1.23) <p>Technical test score:</p> <ul style="list-style-type: none"> - 1: <i>aHR</i>(95% CI)= 1.64 (1.36-1.97) - 2: <i>aHR</i>(95% CI)= 1.26 (1.08-1.46) - 3: <i>aHR</i>(95% CI)=1.24 (1.10-1.41) - 4: <i>aHR</i>(95% CI)= 1.20 (1.06-1.34) 		
128	Gunnell et al. (2002)	N= 8,466 Mean = not reported Range = 45-64 % male = 44.7%	Cohort	General population (Scotland)	Suicide death	23 years	16	0.4%	Possible minor mental disorder [<i>HR</i> =6.78 (1.36-33.71)]	Insufficient data	8
129	Hansson et al. (2019)	N= 12,840 Mean = 47.4 (cases), 47.8 (controls) % male = 37.7%	Case control	Individuals with bipolar disorder (Sweden)	Suicide death	9 years	90 (55 men and 35 women)	0.7%	<p>Living alone: <i>HR</i>(95% CI)= 2.71 (1.25-5.89), <i>p</i>=.01</p> <p>Any affective episode in the previous year: <i>HR</i>(95% CI)= 3.19 (1.66-6.14), <i>p</i><.01</p> <p>Any depressive episode in the previous year: <i>HR</i>(95% CI)=1.97 (0.94-4.11), <i>p</i>=.07</p> <p>Any comorbid psychiatric disorder: <i>HR</i>(95% CI)=2.57 (1.46-4.52), <i>p</i><.01</p> <p>Comorbid substance use disorder: <i>HR</i>(95% CI)=4.20 (2.28-7.75), <i>p</i><.01</p> <p>Previous suicide attempt: <i>HR</i>(95% CI)=4.12 (2.08-8.15), <i>p</i><.01</p> <p>Psychiatric inpatient care: <i>HR</i>(95% CI)=2.95 (1.47-5.90), <i>p</i><.01</p> <p>Involuntary commitment: <i>HR</i>(95% CI)=4.30 (1.87-9.86), <i>p</i><.01</p>	<p>Gender differences:</p> <p>Living alone <i>R</i> = -0.04 [-0.11, 0.03]</p> <p>Any affective episode in the previous year: <i>R</i> = 0.04 [0.02, 0.06]</p> <p>Any depressive episode in the previous year: <i>R</i> = 0.04 [0.01, 0.06]</p> <p>Any comorbid psychiatric disorder: <i>R</i> = 0.04 [0.02, 0.06]</p> <p>Comorbid substance use disorder: <i>R</i> = 0.04 [0.02, 0.06]</p> <p>Previous suicide attempt: <i>R</i> = 0.04 [0.03, 0.06]</p> <p>Psychiatric inpatient care: <i>R</i> = 0.04 [0.02, 0.06]</p> <p>Involuntary commitment: <i>R</i> = 0.04 [0.02, 0.06]</p>	7
130	Hedna et al. (2018)	N= 185,225	Cohort	Patients who initiated	Suicide death	7 years	Suicide death	Suicide	Single [<i>aSHR</i> (95% CI)]=1.81 (1.13-2.89)]	Insufficient data	5

		Mean = 83.4 % male = 36.5%		antidepressant medication (Sweden)	or suicide attempt		h: 295 Suicide attempt: 654	death: 0.2% Suicide attempt: 0.3%	Widowed [<i>aSHR</i> (95% CI)=1.15 (0.79-1.65)] Divorced [<i>aSHR</i> (95% CI)=1.58 (1.06-2.36)] Occupation - Lower white collar [<i>aSHR</i> (95% CI) = 1.37 (0.78=2.42)] - Blue collar [<i>aSHR</i> (95% CI)=1.14 (0.76-1.70)]		
131	Ilgen et al. (2010)	N= 3,291,891 Mean = not reported Range = 18-80+ % male = 90%	Cohort	Veterans (USA)	Suicide death	7 years	7684	0.2%	Any psychiatric disorder [<i>aHR</i> (95% CI)=2.50 (2.38-2.64)] Any substance abuse or dependence [<i>aHR</i> (95% CI)=2.27 (2.11-2.45)] Alcohol abuse or dependence [<i>aHR</i> (95% CI)=2.28 (2.12-2.45)] Drug abuse or dependence [<i>aHR</i> (95% CI)=2.09 (1.90-2.31)] Bipolar disorder [<i>aHR</i> (95% CI)=2.98 (2.73-3.25)] Depression [<i>aHR</i> (95% CI)=2.61 (2.47-2.75)] Other anxiety [<i>aHR</i> (95% CI)=2.10 (1.94-2.28)] Posttraumatic stress disorder [<i>HR</i> (95% CI)=1.84 (1.70-1.98)] Schizophrenia [<i>aHR</i> (95% CI)=2.10 (1.93-2.28)]	Insufficient data	7
132	Jee et al. (2011)	N= 1,234,927 Mean = 45.6 % male = 64.0	Cohort	General population (Korea)	Suicide death	14 years	472	0.04%	High blood pressure: - Pre-hypertensive [<i>aHR</i> (95% CI)=1.06 (0.82-1.38)] - Stage 2 hypertension [<i>aHR</i> (95% CI)=1.13 (0.78-1.66)] Short stature: - Quartile 1 [<i>aHR</i> (95% CI)=1.68 (1.23-2.30)] - Quartile 2 [<i>aHR</i> (95% CI)= 1.29 (0.95-1.75)] - Quartile 3 [<i>aHR</i> (95% CI)=1.10 (0.81-1.50)] Underweight BMI [<i>aHR</i> (95% CI)=2.08 (1.26-3.45)]	Gender differences: High blood pressure: - Pre-hypertension: <i>r</i> = 0.01 [0.004, 0.01] - Stage 2 hypertension: <i>r</i> = 0.01 [0.002, 0.01] Short stature: - Quartile 1: <i>r</i> = 0.01 [0.005, 0.013] - Quartile 2: <i>r</i> = 0.01 [0.005, 0.013] - Quartile 3: <i>r</i> = 0.01	5

									Overweight BMI [aHR (95% CI)=1.08 (0.86-1.37)] current smoker [aHR(95% CI)=1.69 (1.27-2.24)] Daily alcohol intake (1-24g/day) [aHR (95% CI)= 1.20 (0.93-1.56)]	[0.002, 0.009] Underweight BMI: - R = -0.02 [-0.04, -0.01] Overweight BMI: - R = 0.01 [0.004, 0.011] Current smoker: - R = 0.001 [-0.002, 0.004] Daily alcohol intake (1-24g/day): - R = 0.003 [0.0003, 0.006]	
133	Jiang et al. (1999)	N= 150,395 Mean = not reported % male = 100%	Cohort	Young Swedish men conscripted for military service	Suicide attempt	2 years	155	0.1%	Body height: - 171-175cm [relative risk (RR) (95% CI)=1.14 (0.73-1.77)] - 166-170cm [RR(95% CI)=1.42 (0.79-2.54)] - <166cm [RR(95% CI)=1.49 (0.54-4.13)] Low weight: - 56-60kg [RR(95% CI)=1.41 (0.83-2.40)] - <56kg [RR(95% CI)=2.03 (1.05-3.89)] Suitability for being an officer (p<.001) Performance in: - logic test (intelligence test) (p<.001) - synonym test (p<.001) - spatial test (p<.001) - practice test (p<.001) psychological capability (p=.014) psychological function capability (p<.001)	Insufficient data	6
134	Johansson et al. (1997)	N= 6,283,099 Mean = not reported Range = 20-80+	Cohort	General population (Sweden)	Suicide death	3 years	8,310	0.1%	Not married [rate ratio (RR) (95% CI)=3.17 (2.93-3.43)] Born abroad [RR(95% CI)=1.32 (1.14-1.53)] Overcrowding [RR(95% CI)=1.25 (1.15-1.36)] Aged [RR(95% CI)=1.21 (1.05-1.39)]	Gender differences: Not married: - R = 0.12 [0.122, 0.127] Ethnicity - born abroad: - R = 0.01 [0.01, 0.02] Overcrowding:	7

		% male = 48.8%							<p>Aged 35-39 [RR(95% CI)=1.26 (1.12-1.42)]</p> <p>Aged 40-44 [RR(95% CI)=1.59 (1.41-1.79)]</p> <p>Aged 45-49 [RR(95% CI)=1.93 (1.71-2.18)]</p> <p>Aged 50-54 [RR(95% CI)=1.26 (1.10-1.43)]</p> <p>Aged 55-59 [RR(95% CI)=1.15 (1.01-1.32)]</p> <p>Aged 65-69 (95% CI)=1.13 (0.99-1.30)]</p> <p>Aged 70-74 [RR (95% CI)= 1.12 (0.97-1.29)]</p> <p>Aged 75-79 [RR (95% CI)= 1.19 (1.02-1.38)]</p> <p>Aged 80+ [RR(95% CI)=1.21 (1.04-1.41)]</p>	<p>- R = 0.02 [0.015, 0.018]</p> <p>Age:</p> <p>20-29: - R = 0.01 [0.01, 0.02]</p> <p>30-39: - R = 0.02 [0.02, 0.03]</p> <p>40-49: - R = 0.01 [0.01, 0.02]</p> <p>50-59: - R = 0.01 [0.01, 0.02]</p> <p>60-69: - R = 0.01 [0.01, 0.02]</p> <p>70-79: - R = 0.02 [0.01, 0.02]</p> <p>80+: - R = 0.02 [0.02, 0.03]</p>	
135	Mukamal et al. (2007a)	<p>N= 46,755</p> <p>Mean = not reported</p> <p>Range = 40-75</p> <p>% male = 100%</p>	Cohort	US male dentists, pharmacists, veterinarians, optometrists, osteopathic physicians and podiatrists	Suicide death	16 years	131	0.3%	Low BMI [aHR(95% CI) = 3.58 (0.89-14.39)]	Insufficient data	7
136	Kaplan et al. (2007)	<p>N= 320,890 (104,026 veterans)</p> <p>Mean = not reported</p> <p>% male = 100%</p>	Case control	Veterans (USA)	Suicide death	12 years	Veterans: 197 Non-veterans: 311	Veterans: 0.2% Non-Veterans: 0.1%	<p>White race [aHR (95% CI)= 3.23 (1.75-5.88)]</p> <p>>12 years of education [aHR(95% CI)= 2.67 (1.38-5.17)]</p> <p>Activity limitations [aHR(95% CI)=4.44 (1.33-14.80)]</p>	<p>Male only results:</p> <p>White race: r = 0.12 [0.03, 0.20]</p> <p>>12 years of education: r = 0.03 [-0.05, 0.12]</p> <p>Activity limitations: r = 0.09 [0.01, 0.18]</p>	6
137	Mukamal et al. (2007b)	<p>N= 47654</p> <p>Mean = not reported</p>	Cohort	US male dentists, pharmacists, veterinarians, optometrists, osteopathic physicians	Suicide death	16 years	136	0.3%	<p>High alcohol consumption</p> <p>0.1-14.9 (g/drinking day) [aHR(95% CI)=1.65 (0.50-5.47)]</p> <p>15.0-29.0 (g/drinking day) [aHR(95%</p>	Insufficient data	7

		% male = 100%		ns and podiatrists					CI)=1.51 (0.46-4.96)] >30 (g/drinking day) [aHR(95% CI)=2.42 (0.75-7.80)]		
138	Kikuchi et al. (2009)	N= 26,481 Mean = not reported Range = 40-79 % male = 100%	Cohort	General population (Japan)	Suicide death	6 years	68	0.3%	Any level of pain very mild [aHR(95% CI)=1.36 (0.67-2.75)] mild [aHR(95% CI)=2.11 (1.02-4.33)] moderate or severe [aHR(95% CI)=2.93 (1.34-6.42)]	Insufficient data	5
139	Kosidou et al. (2014)	N= 6146 Mean = not reported Range = 18-33 % male = 40.1%	Cohort	General population (Sweden)	Suicide attempts	8 years	91	1.5%	The relationship between school performance and risk of suicide attempts did not differ by sex [x ² =0.21, df=3, p=.98]	Insufficient data	6
140	Kosik et al. (2017)	N= 1,253 Mean = not reported Range = Phase 1: 18-27 Phase 2: 30-39 % male = 52.5%	Cohort	Birth to adulthood cohort (USA)	Suicide attempts	12 years	148	11.8%	Academic performance in childhood (10.5% of men who attempted suicide had lower reading, mathematics and spelling scores as a child)	Insufficient data	7
141	Lorant et al. (2005)	N= 24,830 Mean = not reported % male = 71%	Observational	Data from 10 European countries	Suicide death	4 years	Men: 17,646 Women: 7,184	-	Low level of educational attainment - Rate ratio (RR) (95% CI)=1.43(1.388-1.47) Socio-economic disadvantage (housing tenure, renting or owner) - Rate ratio (RR) (95% CI)=1.73 (1.65-1.81)	Insufficient data	6
142	Magnusson et al. (2006)	N= 1,299,177 Mean = not reported	Cohort	Young Swedish men conscripted for military service	Suicide death	31 years	3,075	0.2%	Underweight BMI [aHR(95% CI)=1.17 (1.04-1.31)]	Insufficient data	6

		Range = 18-19 % male = 100%										
143	Miller et al. (2000)	N= 300,000 Mean = 28 % male = 100%	Cohort	Male US Army Personnel	Suicide death	10 years	113	0.04%	Current smoker - 1-10 a day [aHR(95% CI)=1.2 (0.6-2.3)] - 11-20 [aHR(95% CI)=1.8 (1.1-3.0)] - >21 [aHR(95% CI)=2.3 (1.2-4.6)] former smoker [aHR(95% CI)=1.3 (0.7-2.3)]	Insufficient data	6	
144	Monnin et al. (2012a)	N= 273 Mean = 37.8% % male = 30.8%	Cohort	Participants admitted to psychiatric emergency units after a suicide attempt (France)	Suicide attempt	2 years	75	27.7%	Current alcohol dependence [HR(95% CI)=3.58 (1.56-8.21)] Current alcohol abuse [HR(95% CI)=2.76 (1.09-6.97)] Current abuse or dependence (alcohol and/or drug) [HR(95% CI)=2.98 (1.32-6.72)] Past suicide attempts [HR(95% CI)=1.15 (1.05-1.25)] Current recurrent psychotic syndrome [HR(95% CI)=3.83 (1.13-12.98)]	Risk factors associated with re-attempts in the two years following the index suicide attempt (gender differences) Repeaters: Current alcohol dependence: - Men: 9/16 - Women: no data Current alcohol abuse: - Men: 6/19 - Women: no data Past suicide attempts (mean (SD)): - R = -0.19 [-0.39, 0.02] Current recurrent psychotic syndrome: - R = -0.03 [-0.25, 0.20] Non-repeaters: Current alcohol dependence: - Men: 6/53 - Women: no data Current alcohol abuse: - men: 4/55 - women: no data past suicide attempts (mean (SD)): - r = -0.13 [-0.27, 0.02] current recurrent psychotic syndrome: - r = -0.03 [-0.17, 0.11]	6	

145	Oquendo et al. (2007)	N= 314 Mean = Mean : Men: 37.51 Women: 37.80 % male = 41.4%	Cohort	Patients with DSM-III-R major depression or bipolar disorder seeking treatment for a major depressive episode (USA)	Suicide attempt or suicide death	2 years	Suicide death: 4 Suicide attempt: 48	Suicide death: 1.3% Suicide attempt: 15.3%	Family history of suicidal acts (HR=3.22, p=.05) Cigarette smoking (HR=4.21, p=.04)	Gender differences: Family history of suicidal acts: - R = 0.01 [-0.10, 0.12] Cigarette smoking: - R = 0.07 [-0.05, 0.17]	7
146	Paffenbarger et al. (1994)	N= 21,582 Mean = not reported Range = 35-74 % male = 100%	Cohort	Harvard alumni (USA)	Suicide death	23-27 years	129	0.6%	Smoking: - Former [Relative Risk (RR)=1.91, p=.09] - <1 pack a day [RR=1.65, p=.009] - 1+ pack a day [RR=1.97, p=.009]	Insufficient data	7
147	Peters et al. (2018)	N= 389,365 Mean = 56.9 % male = 46.2%	Cohort	UK Biobank participants	Suicide death	10 years	154	0.04%	Economic deprivation [HR(95% CI)=1.16 (1.10-1.22)] Smoking [HR(95% CI)=2.91 (1.85-4.57)]	Insufficient data	8
148	Poudel-Tandukar et al. (2011)	N= 105,528 Mean = not reported Range = 40-69 % male = 44.9%	Cohort	General population (Japan)	Suicide death	10-15 years	406	0.4%	Living alone [aHR(95% CI)=1.80 (0.99-3.25)] Living with parent(s) only [HR(95% CI)=1.86 (1.03-3.36)] Living with child(ren) only [aHR(95% CI)=2.20 (1.32-3.66)] Living with parents and child(ren) [aHR(95% CI)=1.95 (1.02-3.72)] Living with spouse and child(ren) and parent(s) [aHR(95% CI)=1.05 (0.69-1.61)]	Gender differences: Living alone: - R = -0.05 [-0.15, 0.05] Living with parent(s) only - R = -0.07 [-0.17, 0.03] Living with child(ren) only - R = -0.07 [-0.17, 0.03] Living with parents and child(ren) - R = 0.05 [-0.05, 0.14] Living with spouse and child(ren) and parent(s) - R = 0.03 [-0.06, 0.13]	7
149	Quevedo et al. (2011)	N= 726 Mean = not	Cohort	Men who have recently had a	Suicide plans and attempts	30-60 days postpartum	31	4.8%	Mood episodes postpartum: - Hypomania [aOR(95% CI)=1.73]	Male only: Mood episodes postpartum:	10

		reported % male = 100%		child (Brazil)					(0.19-14.98] - Mania [aOR(95% CI)=1.79(0.19-16.51)] - Depression [aOR(95% CI)=20.97(5.74-76.53)] - Mixed [aOR(95% CI)=46.50(10.52-205.53)]	- Hypomania [r = 0.15(0.08, 0.22)] - Mania [r = 0.16(0.09, 0.23)] - Depression [r = 0.64(0.60, 0.68)] - Mixed [r = 0.73(0.69, 0.76)]	
150	Rojas and Stenberg (2010b)	N= 15,711 Mean = not reported Range = 17-30 % male = 100%	Cohort	General population (Sweden)	Suicide death	14 years	33	0.4%	Self-rated loneliness during childhood [RR(95% CI)=3.38(1.19-9.02)] Poverty [RR(95% CI)=2.19(1.03-4.63)]	Insufficient data	7
151	Rossow et al. (1999)	N= 46,490 Mean = not reported Range = 18-20 % male = 100%	Cohort	Male Swedish conscripts	Suicide attempt and suicide death	25 years	Suicide death: 429 Suicide attempt: 589	Suicide death: 0.9% Suicide attempt: 1.2%	Alcohol abuse [OR(95% CI)=0.46(0.26-0.81)] Psychiatric morbidity at conscription [OR(95% CI)=1.19(0.73-1.92)] Psychiatric morbidity during follow up [OR(95% CI)=0.86(0.54-1.39)]	Male only: Alcohol abuse [r = 0.21(0.20, 0.22)] Psychiatric morbidity at conscription [r = 0.05(0.04, 0.06)] Psychiatric morbidity during follow up [r = 0.04(0.03, 0.05)]	8
152	Rostila et al. (2013)	N= 1,748,069 Mean = not reported Range = 25-64 % male = 50.4%	Cohort	General population - individuals who experienced death of a sibling (Sweden)	Suicide death	21 years	367	0.02%	Bereavement (death of a sibling) - All causes [RR(95% CI)=1.28(0.93-1.77)] - Not suicide [RR(95% CI)=1.21(0.88-1.71)] - External other than suicide [RR(95% CI)=1.41(0.69-2.86)] - Cardiovascular diseases [RR(95% CI)=1.27(0.66-2.44)] - Cancer [RR(95% CI)=1.20(0.70-2.05)] - All other causes [RR(95% CI)=1.08(0.54-2.16)] Sibling died by suicide [RR(95% CI)=2.44(1.34-4.45)]	Gender differences (suicide) in those who experienced the death of a sibling: - r = 0.02 [0.02, 0.03] Differences in suicide between men who experienced death of a sibling and those who were not bereaved: - r = 0.01 [0.006, 0.011]	7
153	Sadeh and	N= 748	Cohort	Psychiatric	Suicide	1 year post-	148	19.8%	Greater disposition	Greater disposition	6

	McNiel (2013)	Mean = 30 % male = 55.6%		inpatients (USA)	attempt	hospitalisation			towards angry behaviour - Gender x Novaco Anger Scale (NAS): [wald x2=7.92, OR=0.61, p=.005] Childhood sexual victimisation - Nas arousal x gender x childhood sexual victimisation: [wald x2=4.03, OR=1.52, p=.045] NAS behaviour x gender x childhood sexual victimisation: [wald x2=6.87, OR=0.63, p=.009]	towards angry behaviour - Gender x Novaco Anger Scale (NAS) [r = 0.14 (0.07, 0.21)] - Childhood sexual victimisation - Nas arousal x gender x childhood sexual victimisation: [r = 0.11 (0.04, 0.18)] NAS behaviour x gender x childhood sexual victimisation: [r = 0.13 (0.06, 0.20)]	
154	Shalit et al. (2016)	N= 59083 Mean = not reported Range = 18-24 % male = 68%	Cohort	General population (USA)	Suicide attempts	3 years	512	0.9%	Cannabis use [aOR (95% CI) = 1.91 (1.02-3.56)] Daily cannabis use [aOR(95% CI) = 4.28 (1.32-13.83)]	Male only: Cannabis use [r = 0.18 (0.17, 0.19)] Daily cannabis use [r = 0.37 (0.36, 0.38)]	7
155	Skogman et al. (2004)	N= 1052 Mean = 41 (men), 39 (women) % male = 39%	Cohort	Individuals who have been admitted to the Emergency Inpatient Unit following a suicide attempt (Sweden)	Suicide death	Up to 13 months	50	4.8%	Previous suicide attempts [OR(95% CI)=3.58 (1.55-8.28)] Major depression [OR(95% CI)=2.46 (1.07-5.63)] Violent index attempt [OR(95% CI)=3.82 (1.50-9.73)]	Male only: Previous suicide attempts [r = 0.33 (0.28, 0.38)] Major depression [r = 0.24 (0.18, 0.30)] Violent index attempt [r = 0.35 (0.30, 0.40)] Gender differences in suicide attempters: Previous suicide attempts: - R = -0.08 [-0.14, -0.02] Major depression: - R = 0.02 [-0.04, 0.08] Violent index attempt: - R = 0.14 [0.08, 0.21]	5
156	Smith et al. (2018)	N= 51,974 Mean = not reported Range =	Cohort	Men newly diagnosed with prostate cancer in New South Wales (Australia)	Suicide death	10 years	49	0.1%	Time since diagnosis - RR in 1-2 years after diagnosis = 0.29, 95% CI: 0.12-0.71, 2-4 years RR = 0.30, 95% CI: 0.14-0.16 and 4+	Deaths due to suicide (49) vs all men with prostate cancer (51,924) Time since diagnosis: 0-1:	7

		<65 - 75+ % male = 100%							years $RR = 0.26$, 95% CI: 0.11-0.60 compared with <1 year since diagnosis). Non-localised disease ($RR = 2.68$, 95% CI: 1.15-6.23) Single, divorced, widowed or separated ($RR = 4.18$, 95% CI: 2.36-7.42).	- $R = -0.68$ [NaN, NaN] 1-2: - $R = -0.05$ [-0.07, 0.04] 2-4: - $R = -0.03$ [-0.04, 0.02] 4+: - $R = -0.01$ [-0.02, -0.01] Single, divorced, widowed or separated: - $R = 0.02$ [0.01, 0.03]	
157	Stenbacka and Jokinen (2015b)	N= 48,834 Mean = not reported Range = 18-20 % male = 100%	Cohort	Young Swedish men conscripted for military service	Suicide attempt and suicide death	37 years	Suicide death: 615 Suicide attempt: 119	Suicide death: 1.3% Suicide attempt: 2.4%	Violent suicide attempt: - Family nervous problem [$HR(95\% CI)=1.31$ (0.99-1.71)] - Father's alcohol habits [$HR(95\% CI)=1.12$ (0.68-1.84)] - Own medication for psychiatric problems [$HR(95\% CI)=2.12$ (1.52-2.96)] - Intelligence (below average) [$HR(95\% CI)=1.75$ (1.32-2.33)] - Low emotional control [$HR(95\% CI)=1.24$ (0.90-1.70)] - Psychiatric diagnosis at conscription [$HR(95\% CI)=1.06$ (0.74-1.52)] - Conduct problems at school [$HR(95\% CI)=2.16$ (1.62-2.89)] - Contact with police or juvenile authorities [$HR(95\% CI)=1.36$ (1.0-1.82)] - Smoking >10 cigarettes a day [$HR(95\% CI)=1.08$ (0.81-1.44)] - Problem drinking [$HR(95\% CI)=1.08$ (0.81-1.44)]	Male only: Suicide attempt vs total cohort (1195 men)/total cohort (48834 men) - percentages: Family nervous problem: $R = 0.04$ [0.03, 0.05] Fathers alcohol habits: $R = 0.04$ [0.03, 0.05] Own medication for psychiatric problems: $R = 0.09$ [0.08, 0.10] Intelligence (below average): $R = 0.06$ [0.05, 0.07] Low emotional control: $R = 0.08$ [0.07, 0.09] Psychiatric diagnosis (at conscription): $R = 0.09$ [0.08, 0.10] Conduct problems at school - insufficient data Contact with police or juvenile authorities: $R = 0.07$ [0.07, 0.08] Smoking >10 cigarettes a day: insufficient data Problem drinking: $R = 0.07$ [0.07, 0.08] Sniffing solvents: $R = 0.07$ [0.06, 0.08]	9

									<ul style="list-style-type: none"> - Cl)=1.31 (0.91-1.88) - Sniffing solvents [HR(95% CI)=1.58 (1.14-2.17)] - Drug use [HR(95% CI)=1.31 (0.82-2.08)] - Non-violent suicide attempt: - Family nervous problems [HR(95% CI)=1.18 (1.02-1.38)] - Father's alcohol habits [HR(95% CI)=1.33 (1.03-1.73)] - Own medication for psychiatric problems [HR(95% CI)=1.70 (1.40-2.05)] - Intelligence (below average) [HR(95% CI)=1.86 (1.60-2.18)] - Low emotional control [HR(95% CI)=1.36 (1.14-1.63)] - Psychiatric diagnosis at conscription [HR(95% CI)=1.38 (1.14-1.68)] - Conduct problems at school [HR(95% CI)=1.43 (1.22-1.69)] - Contact with police or juvenile authorities [HR(95% CI)=1.80 (1.53-2.12)] - Smoking >10 cigarettes a day [HR(95% CI)=1.26 (1.08-1.48)] - Problem drinking [HR(95% CI)=1.54 (1.27-1.87)] - Sniffing solvents [HR(95% CI)=1.35 (1.13-1.62)] - Drug use [HR(95% CI)=1.20 (0.93-1.56)] 	<p>Drug use: R = 0.07 [0.06, 0.08]</p> <p>Suicide death (133 men, 48834 controls):</p> <p>Family nervous problems: R = 0.01 [0.003, 0.020]</p> <p>Father's alcohol habits: R = 0.007 [-0.002, 0.016]</p> <p>Own medication for psychiatric problems: R = 0.02 [0.01, 0.03]</p> <p>Low emotional control: R = 0.02 [0.02, 0.03]</p> <p>Psychiatric diagnosis at conscription: R = 0.02 [0.02, 0.03]</p> <p>Conduct problems at school: insufficient data</p> <p>Contact with police or juvenile authorities: R = 0.03 [0.02, 0.03]</p> <p>Smoking >10 cigarettes a day: insufficient data</p> <p>Problem drinking: R = 0.02 [0.01, 0.03]</p> <p>Sniffing solvents: R = 0.02 [0.01, 0.02]</p> <p>Drug use: R = 0.02 [0.01, 0.02]</p>	
158	Stenbäck et al. (2014)	N=48,834	Cohort	Young Swedish men conscription	Suicide death	35 years	615	1.3%	Non-violent criminality [aHR(95%	Non-violent vs violent criminality:	7

		Mean = not reported Range = 18-20 % male = 100%		ted for military service					CI)=1.35 (1.10-1.67)] violent criminality [aHR(95% CI)=1.30 (0.92-1.82)]	Non-violent: R = -0.04 [-0.09, 0.02] Violent vs non-violent criminality Violent: R = -0.33 [-0.39, -0.28]	
159	Strand and Kunst (2006)	N= 613,807 Mean = not reported Range = 25-35 % male = 75.9%	Cohort	General population (Norway)	Suicide death	11 years	1013	0.2%	Father's education: - Higher [aRR(95% CI)=1.19 (0.92-1.53)] - Higher secondary [aRR(95% CI)=1.20 (0.99-1.45)] - Lower secondary [aRR(95% CI)=1.16 (0.96-1.40)] Mother's education: - Higher [aRR(95% CI)=1.17 (0.84)] - Higher secondary [aRR(95% CI)=1.33 (0.98-1.82)] - Lower secondary [aRR(95% CI)=1.20 (1.02-1.41)] Father's occupation - Upper non-manual [aRR(95% CI)=1.12 (0.85-1.48)] - Lower non-manual [aRR(95% CI)=1.15 (0.93-1.43)] - Skilled manual [aRR(95% CI)=1.13 (0.77-1.65)] Childhood household income: - High [aRR(95% CI)=1.19 (0.94-1.50)] - 2 [aRR(95% CI)=1.06 (0.84-1.33)] - 3 [aRR(95% CI)=1.12 (0.90-1.40)]	Gender differences: Fathers education: - Higher: r = -0.12 [-0.18, -0.06] - Higher secondary: r = -0.05 [-0.11, 0.01] - Lower secondary: r = 0.04 [-0.02, 0.10] Mothers education: - Higher: r = -0.12 [-0.18, -0.06] - Higher secondary: r = -0.03 [-0.09, 0.04] - Lower secondary: r = -0.03 [-0.09, 0.02] Fathers occupation: - Upper non-manual: r = -0.06 [-0.12, 0.003] - Lower non-manual: r = -0.08 [-0.14, -0.02] - Skilled manual: r = 0.05 [-0.05, 0.11] - Unskilled manual: r = 0.06 [0.001, 0.124] Childhood household income: - High: r = -0.08 [-0.14, -0.02] - 2: r = -0.03 [-0.09, 0.04] - 3: r = 0.004 [-0.06, 0.07] - 4: r = 0.03 [-0.03, 0.09]	7
160	Sun et al. (2012)	N = 55,946	Cohort	Elderly Chinese men and women	Suicide death	10 years	131	0.2%	Depressive symptoms [aHR =2.03 (0.96-4.29)]	Men: Depressive symptoms (GDS >8):	6

		Mean = not reported Range = 65-85+ % male = 33.4%								- $R = 0.06$ [0.01, 0.12] Gender differences - depressive symptoms: - $R = -0.08$ [-0.25, 0.09]	
161	Tidemalm et al. (2014)	N= 6086 Mean = Men: 49.3, Women: 48.3 % male = 40%	Cohort	Swedish patients with bipolar disorder	Suicide attempt and suicide death	7 years	Suicide death: 13 Suicide attempt: 338	Suicide death: 0.2% Suicide attempt: 5.6%	Recent affective episodes [OR = 3.63 (1.76-7.51)] Previous suicide attempts [OR = 3.93 (2.48-6.24)] Recent psychiatric inpatient care ($p < .001$) [OR = 3.57 (1.59-8.01)] Lifetime depressive episodes [OR = 2.06 (1.08, 3.92)] Lifetime hypomanic episodes [OR = 1.30 (0.80, 2.12)] Lifetime mixed episodes [OR = 1.18 (0.72, 1.96)] Early onset of psychiatric problems [OR = 1.55 (0.88, 2.74)] Psychiatric comorbidity: - Substance use disorder [OR = 1.95 (1.11, 3.44)] - Anxiety disorder [OR = 1.50 (0.85, 2.66)] - Eating disorder [OR = 5.09 (1.07, 4.33)] Complicating social factors [OR] = 1.67 (1.08, 2.59)] Violent behaviour [OR = 1.42 (0.81, 2.47)]	Male only: Recent affective episodes [$r = 0.33$ (0.31, 0.35)] Previous suicide attempts [$r = 0.35$ (0.33, 0.37)] Recent psychiatric inpatient care [$r = 0.33$ (0.31, 0.35)] Lifetime depressive episodes [$r = 0.20$ (0.18, 0.22)] Lifetime hypomanic episodes [$r = 0.07$ (0.05, 0.10)] Lifetime mixed episodes [$r = 0.05$ (0.03, 0.08)] Early onset of psychiatric problems [$r = 0.12$ (0.10, 0.15)] Psychiatric comorbidity: - Substance use disorder [$r = 0.18$ (0.16, 0.20)] - Anxiety disorder [$r = 0.11$ (.09, 0.14)] - Eating disorder [$r = 0.41$ (0.39, 0.43)] Complicating social factors [$r = 0.14$ (0.12, 0.17)] Violent behaviour [$r = 0.10$ (0.08, 0.13)]	7
162	Tidemalm et al. (2008)	N= 39,685 Mean = Males: 38.4 Females: 37.0 % male = 47%	Cohort	People admitted to hospital for attempted suicide (Sweden)	Suicide death	21-31 years	1970	5.0%	Bipolar or unipolar disorder [aHR = 3.5 (3.0-4.2)] Other depressive disorder [aHR = 1.4 (1.2-1.6)] Schizophrenia [aHR = 4.1 (3.5-4.8)] Anxiety disorder [aHR = 1.9 (1.5-2.3)] Alcohol abuse or dependence [aHR = 1.1 (1.0-1.3)]	Gender differences: Bipolar or unipolar disorder: - $R = 0.17$ [0.11, 0.23] Other depressive disorder: - $R = 0.03$ [-0.03, 0.09] Schizophrenia:	7

									Drug abuse or dependence [aHR =1.6 (1.1-2.2)] Personality disorder [aHR =1.8 (1.4-2.3)]	- R = 0.32 [0.26, 0.37] Anxiety disorder: - R = 0.08 [0.02, 0.14] Alcohol abuse or dependence: - R = 0.66 [0.61, 0.71] Drug abuse or dependence: - R = 0.09 [0.32, 0.15] Personality disorder: - R = 0.18 [0.12, 0.24]	
163	Tsutsumi et al. (2007)	N= 3,125 Mean = not reported Range = <39-65 % male = 100%	Cohort	Japanese male workers	Suicide death	9 years	14	0.5%	Low control at work [Relative Risk (RR) =4.10 (1.31-12.83)]	Male only: Low control at work: - R = 0.07 [-0.05, 0.18]	8
164	von Borczyskowski et al. (2010)	N= 2,471,496 Mean = not reported % male = 73%	Cohort	General population (Sweden)	Suicide death	14 years	8815	0.4%	Parental household socioeconomic status: - Blue collar [aHR =1.22 (1.15-1.29)] - Unclassified [aHR =1.16 (1.08-1.25)] Housing (multi family residence) [aHR =1.15 (1.09-1.21)] Parental psychiatric disorder Suicide [aHR =1.74 (1.51-2.01)] Psychotic or affective disorder [aHR =1.52 (1.33-1.73)] Alcohol abuse [aHR(9% CI)=1.61 (1.45-1.77)] Single parenthood [aHR =1.41 (1.32-1.51)] Maternal age: <25 [aHR =1.15 (1.09-1.22)] >34 [aHR =1.13 (1.05-1.22)]	Gender differences: Parental household socioeconomic status: Blue collar: - r = -0.003 [-0.02, 0.02] Unclassified: - r = 0.001 [-0.02, 0.02] Housing - multi-family residence: - r = -0.008 [-0.03, 0.01] Parental psychiatric disorder: Suicide: - R = 0.001 [-0.02, 0.02] Psychotic or affective disorder: - R = 0.0002 [-0.02, 0.02] Alcohol abuse: - R = -0.0002 [-0.02, 0.02] Single parenthood: - R = -0.002 [-0.02, 0.02] Maternal age:	8

										<p><25 - R = 0.06 [0.04, 0.09]</p> <p>>34: - R = -0.001 [-0.02, 0.01]</p>	
165	Weiser et al. (2016)	<p>N= 89,049</p> <p>Mean = 21.7</p> <p>% male = 100%</p>	Cohort	The diagnostic records of mental health professionals treating 89,287 male soldiers during military service were obtained for all soldiers serving in the Israeli military between 2000 and 2006.	Suicide death	Up to 9.8 years	54	0.1%	Previously diagnosed psychiatric disorder who reported current suicidal ideation [HR =4.52 (1.08-18.91)] or a history of suicide attempts [HR =6.43 (1.54-26.90)]	<p>Male only:</p> <p>Previously diagnosed with a psychiatric disorder and reported current suicidal ideation: - R = 0.002 [-0.005, 0.009]</p> <p>Previously diagnosed with a psychiatric disorder and reported a history of suicide attempts: - R = 0.01 [0.003, 0.02]</p>	10
166	Yi and Hong (2015)	<p>N = 10,238</p> <p>Mean = 56.3</p> <p>% male = 100%</p>	Cohort	Korean Vietnam war veterans	Suicide death	7.5 years	41	0.4%	Severe depressive symptoms [aHR =3.4 (1.5-7.7)] Very poor self-rated health [HR =2.4 (1.1-5.2)] Low education [HR = 2.4 (1.0-5.6)] Past drinking [HR =8.7 (1.0-75.5)]	<p>Male only:</p> <p>Severe depressive symptoms - R = -0.01 [-0.03, 0.01]</p> <p>Very poor self-rated health - R = 0.05 [0.03, 0.07]</p> <p>Low education - R = 0.02 [0.003, 0.04]</p> <p>Past drinking: - R = 0.02 [-0.001, 0.04]</p>	8
167	Yousaf et al. (2005)	<p>N = 564,508</p> <p>Mean = not reported</p> <p>% male = 40.4%</p>	Cohort	Danish cancer patients	Suicide death	18 years	1241	0.2%	<p>Time since diagnosis:</p> <ul style="list-style-type: none"> - <0.25 year [RR =1.7 (1.1-2.5)] - 0.25 - <1 year [RR =2.0 (1.6-2.7)] - 1 - <3 year [RR =1.6 (1.3-2.0)] - 3 - <5 year [RR =1.2 (0.9-1.6)] <p>Poor prognosis: [RR =1.7 (1.2-2.2)]</p>	<p>Gender differences:</p> <p>Time since diagnosis:</p> <p><0.25: - R = 0.14 [0.09, 0.20]</p> <p>0.25 - <1 year: - R = 0.02 [-0.03, 0.08]</p> <p>1 - <3 year: - R = -0.004 [-0.06, 0.05]</p> <p>3 - <5 year: - R = -0.02 [-0.07, 0.04]</p> <p>Poor prognosis:</p>	7

											-	$R = 0.50$ $[0.44, 0.54]$	
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Appendix 5 - Summary Table for Retrospective Studies

SN ³	Author(s)	Sample	Study Design	Population	Measure of Suicide	Exclusion Criteria at Baseline	Study Period	Death by Suicide/Suicide Attempt		Main Findings	Main Findings Effect Size r (95% CI)	QA ⁴
								N	%			
63.	Agerbo (2005)	N = 9,011 cases, 180,220 controls, 111 172 marital partners, 174 672 children Mean = not reported Range = 25-60 % male = 68.2%.	Case control	Individuals who died by suicide matched to age-gender matched controls, 111 172 marital partners; 174 672 children (Denmark)	Suicide death	-		99011 (2867 female, 6144 male) cases	-	Partner admitted with a psychiatric disorder (2 years earlier) [RR =3.86 (2.65-5.63)] Bereavement (partner died by suicide [RR =46.20 (18.34-116.40)] or partner death by any cause [RR =10.14 (6.51-15.80)]) Child death by suicide [RR =2.06 (0.84-5.07)] or other cause [RR =1.85 (1.38-2.47)] Widow/widower [RR =2.98 (2.30-3.87)] Separated [RR =1.93 (1.67-2.23)] Divorced [RR =1.75 (1.58-1.95)] Never married [RR =1.48 (1.34-1.64)] Cohabitant and living with partner [RR =1.16 (1.05-1.28)]	Male only: Partner admission after 31 dec two years before: - R = 0.03 [0.02, 0.03] Partner admission before 31 dec two years before: - R = 0.02 [0.01, 0.02] Partner death by suicide: - R = 0.04 [0.03, 0.05] Partner death by other cause: - R = 0.04 [0.03, 0.04] Child death by suicide: - R = 0.01 [0.003, 0.02] Child death by other cause: - R = 0.01 [0.01, 0.02] Marital status: Divorced: - R = 0.06 [0.06, 0.07] Widowed - R = 0.02 [0.02, 0.03] Separated - R = 0.04 [0.03, 0.04] Never married - R = 0.07 [0.06, 0.07]	8

³ Study Number (SN)

⁴ Quality Assessment (QA)

										<p>Cohabitant and living with partner: - $R = -0.01$ [-0.02, -0.01]</p> <p>Gender differences:</p> <p>Partner admission after 31 dec two years before: - $r = -0.005$ [-0.93, 0.02]</p> <p>Partner admission before 31 dec two years before: - $r = -0.01$ [-0.03, 0.01]</p> <p>Partner death by suicide: - $R = -0.01$ [-0.03, 0.01]</p> <p>Partner death by other cause: - $r = 0.001$ [-0.02, 0.02]</p> <p>Child death by suicide: - $r = -0.02$ [-0.04, 0.002]</p> <p>Child death by other cause: - $r = -0.02$ [-0.04, -0.002]</p> <p>Marital status: Divorced: - $r = -0.08$ [-0.10, -0.06]</p> <p>Widowed - $r = -0.08$ [-0.11, -0.06]</p> <p>Separated - $r = -0.03$ [-0.05, -0.01]</p> <p>Never married - $r = 0.15$ [0.13, 0.17]</p> <p>Cohabitant and living with partner: - $r = 0.04$ [0.01, 0.06]</p>
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64.	Agerbo et al. (2011)	N= 88,023 Mean = not reported % male = 66.4%	Observational	Individuals who died by suicide in Denmark	Suicide death	-		88,023	100%	Divorce Controlling for confounders, a one percent increase in divorce increases male suicides by 0.52%	Not possible to calculate effect sizes	8
65.	Altınöz et al. (2019)	N= 3,450 Mean = not reported Range = 65-75+ % male = 73.8%	Cohort	Individuals who died by suicide in Turkey	Suicide death	-	11 years	3,450	100%	Illness (37.8% of suicides) Marital conflict (6% of suicides) Financial difficulty (5.3% of suicides)	Gender differences (by age group): Illness: 65-69: - $R = -0.04$ [-0.10, 0.02] 70-74 - $R = -0.12$ [-0.19, -0.06] >75 - $r = -0.11$ [-0.17, -0.04] Marital conflict: 65-69: - $R = -0.01$ [-0.07, 0.05] 70-74 - $R = 0.001$ [-0.06, 0.06] >75 - $R = -0.03$ [-0.09, 0.03] Financial difficulty: 65-69: - $R = 0.12$ [0.06, 0.19] 70-74 - $R = 0.08$ [0.01, 0.14] >75: - $R = 0.02$ [-0.04, 0.08]	5

66.	Andrés et al. (2009)	N= Cases : 15,648 Controls: 311,960 Mean = not reported Range = 18-65 % male = 66%	Case control	Individuals who died by suicide in Denmark	Suicide death	-	16 years	15,648 (males: 10,438, females: 5,210)	100% of cases	Occupation: - Top- or high-level manager [OR =0.7 (0.6-0.8) - Low level manager [OR =0.8 (0.7-0.9)] - Skilled blue-collar worker [OR =0.9 (0.8-1.0)] - Unskilled blue-collar worker [OR =1.2 (1.1-1.3)] - Self-employed [OR =1.3 (1.2-1.5)] - Out of labour force [OR =1.4 (1.2-1.5)] Income: - second lowest income quartile [OR = 0.8 (0.8-0.9)] - lowest income quartile [OR =3.8 (3.4-4.2)] Marital status: - cohabiting [OR =1.3 (1.2-1.4)] - single [OR =1.8 (1.7-1.9)]	Gender differences Occupation: - top or high level manager : r = -0.03 [-0.04, -0.01] - low level manager : r = -0.03 [-0.04, -0.02] - skilled blue collar worker: r = 0.0004 [-0.01, 0.02] - unskilled blue collar worker: r = 0.04 [0.03, 0.05] - unspecified wage worker: r = 0.11 [0.10, 0.13] - self-employed: r = 0.004 [-0.007, 0.02] - unemployed: r = 0.04 [0.03, 0.05] - full time student: r = 0.02 [-0.01, 0.05] - out of labour force: r = 0.09 - age and disability pensioner: r = -0.005 [-0.02, 0.01] Income - second highest income quintile: r = -0.001 [-0.01, 0.004] - second lowest income quintile: r = 0.04	9
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											<p>[0.03, 0.05]</p> <p>- lowest income quintile: $r = 0.02$ [0.01, 0.02]</p> <p>marital status:</p> <p>- cohabitating: $r = 0.09$ [0.08, 0.10]</p> <p>- single: $r = -0.01$ [-0.01, 0.001]</p>	
67.	Bae et al. (2015)	<p>N= 42,347</p> <p>Mean = not reported</p> <p>Range = <50- >65</p> <p>% male = 45.6%</p>	Cohort	General population (Korea)	suicide attempts	-	4 years	29	0.7%	<p>Frequency of alcohol drinking</p> <p>Less than monthly: $OR=0.54$ (0.14-2.02)</p> <p>Monthly: $OR=0.99$ (0.40-2.47)</p> <p>2-4 times/mo: $OR=0.87$ (0.35-2.18)</p> <p>2-3 times/wk: $OR=0.84$ (0.39-1.80)</p> <p>≥ 4 times/wk: $OR=1.26$ (0.63-2.52)</p> <p>Quantity of alcohol drinking per occasion (drinks)</p> <p>1-2: $OR= 0.85$ (0.36-2.03)</p> <p>3-4: $OR= 0.81$ (0.35-1.87)</p> <p>5-6: $OR=1.04$ (0.40-2.74)</p> <p>7-9: $OR=0.89$ (0.41-1.95)</p> <p>≥ 10: $OR=1.07$ (0.49-2.36)</p> <p>Frequency of alcoholic blackouts</p> <p>Less than monthly: $OR= 0.87$ (0.43-1.78)</p> <p>Monthly: $OR=0.64$ (0.26-1.57)</p> <p>More than once a week: $OR=2.37$ (1.14 -4.94)</p> <p>Categorised AUDIT scores</p> <p>8-15: $OR=0.38$ (0.18-0.83)</p> <p>16-19: $OR=1.31$ (0.61-2.82)</p> <p>≥ 20: $OR=1.31$ (0.66-2.61)</p>	<p>Male only:</p> <p>Frequency of alcohol drinking:</p> <p>Less than monthly [$r = 0.17$ (0.16, 0.18)]</p> <p>Monthly [$r = .003$ (-0.01, 0.01)]</p> <p>2-4 times/mo [$r = 0.04$ (0.03, 0.05)]</p> <p>2-3 times/wk [$r = 0.05$ (0.04, 0.06)]</p> <p>≥ 4 times/wk [$r = 0.06$ (0.05, 0.07)]</p> <p>Quantity of alcohol drinking per occasion (drinks):</p> <p>1-2 [0.04 (0.03, 0.05)]</p> <p>3-4 [$r = 0.06$ (0.05, 0.07)]</p> <p>5-6 [$r = 0.01$ (0, 0.02)]</p> <p>7-9 [$r = 0.03$ (0.02, 0.04)]</p> <p>≥ 10 [$r = 0.02$ (0.01, 0.03)]</p> <p>Frequency of alcoholic blackouts</p> <p>Less than monthly [$r = 0.04$ (0.03, 0.05)]</p> <p>Monthly [$r = 0.12$ (0.11, 0.13)]</p> <p>More than once a week [$r = 0.23$ (0.22, 0.24)]</p> <p>Categorised AUDIT scores</p> <p>8-15 [$r = 0.26$ (0.25, 0.27)]</p> <p>16-19 [$r = 0.07$ (0.06, 0.08)]</p> <p>≥ 20 [$r = 0.07$ (0.06, 0.08)]</p> <p>Gender differences:</p>	8

											<p>Frequency of alcohol drinking:</p> <p>Less than monthly: - $R = -0.02$ [-0.05, 0.01]</p> <p>Monthly - $R = 0.02$ [-0.02, 0.05]</p> <p>2-4 times/mo - $r = -0.03$ [-0.06, 0.01]</p> <p>2-3 times/wk - $r = -0.06$ [-0.09, 0.03]</p> <p>>4 times/wk - $r = -0.07$ [-0.12, -0.03]</p> <p>Quantity of alcohol drinking per occasion (drinks):</p> <p>1-2 - $r = 0.001$ [-0.02, 0.02]</p> <p>3-4 - $r = -0.02$ [-0.04, 0.01]</p> <p>5-6 - $r = -0.07$ [-0.10, 0.03]</p> <p>7-9 - $r = -0.02$ [-0.06, 0.02]</p> <p>>10: - $r = -0.09$ [-0.12, 0.05]</p> <p>Frequency of alcoholic blackouts</p> <p>Less than monthly: - $r = -0.05$ [-0.09, 0.01]</p> <p>Monthly:</p>
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										<ul style="list-style-type: none"> - $r = 0.07$ [-0.03, 0.17] More than once: - $r = -0.07$ [-0.16, 0.01] Categorised AUDIT scores 8-15: - $r = -0.06$ [-0.09, -0.04] 16-19: - $r = -0.08$ [-0.13, -0.03] >20 - $r = -0.12$ [-0.17, -0.06] 		
68.	Bálint et al. (2016)	<p>N= not reported</p> <p>Mean = not reported</p> <p>Range - 20-60+</p> <p>% male = 2011: 76.38%</p>	Observational	General population (Hungary)	Suicide death	-	21 years	<p>1980: 4685</p> <p>1990: 4026</p> <p>2001: 2913</p> <p>2011: 2220</p>	-	<p>Age: $IRR = 1.278$ (1.177-1.389), $p < .001$</p> <p>Unmarried: $IRR = 1.493$ (1.161-1.919), $p < .01$</p> <p>Divorced: $IRR = 2.765$ (2.151-3.554), $p < .001$</p> <p>Widowed: $IRR = 2.885$ (2.006-4.148), $p < .001$</p> <p>Completed general secondary school: $IRR = 1.748$ (1.305-2.342), $p < .001$</p> <p>Not higher than vocational school: $IRR = 3.485$ (2.660-4.657), $p < .001$</p>	<p>Gender differences (2011):</p> <p>Age group:</p> <p>20-29:</p> <ul style="list-style-type: none"> - $R = 0.09$ [0.05, 0.13] <p>30-39:</p> <ul style="list-style-type: none"> - $R = 0.05$ [0.01, 0.09] <p>40-49:</p> <ul style="list-style-type: none"> - $R = 0.04$ [0.001, 0.082] <p>50-59:</p> <ul style="list-style-type: none"> - $r = 0.05$ [0.01, 0.09] <p>60-:</p> <ul style="list-style-type: none"> - $r = -0.15$ [-0.19, -0.11] <p>Marital status:</p> <p>Married:</p> <ul style="list-style-type: none"> - $r = 0.06$ [0.02, 0.10] <p>Unmarried:</p> <ul style="list-style-type: none"> - $r = 0.16$ [0.12, 0.20] <p>Divorced:</p> <ul style="list-style-type: none"> - $r = -0.004$ [-0.044, 0.036] <p>Widowed:</p>	5

											<ul style="list-style-type: none"> - $r = -0.14$ [-0.18, -0.10] Educational attainment: Not higher than vocational school: - $r = 0.08$ [0.04, 0.12] Completed general secondary school: - $r = -0.06$ [-0.10, -0.02] 	
69.	Blakely et al. (2003)	<p>N= 2,040,000</p> <p>Mean = not reported</p> <p>Range = 18-64</p> <p>% male = 79%</p>	Observational	General population (New Zealand)	Suicide death	Age 15-17 or 65+	3 years	429	0.02 %	<p>Marital status Not Married: $OR=1.84$ (1.45-2.34)</p> <p>Highest Qualification Tertiary: $OR=0.70$ (0.49-1.01) Trade: $OR=1.05$ (0.80-1.39) School: $OR= 1.06$ (0.78-1.44)</p> <p>Labour Force Status Unemployed: $OR=2.26$ (1.56-3.28) Non-active: $OR=2.59$ (1.89-3.55)</p> <p>Household car access One: $OR=1.18$ (0.93-1.50) Nil: $OR= 1.01$ (0.63-1.62)</p>	<p>Male only:</p> <p>Marital status Not Married [$r = 0.17$ (0.169, 0.171)]</p> <p>Highest Qualification Tertiary [$r = 0.10$ (0.099, 0.101)] Trade [$r = 0.01$ (0.009, 0.011)] School [$r = 0.02$ (0.019, 0.021)]</p> <p>Labour Force Status Unemployed [$r = 0.22$ (0.219, 0.221)] Non-active [$r = 0.25$ (0.249, 0.251)]</p> <p>Household car access One [$r = 0.05$ (0.049, 0.051)] Nil [$r = 0.003$ (0.002, 0.004)]</p> <p>Gender differences (25-64 year olds):</p> <p>Not married: - $R = 0.03$ [-0.08, 0.14]</p> <p>Highest qualification: Tertiary: - $R = -0.16$ [0.27, -0.05]</p> <p>Trade: - $R = 0.06$ [-0.06, 0.17]</p>	8

										<p>School: - R = -0.07 [-0.18, 0.03]</p> <p>Nil: - R = 0.02 [-0.08, 0.13]</p> <p>Labour force status</p> <p>Unemployed: - R = 0.02 [-0.09, 0.12]</p> <p>Non-active: - R = -0.16 [-0.27, -0.05]</p> <p>Household car access</p> <p>One: - R = -0.004 [-0.14, 0.13]</p> <p>Nil: - R = -0.04 [-0.17, 0.10]</p>		
70.	Canu et al. (2019)	N= 5,834,618 Mean = not reported Range = 18-64 % male = 50.7%	Cohort	General population (Swiss National Cohort)	Suicide death	-	24 years	19,863	0.3%	<p>Skill Level</p> <p>- Lowest : DSR =32.87 (30.38-35.36)</p> <p>- Second lowest: DSR =28.82 (27.79-29.86)</p> <p>- Second highest: DSR =25.95 (23.74-28.15)</p> <p>- Highest : DSR =30.44 (18.30-42.58)</p> <p>- Uncertain: DSR =34.46-37.42)</p> <p>Weekly working hours</p> <p>- 1-5 h per week: DSR =37.92 (24.96-50.87)</p> <p>- 6-19h per week: DSR =40.64 (26.62-54.65)</p> <p>- 20-27h per week: DSR =47.61 (29.70-65.53)</p> <p>- 28-35 h per week: DSR =35.54 (29.19-41.88)</p> <p>- 36-39h per week: DSR</p>	<p>Gender differences:</p> <p>unemployed/job-seeking - R = 0.04 [0.03, 0.04]</p> <p>not in paid employment - R = 0.01 [0.009, 0.013]</p>	10

										<p>=22.40 (17.78-27.01)</p> <p>- 40-45h per week: <i>DSR</i> = 25.33 (24.37-26.28)</p> <p>- 46 and more hours per week: <i>DSR</i> =46.28 (44.50-38.05)</p> <p>Socio-professional category</p> <p>- Top management and independent professions: <i>DSR</i> =21.17 (17.53-24.80)</p> <p>- Other self-employed: <i>DSR</i> =33.17 (29.78-36.56)</p> <p>- Professionals and senior management: <i>DSR</i> =22.76 (16.38-29.13)</p> <p>- Supervisors/low-level management and skilled labour: <i>DSR</i> =26.71 (25.22-28.20)</p> <p>- Unskilled employees and workers: <i>DSR</i> =26.25 (24.73-27.77)</p> <p>- In paid employment, not classified elsewhere: <i>DSR</i> =29.46 (27.66-31.26)</p> <p>- Unemployed/job-seeking: <i>DSR</i> =52.92 (24.32-59.56)</p> <p>- Not in paid employment: <i>DSR</i> =53.57 (50.39-56.74)</p> <p>Nationality</p> <p>- Swiss: <i>DSR</i> =32.64 (31.76-33.52)</p> <p>- Non-swiss: <i>DSR</i> =18.42 (17.19-19.65)</p> <p>Region language</p> <p>- German: <i>DSR</i> =29.47 (28.59-30.35)</p> <p>- French: <i>DSR</i> =29.70 (28.35-31.05)</p> <p>- Italian: <i>DSR</i> =23.32 (18.72-27.92)</p> <p>- Rhaeto-romansh: <i>DSR</i> =36.24 (26.56-45.92)</p>		
71.	Castel pietra	N = cases : 876	Case control	Individuals who died by	Suicide	-	9 years	876	16.7 %	Affective disorders: <i>OR</i> =5.8 (2.4-14.1)	Gender differences:	10

	et al. (2019)	controls: 4,380 mean = not reported % male = 69.4%		suicide compared to general population controls (Italy)	death					Non-affective disorders: <i>OR</i> =6.5 (4.2-10.1) Treatment modifications (switches and combinations): <i>OR</i> =1.4 (1.2-1.8) Discontinuations: <i>OR</i> =1.1 (0.8-1.4)	Affective disorders: <i>r</i> = -0.24 [-0.46, 0.01] Non-affective disorders: <i>r</i> = -0.10 [-0.25, 0.05] Treatment modifications: <i>r</i> = -0.04 [-0.08, 0.01] Discontinuations: <i>r</i> = -0.01 [-0.04, 0.02]	
72.	Cibis et al. (2012)	N= 3,235 Mean = not reported % male = 45.4%	Cohort	Individuals who died by suicide and who attempted suicide in Nuremberg and Wuerzburg (Germany)	Suicide death and suicide attempts	-	4 years	Suicide death: 656 Suicide attempt: 2579	Suicide death: 20.3% Suicide attempt: 79.7%	Preference of lethal methods (ϕ =-0.27; p <0.001)	Gender differences Hanging (ratio completed suicides/total episodes): - <i>R</i> = 0.08 [-0.001, 0.159] Firearms (ratio completed suicides/total episodes): - <i>R</i> = 0.03 [-0.15, 0.21] Jumping (ratio completed suicides/total episodes): - <i>R</i> = 0.05 [-0.05, 0.16]	5
73.	Conner et al. (2001)	N= 753 cases 2,115 controls Mean = not reported Range = 20-64 % male = Cases : 69% Controls: 70%	Case control	Individuals who died by suicide compared to accident victims (USA)	Suicide death	Missing data	6 years	753 (males: 517, females: 236)	100% of cases	Suicide Victims Violence exhibited rarely or never: Male: 390 (51.8%) Female: 179 (23.8%) Violence exhibited sometimes or often: Male: 127 (16.9%) Female: 57 (7.6%)	Gender differences: Accident victims Violence exhibited rarely or never: <i>r</i> = -0.05 [-0.09, -0.01] Violence exhibited sometimes or often: <i>r</i> = 0.05 [0.01, 0.09] Suicide victims: Violence exhibited rarely or never: <i>r</i> = -0.01 [-0.08, 0.06] Violence exhibited sometimes or often: <i>r</i> = 0.01 [-0.06, 0.08]	7
74.	Conner et al. (2013)	N= 2,962 ,810 Mean = not reported	Cohort	All male Department of Veterans Affairs, Veterans Health Administration	Suicide death	-	6 years	7,426	0.3%	Mental health comorbidity. Increases as the number of conditions increases (up to 6 in this study) 0: 3970 (53.5%), <i>HR</i> =1	Unable to calculate	7

		Rang e = 18- 80+ % male = 100%		(VHA) service users who utilized VHA services in fiscal year (FY) 1999 and were alive at the start or FY 2000 (USA)						1: 1,431 (19.3%), HR=1.99 (1.87- 2.12) 2: 994 (13.4%), HR=2.69 (2.51- 2.89) 3: 589 (7.9%), HR= 3.27 (2.98-3.59) 4: 313 (4.2%), HR=4.46 (3.88- 5.14) 5: 101 (1.4%), HR=4.74 (3.87- 5.82) 6: 28 (0.4%), HR=6.70 (4.49-10)		
75.	Dalca et al. (2013)	N= Cases : 201 Contr ols: 127 Mean = Cases : 41.39 Contr ols: 40.94 % male = Cases : 79.6 % Contr ols: 69.3 %	Case control	Individu als who died by suicide during an episode of major depressi ve disorder (MDD) compar ed to living particip ants with MDD (Canada)	Suici de deat h	-	-	201 (160 male and 41 fema le)	100% of cases	Impulsive aggression (p<.05) Alcohol dependence (OR = 1.93 (95% CI, 0.97- 3.86), P = .057) Cluster B disorders (OR = 25.32 (95% CI, 3.40-188.37), P < .001) Impulsivity (male suicide completers, 51.9% vs male controls, 25.8%; $\chi^2 = 4.27$, P < .05; female, P = .592).	Gender differences: Alcohol dependence: r = -0.06 [0.29, 0.19] Cluster B disorders: r= 0.39 [0.06, 0.64] Impulsivity:r= 0.14 [0.01, 0.28]	6
76.	Dulska s et al. (2019)	N= 19,40 9 Mean = not repor ted % male = 49%	Cohort	Individu als with colorect al cancer (Lithua nia)	Suici de deat h	-	14 yea rs	67 (mal es: 49, fema les: 18)	0.4%	Overall: SMR = 1.48 (1.12-1.96) Age at diagnosis: - 60-69: SMR = 1.95 (1.28- 2.96), p<.001 - 70-79: SMR = 1.67 (1.01- 2.77), p=.046 Year of diagnosis: - 1998- 2002: SMR = 2.04 (1.40-2.98), p<.001 Diagnosis: - C20- C21: SMR = 1.89 (1.30-2.73), p<.001 Time after diagnosis: - 1-3 months: SMR =4.22 (2.11-8.44), p<.001 - 4-6 months: SMR =3.61 (1.62-8.04), p<.001 - 7-12 months: SMR =2.38 (1.13-4.99), p=.018 - 2-5 years: SMR = 1.54 (1.02-2.32), p=.04 Gender differences: Age at diagnosis: <50: - R = 0.01 [-0.23, 0.25] 50-59: - R = -0.26 [-0.48, - 0.002] 60-69: - R = 0.15 [-0.09, 0.38] 70-79: - R = 0.03 [-0.21, 0.26] >80: - r = -0.01 [-0.25, 0.22] Year of diagnosis: 1998-2002: - R = 0.05 [-0.19, 0.28] Diagnosis:	6	

											<p>C20-C21: - $R = 0.16$ [-0.08, 0.39]</p> <p>Time after diagnosis:</p> <p>1-3 months: - $R = 0.06$ [-0.17, 0.30]</p> <p>4-6 months: - $R = 0.02$ [-0.22, 0.25]</p> <p>7-12 months: - $R = 0.12$ [-0.13, 0.35]</p> <p>2-5 years: - $R = -0.08$ [-0.31, 0.16]</p>	
77.	Erlangsen et al. (2012)	<p>N= 2,899,411</p> <p>Mean = not reported</p> <p>Range = 50-70+</p> <p>% male = 47.7%</p>	Cohort	General population (Denmark)	Suicide death	-	16 years	8,141	0.3%	<p>Schizophrenia [Relative Risk (RR) = 3.5 (3.0-4.2)]</p> <p>Age at first record of schizophrenia:</p> <ul style="list-style-type: none"> - <40 years [RR = 3.0 (2.3-3.9)] - 40-59 years [RR = 4.5 (3.5-5.9)] - >60 years [RR = 2.6 (1.3-5.3)] <p>Psychiatric hospitalisation:</p> <p>No schizophrenia</p> <ul style="list-style-type: none"> - Currently hospitalised [RR = 45.4 (38.7-53.2)] - Previously hospitalised [RR = 5.7 (5.3-6.1)] <p>Schizophrenia</p> <ul style="list-style-type: none"> - Currently hospitalised [RR = 8.6 (5.4-13.7)] - Previously hospitalised [RR = 5.3 (4.4-6.5)] <p>Number of psychiatric admissions</p> <p>Schizophrenia:</p> <ul style="list-style-type: none"> - 1 [RR = 2.9 (1.6-5.1)] - 2-3 [RR = 4.1 (2.7-6.3)] - 4-6 [RR = 5.9 (3.9-8.8)] - >7 [RR = 7.7 (6.0-9.8)] <p>Time since admission or discharge</p>	<p>Gender differences</p> <p>Schizophrenia: - $r = -0.05$ [-0.07, -0.03]</p> <p>Age at first record of schizophrenia:</p> <p><40: - $R = 0.20$ [0.07, 0.32]</p> <p>40-59: - $R = -0.11$ [-0.24, 0.11]</p> <p>>60: - $R = -0.12$ [-0.25, 0.004]</p> <p>Psychiatric hospitalisation:</p> <p>No schizophrenia:</p> <p>Currently hospitalised: - $R = 0.09$ [0.06, 0.12]</p> <p>Previously hospitalised: - $R = -0.18$ [-0.20, -0.15]</p> <p>Schizophrenia:</p> <p>Currently hospitalised: - $R = -0.003$ [-0.13, 0.12]</p>	9

								<p>Schizophrenia:</p> <ul style="list-style-type: none"> - Admitted <3 months [RR =21.9 (13.2-36.5)] - Admitted >3 months [RR =2.1 (0.7-6.6)] - Discharged <3 months [RR =24.0 (16.4-35.1)] - Discharged >3 months [RR =4.2 (3.4-5.3)] <p>Comorbidity of mood disorders</p> <p>Schizophrenia:</p> <ul style="list-style-type: none"> - No [RR =2.8 (2.2-3.5)] - Yes [RR =5.9 (4.4-8.0)] <p>Comorbidity of substance abuse</p> <p>Schizophrenia:</p> <ul style="list-style-type: none"> - No [RR =3.2 (2.5-3.9)] - Yes [RR =4.2 (3.0-5.7)] <p>Comorbidity of personality disorders</p> <p>Schizophrenia:</p> <ul style="list-style-type: none"> - No [RR =3.0 (2.8-3.7)] - Yes [RR =5.3 (3.8-7.2)] <p>Comorbidity of dementia</p> <p>Schizophrenia:</p> <ul style="list-style-type: none"> - No [RR = 3.4 (2.8-4.1)] - Yes [RR =3.3 (1.8-6.0)] <p>Previous suicide attempts</p> <p>No schizophrenia:</p> <ul style="list-style-type: none"> - No: RR=1 - Yes [RR =17.2 (15.6-19.0)] <p>Schizophrenia</p> <ul style="list-style-type: none"> - No [RR =3.3 (2.7-4.1)] - Yes [RR =21.9 (15.4-31.0)] <p>Suicide attempts within the past 365 days</p> <p>No schizophrenia:</p> <ul style="list-style-type: none"> - No [RR=1] - Yes [RR=58.2 (51.4-66.0)] <p>Schizophrenia</p> <ul style="list-style-type: none"> - No [RR=3.5 (2.9-4.3)] - Yes [RR=54.1 (30.4-96.1)] 	<p>Previously hospitalised:</p> <ul style="list-style-type: none"> - R = 0.003 [-0.12, 0.13] <p>Number of psychiatric admissions (schizophrenia group):</p> <p>Admitted <3 months:</p> <ul style="list-style-type: none"> - R = 0.09 [-0.03, 0.22] <p>Admitted >3 months:</p> <ul style="list-style-type: none"> - R = -0.13 [-0.26, 0.004] <p>Discharged <3 months:</p> <ul style="list-style-type: none"> - R = -0.06 [-0.18, 0.06] <p>Discharged >3 months:</p> <ul style="list-style-type: none"> - R = 0.06 [-0.07, 0.18] <p>Comorbidity of mood disorders:</p> <ul style="list-style-type: none"> - R = -0.08 [-0.20, 0.04] <p>Comorbidity of substance abuse:</p> <ul style="list-style-type: none"> - R = 0.04 [-0.09, 0.16] <p>Comorbidity of personality disorders:</p> <ul style="list-style-type: none"> - R = 0.04 [-0.09, 0.16] <p>Comorbidity of dementia:</p> <ul style="list-style-type: none"> - R = -0.003 [-0.13, 0.12] <p>Previous suicide attempt:</p> <p>No schizophrenia:</p> <ul style="list-style-type: none"> - R = -0.16 [-0.18, -0.14] <p>Schizophrenia:</p> <ul style="list-style-type: none"> - R = -0.07 [-0.19, 0.06] <p>Suicide attempt within the past 365 days:</p>	
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											No schizophrenia: - $R = -0.11$ [-0.13, -0.09] Schizophrenia: - $R = -0.11$ [-0.24, 0.01]	
78.	Forsman et al. (2019)	N= 10,002 Mean = Violent suicide SSRI+ = 55.7 (19.5)) SSRI- = 51.3 (19.8)) Non-violent suicide SSRI+ = 50.4 (15.6)) SSRI- = 49.4 (16.5)) % male = 68%	Observational	Individuals who died by suicide (Sweden)	Suicide death	-	12 years	10,002	100%	Days since first SSRI prescription: - 0-28: $OR = 3.6$ (1.6-8.1) - 29-56: $OR = 1.5$ (0.6-3.4)	Male only (violent vs non-violent suicide): Days since first SSRI prescription: - 0-28: [$r = 0.33$ (0.31, 0.35)] - 29-56: [$r = 0.11$ (0.09, 0.13)] Gender differences Days since first SSRI prescription 0-28: - $R = 0.17$ [-0.01, 0.34] 29-56: - $R = 0.14$ [-0.08, 0.35]	10
79.	Fountoulakis et al. (2014)	N= 6177 87 Mean = not reported % male = 76%	Observational	Individuals who died by suicide in 29 European countries	Suicide death	-	11 years	617787	100%	Unemployment ($p < .001$) National growth rate ($p < .0001$) Inflation ($p = .03$)	Unable to calculate effect sizes	7
80.	Gao et al. (2013)	N= 849,434 Mean = not reported Range = 18-70+ % male = 44.0%	Cohort	British adults were identified from The Health Improvement Network (THIN) database (UK)	Suicide death and suicide attempts	1) patients with missing date of BMI as recorded or calculated; 2) patients who were not registered with a primary care practice for at least 1 year before	7 years	Suicide death: 75 Suicide attempt: 3,111	Suicide death: 0.009% Suicide attempt: 0.4%	Suicide attempt Age(years) 18-29: number of events=365, $IR = 275.4$ (247.2-303.7) 30-39: number of events= 266, $IR = 130.9$ (115.2-146.7) 40-49: number of events = 246, $IR = 81.7$ (71.5-91.9) 50-59: number of events = 173, $IR = 46.4$ (39.5-53.4) 60-69: number of events= 91, $IR = 28.1$ (22.3-33.9) >70: number of events= 93, $IR = 34.9$ (27.8-41.9) Smoking	Gender differences: Suicide attempt: Age: 18-29: - $R = 0.04$ [0.01, 0.08] 30-39: - $R = 0.02$ [-0.01, 0.06] 40-49: - $R = -0.03$ [-0.07, 0.003]	8

							<p>and after (except for deaths) the date of the first BMI; 3) pregnancy at baseline or during follow-up; 4) patients with a history of suicide attempt prior to their first BMI measurement; and 5) patients with a previous diagnosis of cancer or incident cancer during follow-up, except nonmelanoma skin cancer.</p>			<p>Current: number of events=733, <i>IR</i> =136.5 (126.6-146.3) Former: number of events=110, <i>IR</i> =36.4 (29.6-43.2) Never: number of events=389, <i>IR</i> =51.5 (46.4-56.6)</p> <p>Type 2 Diabetes Yes: number of events=87, <i>IR</i> =54.8 (43.3-66.3) No: number of events= 1,147, <i>IR</i> =79.6 (75.0-84.2)</p> <p>Hypertension Yes: number of events=163, <i>IR</i> =43.9 (37.1-50.6) No: number of events= 1,071, <i>IR</i> =87.2 (82.0-92.4)</p> <p>Dyslipidemia Yes: number of events= 287, <i>IR</i> = 52.4 (46.3-58.5) No: number of events= 947, <i>IR</i>(95%CI)= 90.0 (84.3-95.7)</p> <p>Depression Yes: number of events =336, <i>IR</i> =317.8 (283.8-351.7) No: number of events = 898, <i>IR</i> =60.1 (56.2-64)</p> <p>Men - with depression history</p> <p>BMI <18.5: number of events = 7, <i>IR</i>=471.3 (122.2-820.4), crude <i>IRR</i>=1.05 (0.49-2.25), adjusted <i>RR</i>=0.83 (0.39-1.79) 18.5-24.9 number of events = 134, <i>IR</i>=445.6 (370.2-521.09), 25.0-29.9: number of events =128, <i>IR</i>= 292.3 (241.6-342.9), crude <i>RR</i>= 0.66 (0.52-0.84), adjusted <i>RR</i>= 0.79 (0.62-1.01) 30.0-34.9: number of events = 49, <i>IR</i> 228.9 (164.8-293.0), crude <i>RR</i>=0.52 (0.37-0.72), adjusted <i>RR</i>=0.65 (0.47-0.91) 35.0-39.9: number of events = 14, <i>IR</i>= 213.2 (101.5-324.9), crude <i>RR</i>=0.48 (0.28-0.84), adjusted <i>RR</i>=0.63 (0.36-1.09) ≥40.0: number of events = 4, <i>IR</i>=166.0 (3.3-328.7), crude <i>RR</i>=0.38 (0.14-</p>	<p>50-59: - <i>R</i> = 0.02 [-0.01, 0.06]</p> <p>60-69: - <i>R</i> = 0.05 [0.01, 0.08]</p> <p>>70: - <i>R</i> = -0.02 [-0.06, 0.01]</p> <p>Smoking: Current: - <i>R</i> = 0.008 [-0.03, 0.04] Former: - <i>R</i> = 0.07 [0.04, 0.11] Never: - <i>R</i> = -0.05 [-0.08, -0.12]</p> <p>Type 2 diabetes: - <i>R</i> = 0.04 [0.0002, 0.0706]</p> <p>Hypertension: - <i>R</i> = 0.001 [-0.03, 0.04]</p> <p>Dyslipidemia: - <i>R</i> = 0.07 [0.04, 0.11]</p> <p>Depression: - <i>R</i> = -0.13 [-0.16, -0.09]</p> <p>Suicide: Age: 18-29: - <i>R</i> = 0.14 [-0.10, 0.36]</p> <p>30-39: - <i>R</i> = 0.17 (NaN)</p> <p>40-49: - <i>R</i> = -0.11 [-0.33, 0.11]</p> <p>50-59: - <i>R</i> = 0.09 [-0.14, 0.30]</p> <p>60-69: - <i>R</i> = -0.09 [-0.31, 0.14]</p> <p>>70:</p>
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								<p>1.02), adjusted RR=0.49 (0.18- 1.33)</p> <p>Men - without depression history</p> <p>BMI <18.5: number of events =39, IR=241 (165.7-317.3), crude RR=2.82 (2.03-3.93), adjusted RR=2.25 (1.61-3.13) 18.5-24.9: number of events=371, IR=84.7 (76.1- 93.3) 25.0-29.9: number of events=307, IR=46.9 (41.7- 52.2), crude RR=0.56 (0.48- 0.65), adjusted RR=0.64 (0.55- 0.74) 30.0-34.9: number of events=121, IR=42.8 (35.2- 50.5), crude RR=0.51 (0.42- 0.63), adjusted RR=0.60 (0.49- 0.74) 35.0-39.9: number of events = 44, IR= 58.0 (40.8-75.1), crude RR=0.69 (0.51-0.94), adjusted RR=0.81 (0.59-1.10) ≥40.0: number of events=16, IR=58.0 (29.6-86.4), crude RR=0.69 (0.42- 1.14), adjusted RR=0.79 (0.48- 1.30)</p> <p>Suicide death Age(years) 18-29: number of events= 9, IR = 6.7 (2.3-11.2) 30-39: number of events= 6, IR =2.9 (0.6-5.3) 40-49: number of events = 9, IR =3.0 (1.0-4.9) 50-59: number of events = 20, IR = 5.4 (3.0-7.7) 60-69: number of events= 3, IR =0.9 (-0.1 -2.0) >70: number of events= 9, IR =3.4 (1.2-5.6)</p> <p>Smoking Current: number of events= 26, IR =4.8 (3.0-6.7) Former: number of events= 3, IR =1.0 (-0.1 - 2.1) Never: number of events= 26, IR =3.4 (2.1-4.8)</p> <p>Type 2 Diabetes Yes: number of events= 7, IR =4.4 (1.1-7.7) No: number of events= 49, IR =3.4 (2.4-4.3)</p>	<p>- R = -0.17 [-0.38, 0.06]</p> <p>Smoking:</p> <p>Current: - R = 0.04 [-0.19, 0.26]</p> <p>Former: - R = 0.002 [- 0.22, 0.22]</p> <p>Never: - R = -0.05 [-0.27, 0.17]</p> <p>Type 2 diabetes: - R = -0.04 [-0.26, 0.18]</p> <p>Hypertension: - R = -0.03 [-0.25, 0.19]</p> <p>Dyslipidemia: - R = -0.06 [-0.28, 0.16]</p> <p>Depression: - R = 0.06 [-0.17, 0.28]</p>	
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									<p>Hypertension Yes: number of events= 13, <i>IR</i> = 3.5 (1.6-5.4) No: number of events= 43, <i>IR</i> = 3.5 (2.4-4.5)</p> <p>Dyslipidaemia Yes: number of events= 14, <i>IR</i> = 2.6 (1.2-3.9) No: number of events= 42, <i>IR</i> =4.0 (2.8-5.2)</p> <p>Depression Yes: number of events = 15, <i>IR</i> =14.1 (7.0-21.2) No: number of events = 41, <i>IR</i> =2.7 (1.9-3.6)</p> <p>BMI <18.5: number of events = 3, <i>IR</i> =4.3 (0.0-9.2), crude <i>RR</i> =2.04 (0.62-6.70), adjusted <i>RR</i> =2.13 (0.65-7.01) 18.5-24.9: number of events=29, <i>IR</i>=2.2 (1.4-2.9) 25.0-29.9: number of events=28, <i>IR</i>=<i>IR</i> =2.0 (1.3-2.8), crude <i>RR</i> =0.93 (0.55-1.56), adjusted <i>RR</i> =0.77 (0.45-1.30) ≥ 30.0: number of events=15, <i>IR</i> =1.5 (0.8-2.3), crude <i>RR</i> =0.70 (0.37-1.30), adjusted <i>RR</i> =0.59 (0.31-1.11)</p>			
81.	Haglund et al. (2019)	N= 2,833,088 Mean = not reported % male = not reported	Cohort	All individuals who completed suicide within 1 month of discharge from psychiatric hospitals in Sweden from 1973 through 2009 (Sweden)	Suicide death	Individuals whose date of death was the same as the date of discharge (died during inpatient stay)	36 years	2,833,088	100%	<p>Principal diagnosis at discharge:</p> <ul style="list-style-type: none"> - Substance use disorder: <i>HR</i> =2.29 (1.90-2.74) - Anxiety disorder: <i>HR</i> =2.84 (2.34-3.43) - Bipolar disorder: <i>HR</i> =2.19 (1.72-2.79) - Depression: <i>HR</i> =4.48 (4.00-5.03) - Reaction to crisis: <i>HR</i> =3.60 (2.97-4.37) - Personality disorder: <i>HR</i> =2.70 (2.18-3.36) - Schizophrenia: <i>HR</i> =1.66 (1.41-1.96) - Other nonorganic psychosis: <i>HR</i> =2.48 (2.11-2.91) - Self-harm <30 days previous to admission: 	Insufficient data to calculate effect sizes	10

										<p><i>HR</i> = 5.52 (4.89-6.22)</p> <p>Principal diagnosis at discharge:</p> <ul style="list-style-type: none"> - Alcohol use disorder: <i>HR</i> =4.64 (3.40-6.32) - Substance use disorder: <i>HR</i> = 5.28 (3.46-8.05) - Anxiety disorder: <i>HR</i> =3.97 (2.39-6.58) - Bipolar disorder: <i>HR</i> =4.51 (1.96-10.38) - Depression: <i>HR</i> =2.40 (1.94-2.98) - Reaction to crisis: <i>HR</i> =2.28 (1.54-3.37) - Personality disorder: <i>HR</i> =6.66 (4.27-10.37) - Schizophrenia: <i>HR</i> =9.28 (6.01-14.32) - Other nonorganic psychosis: <i>HR</i> =5.48 (3.54-8.48) - Other psychiatric disorder: <i>HR</i> =5.48 (3.54-8.48) 		
82.	Hemps tead et al. (2013)	<p>N= 3,413</p> <p>Mean = 47</p> <p>% male = 100%</p>	Cohort	Men who died by suicide in New Jersey (USA)	Suicide death	-	6 years	3,413	100%	<p><i>Odds Ratios</i> - men who died by firearm suicide:</p> <p>Age group</p> <p>Less than 25: 1</p> <p>25-34: 2.18 (1.23,3.88)</p> <p>35-49: 2.35 (1.31,4.20)</p> <p>50-64: 3.91 (2,15,7,09)</p> <p>65-74: 6.97 (3.60,13,50)</p> <p>75+: 7.85 (4,01,15,37)</p> <p>Race group</p> <p>White: 1</p> <p>Black: 2.24 (1.54,3.24)</p> <p>Hispanic: 0.55 (0.35,0.85)</p> <p>Others: 0.21 (0.11, 0.39)</p> <p>Marital status</p> <p>Single: 1</p> <p>Married: 1.11 (0.88,1,41)</p> <p>Circumstances</p> <p>Physical health problem: 1.50 (1.20,1,88)</p> <p>Recent crisis: 1.30 (1.05,1.61)</p> <p>Job problem: 1.27 (0.96 ,1.69)</p> <p>Intimate partner problem: 1.32 (1,07, 1,65)</p>	<p>Male only:</p> <p>Age group</p> <p>25-34: [<i>r</i> = 0.21 (0.19, 0.24)]</p> <p>35-49: [<i>r</i> =0.23 (0.20, 0.26)]</p> <p>50-64: [<i>r</i> = 0.35 (0.32, 0.38)]</p> <p>65-74: [<i>r</i> = 0.47 (0.44, 0.50)]</p> <p>75+: [<i>r</i> = 0.49 (0.46, 0.52)]</p> <p>Race group</p> <p>Black: [<i>r</i> = 0.22 (0.19, 0.25)]</p> <p>Hispanic: [<i>r</i> = 0.16 (0.13, 0.19)]</p> <p>Others: [<i>r</i> = 0.40 (0.37, 0.43)]</p> <p>Marital status</p> <p>Married: [<i>r</i> = 0.03 (-0.004, 0.06)]</p> <p>Circumstances</p> <p>Physical health problem: [<i>r</i> = 0.11 (0.08, 0.14)]</p> <p>Recent crisis: [<i>r</i> =0.07 (0.04, 0.10)]</p>	7

										Recent death/suicide of friend/family: 1.31 (0.93, 1.86) Made prior attempt: 0.37 (0.28, 0.49) Disclosed intent to harm self: 1.14 (0.92, 1.42) All other circumstances: 1.14 (0.95, 1.36)	Job problem: [r = 0.07 (0.04, 0.10)] Intimate partner problem: [r = 0.08 (0.05, 0.11)] Recent death/suicide of friend/family: [r = 0.07 (0.04, 0.10)] Made prior attempt: [r = 0.26 (0.23, 0.29)] Disclosed intent to harm self: [r = 0.04 (0.01, 0.07)] All other circumstances: [r = 0.04 (0.01, 0.07)]	
83.	Henson et al. (2019)	N= 4,722,099 Mean = not reported % male = 50.3%	Cohort	Cancer patients (England)	Suicide death	Patients identified as having cancer on their death certificate (unaware of diagnosis before death)	20 years	2,491	0.1%	<i>The AER (absolute excess risk) for men was significantly greater than for women for 6 cancer types, namely, pancreas (men, 4.41; women, 1.37), esophagus (men, 2.40; women, 0.72), lung (men, 2.15; women, 0.86), stomach (men, 2.11; women, -0.05), head and neck (men, 1.08; women, 0.29), and colorectal (men, 0.47; women, 0.05). Significant heterogeneity (P = .03) was observed in the SMRs by sex among patients with stomach cancer (men, 2.46; women, 0.91).</i>	Gender differences - suicide death in cancer patients: - R = 0.01 [0.007, 0.0095]	9
84.	Horwitz et al. (2019)	N= 116,515 Mean = Male civilian: 43.21 (23.4) Male veteran: 58.84 (22.2) Female civilian: 46.84 (21.4) Female veteran: 44.69	Case control	Veteran and civilian suicide decedents (USA)	Suicide death	-	12 years	116,515 Male civilians: 67,716 Male veterans: 22,707 Female civilians: 25,251 Female veterans: 841	100%	Physical health problem: aOR = 1.10 (1.06-1.14) Suicide note: aOR = 1.05-1.14 Firearm: aOR = 1.41 (1.36-1.47)	Gender differences (veterans): Physical health problem: r = 0.06 [0.05, 0.08] Suicide note: r = -0.04 [-0.05, -0.02] Firearm: r = 0.12 [0.10, 0.13] Male veterans vs civilians Physical health problem: r = 0.20 [0.20, 0.21] Suicide note: r = 0.03 [0.02, 0.03] Firearm: r = 0.15 [0.14, 0.16]	9

		% male 77.6 %										
85.	Ishii et al. (2013)	N, mean, % male = not reported		The data of male and female standardized mortality rate (SMR) of suicide in 2008 for all 47 prefectures in Japan	Suicide death	-	1 year	-	-	Elderly population rate ($p < .001$) Complete unemployment rate ($p < .002$) Decrease in marriage rate ($p = .02$) Decrease in annual postal savings ($p < .001$)	Insufficient data to calculate effect sizes	5
86.	Kimering et al. (2016)	N= 6351 854 Mean = not reported Range = 18-80+ % male = 94.6 %	Cohort	Veterans who received Veterans health Administration services and were screened for military sexual trauma (USA)	Suicide death	Observations were excluded from the analyses (0.4%) owing to incomplete or out-of-range values for age (9,523) or rural/urban residence (13,196).	4 years	9,017	0.1%	Military sexual trauma $HR = 1.69$ (1.45, 1.97)	Gender differences: Military sexual trauma: - $R = -0.36$ [-0.39, -0.33]	8
87.	Kittel et al. (2019)	N= 269,078 Mean = not reported % male = 48.2 %	Cohort	General population - 2008-2014 National Survey on Drug Use and Health data (USA)	Suicide attempts	Under 18 and missing data	6 years	2363	0.9%	Race: - Non-hispanic black: $OR = 1.28$ (0.92-1.79) - Non-hispanic native American/alaskan native: $OR = 2.28$ (1.05-4.95) - Non-hispanic more than one race: $OR = 1.71$ (0.83-3.55) - Hispanic: $OR = 1.07$ (0.76-1.49) Health: - Good: $OR = 1.41$ (0.98-2.04) - Fair/poor: $OR = 1.95$ (1.27-3.01) Age: - 18-25 years old: $OR = 2.44$ (1.17-5.08) - 26-34 years old: $OR = 1.32$ (0.63-2.79) - 35-49 years old: $OR = 1.46$ (0.75-2.87)	Male only: Race: - Non-hispanic black: [$r = 0.07$ (0.066, 0.074)] - Non-hispanic native American/alaska native: [$r = 0.22$ (0.216, 0.224)] - Non-hispanic more than one race: [$r = 0.15$ (0.146, 0.154)] - Hispanic: [$r = 0.02$ (0.016, 0.024)] Health: - Good: [$r = 0.09$ (0.086, 0.094)] - Fair/poor: [$r = 0.18$ (0.176, 0.184)]	8

									<ul style="list-style-type: none"> - 50-64 years old: <i>OR</i> =1.21 (0.56-2.62) <p>Education:</p> <ul style="list-style-type: none"> - Less than high school: <i>OR</i> = 2.90 (1.57-4.51) - High school: <i>OR</i> =2.29 (1.50-3.48) - Some college/associates degree: <i>OR</i> =1.34 (0.86-2.09) <p>Marital status:</p> <ul style="list-style-type: none"> - Widowed: <i>OR</i> = 1.60 (0.64-3.99) - Divorced/separated: <i>OR</i> =1.79 (1.17-2.74) - Never been married: <i>OR</i> =1.79 (1.25-2.54) <p>Tobacco use in the past year: <i>OR</i> = 1.25 (0.97-1.60)</p> <p>Illicit drug use/dependence in the past year: <i>OR</i> = 2.14 (1.64-2.78)</p> <p>Alcohol use in the past year:</p> <ul style="list-style-type: none"> - 1-11 days: <i>OR</i> = 1.07 (0.67-1.70) - 12-49 days: <i>OR</i> = 1.33 (0.87-2.01) - 50-99 days: <i>OR</i> =1.23 (0.70-2.16) <p>Major depressive episode in past year: <i>OR</i> = 8.72 (6.80-11.18)</p> <p>Alcohol use disorder in past year: <i>OR</i> = 2.18 (1.69-2.82)</p>	<p>Age:</p> <ul style="list-style-type: none"> - 18-25 years old: [<i>r</i> = 0.24 (0.236, 0.244)] - 26-34 years old: [<i>r</i> = 0.08 (0.076, 0.084)] - 35-49 years old: [<i>r</i> = 0.10 (0.096, 0.104)] - 50-64 years old: [<i>r</i> = 0.05 (0.046, 0.054)] <p>Education:</p> <ul style="list-style-type: none"> - Less than high school: [<i>r</i> = 0.22 (0.216, 0.224)] - High school: [<i>r</i> = 0.22 (0.216, 0.224)] - Some college/associates degree: [<i>r</i> = 0.08 (0.076, 0.084)] <p>Marital status:</p> <ul style="list-style-type: none"> - Widowed: [<i>r</i> = 0.13 (0.126, 0.134)] - Divorced/separated: [<i>r</i> = 0.16 (0.156, 0.164)] - Never been married: [<i>r</i> = 0.16 (0.156, 0.164)] <p>Tobacco use in the past year: [<i>r</i> = 0.06 (0.002, 0.01)]</p> <p>Illicit drug use/dependence in the past year: [<i>r</i> = 0.21 (0.206, 0.214)]</p> <p>Alcohol use in the past year:</p> <ul style="list-style-type: none"> - 1-11 days: [<i>r</i> = 0.02 (0.016, 0.024)] - 12-49 days: [<i>r</i>
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											<p>= 0.08 (0.076, 0.084)]</p> <p>- 50-99 days: [r = 0.06 (0.056, 0.064)]</p> <p>Major depressive episode in past year: [r = 0.51 (0.507, 0.513)]</p> <p>Alcohol use disorder in past year: [r = 0.21 (0.206, 0.214)]</p>	
88.	Kochanski-Ruscio et al. (2014)	<p>N= 423</p> <p>Mean = 25.6</p> <p>% male = 62.2 %</p>	Cohort	Military inpatients admitted for suicide-related events (USA)	Suicide attempt	-	5 years	423	100%	<p>Problem Substance Abuse: B=0.89, SE=0.31, OR [95% CI]= 2.43 [1.31, 4.50], W=7.97, p=.005</p> <p>Mood Disorder: B=1.06, SE=0.34, OR [95% CI]= 2.88 [1.49, 5.59], W=9.83, p=.002</p>	<p>Male only:</p> <p>Problem Substance Abuse: [r = 0.24 (0.15, 0.33)]</p> <p>Mood Disorder: [r = 0.28 (0.19, 0.37)]</p>	5
89.	Li (1995)	<p>N= 6266 white married and 3486 white widowed persons</p> <p>Mean = not reported</p> <p>Range = 60-80+</p> <p>% male = 58%</p> <p>Married: 58%</p> <p>Widowed: 22.4 %</p>	Cohort	A cohort of 6266 white married and 3486 white widowed persons aged 60 yr or older in 1963 was evaluated based on a 12-yr follow-up survey in Washington County, MD (USA)	Suicide death	-	12 years	Married: 18 Widowed: 12	Married: 0.3% Widowed: 0.3%	<p><i>Relative risk</i></p> <p>Marital status (widowed vs married): 5.2 (1.4-18.5)</p> <p>Years of schooling (<9 vs >9yr): 1.7 (0.5-6.5)</p> <p>Church attendance (< 1 vs > 1 times/month): 1.1 (0.4-3.5)</p> <p>Smoking (yes vs no): 1.4 (0.4-4.3)</p>	<p>Gender differences:</p> <p>Marital status:</p> <p>Married: - R = 0.08 [-0.27, 0.42]</p> <p>Widowed: - R = -0.08 [-0.42, 0.27]</p>	7
90.	Lundin et al. (2012)	<p>N= 771,068</p> <p>Mean = not reported</p> <p>Range = 25-59</p> <p>% male = 49.8 %</p>	cohort	General population (Sweden)	Suicide death	Individuals aged <25 years were not included in the study population since, as a group, they are less established	5 years	249	0.03 %	<p>Sickness Absence</p> <p>0-15 days: Crude and Adjusted OR=1</p> <p>16-34 days: Crude OR = 2.15 (2.09-2.21), adjusted OR = 1.66 (1.61-1.71)</p> <p>35-62 days: Crude OR = 3.31 (3.21-3.44), adjusted OR = 2.27 (2.18-2.35)</p> <p>>62 days: crude OR = 4.66 (4.52-4.81), adjusted OR =2.70 (2.60-2.80)</p> <p>Unemployed 1992-1993 (days)</p>	<p>Male only:</p> <p>Sickness Absence</p> <p>16-34 days: [r = 0.21 (0.208, 0.212)]</p> <p>35-62 days: [r = 0.31 (0.308, 0.312)]</p> <p>>62 days: [r = 0.39 (0.388, 0.392)]</p> <p>Unemployed 1992-1993 (days) 1-90 (n=7)</p>	8

					hed on the labour market. People receiving a disability pension in 1990-1993 and people with an annual income of <SEK 29,700 in 1990 or SEK 32,200 in 1991 were excluded from the analyses since they were excluded from, or only weakly linked to, the labour market.				<p>0 (n=62)</p> <ul style="list-style-type: none"> - Full model: OR =1 <p>1-90 (n=7)</p> <ul style="list-style-type: none"> - Full model: OR = 1.49 (0.72-3.09) <p><90 (n=9)</p> <ul style="list-style-type: none"> - Full model: OR =1.54 (0.98-2.42) <p>Socioeconomic position in 1990 USW (n=29)</p> <ul style="list-style-type: none"> - Full model: OR =1.22 (0.68-2.21) <p>SW (n=33)</p> <ul style="list-style-type: none"> - Full model: OR =1.48 (0.83-2.63) <p>ANM (n=20)</p> <ul style="list-style-type: none"> - Full model: OR = 1.66 (0.89-3.11) <p>NMI (n=34)</p> <ul style="list-style-type: none"> - Full model: OR = 1.60 (0.9202.79) <p>HNM (n=20)</p> <ul style="list-style-type: none"> - Full model: OR =1 <p>E+F (n=10)</p> <ul style="list-style-type: none"> - Full model: OR = 1.61 (0.75-3.45) <p>NC (n=25)</p> <ul style="list-style-type: none"> - Full model: OR = 1.59 (0.86-2.93) <p>Employed 1990-1991</p> <p>Yes (n=158)</p> <ul style="list-style-type: none"> - Full model: OR =1 <p>No (n=13)</p> <ul style="list-style-type: none"> - Full model: OR = 0.90 (0.48-1.68) 	<ul style="list-style-type: none"> - [r = 0.11 (0.108, 0.112)] - [r = 0.12 (0.118, 0.122)] <p>Socioeconomic position in 1990 USW (n=29)</p> <ul style="list-style-type: none"> - [r = 0.05 (0.048, 0.052)] <p>SW (n=33)</p> <ul style="list-style-type: none"> - [r = 0.11 (0.108, 0.112)] <p>ANM (n=20)</p> <ul style="list-style-type: none"> - [r = 0.14 (0.138, 0.142)] <p>NMI (n=34)</p> <ul style="list-style-type: none"> - [r = 0.13 (0.128, 0.132)] <p>E+F (n=10)</p> <ul style="list-style-type: none"> - [r = 0.13 (0.128, 0.132)] <p>NC (n=25)</p> <ul style="list-style-type: none"> - [r = 0.13 (0.128, 0.132)] <p>Employed 1990-1991 No (n=13)</p> <ul style="list-style-type: none"> - [r = 0.03 (0.028, 0.032)] 		
91.	Mahar et al. (2019)	N = 20,397 cases, 81 559 controls Mean = 42.1 % male = 100%	Case control	Ex-serving Canadian Armed Forces and Royal Canadian Mounted Police veterans compared to civilian controls (Canada)	Suicide death	Female veterans were excluded (lack of data). Individuals not registered for health insurance.	23 years	Veterans: 854 Civilians: 5,294	Veterans: 4.2% Civilians: 6.5%	<p>Death by suicide: Veteran status:</p> <ul style="list-style-type: none"> - Civilian: HR =1.00 - Veterans: HR = 1.01 (0.71-1.43) - P=.96 <p>Incidence rates of suicide in male veterans releasing between 1990 and 2013 (Rate of deaths by suicide per 1 00 000 person years):</p> <ul style="list-style-type: none"> - <30: 18.2 (6.7-39.6) - 30-39: 29.7 (17.0-48.3) - 40-49: 18.7 (10.7-30.3) - 50+: 1.5 (0.04-8.2) <p>Calendar year of release:</p> <ul style="list-style-type: none"> - 1990-1999: 13.9 (8.5-21.4) 	<p>Differences between civilians and veterans (suicide): r = -0.003 [-0.01, 0.002]</p> <p>Differences between veterans suicide and death from other causes: r = -0.04 [-0.04, -0.03]</p> <p>Insufficient data on age.</p>	9

										<p>- 2000-2013: 19.7 (11.9-30.8)</p> <p>Length of service:</p> <ul style="list-style-type: none"> - <5 years: 10.1 (3.3-23.5) - 5-9 years: 32.4 (15.5-59.4) - 10-19 years: 23.5 (10.7-44.5) - 20+ years: 12.3 (6.9-20.4) <p>Time period following release:</p> <ul style="list-style-type: none"> - 0-5 years: 21.3 (13.5-32.0) - 6-10 years: 12.5 (5.4-24.6) - 11-15 years: 9.4 (2.6-24.0) 		
92.	Mathy et al. (2011)	N= 11,200 Mean = not reported % male = 68.2%	Cohort	Individuals who died by suicide in Denmark	Suicide death	-	11 years	11,200	100%	<p>Relationship status</p> <ul style="list-style-type: none"> - Current or past married status Adjusted analysis: 1.00 - Never married Adjusted analysis: 1.92 (1.82-2.03) - Current or past registered partnership status Adjusted analysis: 8.19 (5.48-12.24) <p>Gender differences:</p> <ul style="list-style-type: none"> - Never married R = 0.16 [0.14, 0.18] - Current or past registered partnership status: R = 0.01 [-0.006, 0.032] 	Male only: Relationship status Never married Adjusted analysis: [r = 0.18 (0.16, 0.20)] Current or past registered partnership status Adjusted analysis: [r = 0.50 (0.49, 0.51)]	8
93.	O'Donnell et al. (2019)	N= 1,362 Mean = 20 in the 18-24 age group, 30 in the 25-34 age group	Cohort	Male military veteran suicide decedents (USA)	Suicide death	Female veterans were excluded (lack of data)	9 years	1,362	-	<p>Age group:</p> <ul style="list-style-type: none"> - 25-34: OR = 2.28 (1.39-3.74) <p>Race/ethnicity:</p> <ul style="list-style-type: none"> - Black, non-Hispanic: OR = 1.30 (0.59-2.86) - Hispanic: OR = 1.55 (0.81-2.97) <p>Marital status:</p> <ul style="list-style-type: none"> - Married 	Male only: Age group: 25-34: [r = 0.22 (0.17, 0.27)] Race/ethnicity: Black, non-Hispanic: [r = 0.07 (0.02, 0.12)] Hispanic: [r = 0.12 (0.07, 0.17)]	9

		% male = 100%							<p>: OR = 1.51 (0.99-2.31)</p> <p>-</p> <p>Divorce d: OR = 1.68 (1.02-2.74)</p> <p>- Married but separated: OR = 1.03 (0.32-3.35)</p> <p>-</p> <p>Widowed: OR = 3.72 (0.64-21.60)</p> <p>Method:</p> <p>-</p> <p>Firearm: OR = 1.37 (0.53-3.57)</p> <p>- Sharp instrument: OR = 2.93 (0.63-13.57)</p> <p>-</p> <p>Hanging: OR = 1.39 (0.51-3.78)</p> <p>Circumstances: Health related:</p> <p>-</p> <p>Diagnosis of depression: OR = 1.75 (1.21-2.55)</p> <p>- Alcohol dependence or suspected intoxication: OR = 1.13 (0.79-1.61)</p> <p>- Other substance abuse: OR = 1.34 (0.87-2.07)</p> <p>Life stress:</p> <p>-</p> <p>Deployment mentioned in narrative: OR = 14.53 (9.03-23.39)</p> <p>Other preceding circumstances:</p> <p>-</p> <p>Disclosed intent: OR = 1.17 (0.81-1.70)</p>	<p>Marital status: Married: [r = 0.11 (0.06, 0.16)] Divorced: [r = 0.14 (0.09, 0.19)] Married but separated: [r = 0.008 (-0.05, 0.06)] Widowed: [r = 0.34 (0.29, 0.39)]</p> <p>Method: Firearm: [r = 0.09 (0.04, 0.14)] Sharp instrument: [r = 0.28 (0.23, 0.33)] Hanging: [r = 0.09 (0.04, 0.14)]</p> <p>Circumstances: Health related: Diagnosis of depression: [r = 0.15 (0.10, 0.20)] Alcohol dependence or suspected intoxication: [r = 0.03 (-0.02, 0.08)] Other substance abuse: [r = 0.08 (0.03, 0.13)]</p> <p>Life stress: Deployment mentioned in narrative: [r = 0.08 (0.03, 0.13)]</p> <p>Other preceding circumstances: Disclosed intent: [r = 0.08 (0.03, 0.13)]</p>		
94.	Park et al. (2018)	N= 12,436 Mean = not reported Range = 25-75+ % male = 71.1%	Cohort	Individuals who died by suicide in South Korea	Suicide death	We excluded those who were younger than 25 years from both datasets, as only those aged 25 years and older are defined as "adults" by the World Health	5 years	12,436	100%	<p>Married (Ref.) Never-married: OR=4.73 (4.42-5.05), p<.001 Widowed: OR=1.42 (1.29-1.55), p<.001 Divorced: OR=5.81 (5.48-6.17), p<.001</p> <p>Educational attainment College or more (Ref.) High school: OR=1.33 (1.25-1.40), p<.001 Middle School or less: OR=1.55 (1.46-1.65), p<.001</p> <p>Age group 25-34 (Ref.)</p>	<p>Male only: Never-married: [r = 0.39 (0.38, 0.41)] Widowed: [r = 0.10 (0.08, 0.12)] Divorced: [r = 0.44 (0.43, 0.45)]</p> <p>Educational attainment High school: [r = 0.08 (0.06, 0.10)] Middle School or less: [r = 0.12 (0.10, 0.14)]</p> <p>Age group</p>	7

						Organization (Chin et al., 2011; WHO, 1996), and marital status may change for this younger group.				35-44: <i>OR</i> =2.38 (2.18-2.59), <i>p</i> <.001 45-54: <i>OR</i> =3.88 (3.54-4.26), <i>p</i> <.001 55-64: <i>OR</i> =5.97 (5.40-6.60), <i>p</i> <.001 65-74: <i>OR</i> =7.44 (6.67-8.29), <i>p</i> <.001 75+: <i>OR</i> =17.14 (15.32-19.18), <i>p</i> <.001	35-44: [<i>r</i> = 0.23 (0.21, 0.25)] 45-54: [<i>r</i> = 0.25 (0.23, 0.27)] 55-64: [<i>r</i> = 0.44 (0.43, 0.45)] 65-74: [<i>r</i> = 0.48 (0.47, 0.49)] 75+: [<i>r</i> = 0.62 (0.61, 0.63)]	
95.	Patasius et al. (2019)	N= 8,908 Mean = not reported % male = 100%	Cohort	Men with prostate cancer (Lithuania)	Suicide death	-	9 years	49	0.6%	Overall: <i>SMR</i> = 1.23 (0.93-1.63) Age at diagnosis: - 65-74: 1.53 (1.05-2.23) - 75+: 1.63 (1.00-2.66) TNM (cancer) stage: - III: <i>SMR</i> = 1.15 (0.85-1.57) - IV: <i>SMR</i> = 2.33 (1.16-4.66) ADT group: - Non-users: <i>SMR</i> = 1.14 (0.71-1.84) - Users: <i>SMR</i> = 1.45 (1.04-2.02) Age at diagnosis: - 65-74: <i>HR</i> = 2.80 (1.16-6.79), <i>p</i> =.02 - 75+: <i>HR</i> = 4.31 (1.55-11.97), <i>p</i> =.005 TNM stage: - IV: <i>HR</i> = 2.20 (1.02-4.73), <i>p</i> =.04	Unable to calculate effect sizes	8
96.	Phillips and Hempstead (2017)	N= 442,135 Mean = not reported Range = 25+ % male = 78.4%	Cohort	Individuals who died by suicide in the US, between 2000-2014	Suicide death	Deaths with missing data were excluded (1.34%)	14 years	442,135	100%	MH problem: Total=40.1, College No=39.0, College Yes=45.4, <i>p</i> =.002 In treatment for MH problem: Total=25.3, College No=23.7, College Yes=33.6, <i>p</i> =.000 Substance abuse problem: Total=14.7, College No=16.1, College Yes=7.8, <i>p</i> =.000 MH problem but no MH treatment: Total=37.6, College No=40.2, College Yes=26.1, <i>p</i> =.000 Interpersonal: Total=44.7, College No=46.3, College Yes=36.5, <i>p</i> =.000	Gender differences: Mental health problem: - <i>R</i> = -.20 [-0.23, -0.17] In treatment for mental health problem: - <i>R</i> = -0.18 [-0.21, -0.16] Substance abuse problem: - <i>R</i> = -0.05 [-0.07, -0.02] Family relationship problem: - <i>R</i> = -0.05 [-0.08, -0.02]	6

									<p>Family relationship problem: Total=8.0, College No=8.5, College Yes=5.5, $p=.009$</p> <p>Argument preceded death: Total=15.1, College No=16.6, College Yes=7.5, $p=.000$</p> <p>Intimate partner problem: Total=30.8, College No=32.2, College Yes=23.3, $p=.000$</p> <p>Job problems: Total=14.7, College No=14.0, College Yes=18.5, $p=.002$</p> <p>Planning and intent Left note: Total=34.1, College No=31.6, College Yes=46.4, $p=.000$</p> <p>Disclosed intent: Total=24.9, College No=25.7, College Yes=20.8, $p=.009$</p> <p>Method Firearm: Total: 59.2, College No=59.9, College Yes=55.8, $p=.049$</p> <p>Other: Total=6.1, College No=5.5, College Yes=9.4, $p=.000$</p>	<p>Intimate partner problem: - $R = 0.08$ [0.05, 0.11]</p> <p>Job problems: - $R = 0.06$ [0.03, 0.09]</p> <p>Left suicide note: - $R = -0.05$ [-0.08, -0.02]</p> <p>Disclosed intent: - $R = -0.003$ [-0.03, 0.02]</p> <p>Method: Firearm: - $R = 0.26$ [0.24, 0.29]</p> <p>Other: - $R = -0.03$ [-0.06, -0.01]</p>		
97.	Robinson et al. (2009)	N=417,572 Mean = 67.9 % male = 49.4%	Cohort	Individuals with cancer in South East England from 1996-2005	Suicide death	Patients whose date of death was the same as date of death. Patients who were aged less than 15 years at cancer diagnosis	9 years	166 Male suicides: 117 Female suicides: 49	0.04%	<p>Time since diagnosis (years) 0-1: 2.09 (1.39-3.15) >1: 1/.00</p> <p>Age at diagnosis (years) 15-60: 1.00 61-75: 0.78 (0.24-2.59) >75: 1.24 (0.24-6.44)</p> <p>Stage 1-2: 1.00 3-4: 0.79 (0.43-1.44) N/K: 1.38 (0.94-2.05)</p> <p>Fatality of cancer Low: 1.00 High: 1.76 (1.10-2.82)</p> <p>Period of diagnosis 1996-1999: 1.00 2000-2002: 0.98 (0.64-1.49) 2003-2005: 1.10 (0.66-1.85)</p> <p>IMD 2004 quintile 1: 1.00 3: 1.07 (0.65-1.75)</p>	<p>Gender differences:</p> <p>Years since diagnosis: <1: - $R = 0.16$ [0.002, 0.302] 1-5: - $R = -0.11$ [-0.26, 0.05] >5: - $R = -0.07$ [-0.22, 0.08]</p>	8

										4-5: 1.06 (0.71-1.60)		
98.	Salib and Green (2003)	N= 200 Mean = 71 % male = 58.5%	Cohort	Individuals aged 60+ who died by suicide between 1989-2001 in Cheshire (England)	Suicide death	-	13 years	200	100%	<p>Intimation of intent Yes: 61 (52%) No: 56 (48%) OR 1.2 95% CI 0.7-2</p> <p>Marital status Widowed: 35 (30%) Other: 82 (70%) OR 0.4 95% CI 0.2-0.6</p> <p>Living alone Yes: 58 (50%) No: 59 (50%) OR 0.7 95% CI 0.7-1.3</p> <p>Children No: 43 (37%) Yes: 74 (63%) OR 1.2 95% CI 0.6-2.2</p> <p>Known to services Yes: 23 (20%) No: 94 (80%) OR 0.4 95% CI 0.2-0.7</p> <p>Method of suicide Violent suicide: 69 (59%) Non-violent suicide: 48 (41%) OR 1.5 95% CI 0.9-2.7</p> <p>Previous attempts Yes: 18 (15%) No: 99 (85%) OR 0.5 95% CI 0.2-1</p> <p>History of recent ill health & GP contact Yes: 56 (48%) No: 61 (52%) OR 0.8 95% CI 0.8-1.4</p>	<p>Gender differences: Intimation of intent [r = 0.05 (-0.09, 0.19)]</p> <p>Marital status Widowed: [r = 0.24 (0.11, 0.37)]</p> <p>Living alone [r = 0.10 (-0.04, 0.24)]</p> <p>Children No: [r = 0.50 (0.39, 0.60)]</p> <p>Known to services Yes: [r = 0.24 (0.11, 0.37)]</p> <p>Method of suicide Violent suicide: [r = 0.11 (-0.03, 0.25)]</p> <p>Previous attempts Yes: [r = 0.19 (0.05, 0.32)]</p> <p>History of recent ill health & GP contact [r = 0.06 (-0.08, 0.20)]</p>	5
99.	SALIB et al. (2004)	N= 200 Mean = 71 % male = 58.5%		Individuals aged 60 and above who died by suicide between 1989 and 2001 in Cheshire (England)	Suicide death	-	13 years	200	100%	<p>Deceased with no children</p> <p>Living alone Yes - Male: 22 (51%)</p> <p>Marital status Widowed - Male: 3 (7%)</p> <p>Method Violent - Male: 27 (63%)</p> <p>GP contact Yes - Male: 25 (58%)</p> <p>Known to services Yes - Male: 10 (23%)</p> <p>Evidence of intent Yes</p>	<p>Gender differences: Deceased with no children: Living alone: - R = -0.31 [-0.51, -0.06]</p> <p>Widowed: - R = -0.57 [-0.74, -0.33]</p> <p>Violent method: - R = 0.25 [0.01, 0.46]</p> <p>GP contact: - R = 0.21 [-0.03, 0.42]</p> <p>Known to services:</p>	5

									<ul style="list-style-type: none"> - Male: 21 (49%) History of DSH Yes - Male: 6 (14%) Deceased with children Living alone Yes - Male: 36 (49%) Marital status Widowed - Male: 32 (43%) Method Violent - Male: 42 (57%) GP contact Yes - Male: 31 (42%) Known to services Yes - Male: 13 (17%) Evidence of intent Yes - Male: 40 (54%) History of DSH Yes - Male: 12 (16%) 	<ul style="list-style-type: none"> - R = 0.06 [-0.18, 0.28] Evidence of intent: - R = -0.07 [-0.29, 0.17] History of DSH: - R = 0.10 [-0.14, 0.233] Deceased with children: Living alone: - R = 0.42 [0.24, 0.58] Widowed: - R = -0.08 [-0.25, 0.09] Violent method: - R = 0.03 [-0.14, 0.20] GP contact: - R = -0.19 [-0.35, -0.01] Known to services: - R = -0.36 [-0.51, -0.19] Evidence of intent: - R = 0.09 [-0.08, 0.26] History of DSH: - R = -0.21 [-0.37, -0.03] 		
100	Stickle et al. (2016)	N= 27,007 Mean = not reported Range = <30 - >60 % male = 69%	Cohort	Individuals who died by suicide between 2001-2010 in Japan	Suicide death	Non-Japanese suicides and those with a birthday on the 29 th of February	10 years	27,007	100%	<ul style="list-style-type: none"> Proximity to birthday: -5: Mean daily no of suicide deaths: 5.8, OR : 1.134 (1.005-1.281), p=.04 -4: Mean daily no of suicide deaths: 6.0, OR : 1.158 (1.015-1.320), p=.03 -3: Mean daily no of suicide deaths: 6.1, OR : 1.218 (1.052-1.410), p<.01 -2: Mean daily no of suicide deaths: 6.5, OR : 1.328 (1.125-1.567), p<.01 -1: Mean daily no of suicide deaths: 7.3, OR : 1.468 	<ul style="list-style-type: none"> Male only: Proximity to birthday: -5: [r = 0.44 (0.43, 0.45)] -4: [r = 0.04 (0.03, 0.05)] -3: [r = 0.05 (0.04, 0.06)] -2: [r = 0.08 (0.07, 0.09)] -1: [r = 0.11 (0.10, 0.12)] 0: [r = 0.14 (0.13, 0.15)] 1: [r = 0.11 (0.10, 0.12)] 2: [r = 0.08 (0.07, 0.09)] 3: [r = 0.08 (0.07, 0.09)] 4: [r = 0.06 (0.05, 0.07)] 5: [r = 0.06 (0.05, 0.07)] 	7

									(1.208-1.784), $p < .01$ 0: Mean daily no of suicide deaths: 8.6, OR : 1.677 (1.294-2.172), $p < .01$ 1: Mean daily no of suicide deaths: 7.6, OR : 1.466 (1.211-1.776), $p < .01$ 2: Mean daily no of suicide deaths: 6.9, OR : 1.350 (1.148-1.586), $p < .01$ 3: Mean daily no of suicide deaths: 6.7, OR : 1.324 (1.149-1.526), $p < .01$ 4: Mean daily no of suicide deaths: 6.4, OR : 1.252 (1.101- 1.424), $p < .01$ 5: Mean daily no of suicide deaths: 6.3, OR : 1.256 (1.115-1.414), $p < .01$ 6: Mean daily no of suicide deaths: 6.0, OR : 1.190 (1.065-1.330), $p < .01$ 7: Mean daily no of suicide deaths: 5.8, OR : 1.121 (1.005-1.250), $p < .04$ 9: Mean daily no of suicide deaths: 5.7, OR : 1.112 (1.003-1.233), $p = .04$ 11: Mean daily no of suicide deaths: 5.6, OR : 1.110 (1.007-1.224), $p = .04$	6: [r = 0.05 (0.04, 0.06)] 7: [r = 0.03 (0.02, 0.04)] 9: [r = 0.03 (0.02, 0.04)] 11: [r = 0.03 (0.02, 0.04)]		
101	Ursano et al. (2018)	N= Cases : 9,650 Control: 153,528 Mean = not reported % male = 86.3 %	Case control	Army soldiers with a suicide attempt compared to those without a suicide attempt (USA)	Suicide attempt	-	5 years	9,650	100% of cases	Any history of family violence Males (n=139,717) No: OR =1, SRE (standardized risk estimate)= 313 Yes: OR = 3.4 (3.1-3.8), $p < .05$, SRE=1.069 $\chi^2=560.3$, $p < .05$ Role in family violence Males (n = 139,717) No history of family violence: OR =1, SRE=313 Perpetrator: OR =3.7 (3.3-4.1), $p < .05$, SRE=1,159 Victim: OR =2.2 (1.6-2.9), $p < .05$, SRE=2.3 $\chi^2=588.1$, $p < .05$	Male only: Any history of family violence: [r = .32 (0.32, 0.33)] Role in family violence: Perpetrator: [r = 0.34 (0.34, 0.35)] Victim: [r = 0.21 (0.21, 0.22)]	9

102	Vasiladis et al. (2017)	<p>N= Cases : 493 Controls: 2,494</p> <p>Mean = not reported</p> <p>Range = 64-90+</p> <p>% male = Cases : 77% (380) Controls: 31% (113)</p>	Case controls	Elderly individuals who died by suicide compared to controls between 2004 and 2007 in Quebec (Canada)	Suicide death	-	3 years	493	100% of cases	<p>Age</p> <p>64-<70: reference 70-<75: 0.44 (0.29-0.67) 75-<80: 0.65 (0.43-0.99) 80-< 85: 0.71 (0.41-1.23) 85-<90: 1.37 (0.59-3.17) 90+: 4.71 (0.87-25.65)</p> <p>Public drug insurance: 1.23 (0.70-2.16)</p> <p>Arthritis: 1.05 (0.37-1.14) Heart diseases: 0.39 (0.28-0.55) Cerebral vascular accident: 1.54 (0.46-5.17) Anxio/depressive disorders: 1.64 (0.93-2.89) All other mental disorders: 3.94 (2.14-7.25) Psychotropic drug use: 2.36 (1.67-3.34) Past year visits for mental health reasons: 1.07 (0.90-1.28) Past year visits for other health reasons: 1.11 (1.08-1.14) Past year emergency department visit: 24.29 (4.66-126.55) # hospitalizations: 0.02 (0.001-0.10)</p> <p>At least one physical and mental disorder *ambulatory visits for other health reasons - males: 1.03 (0.97-1.10)</p> <p>At least one physical and mental disorder *Number of hospitalisations - males: 2.25 (0.71-7.11)</p>	<p>Male only:</p> <p>Age</p> <p>70-<75: [<i>r</i> = 0.22 (0.12, 0.31)] 75-<80: [<i>r</i> = 0.12 (0.02, 0.22)] 80-< 85: [<i>r</i> = 0.09 (-0.01, 0.19)] 85-<90: [<i>r</i> = 0.09 (-0.01, 0.19)] 90+: [<i>r</i> = 0.39 (0.30, 0.47)]</p> <p>Public drug insurance: [<i>r</i> = .06 (-0.04, 0.16)]</p> <p>Arthritis: [<i>r</i> = 0.01 (-0.09, 0.11)] Heart diseases: [<i>r</i> = 0.25 (0.15, 0.34)] Cerebral vascular accident: [<i>r</i> = 0.12 (0.02, 0.22)] Anxio/depressive disorders: [<i>r</i> = 0.14 (0.04, 0.24)] All other mental disorders: [<i>r</i> = 0.35 (0.25, 0.44)] Psychotropic drug use: [<i>r</i> = 0.23 (0.13, 0.32)] Past year visits for mental health reasons: [<i>r</i> = 0.02 (-0.08, 0.12)] Past year visits for other health reasons: [<i>r</i> = 0.03 (-0.07, 0.13)] Past year emergency department visit: [<i>r</i> = 0.66 (0.60, 0.71)]</p> <p>At least one physical and mental disorder *ambulatory visits for other health reasons - males: [<i>r</i> = 0.01 (-0.09, 0.11)]</p> <p>At least one physical and mental disorder *Number of hospitalisations - males: [<i>r</i> = 0.22 (0.12, 0.31)]</p>	8
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103	Waern (2003)	N= Cases : 85 Contr ol: 153 Mean = not reported Range = 65+ % male = 54.1 %	Case control s	Elderly individuals who died by suicide compared to controls in Sweden	Suicide death	-	2 years	85	100% of cases	Diagnosis: Major depression - Cases: 21 (45.7%) - Controls: 2 (2.4%) - OR : 30.2 (6.5-139.3), p=0.0 Minor depression - Cases: 8 (17.4%) - Controls: 3 (3.6%) - OR : 8.2 (1.8-36.0), p=.006 Alcohol use disorder - Cases: 16 (34.8%) - Controls: 2 (2.4%) - OR : 18.4 (3.9-86.2), p=0.0	Diagnosis (male only: 130): Depression: [r = 0.68 (0.58, 0.76)] Minor depression: [r = 0.50 (0.36, 0.62)] Alcohol use disorder: [r = 0.63 (0.51, 0.72)] Gender differences: Depression - R = -0.01 [-0.21, 0.20] Minor depression - R = -0.01 [-0.22, 0.20] Alcohol use disorder - R = 0.19 [-0.03, 0.39]	8
104	Windsor-Shellard and Gunnell (2019)	N= 18,998 Mean = not reported Range = 20-64 % male = 56.3 %	Cohort	Individuals who died by suicide (England)	Suicide death	-	4 years	18,998	100%	Highest risk for: - Low skilled construction occupations: SMR = 285 (253-319) - Call and contact centre occupations: SMR = 237 (158-335) - Roofers, roof tilers and slaters: SMR = 235 (189-289)	Unable to compare specific occupations by gender	11
105	Yang et al. (2019)	N= Cases : 707 Contr ols: 90,204 Mean = Cases : 67 Contr ols: 72 % male = 100%	Case control s	Male patients with genital-system cancer (USA)	Suicide death	Cases without a diagnosis, or microscopic confirmation, only with autopsy findings, or incomplete variables were excluded.	11 years	707	100% of cases	Age at diagnosis: - 18-66: OR = 3.30 (2.70-4.0), p<.001 - 67-75: OR = 1.83 (1.49-2.26), p<.001 Marital status: - unmarried: OR = 1.33 (1.07-1.66), p=.01 - divorced, separated, widowed: OR = 1.34 (1.11-1.61), p=.002 Race: - Caucasian: OR = 2.07 (1.28-3.37), p=.003	Male only: Age at diagnosis: - 18-66: [r = 0.31 (0.30, 0.32)] - 67-75: [r = 0.16 (0.15, 0.17)] Marital status: - unmarried: [r = 0.08 (0.07, 0.09)] - divorced, separated, widowed : [r = 0.08	10

										<p>Surgery: - No/unknown : OR = 1.41 (1.19-1.67), p<.001</p> <p>Years elapsed from diagnosis: <1 OR = 1.76 (1.16-2.68), p=.008)</p>	<p>(0.07, 0.09])</p> <p>Race: - Caucasian: [r =0.20 (0.19, 0.21)]</p> <p>Surgery: - No/unknown: [r = 0.09 (0.08, 0.10)]</p> <p>Years elapsed from diagnosis: <1 [r = 0.15 (0.14, 0.16)]</p>	
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Appendix 6 - Number of Studies Based in Low/Middle- and High-Income Countries (World Bank, 2020) Investigating Suicide Attempts

Suicide Attempts in Prospective and Retrospective Studies		
Risk Factor	Low/Middle Income Countries	High-Income Countries
Number of Studies		
Sociodemographics		
Unmarried/Single/Divorced/Widowed	-	3
Unemployed	-	2
Low Level of Education	-	1
Short Stature	-	1
Same-Sex Relationship	-	-
Social and Material Deprivation	-	-
Living Alone	-	-
Ethnicity	-	-
Low Household Income	-	-
Small Circle of Friends	-	-
Physical Health/Illness		
Cancer	-	2
Underweight	-	1
Smoking	-	1
Obesity	-	-
Diabetes	-	-
Mental Health Problems/Psychiatric Illness		
Alcohol and/or Drug Use	-	5
Depression	1	5
Psychiatric Disorder	-	2
Personality Disorder	-	2
Anxiety	-	2
Affective Disorder	-	2
Psychiatric Inpatient Care	-	1
Schizophrenia	-	-
Bipolar Disorder	-	-
Neurotic Disorder	-	-
Psychological Factors		
Low IQ	-	2
Intelligence	-	1
Poor Emotional Control	-	1
Negative Life Events/Trauma		

Adverse Childhood Experiences	-	2
Criminal Activity	-	1
Bereavement	-	-
Characteristics of Suicidal Behaviour		
Previous Attempts	-	2

Appendix 7 - Number of Studies Based in Low/Middle- and High-Income Countries (World Bank, 2020) Investigating Suicide Death

Suicide Death in Prospective and Retrospective Studies		
Risk Factor	Low/Middle Income Countries	High-Income Countries
Number of Studies		
Sociodemographics		
Unmarried/Single/Divorced/Widowed	-	20
Low Level of Education	-	11
Unemployed	-	7
Living Alone	-	4
Social and Material Deprivation	-	3
Same-Sex Relationship	-	2
Ethnicity	-	2
Low Household Income	-	2
Short Stature	-	1
Small Circle of Friends	-	2
Physical Health/Illness		
Cancer	-	7
Smoking	-	6
Underweight	-	5
Obesity	-	2
Diabetes	-	2
Physical Health Problems	1	2
Mental Health Problems/Psychiatric Illness		
Alcohol and/or Drug Use	-	19
Depression	-	15
Psychiatric Disorder	-	12
Personality Disorder	-	7
Anxiety	-	6
Schizophrenia	-	5
Bipolar Disorder	-	4
Neurotic Disorder	-	2
Affective Disorder	-	2
Psychiatric Inpatient Care	-	2
Current Use of Psychiatric Medication	-	2
Mental Health Comorbidities	-	2
Psychological Factors		
Low IQ	-	4
Poor Emotional Control	-	3
Intelligence	-	1
Negative Life Events/Trauma		

Adverse Childhood Experiences	-	4
Bereavement	-	4
Criminal Activity	-	3
Recent Crisis	-	3

Characteristics of Suicidal Behaviour

Previous Attempts	-	6
Disclosing Intent	-	3
Lethal/High-Risk Methods	-	3

Appendix 8 - Demographic characteristics, health and psychosocial factors by suicidal history

(N (%) or M (SD))			
Psychosocial Factor	No Suicidal History	Suicidal Thoughts	Suicide Attempts
Sociodemographics			
Age	16-34: 1209 (16.0%) 35-54: 1901 (25.2%) 55-74: 1997 (26.5%) 75+: 1002 (13.3%)	16-34: 243 (3.2%) 35-54: 379 (5.0%) 55-74: 280 (3.7%) 75+: 50 (0.7%)	16-34: 143 (1.9%) 35-54: 194 (2.6%) 55-74: 138 (1.8%) 75+: 10 (0.1%)
Marital Status			
Same-sex couple	5 (83.3%)	1 (16.7%)	0 (0%)
Divorced or separated	702 (72.5%)	113 (11.7%)	153 (15.8%)
Widowed	764 (89.6%)	23 (2.7%)	66 (7.7%)
Single	1129 (71.1%)	186 (11.7%)	273 (17.2%)
Married or cohabitating (ref)	3533 (85.5%)	161 (3.9%)	437 (10.6%)
Ethnicity			
Mixed/multiple ethnicities/other ethnic groups	117 (77.5%)	22 (14.6%)	12 (7.9%)
Asian/Asian British	314 (88.0%)	25 (7.0%)	18 (5.0%)
Black/African/Caribbean/black British	158 (80.2%)	28 (14.2%)	11 (5.6%)
White (ref)	5518 (81.0%)	853 (12.5%)	442 (6.5%)
Education			
No qualifications	150 (2.0%)	15 (0.2%)	10 (0.1%)
Below degree level qualifications	2691 (35.7%)	470 (6.2%)	252 (3.3%)
Degree level qualification (ref)	1427 (18.9%)	290 (3.8%)	75 (1.0%)
Employment			
Economically inactive	2763 (36.6%)	337 (4.5%)	232 (3.1%)
Unemployed	148 (2.0%)	44 (0.6%)	26 (0.3%)
In employment (ref)	3198 (42.4%)	571 (7.6%)	227 (3.0%)
QIMD			
34.17 -> 87.80 most deprived	1067 (14.1%)	185 (2.5%)	170 (2.3%)
21.35 -> 34.17	1155 (15.3%)	188 (2.5%)	114 (1.5%)
13.79->21.35	1283 (17.0%)	190 (2.5%)	90 (1.2%)
8.49 -> 13.79	1269 (16.8%)	221 (3.9%)	60 (0.8%)
0.53 -> 8.49 least deprived (ref)	1335 (17.7%)	168 (2.2%)	51 (0.7%)
Rurality			

Village, hamlet and isolated dwellings	617 (8.2%)	83 (1.1%)	20 (0.3%)
Town & fringe	631 (8.4%)	108 (1.4%)	46 (0.6%)
Urban (ref)	4861 (64.4%)	761 (10.1%)	419 (5.6%)
Health			
General Health (SF1)	3.49 (1.12)	3.23 (1.15)	2.72 (1.25)
Multimorbidity	2.40 (2.14)	2.85 (2.29)	3.64 (2.61)
Smoking History			
Ever smoked	2495 (33.1%)	289 (3.8%)	95 (1.3%)
Never smoked (ref)	3608 (47.8%)	661 (8.8%)	387 (5.1%)
Mental Health and Wellbeing			
Self-diagnosis - self report of having ever had any of 8 CMD			
Yes	2310 (30.6%)	755 (10.0%)	439 (5.8%)
No (ref)	3796 (50.3%)	196 (2.6%)	46 (0.6%)
Prof diagnosis - ever diagnosed with any of 8 CMD			
Yes	1337 (17.7%)	565 (7.5%)	400 (5.3%)
No (ref)	4761 (63.1%)	385 (5.1%)	84 (1.1%)
Ever admitted to hospital or ward specialising in mental health			
Yes	75 (1.0%)	34 (0.5%)	103 (1.4%)
No (ref)	6034 (80.0%)	918 (12.1%)	382 (5.1%)
Life Experiences			
Childhood Adversity	.88 (.88)	1.30 (1.12)	2.04 (1.79)
Trauma	3.57 (2.32)	5.27 (2.96)	6.81 (3.58)
Social Support	20.11 (2.36)	19.68 (2.52)	18.64 (3.67)

Appendix 9 - Demographic characteristics, health, psychosocial factors and suicidal history by gender

Gender Differences in Descriptive Statistics (N (%)* or M (SD))						
Psychosocial Factor	No Suicidal History		Suicidal Thoughts		Suicide Attempts	
	Males	Females	Males	Females	Males	Females
Sociodemographics						
Age	16-34: 491 (16.1%) 35-54: 759 (24.8%) 55-74: 907 (29.7%) 75+: 398 (13.0%)	16-34: 718 (16.0%) 35-54: 1142 (25.4%) 55-74: 1090 (24.3%) 75+: 604 (13.5%)	16-34: 76 (2.5%) 35-54: 142 (4.6%) 55-74: 121 (4.0%) 75+: 17 (0.6%)	16-34: 167 (3.7%) 35-54: 237 (5.3%) 55-74: 159 (3.5%) 75+: 33 (0.7%)	16-34: 37 (1.2%) 35-54: 56 (1.8%) 55-74: 51 (1.7%) 75+: 3 (0.1%)	16-34: 106 (22.1%) 35-54: 138 (33.8%) 55-74: 87 (1.9%) 75+: 7 (0.2%)
Marital Status						
Same-sex couple	0 (0%)	5 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)
Divorced or separated	250 (76.5%)	452 (70.5%)	22 (6.7%)	91 (14.2%)	55 (16.8%)	98 (15.3%)
Widowed	196 (91.6%)	568 (88.9%)	6 (2.8%)	17 (2.7%)	12 (5.6%)	54 (8.5%)
Single	528 (74.3%)	601 (68.5%)	65 (9.1%)	121 (13.8%)	118 (16.6%)	155 (17.7%)
Married or cohabitating (ref)	1589 (88.0%)	1944 (83.6%)	53 (2.9%)	108 (4.6%)	163 (9.0%)	274 (11.8%)
Ethnicity						
mixed/multiple ethnicities/other ethnic groups	51 (89.5%)	66 (70.2%)	4 (7.0%)	10 (10.6%)	2 (3.5%)	18 (19.1%)
Asian/Asian British	138 (90.8%)	176 (85.9%)	7 (4.6%)	11 (5.4%)	7 (4.6%)	18 (8.8%)
black/African/Caribbean/black British	55 (82.1%)	103 (79.2%)	8 (11.9%)	7 (5.4%)	4 (6.0%)	20 (15.4%)
white (ref)	2312 (83.3%)	3206 (79.4%)	328 (11.8%)	308 (7.6%)	134 (4.8%)	525 (13.0%)
Education						
no qualifications	72 (2.4%)	78 (1.7%)	4 (0.1%)	11 (0.2%)	5 (0.2%)	5 (0.1%)
Below degree level qualifications	1170 (38.3%)	1521 (33.9%)	186 (6.1%)	284 (6.3%)	72 (2.4%)	180 (4.0%)
degree level qualification (ref)	590 (19.3%)	837 (18.6%)	104 (3.4%)	186 (4.1%)	23 (0.8%)	52 (1.2%)
Employment						
economically inactive	1052 (34.4%)	1711 (38.1%)	117 (3.8%)	220 (4.9%)	78 (2.6%)	154 (3.4%)
unemployed	75 (2.5%)	73 (1.6%)	14 (0.5%)	30 (0.7%)	10 (0.3%)	16 (0.4%)
In employment (ref)	1428 (46.7%)	1770 (39.4%)	225 (7.4%)	346 (7.7%)	59 (1.9%)	168 (3.7%)
QIMD						
34.17 -> 87.80 most deprived	431 (14.1%)	636 (14.2%)	68 (2.2%)	117 (2.6%)	54 (1.8%)	116 (2.6%)
21.35 -> 34.17	462 (15.1%)	693 (15.4%)	78 (2.6%)	110 (2.5%)	31 (1.0%)	83 (1.8%)

13.79->21.35	519 (17.0%)	764 (17.0%)	69 (2.3%)	121 (2.7%)	28 (0.9%)	62 (1.4%)
8.49 -> 13.79	537 (17.6%)	732 (16.3%)	82 (2.7%)	139 (3.1%)	17 (0.6%)	43 (1.0%)
0.53 -> 8.49 least deprived (ref)	606 (19.8%)	729 (16.2%)	59 (1.9%)	109 (2.4%)	17 (0.6%)	34 (0.8%)
Rurality						
village, hamlet and isolated dwellings	287 (9.4%)	330 (7.4%)	29 (0.9%)	54 (1.2%)	7 (0.2%)	13 (0.3%)
town & fringe	299 (9.8%)	332 (7.4%)	39 (1.3%)	69 (1.5%)	15 (0.5%)	31 (0.7%)
urban (ref)	1969 (64.4%)	2892 (64.4%)	288 (9.4%)	473 (10.5%)	125 (4.1%)	294 (6.6%)
Health						
General Health (SF1)	3.48 (1.13)	3.48 (1.12)	3.17 (1.15)	3.27 (1.14)	2.60 (1.32)	2.77 (1.22)
Multimorbidity	2.29 (2.10)	2.49 (2.17)	2.76 (2.29)	2.90 (2.29)	3.54 (2.57)	3.69 (2.62)
Smoking History						
ever smoked	864 (28.3%)	1631 (36.3%)	92 (3.0%)	197 (4.4%)	27 (0.9%)	68 (1.5%)
never smoked (ref)	1689 (55.2%)	1919 (42.8%)	262 (8.6%)	399 (8.9%)	118 (3.9%)	269 (6.0%)
Mental Health and Wellbeing						
Self-diagnosis - self report of having ever had any of 8 CMD						
yes	755 (24.7%)	1555 (34.6%)	263 (8.6%)	492 (11.0%)	126 (4.1%)	313 (7.0%)
no (ref)	1799 (58.8%)	1997 (44.5%)	93 (3.0%)	103 (2.3%)	21 (0.7%)	25 (0.6%)
Prof diagnosis - ever diagnosed with any of 8 CMD						
yes	371 (12.1%)	966 (21.5%)	184 (6.0%)	381 (8.5%)	114 (3.7%)	286 (6.4%)
no (ref)	2180 (71.3%)	2581 (57.5%)	171 (5.6%)	214 (4.8%)	33 (1.1%)	51 (1.1%)
Ever admitted to hospital or ward specialising in mental health						
yes	31 (1.0%)	44 (1.0%)	17 (0.6%)	17 (0.4%)	33 (1.1%)	70 (1.6%)
no (ref)	2524 (82.5%)	3510 (78.2%)	339 (11.1%)	579 (12.9%)	114 (3.7%)	268 (6.0%)
Life Experiences						
Childhood Adversity	.83 (.89)	.91 (.88)	1.24 (1.08)	1.34 (1.14)	1.85 (1.70)	2.12 (1.83)
Trauma	3.85 (2.47)	3.37 (2.19)	5.80 (3.10)	4.94 (2.83)	7.18 (3.68)	6.64 (3.54)
Social Support	19.89 (2.50)	20.27 (2.24)	19.33 (2.83)	19.89 (2.30)	17.29 (4.24)	19.23 (3.22)

Appendix 10 - Suicidal thoughts and behaviours

	Prevalence N (%)	Sex Differences OR (95% CI)
Missing Data/Refused to Answer/Don't Know		
Men	206 (6.7%)	
Women (reference category)	340 (7.6%)	
All	546 (7.2%)	
No Suicidal History		
Men	2357 (77.1%)	Reference category
Women	3230 (71.0%)	
All	5587 (75.0%)	
Suicidal Thoughts and Attempts		
Men	142 (4.6%)	.62 [.51, .76]***
Women (reference category)	314 (7.0%)	
All	456 (6.0%)	
Suicidal Thoughts (No Attempts)		
Men	348 (11.4%)	.82 [.71, .95]**
Women (reference category)	581 (12.9%)	
All	929 (12.3%)	
Suicide Attempt(s) (No Thoughts)		
Men	5 (0.2%)	.30 [.11, .79]*
Women (reference category)	23 (0.5%)	
All	28 (0.4%)	

Appendix 11 - Help-seeking following a suicide attempt in males and females

Help-seeking Tried to get help from:	Number (%)			
	Males		Females	
	Not mentioned	Mentioned	Not mentioned	Mentioned
Anyone	73 (50.0%)	73 (50%)	181 (53.7%)	156 (46.3%)
A friend	54 (74.0%)	19 (26.0%)	150 (77.3%)	41 (22.7%)
A family member	55 (75.3%)	18 (24.7%)	139 (76.8%)	42 (23.2%)
A neighbour	71 (97.3%)	2 (2.7%)	176 (97.2%)	5 (2.8%)
GP/Family doctor	33 (45.2%)	40 (54.8%)	90 (49.7%)	91 (50.3%)
A hospital	42 (57.5%)	31 (42.5%)	103 (56.9%)	78 (43.1%) ⁴
Someone else	72 (98.6%)	1 (1.4%)	181 (100%)	0 (0%)
Mental health professional	69 (94.5%)	4 (5.5%)	170 (93.9%)	11 (6.1%)
Helpline number/support group	72 (98.6%)	1 (1.4%)	178 (98.3%)	3 (1.7%)
Other	71 (97.3%)	2 (2.7%)	178 (98.3%)	3 (1.7%)

Appendix 12 - Gender Differences in Mental Illness Variables

Mental Illness	Men N (%)		Women N (%)	
	Mentioned	Not mentioned	Mentioned	Not mentioned
Self-diagnosed				
Depression	811 (26.5%)	2246 (73.5%)	1467 (32.7%)	3018 (67.3%)
Post-Natal Depression	2 (0.1%)	3055 (99.9%)	464 (10.3%)	4021 (89.7%)
Nervous Breakdown	129 (4.2%)	2928 (95.8%)	220 (4.9%)	4265 (95.1%)
Obsessive Compulsive Disorder	115 (3.8%)	2942 (96.2%)	162 (3.6%)	4323 (96.4%)
Seasonal Affective Disorder	103 (3.4%)	2954 (96.6%)	218 (4.9%)	4267 (95.1%)
Panic Attacks	408 (13.3%)	2649 (86.7%)	1104 (24.6%)	3381 (75.4%)
Phobia	217 (7.1%)	2840 (92.9%)	443 (9.9%)	4042 (90.1%)
Post-Traumatic Stress Disorder	94 (3.1%)	2963 (96.9%)	180 (4.0%)	4305 (96.0%)
Professional diagnosis				
Depression	556 (18.2%)	2499 (81.8%)	1196 (26.7%)	3284 (73.3%)
Post-Natal Depression	0 (0%)	3057 (100%)	340 (7.6%)	4144 (92.4%)
Nervous Breakdown	92 (3.0%)	2962 (97.0%)	158 (3.5%)	4325 (96.5%)
Obsessive Compulsive Disorder	29 (0.9%)	3028 (99.1%)	57 (1.3%)	4428 (98.7%)
Seasonal Affective Disorder	15 (0.5%)	3042 (99.5%)	40 (0.9%)	4444 (99.1%)
Panic Attacks	217 (7.1%)	2839 (92.9%)	685 (15.3%)	3795 (84.7%)
Phobia	31 (1.0%)	3025 (99.0%)	66 (1.5%)	4418 (98.5%)
Post-Traumatic Stress Disorder	53 (1.7%)	3004 (98.3%)	106 (2.4%)	4378 (97.6%)

Appendix 13 - Multinomial logistic regression of demographic characteristics, health and psychosocial factors variables associated with suicidal history group membership

Full Ideation to Action Model												
Model Variables	Suicidal Ideation vs No Suicidal History				Suicide Attempts vs No Suicidal History				Suicidal Thoughts vs Suicide Attempts			
	Unadjusted OR	P value	Fully Adjusted OR	P value	Unadjusted OR	P value	Fully Adjusted OR	P value	Unadjusted OR	P value	Fully Adjusted OR	P value
Sociodemographics												
Age	.71 [.66, .77]	<.0001	.72 [.64, .80]	<.0001	.63 [.57, .69]	<.0001	.51 [.43, .61]	<.0001	.88 [.78, .99]	.03	.71 [.59, .86]	<.0001
Sex												
male	.83 [.72, .96]	.01	.99 [.84, 1.17]	.94	.61 [.50, .74]	<.0001	.71 [.55, .91]	.008	.83 [.72, .96]	.01	.73 [.55, .95]	.02
female (ref)												
Marital Status												
Same-sex couple	-	-	-	-	4.39 [.51, 37.78]	.18	.30 [.02, 5.01]	.40	-	-	-	-
Divorced or separated	1.76 [1.44, 2.16]	<.0001	1.26 [1.00, 1.58]	.05	3.53 [2.74, 4.55]	<.0001	1.55 [1.12, 2.13]	.007	2.01 [1.48, 2.71]	<.0001	1.26 [.90, 1.77]	.19
Widowed	.70 [.53, .92]	.009	1.34 [.97, 1.84]	.07	.66 [.42, 1.03]	.07	1.16 [.67, 1.98]	.60	.95 [.57, 1.57]	.83	.89 [.50, 1.58]	.69
Single	1.96 [1.66, 2.31]	<.0001	1.61 [1.32, 1.95]	<.0001	3.62 [2.90, 4.51]	<.0001	2.23 [1.68, 2.96]	<.0001	1.85 [1.43, 2.40]	<.0001	1.36 [1.01, 1.84]	.04
Married or cohabitating (ref)												
Ethnicity												
mixed/multiple ethnicities/other ethnic groups	1.22 [.77, 1.93]	.41	1.27 [.76, 2.12]	.36	1.28 [.70, 2.34]	.42	1.26 [.60, 2.67]	.54	1.05 [.52, 2.15]	.89	-	-
Asian/Asian British	.52 [.34, .78]	.002	.76 [.48, 1.19]	.23	.72 [.44, 1.16]	.18	1.42 [.77, 2.62]	.26	1.39 [.75, 2.57]	.30	-	-
black/African/Caribbean/black British	1.15 [.76, 1.72]	.51	.95 [.59, 1.53]	.85	.87 [.47, 1.61]	.66	.52 [.25, 1.11]	.09	.76 [.37, 1.54]	.44	-	-

white (ref)												
Education												
no qualifications	.47 [.27, .82]	.00 8	.63 [.34, 1.15]	.13	1.27 [.64, 2.50]	.50	1.53 [.67, 3.49]	.31	2.70 [1.15, 6.31]	.02	2.43 [.98, 6.03]	.06
Below degree level qualifications	.86 [.73, 1.01]	.07	.71 [.59, .85]	<.0 001	1.78 [1.37, 2.34]	<.0 001	1.17 [.85, 1.59]	.34	2.07 [1.54, 2.79]	<.0 001	1.63 [1.1 8, 2.25]	.00 3
3 - degree level qualification (ref)												
Employment												
economically inactive	.69 [.60, .80]	<.0 001	.85 [.70, 1.02]	.09	1.18 [.98, 1.43]	.09	.81 [.62, 1.08]	.15	1.71 [1.36, 2.15]	<.0 001	.98 [.73, 1.31]	.87
unemployed	1.62 [1.14, 2.31]	.00 8	1.11 [.74, 1.65]	.62	2.45 [1.58, 3.80]	<.0 001	1.01 [.59, 1.74]	.96	1.52 [1.91, 2.53]	.11	.92 [.53, 1.62]	.78
In employment (ref)												
QIMD												
34.17 -> 87.80 most deprived	1.36 [1.09, 1.70]	.00 8	.94 [.73, 1.23]	.67	4.13 [2.99, 5.71]	<.0 001	1.53 [1.0 3, 2.28]	.04	3.04 [2.08, 4.43]	<.0 001	1.58 [1.0 3, 2.42]	.04
21.35 -> 34.17	1.30 [1.04, 1.62]	.02	1.02 [.79, 1.32]	.87	2.58 [1.84, 3.63]	<.0 001	1.31 [.87, 1.96]	.20	2.00 [1.35, 2.95]	.00 1	1.27 [.82, 1.95]	.27
13.79->21.35	1.13 [.90, 1.41]	.29	.95 [.74, 1.22]	.70	1.83 [1.28, 2.60]	.00 1	1.06 [.71, 1.61]	.77	1.62 [1.08, 2.42]	.02	1.12 [.73, 1.73]	.61
8.49 -> 13.79	1.36 [1.09, 1.69]	.00 6	1.25 [.99, 1.59]	.06	1.23 [.84, 1.81]	.28	.99 [.64, 1.53]	.97	.91 [1.59, 1.39]	.66	.80 [.50, 1.25]	.31
0.53 -> 8.49 least deprived (ref)												
Rurality												
village, hamlet and isolated dwellings	.85 [.66, 1.09]	.19	.95 [.72, 1.25]	.70	.38 [.24, .60]	<.0 001	.75 [.44, 1.27]	.29	.44 [1.27, .74]	.00 2	.77 [.44, 1.33]	.35
town & fringe	1.11 [.90, 1.34]	.34	1.21 [.94, 1.55]	.14	.85 [.62, 1.17]	.31	1.19 [.80, 1.76]	.39	.76 [1.53, 1.10]	.15	.97 [.65, 1.46]	.89
urban (ref)												
Health												
Health in general (SF1)	.83 [.78, .88]	<.0 001	.89 [.83, .97]	.00 5	.57 [.53, .62]	<.0 001	.83 [.74, .92]	.00 1	.70 [1.63, .76]	<.0 001	.92 [.81, 1.03]	.16

Multimorbidity	1.09 [1.06, 1.13]	<.0 001	1.03 [.99, 1.07]	.18	1.23 [1.19, 1.28]	<.0 001	1.14 [1.0 8, 1.20]	<.0 001	1.13 [1.08, 1.18]	<.0 001	1.10 [1.0 4, 1.17]	.00 1
Smoking History												
ever smoked	.63 [.55, .74]	<.0 001	.84 [.71, 1.00]	.04	.36 [.28, .45]	<.0 001	.63 [.48, .83]	.00 1	.56 [.43, .73]	<.0 001	.77 [.58, 1.03]	.07
never smoked (ref)												
Mental Health and Wellbeing												
Self-diagnosis - self report of having ever had any of 8 CMD												
yes	6.68 [5.64, 7.92]	<.0 001	3.17 [2.5 3, 3.97]	<.0 001	15.63 [11.48 , 21.27]	<.0 001	1.91 [1.2 1, 3.01]	.00 6	2.34 [1.66, 3.30]	<.0 001	.60 [.37, .97]	.04
no (ref)												
Prof diagnosis - ever diagnosed with any of 8 CMD												
yes	5.28 [4.57, 6.11]	<.0 001	1.92 [1.5 8, 2.35]	<.0 001	16.82 [13.19 , 21.45]	<.0 001	4.36 [3.0 0, 6.34]	<.0 001	3.18 [2.43, 4.17]	<.0 001	2.27 [1.5 4, 3.37]	<.0 001
no (ref)												
Ever admitted to hospital or ward specialising in mental health												
yes	3.07 [2.03, 4.63]	<.0 001	1.17 [.75, 1.82]	.48	21.84 [15.94 , 29.92]	<.0 001	5.24 [3.5 3, 7.78]	<.0 001	7.12 [4.74, 10.68]	<.0 001	4.54 [2.9 3, 7.03]	<.0 001
no (ref)												
Life Experiences												
Childhood Adversity	1.52 [1.43, 1.62]	<.0 001	1.23 [1.1 4, 1.32]	<.0 001	2.10 [1.96, 2.26]	<.0 001	1.61 [1.3 9, 1.65]	<.0 001	1.38 [1.28, 1.49]	<.0 001	1.23 [1.1 3, 1.34]	<.0 001
Trauma	1.28 [1.25, 1.31]	<.0 001	1.16 [1.1 3, 1.20]	<.0 001	1.47 [1.42, 1.51]	<.0 001	1.23 [1.1 8, 1.28]	<.0 001	1.15 [1.11, 1.19]	<.0 001	1.05 [1.0 1, 1.10]	.01
Social Support Score	.94 [.91, .96]	<.0 001	.95 [.92, .99]	.00 4	.87 [.85, .89]	<.0 001	.93 [.89, .97]	<.0 001	.93 [.90, .95]	<.0 001	.98 [.94, 1.02]	.25

Appendix 14 - Multinomial logistic regression of demographic characteristics, health and psychosocial factors associated with suicidal history group membership in males

Full Ideation to Action Model in Males												
Model Variables	Suicidal Ideation vs No Suicidal History				Suicide Attempts vs No Suicidal History				Suicidal Thoughts vs Suicide Attempts			
	Unadjusted OR	P value	Fully Adjusted OR	P value	Unadjusted OR	P value	Fully Adjusted OR	P value	Unadjusted OR	P value	Fully Adjusted OR	P value
Sociodemographics												
Age	.76 [.67, .85]	<.0001	.88 [.74, 1.06]	.18	.69 [.57, .82]	<.0001	.57 [.45, .73]	<.0001	.91 [.74, 1.12]	.36	-	-
Marital Status												
Same-sex couple	-	-	-	-	-	-	-	-	-	-	-	-
Divorced or separated	2.28 [1.64, 3.16]	<.0001	1.40 [.97, 2.02]	.07	2.53 [1.53, 4.17]	<.0001	.73 [.44, 1.22]	.23	1.22 [.68, 2.19]	.50	.68 [.38, 1.23]	.20
Widowed	.71 [.41, 1.24]	.23	1.17 [.66, 2.08]	.59	.93 [.41, 2.11]	.87	1.19 [.55, 2.55]	.66	1.52 [.54, 4.22]	.43	.91 [.34, 2.43]	.85
Single	2.29 [1.78, 2.95]	<.0001	1.84 [1.36, 2.48]	<.0001	4.29 [3.02, 6.09]	<.0001	1.57 [1.05, 2.36]	.03	1.72 [1.12, 2.65]	.01	1.14 [.73, 1.79]	.56
Married or cohabitating (ref)												
Ethnicity												
mixed/multiple ethnicities/other ethnic groups	.55 [.20, 1.54]	.26	.79 [.29, 2.13]	.64	.68 [.16, 2.81]	.59	1.09 [.34, 3.45]	.89	1.22 [.22, 6.76]	.82	-	-
Asian/Asian British	.36 [.17, .77]	.009	.73 [.37, 1.46]	.38	.88 [.40, 1.91]	.74	1.62 [.74, 3.58]	.23	2.45 [.84, 7.11]	.10	-	-
black/African/Caribbean/black British	1.03 [.48, 2.17]	.95	.98 [.43, 2.27]	.97	1.26 [.45, 3.51]	.67	.76 [.27, 2.14]	.61	1.22 [.36, 4.13]	.75	-	-
white (ref)												
Education												
no qualifications	.32 [.12, .90]	.03	.48 [.19, 1.21]	.12	1.79 [.66, 4.85]	.25	1.63 [.62, 4.26]	.32	5.54 [1.38, 22.27]	.02	3.28 [.86, 12.44]	.08
Below degree level qualifications	.89 [.67, 1.16]	.40	.75 [.57, .98]	.05	1.58 [.98, 2.55]	.06	1.00 [.65, 1.54]	1.00	1.76 [1.04, 2.99]	.04	1.36 [.82, 2.14]	.24

			1.00]				1.54]				2.24]	
degree level qualification (ref)												
Employment												
economically inactive	.74 [.58, .93]	.01	.74 [.54, 1.00]	.05	1.81 [1.28, 2.55]	.00 1	1.32 [.88, 1.98]	.18	2.45 [1.63, 3.68]	<.0 001	1.21 [.76, 1.94]	.4 1
unemployed	1.24 [.69, 2.22]	.48	.62 [.32, 1.20]	.15	3.25 [1.60, 6.60]	.00 1	1.03 [.49, 2.17]	.93	2.63 [1.11, 6.22]	.03	1.51 [.64, 3.59]	.3 5
In employment (ref)												
QIMD												
34.17 -> 87.80 most deprived	1.60 [1.10, 2.32]	.01	1.00 [.66, 1.52]	.99	4.45 [2.55, 7.79]	<.0 001	1.56 [.92, 2.65]	.10	2.79 [1.46, 5.34]	.00 2	1.59 [.83, 3.06]	.1 6
21.35 -> 34.17	1.77 [1.23, 2.53]	.00 2	1.25 [.85, 1.82]	.25	2.40 [1.31, 4.38]	.00 5	.89 [.52, 1.54]	.68	1.36 [.69, 2.68]	.38	.92 [.47, 1.77]	.7 9
13.79->21.35	1.32 [.91, 1.92]	.14	1.10 [.75, 1.60]	.63	1.92 [1.04, 3.54]	.04	1.03 [.61, 1.74]	.92	1.45 [.72, 2.91]	.30	1.06 [.55, 2.03]	.8 7
8.49 -> 13.79	1.55 [1.09, 2.22]	.02	1.38 [.97, 1.98]	.08	1.13 [.57, 2.23]	.73	.92 [.53, 1.59]	.77	.73 [.34, 1.54]	.40	.71 [.36, 1.39]	.3 1
0.53 -> 8.49 least deprived (ref)												
Rurality												
village, hamlet and isolated dwellings	.71 [.48, 1.07]	.10	.87 [.58, 1.30]	.49	.39 [.18, .83]	.02	.99 [.49, 1.63]	.72	.54 [.23, 1.27]	.16	.94 [.44, 1.99]	.8 7
town & fringe	.92 [.65, 1.32]	.65	.95 [.65, 1.39]	.80	.79 [.46, 1.37]	.41	.97 [.58, 1.64]	.91	.86 [.46, 1.62]	.64	.95 [.51, 1.79]	.8 8
urban (ref)												
Health												
Health in general (SF1)	.79 [.72, .87]	<.0 001	.89 [.79, 1.01]	.07	.53 [.46, .61]	<.0 001	.85 [.73, .99]	.04	.67 [.57, .79]	<.0 001	.97 [.80, 1.17]	.7 6
Multimorbidity	1.11 [1.06, 1.16]	<.0 001	1.00 [.94, 1.07]	.99	1.25 [1.17, 1.33]	<.0 001	1.11 [1.0 2, 1.20]	.02	1.13 [1.04, 1.21]	.00 2	1.06 [.97, 1.16]	.2 2
Smoking History												
ever smoked	.68 [.53, .87]	.00 3	.91 [.70, 1.17]	.44	.45 [.29, .69]	<.0 001			.66 [.41, 1.07]	.09	1.01 [.64, 1.58]	.9 8
never smoked (ref)												
Mental Health and Wellbeing												

Self-diagnosis - self report of having ever had any of 8 CMD												
yes	7.15 [5.53, 9.25]	<.0001	2.42 [1.77, 3.31]	<.0001	14.31 [8.94, 22.88]	<.0001	.84 [.49, 1.43]	.51	2.00 [1.19, 3.37]	.009	.43 [.22, .84]	.01
no (ref)												
Prof diagnosis - ever diagnosed with any of 8 CMD												
yes	6.46 [5.10, 8.20]	<.0001	3.06 [2.22, 4.23]	<.0001	20.25 [13.54, 30.28]	<.0001	9.62 [5.67, 16.32]	<.0001	3.13 [2.02, 4.87]	<.0001	2.72 [1.48, 5.00]	.001
no (ref)												
Ever admitted to hospital or ward specialising in mental health												
yes	4.20 [2.30, 7.66]	<.0001	.72 [.05, 11.19]	.81	23.64 [13.99, 39.97]	<.0001	139.59 [37.04, 526.04]	<.0001	5.64 [3.02, 10.51]	<.0001	.79 [.32, 1.97]	.62
no (ref)												
Life Experiences												
Childhood Adversity	1.49 [1.35, 1.66]	<.0001	1.16 [1.02, 1.32]	.02	2.02 [1.78, 2.29]	<.0001	1.75 [1.52, 2.02]	<.0001	1.35 [1.18, 1.55]	<.0001	1.28 [1.10, 1.49]	.001
Trauma	1.29 [1.24, 1.34]	<.0001	1.16 [1.10, 1.21]	<.0001	1.44 [1.37, 1.52]	<.0001	1.23 [1.16, 1.31]	<.0001	1.12 [1.06, 1.19]	<.0001	1.03 [.97, 1.10]	.36
Social Support Score	.93 [.89, .97]	<.0001	.996 [.94, 1.05]	.87	.83 [.79, .86]	<.0001	.81 [.77, .86]	<.0001	.90 [.85, .93]	<.0001	.91 [.86, .96]	.001

Appendix 15 - Multinomial logistic regression of demographic characteristics, health and psychosocial factors associated with suicidal history in females

Full Ideation to Action Model in Females												
Model Variables	Suicidal Ideation vs No Suicidal History				Suicide Attempts vs No Suicidal History				Suicidal Thoughts vs Suicide Attempts			
	Unadjusted OR	P value	Fully Adjusted OR	P value	Unadjusted OR	P value	Fully Adjusted OR	P value	Unadjusted OR	P value	Fully Adjusted OR	P value
Sociodemographics												
Age	.69 [.63, .76]	<.0001	.69 [.59, .80]	<.0001	.61 [.54, .69]	<.0001	.50 [.41, .63]	<.0001	.88 [.76, 1.01]	.08	-	-
Marital Status												
Same-sex couple	-	-	-	-	-	-	-	-	-	-	-	-
Divorced or separated	1.54 [1.20, 1.98]	.001	1.18 [.88, 1.57]	.27	3.62 [2.69, 4.88]	<.0001	1.81 [1.24, 2.65]	.002	2.36 [1.64, 3.38]	<.0001	1.44 [.96, 2.15]	.19
Widowed	.68 [.50, .92]	.01	1.37 [.94, 1.99]	.10	.54 [.32, .91]	.02	1.08 [.57, 2.04]	.82	.80 [.44, 1.44]	.45	.65 [.34, 1.24]	.19
Single	1.83 [1.47, 2.27]	<.0001	1.43 [1.1, 1.85]	.006	3.62 [2.75, 4.77]	<.0001	2.27 [1.60, 3.24]	<.0001	1.98 [1.43, 2.74]	<.0001	1.71 [1.18, 2.46]	.004
Married or cohabitating (ref)												
Ethnicity												
mixed/multiple ethnicities/other ethnic groups	1.67 [.98, 2.83]	.06	1.62 [.90, 2.94]	.11	1.58 [.80, 3.10]	.19	1.40 [.60, 3.28]	.43	.95 [.43, 2.08]	.95	-	-
Asian/Asian British	.63 [.38, 1.02]	.06	.88 [.51, 1.52]	.64	.65 [.35, 1.21]	.17	1.30 [.59, 2.86]	.51	1.04 [.49, 2.23]	.92	-	-
black/African/Caribbean/black British	1.19 [.73, 1.93]	.49	1.06 [.60, 1.88]	.84	.71 [.33, 1.54]	.38	.44 [.17, 1.14]	.09	.60 [.25, 1.43]	.25	-	-
white (ref)												
Education												
no qualifications	.59 [.30, 1.16]	.13	.94 [.44, 2.00]	.87	1.03 [.40, 2.64]	.96	1.40 [.45, 4.38]	.56	1.74 [.57, 5.32]	.33	1.35 [.41, 4.53]	.62
Below degree level qualifications	.85 [.69, 1.04]	.11	.70 [.56, .88]	.003	1.91 [1.39, 2.63]	<.0001	1.31 [.90, 2.93]	.16	2.25 [1.57, 3.23]	<.0001	1.90 [1.28, 2.81]	.001

											2.82	
]	
degree level qualification (ref)												
Employment												
economically inactive	.65 [.54, .78]	<.0 001	.89 [.71, 1.13]	.35	.94 [.75, 1.18]	.61	.74 [.53, 1.04]	.08	1.44 [1.09, 1.91]	.01	.81 [.57, 1.16]	.25
unemployed	1.96 [1.25, 3.08]	.00 3	1.59 [.95, 2.65]	.08	2.26 [1.29, 3.96]	.00 5	1.11 [.55, 2.21]	.78	1.15 [.61, 2.19]	.66	.71 [.35, 1.42]	.33
In employment (ref)												
QIMD												
34.17 -> 87.80 most deprived	1.22 [.92, 1.62]	.18	.88 [.63, 1.23]	.46	3.86 [2.60, 5.75]	<.0 001	1.55 [.95, 2.54]	.08	3.18 [2.00, 5.05]	<.0 001	1.78 [1.0 6, 3.00]	.03
21.35 -> 34.17	1.05 [.79, 1.40]	.74	.90 [.65, 1.24]	.52	2.56 [1.70, 3.87]	<.0 001	1.49 [.91, 2.44]	.12	2.44 [1.51, 3.95]	<.0 001	1.66 [.98, 2.81]	.06
13.79->21.35	1.01 [.76, 1.34]	.95	.89 [.65, 1.21]	.45	1.73 [1.12, 2.66]	.01	1.06 [.64, 1.76]	.82	1.71 [1.05, 2.81]	.03	1.24 [.72, 2.11]	.44
8.49 -> 13.79	1.24 [.94, 1.63]	.12	1.16 [.86, 1.57]	.33	1.25 [.79, 1.99]	.34	1.00 [.59, 1.71]	.99	1.01 [.60, 1.70]	.97	.86 [.50, 1.51]	.61
0.53 -> 8.49 least deprived (ref)												
Rurality												
village, hamlet and isolated dwellings	.96 [.71, 1.31]	.81	1.02 [.72, 1.45]	.90	.39 [.22, .68]	.00 1	.72 [.37, 1.40]	.33	.40 [.22, .75]	.00 4	.68 [.34, 1.35]	.27
town & fringe	1.28 [.97, 1.70]	.08	1.39 [1.0 2, 1.90]	.04	.92 [.63, 1.36]	.68	1.39 [.86, 2.25]	.18	.72 [.46, 1.13]	.15	1.00 [.61, 1.64]	.99
urban (ref)												
Health												
Health in general (SF1)	.85 [.79, .92]	<.0 001	.91 [.83, 1.01]	.07	.59 [.54, .65]	<.0 001	.82 [.71, .94]	.00 5	.70 [.62, .78]	<.0 001	.90 [.78, 1.04]	.15
Multimorbidity	1.08 [1.04, 1.13]	<.0 001	1.03 [.98, 1.09]	.23	1.22 [1.17, 1.28]	<.0 001	1.14 [1.0 7, 1.22]	<.0 001	1.13 [1.07, 1.19]	<.0 001	1.07 [1.0 0, 1.15]	.04
Smoking History												
ever smoked	.59 [.49, .71]	<.0 001	.82 [.66, 1.00]	.05	.30 [.23, .39]	<.0 001	.58 [.42, .81]	.00 1	.51 [.37, .70]	<.0 001	.70 [.49, .98]	.04
never smoked (ref)												

Mental Health and Wellbeing												
Self-diagnosis - self report of having ever had any of 8 CMD												
yes	6.46 [5.14, 8.12]	<.0001	3.20 [2.37, 4.31]	<.0001	15.99 [10.58, 24.16]	<.0001	2.22 [1.24, 3.98]	.008	2.48 [1.56, 3.93]	<.0001	.71 [.38, 1.33]	.28
no (ref)												
Prof diagnosis - ever diagnosed with any of 8 CMD												
yes	4.78 [3.98, 5.76]	<.0001	1.75 [1.36, 2.25]	<.0001	14.83 [10.91, 20.16]	<.0001	3.37 [2.14, 5.31]	<.0001	3.10 [2.20, 4.37]	<.0001	2.02 [1.25, 3.26]	.004
no (ref)												
Ever admitted to hospital or ward specialising in mental health												
yes	2.42 [1.37, 4.26]	.002	1.02 [.56, 1.86]	.95	21.01 [14.13, 31.25]	<.0001	6.43 [3.91, 10.56]	<.0001	8.70 [5.02, 15.07]	<.0001	6.11 [3.40, 10.98]	<.0001
no (ref)												
Life Experiences												
Childhood Adversity	1.54 [1.42, 1.67]	<.0001	1.22 [1.12, 1.34]	<.0001	2.13 [1.95, 2.33]	<.0001	1.53 [1.38, 1.69]	<.0001	1.39 [1.27, 1.52]	<.0001	1.25 [1.12, 1.39]	<.0001
Trauma	1.29 [1.25, 1.33]	<.0001	1.16 [1.12, 1.21]	<.0001	1.52 [1.46, 1.58]	<.0001	1.24 [1.18, 1.30]	<.0001	1.18 [1.13, 1.23]	<.0001	1.06 [1.04, 1.12]	.04
Social Support Score	.94 [.91, .97]	<.0001	.94 [.90, .99]	.008	.89 [.86, .92]	<.0001	.96 [.91, 1.02]	.18	.95 [.91, .98]	.005	1.02 [.97, 1.07]	.53

Appendix 16 - Post Hoc Analysis

In response to a comment from a reviewer, we conducted the following post-hoc analysis. In the whole sample we conducted a series of univariate logistic regressions to investigate whether any variables were significantly overrepresented in men or women (odds ratio associated with men or women). If such differences were identified these variables were incorporated into two composite variables, one for childhood adversity and trauma that were more common in men, and one for childhood adversity and trauma that were more common in women. For the childhood adversity and trauma composite variable in men 12 variables were included and for women 5 variables were combined. These analyses address a limitation identified by Devries et al. (2013) that there is often a lack of adjustment for confounding variables, such as common risk factors.

Table 1. Univariate Logistic Regression Investigating Sex Differences in Childhood Adversity (before 18)

Childhood Adversity (Before 18)	Males		Females		Sex Differences Univariate Logistic Regression*	
	Yes	No	Yes	No	Unadjusted OR	P value
Adult in your life hit, beat, physically hurt you (other than smacking)	431 (48.1%)	2627 (39.5%)	465 (51.9%)	4023 (60.5%)	1.42 [1.23, 1.63]	<.0001
Got scared or felt really bad because adult in your life called you names, said mean things to you, or said they didn't want you	251 (33.6%)	2807 (41.3%)	497 (66.4%)	3991 (58.7%)	.72 [.61, .84]	<.0001
Parent took, kept, or hid you to stop you being with another parent	71 (34.0%)	2987 (40.7%)	138 (66.0%)	4350 (59.3%)	.75 [.56, 1.00]	.05
Adult in your life shook you very hard or shoved you against a wall or a piece of furniture	185 (40.7%)	2873 (40.5%)	270 (59.3%)	4218 (59.5%)	1.01 [.83, 1.22]	.95

*reference category: female

Table 2. Univariate Logistic Regression Investigating Sex Differences in Childhood Adversity (before 12)

Childhood Adversity (Before 12)	Males		Females		Sex Differences Univariate Logistic Regression*	
	Yes	No	Yes	No	Unadjusted OR	P value
Expected to do your own laundry	929 (37.8%)	2129 (41.8%)	1528 (62.2%)	2960 (58.2%)	.85 [.77, .93]	.85
Had regular dental check ups (reverse scored)	345 (41.5%)	2713 (40.4%)	487 (58.5%)	4001 (59.6%)	1.05 [.90, 1.21]	.56
Went to school in clothes that were dirty, torn, didn't fit because no clean ones available	688 (46.2%)	2370 (39.1%)	802 (53.8%)	3686 (60.9%)	1.33 [1.19, 1.50]	<.0001
Went hungry because no one got your meals ready or there was no food in the home	536 (46.4%)	618 (53.6%)	2522 (39.5%)	3870 (60.5%)	1.33 [1.17, 1.51]	<.0001
Looked after younger siblings while parents were out	894 (42.0%)	2164 (39.9%)	1234 (58.0%)	3254 (60.1%)	1.09 [.98, 1.21]	1.00
Were ill but no one looked after you or took you to doctor	410 (43.3%)	2648 (40.1%)	536 (56.7%)	3952 (59.9%)	1.14 [1.00, 1.31]	.06
Did not have a safe place to stay	449 (42.4%)	2609 (40.2%)	611 (57.6%)	3877 (59.8%)	1.09 [.96, 1.25]	.19

*reference category: female

Table 3. Univariate Logistic Regression Investigating Sex Differences in Trauma

Trauma	Males		Females		Sex Differences Univariate Logistic Regression*	
	Yes	No	Yes	No	Unadjusted OR	P value
Experienced serious illness or injury at any time in your life	986 (48.2%)	2064 (37.7%)	1061 (51.8%)	3408 (62.3%)	1.54 [1.39, 1.70]	<.0001
Experienced serious assault to yourself at any time in your life	245 (46.6%)	2805 (40.1%)	281 (53.4%)	4188 (59.9%)	1.30 [1.09, 1.56]	.003
Experienced serious illness or injury to a close relative at any time in your life	998 (39.8%)	2052 (40.9%)	1508 (60.2%)	2961 (59.1%)	.96 [.87, 1.06]	.96
Experienced serious assault of a close relative at any time in your life	123 (35.7%)	2927 (40.8%)	222 (64.3%)	4247 (59.2%)	.81 [.64, 1.01]	.06
Experienced death of an immediate family member at any time in your life	1945 (40.2%)	1105 (41.3%)	2899 (59.8%)	1570 (58.7%)	.96 [.87, 1.06]	.38

Experienced death of a close family friend or other relative at any time in your life	2094 (39.8%)	956 (42.2%)	3161 (60.2%)	1308 (57.8%)	.91 [.83, 1.01]	.07
Experienced separation due to marital difficulties, divorce or steady relationship breakdown at any time in your life	883 (36.8%)	2167 (42.3%)	1516 (63.2%)	2953 (57.7%)	.80 [.72, .88]	<.0001
Experienced serious problem with a close friend, neighbour or relative at any time in your life	378 (39.4%)	2672 (40.7%)	582 (60.6%)	3887 (59.3%)	.95 [.82, 1.09]	.44
Experienced being made redundant or sacked from your job at any time in your life	1337 (55.6%)	1714 (33.5%)	1069 (44.4%)	3400 (66.5%)	2.49 [2.25, 2.74]	<.0001
Experienced looking for work without success for more than 1 month at any time in your life	947 (53.2%)	2104 (36.6%)	832 (46.8%)	3637 (63.4%)	1.97 [1.77, 2.20]	<.0001
Experienced major financial crisis, equivalent to loss of 3 months income at any time in your life	461 (52.2%)	2590 (39.0%)	422 (47.8%)	4047 (61.0%)	1.71 [1.50, 1.97]	<.0001
Experienced something you valued being lost or stolen at any time in your life	627 (41.5%)	2424 (40.3%)	884 (58.5%)	3585 (59.7%)	1.05 [.94, 1.20]	.39
Experienced in trouble with police involving	370 (76.9%)	2681 (38.1%)	111 (23.1%)	4358 (61.9%)	5.43 [4.37, 6.75]	<.0001

court appearance at any time in your life						
Experienced time in prison on remand or serving a sentence at any time in your life	84 (81.6%)	2967 (40.0%)	19 (18.4%)	4450 (60.0%)	6.64 [4.03, 10.95]	<.0001
Experienced bullying a any time in your life	751 (40.9%)	2300 (40.5%)	1086 (59.1%)	3382 (59.5%)	1.02 [.92, 1.14]	.72
Experienced violence at work at any time in your life	141 (62.1%)	2910 (39.9%)	86 (37.9%)	4382 (60.1%)	2.47 [1.89, 3.25]	<.0001
Experienced violence in the home at any time in your life	151 (22.2%)	2900 (42.4%)	529 (77.8%)	3939 (57.6%)	.39 [.32, .47]	<.0001
Experienced sexual abuse at any time in your life	77 (17.0%)	2974 (42.1%)	375 (83.0%)	4093 (57.9%)	.28 [.22, .36]	<.0001
Experienced being expelled from school at any time in your life	102 (55.7%)	2949 (40.2%)	81 (44.3%)	4387 (59.8%)	1.88 [1.40, 2.52]	<.0001
Experienced running away from home at any time in your life	126 (33.2%)	2925 (41.0%)	253 (66.8%)	4215 (59.0%)	.72 [.58, .90]	.003
Experienced being homeless at any time in your life	131 (41.9%)	2920 (40.5%)	182 (58.1%)	4286 (59.5%)	1.06 [.84, 1.33]	.63

*reference category: female

Appendix 17 - Participant Information Table

	Graham	Robert	Mark	Liam	Glen	William	John	Blair	James	Stephen	Sam	Gary
Age	36	49	45	40	26	38	21	28	31	45	19	28
Gender	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male
Ethnicity	White	White	White	White	White	White	White	White	White	White	White	Asian/Asian British
Marital Status	Never married	Married	Married	Married	Never married	Never married	Never married	Never married	In a relationship	Separated	Never married	Never married
Living situation	Live alone	With spouse	With spouse	With spouse and own children	With siblings	Live alone	Student accommodation	With parents	With partner and own children	With parents	With parents	With parents
Education level	Postgraduate qualification	HNC/HND/NQ/SVQ	Degree	Postgraduate qualification	HNC/HND/NQ/SVQ	Degree	HNC/HND/NQ/SVQ	Higher/A-levels	None	HNC/HND/NQ/SVQ	Standard grades/GCSE/O-levels	HNC/HND/NQ/SVQ
Employment status	Employed	Unemployed due to disability/incapacity	Unemployed due to disability/incapacity	Employed	Unemployed due to disability/incapacity	Unemployed and seeking work	Student and working part-time	Employed	Employed	Unemployed and seeking work	Unemployed and seeking work	Unemployed due to disability/incapacity
Sexual orientation	Homosexual	Heterosexual	Heterosexual	Bisexual	Heterosexual	Heterosexual	Not sure	Heterosexual	Heterosexual	-	Asexual	Heterosexual
Currently taking psychiatric medication	Yes	Yes	No	Yes	No	No	No	No	No	Yes Paroxetine	Yes Zopiclone, Quetiapine, Sertraline	Yes
Has ever been diagnosed with mental health/ Diagnosis	Yes	Yes	Yes Depression and anxiety	Yes Depression and anxiety	Yes	No	Yes Depression and anxiety	No	Yes Depression	Yes	Yes Anxiety, autism and insomnia	Yes
Suicidal thoughts (with no attempt)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Would rather not say	Yes
Last time thought about suicide (past week, past year, longer ago)	The past year	The past week	The past year	The past year	Longer ago	Longer ago	The past week	The past year	Longer ago	Longer ago	The past week	The past week
How many times has this occurred?	Lots	Twice	Many times over 2-3 months	22	5	10	-	More than 10	7	Numbers	I haven't counted	-
Age when first thought about suicide	13	-	44	18	19	13	17/18	27	17	19	12	-
Ever made a suicide attempt	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Last time attempted suicide (past week, past year, longer ago)	Longer ago	Longer ago	The past year	The past year	Longer ago	Longer ago	Longer ago	The past year	Longer ago	Longer ago	The past year	The past year
Number of suicide attempts	2	1	1	3	2/3	1	1	3/4	7	Numberous	I don't count	2
Age when first attempted suicide	33	-	44	18	22/23	23	19	27	18	19	12	27

Appendix 18 - MVLS Ethics Approval

Dear Professor Rory OConnor

MVLS College Ethics Committee

Project Title: *An Investigation into the Factors Associated with Suicidal Behaviours in Men 200180116*

The College Ethics Committee has reviewed your application and has agreed that there is no objection on ethical grounds to the proposed study.

We are happy therefore to approve the project, subject to the following conditions.

- Project end date as stipulated in original application.
- The data should be held securely for a period of ten years after the completion of the research project, or for longer if specified by the research funder or sponsor, in accordance with the University's Code of Good Practice in Research: (http://www.gla.ac.uk/media/media_227599_en.pdf)
- The research should be carried out only on the sites, and/or groups defined in the application.
- Any proposed changes in the protocol should be submitted for reassessment, except when it is necessary to change the protocol to eliminate hazard to the subjects or where the change involves only the administrative aspects of the project. The Ethics Committee should be informed of any such changes.
- For projects requiring the use of an online questionnaire, the University has an Online Surveys account for research. To request access, see the University's application procedure at <https://www.gla.ac.uk/research/strategy/ourpolicies/useofonlinesurveystoolforresearch/>.

Terry Quinn

FESO, MD, FRCP, BSc (hons), MBChB (hons)
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- You should submit a short end of study report to the Ethics Committee within 3 months of completion.

Yours sincerely

The University of Glasgow, charity number SC004401
Dr Terry Quinn



PARTICIPANT INFORMATION SHEET

Study title

Understanding risk factors for suicide in men

Invitation

You are being invited to be interviewed as part of a study investigating the risk factors for suicide in men. The study is being carried out by Cara Richardson, a researcher in the Institute of Health and Wellbeing at the University of Glasgow. Before deciding whether to take part, it is important that you understand why the research is being done and what it will involve. Please take time to read the following information carefully.

What is the purpose of the study?

The study aims to understand the factors associated with suicidal thinking and behaviour in men, by asking people who have attempted suicide about their experiences. Up to 12 people who have attempted suicide will take part in the study. The purpose of this study is to learn more about your experiences, not to provide therapy or ongoing support.

Why have I been invited to participate?

You responded to an advertisement about the research and met the requirements to be included in this study (over 18 and have experienced attempted suicide in the last year).

Do I have to take part?

No. It is up to you to decide if you want to take part in the interview or not. You are free to withdraw from the interview at any time, without giving a reason.

What will happen to me if I take part?

If you are interested in taking part, you can contact Cara Richardson via email and send your contact details. Cara will then telephone you to tell you more

about the interview and answer any questions you may have. If you are still happy to take part, she will make an appointment for you come to the University of Glasgow's Mental Health & Wellbeing department, at Gartnavel Royal Hospital or SAMH Glasgow City Centre or Edinburgh offices to be interviewed. The interview will last around 1 hour, and will feel like an informal conversation your experiences of feeling suicidal. You do not have to answer any questions that you don't want to, and you can have breaks during the interview if you wish. The interview will be audio recorded for research purposes. The interview will be transcribed and anonymised.

What do I have to do?

You will attend an interview with the PhD researcher, Cara Richardson, where you will be asked about your life and experiences of suicidal thoughts and behaviours. The interview will last approximately one hour.

What are the possible disadvantages and risks of taking part?

The interview contains questions about your life and about past experiences of suicide attempts. There is a small possibility that some of these questions may get you thinking about certain experiences that you find upsetting. You are free to stop the interview at any point. You will be given a list of contacts (such as Breathing Space, Samaritans, and the local Accident and Emergency Department at the Queen Elizabeth University Hospital Glasgow) if you would like more information or to talk with someone.

What are the possible benefits of taking part?

You will receive £30 to thank you for taking part in the study. The information you provide will help to give us a better understanding of men's suicidal thoughts and behaviours. The results could help to improve treatment of suicidal thoughts and behaviours, as well as informing policies on suicide prevention.

Will my taking part in this study be kept confidential?

Your participation and all of the information you provide in the study will be strictly confidential. Any personal information (including your name and contact details) will be held separately from the information you provide during the interview. Your information will be stored securely in Glasgow University and destroyed ten years after the project ends.

What will happen to my data?

Researchers from the University of Glasgow collect, store and process all personal information in accordance with the General Data Protection Regulation (2018). If you are deemed a risk to yourself or others, the PhD researcher may need to break confidentiality and contact emergency services, your friend/family/support network on your behalf.

What will happen to the results of the research study?

The data will be stored in archiving facilities in line with the University of Glasgow retention policy of up to 10 years. After this period, further retention may be agreed or your data will be securely destroyed in accordance with the relevant standard procedures.

Your identifiable information might be shared with people who check that the study is done properly and, if you agree, with other organisations or universities to carry out research to improve scientific understanding. Your data will form part of the study results that will be published in expert journals, presentations, student dissertations/theses (if applicable) and on the internet for other researchers to use. Your name will not appear in any publication.

Who is organising and funding the research?

The research is funded through a PhD scholarship from SAMH (Scottish Association for Mental Health) and funds held within the Department of Mental Health and Wellbeing at the University of Glasgow.

Who has reviewed the study?

This project has been reviewed by the College of Medical, Veterinary & Life Sciences Ethics Committee.

Contact for Further Information

If you have any questions or require more information please contact Cara Richardson

T: 0141 201 4522

Thank you for taking the time to read this information sheet.



Centre Number:

Project Number:

Participant Identification Number for
this trial:

Title of Project: Understanding risk factors for suicide in men

Name of Researcher(s): Miss Cara Richardson, Professor Rory O'Connor, Dr Katie Robb and Dr Adele Dickson

CONSENT FORM

Please
initial
box

I confirm that I have read and understood the Participant Information Sheet version 1 dated 07/03/2019.

I confirm that I have read and understood the Privacy Notice version 1 dated 07/03/2019.

I have had the opportunity to think about the information and ask questions, and understand the answers I have been given.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my legal rights being affected.

I confirm that I agree to the way my data will be collected and processed and that data will be stored for up to 10 years in University archiving facilities in accordance with relevant Data Protection policies and regulations.

I understand that all data and information I provide will be kept confidential and will be seen only by study researchers and regulators whose job it is to check the work of researchers.

I agree that my name, contact details and data described in the information sheet will be kept for the purposes of this research project.

I understand that if I withdraw from the study, my data collected up to that point will be deleted.

I agree to my interview/focus group being audio-recorded.

I understand that the recorded interview/focus group will be transcribed word by word and the transcription stored for up to 10 years in University archiving facilities in accordance with Data Protection policies and regulations

I understand that my information and things that I say in an interview or focus group may be quoted in reports and articles that are published about the study, but my name or anything else that could tell people who I am will not be revealed.

I agree to take part in the study.

Name of participant

Date

Signature

Name of Person taking consent
(if different from researcher)

Date

Signature

Researcher
(1 copy for participant; 1 copy for researcher)

Date

Signature

Appendix 21 - Interview Schedule

An Investigation into the Factors Associated with Suicidal Behaviours in Men

Previous attempts

Primary Question: Tell me about your most recent experience of attempting to take your own life.

Potential Probes: How did that make you feel?

Primary Question: Tell me about what was going on in your life during the time leading up to your suicide attempt. What sorts of thoughts or emotions did you have at that time?

Probes: How were you feeling? What were you thinking? Was it planned?

Primary Question: What, for you, were the main factors which led to you attempting to take your life? Why?

Probes: Was there anything that caused a change from thinking about it to doing it? How did you feel afterwards?

Only if more than one attempt:

Primary Question: In what ways (if at all) did that differ from previous attempts?

Primary Question: At that time, was there anything that would have prevented you from attempting to take your life? If so, what and why?

Current situation

Primary Question: What (if anything) has changed since then? In what way?

Potential Probes: What has changed? Why do you think it has changed? Why do you think it has stayed the same?

Masculinity

Primary Question: What does it mean, to you, to be male and experience suicidality?

Probes: In what ways (if at all) this was a contributor for you/to your suicidal thoughts and/or actions? What does this mean to you? How do you feel about that?

Closing

Primary Question: How do you feel now when you reflect back on that attempt to take your own life? Why?

Potential Probes: Is there anything that would have helped you at that time? Now? Why?

Primary Question: What advice would you offer someone who is thinking about ending their life? Why?

Primary Question: Is there anything else you would like to share with me today that we have not already discussed?

Appendix 22 - Sample Interview Transcript

<p>Unable to cope with change</p>	<p>CR: mmm DH: emmm... I think it was just the... I'd say like the <u>amount of change that had been creeping into my life</u> and I knew it was coming, I knew it was coming but I never handled it properly</p>	<p>*Descriptive *Cognitive *Conceptual</p> <p>Unable to cope with change Slow build up - almost creeping up on him - trying to avoid it?</p>
<p>Importance of family</p>	<p>CR: did you get any support from anyone at that time? DH: not until I was in the hospital do you know what I mean? But my family were brilliant with us, up every day. They're nice people so I can't fault them for that</p>	<p>It took the drastic step of almost dying for him to access help</p>
<p>Guilt, shame Perceived burdensomeness</p>	<p>CR: yeah DH: my family have always been good with me but... so I've got a lot of guilt about, the way I've behaved over the past five six years you know what I mean</p>	<p>Feels like a burden due to what he feels he has put his family through</p>
<p>Use of alcohol and drugs as a coping mechanism of way to escape life's problems!</p>	<p>CR: what is it you feel guilty about? DH: just... like my substance abuse and the changes in my behaviours like... I'd say... I'd take like I'd go out drinking, take coke and it would completely change my personality know what I mean? Ehh...</p>	

* Descriptive
* Linguistic
* Conceptual

AH: it was very difficult because obviously I've got... I've got a wife, I've got a kid
CR: yeah
AH: I've got a job that was going ok
CR: mhhm
AH: but just that day was just a perfect sort of storm of factors
CR: mhhm
AH: that that came in
CR: yeah... are we able to explore like what else was going on in your life at the time? That kind of led up to... the attempt?
AH: ehhh... because of my depression or my anxiety and depression I can't manage my money properly
CR: ok
AH: I pretend I do but I don't
CR: mhhm
AH: and I'm in... eh debt
CR: ok
AH: not... hundreds of thousands of pounds of debt but...
CR: uhh huh
AH: ehh enough debt that it's it's causing me to worry

Accumulation of stressful life events

Impact of mental illness

Accumulation of stressful life events

Able to list the positive things he has in his life

Build up of things - this certain combination of factors that actually aggravated the event - the methodology this is an unusually severe term - looks as if it came from nowhere or he had no control over it

Feels the need to hide his money worries or that he is struggling

linked to Masculinity
Self-reliance

Appendix 23 - Sex differences in cause of death

Cause of Death	Males N (%)	Females N(%)	Total
Missing Data	80.8%	19.2%	100%
Self-Poisoning	60.3%	39.7%	100%
Hanging, strangulation and suffocation	81.4%	18.9%	100%
Drowning and submersion	68.6%	31.4%	100%
Firearm/handgun	94.7%	5.3%	100%
Exposure to smoke, fire and flames or contact with steam, hot vapours or hot objects	72.3%	27.7%	100%
Contact with sharp or blunt object	84.9%	15.1%	100%
Falling, jumping or pushed from a high place or falling, lying or running before or unto a moving object	74.8%	25.2%	100%
Crashing of motor vehicle	81.3%	18.8%	100%
Other unspecified events	76.9%	23.1%	100%

Cause of Death	Males %	Females %	Total
Missing Data	<5%	<5%	<5%
Self-Poisoning	18.2%	12.0%	30.2%
Hanging, strangulation and suffocation	37.2%	8.7%	45.9%
Drowning and submersion	<5%	<5%	5.8%
Firearm/handgun	<5%	<5%	<5%
Exposure to smoke, fire and flames	<5%	<5%	<5%
Contact with steam, hot vapours or hot objects	<5%	<5%	<5%
Contact with sharp object	<5%	<5%	<5%
Contact with blunt object	<5%	<5%	<5%
Falling, jumping or pushed from a high place	5.0%	<5%	6.9%
Falling, lying or running before or unto a moving object	<5%	<5%	<5%
Crashing of motor vehicle	<5%	<5%	<5%
Other unspecified events	<5%	<5%	<5%

Appendix 24 - Descriptive statistics of sex differences in violent vs non-violent methods

Method Choice	Male N (%)	Female N (%)	Total N (%)
Missing data or undetermined	76.3%	23.7%	100%
Violent methods	79.5%	20.5%	100%
Non-violent methods	60.5%	39.5%	100%

Appendix 25 - Multivariate logistic regression examining the association of psychosocial factors and characteristics of the suicide attempt with violent vs non-violent methods

Factor	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value
Age				
5-14	1.59 [.64, 3.95]	.31	2.66 [.77, 9.19]	.12
15-24	1.57 [1.14, 3.15]	.005	1.38 [.94, 2.03]	.10
25-34	1.01 [.76, 1.36]	.93	.90 [.64, 1.28]	.56
35-44	.75 [.57, 1.00]	.05	.78 [.55, 1.09]	.14
45-54	.80 [.60, 1.07]	.13	.75 [.54, 1.04]	.09
55-64	.86 [.64, 1.16]	.32	.78 [.55, 1.09]	.14
65-74	.81 [.58, 1.13]	.22	.80 [.56, 1.15]	.24
75+ (ref)	-	-	-	-
Sex				
Male	2.53 [2.28, 2.81]	<.0001	2.55 [2.26, 2.89]	<.0001
Female (ref)	-	-	-	-
Marital Status				
Single	.85 [.75, .95]	.004	1.01 [.86, 1.18]	.93
Not known	.68 [.35, 1.31]	.25	.48 [.19, 1.20]	.12
Widowed	.53 [.42, .66]	<.0001	.69 [.52, .91]	.009
Divorced	.52 [.44, .60]	<.0001	.69 [.57, .83]	<.0001
Married (ref)	-	-	-	-
Employment Status				
Students, Independent Means, No Occupation, A Person with a Disability	.59 [.53, .66]	<.0001	.74 [.64, .84]	<.0001
Self-employed - without employees	1.39 [1.11, 1.74]	.004	1.19 [.91, 1.54]	.20
Managers, Superintendents, Armed Forces- Officers	1.00 [.79, 1.27]	.99	.79 [.60, 1.05]	.11
Foremen	1.24 [.79, 1.94]	.35	1.52 [.89, 2.58]	.12
Self-employed - with employees	1.14 [.80, 1.63]	.48	.98 [.65, 1.48]	.92
Employees, Apprentices, Armed Forces - Other Ranks (ref)	-	-	-	-

Mood disorders	1.02 [.65, 1.58]	.95	-	-
Disorders of adult personality and behaviour	1.09 [.48, 2.50]	.83	-	-
Mental and behavioural disorders due to psychoactive substance use	.80 [.49, 1.33]	.39	-	-
Schizophrenia, schizotypal and delusional disorder	1.01 [.56, 1.82]	.99	-	-
Neurotic, stress-related and somatoform disorders	.92 [.46, 1.84]	.81	-	-
Place of Occurrence				
Home	.57 [.51, .64]	<.0001	.43 [.38, .49]	<.0001
Farm, Mine/Quarry, Place of Industry	1.92 [1.10, 3.34]	.02	1.33 [.71, 2.51]	.38
Sport/Recreation Area, Street/Highway, Public Building	1.27 [.96, 1.69]	.10	.96 [.68, 1.35]	.81
Residential Institution	2.48 [.74, 8.28]	.14	1.11 [.25, 4.92]	.89
Other Unspecified Place (ref)	-	-	-	-
SIMD Decile (continuous)	1.08 [1.06, 1.10]	<.0001	1.04 [1.02, 1.07]	<.0001
Urban-Rural Code				
Urban	1.23 [1.10, 1.37]	<.0001	1.00 [.87, 1.14]	.96
Rural (ref)	-	-	-	-
Intent				
Self-Harm - yes	9.59 [8.54, 10.77]	<.0001	11.98 [10.50, 13.67]	<.0001
Undetermined Intent (ref)	-	-	-	-

*Reference category: non-violent deaths

Appendix 26 - Overall Descriptive Statistics

Factor	%
Age	
Missing Data	<5%
5-14	<5%
15-24	10.3%
25-34	17.9%
35-44	22.4%
45-54	22.7%
55-64	13.4%
65-74	6.3%
75+	<5%
Sex	
Male	73.7%
Female (ref)	26.3%
Marital Status	
Single	53.1%
Not known	<5%
Widowed	5.4%
Divorced	13.6%
Married (ref)	26.8%
Employment Status	
Students, Independent Means, No Occupation, Handicapped	29.8%
Self-employed - without employees	5.9%
Managers, Superintendents, Armed Forces-Officers	<5%
Foremen	<5%
Self-employed - with employees	<5%
Employees, Apprentices, Armed Forces - Other Ranks	56.4%
Mood disorders	Diagnosis: <5% No diagnosis: 98.9%
Disorders of adult personality and behaviour	Diagnosis: <5% No diagnosis: 99.7%
Mental and behavioural disorders due to psychoactive substance use	Diagnosis: <5% No diagnosis: 99.2%
Schizophrenia, schizotypal and delusional disorder	Diagnosis: <5% No diagnosis: 99.4%
Neurotic, stress related and somatoform disorders	Diagnosis: <5% No diagnosis: 99.6%
Place of Occurrence	
Home	61.9%

Farm, Mine/Quarry, Place of Industry	<5%
Sport/Recreation Area, Street/Highway, Public Building	<5%
Residential Institution	<5%
Other Unspecified Place (ref)	31.4%
SIMD Decile (continuous)	4.44 (2.75)
	1: 17.5%
	2: 13.1%
	3: 12.8%
	4: 10.9%
	5: 9.6%
	6: <5%
	7: 7.7%
	8: 6.6%
	9: 5.4%
	10: <5%
Urban-Rural Code	
Missing Data	<5%
Urban	25.9%
Rural (ref)	70.9%
Intent	
Self-Harm - yes	73.2%
Undetermined Intent (ref)	26.8%

Appendix 27 - Sex Differences Descriptive Statistics

Factor	Males %	Females %
Age		
Missing Data	81.8%	18.2%
5-14	43.8%	56.3%
15-24	75.0%	25.0%
25-34	76.8%	23.2%
35-44	74.0%	26.0%
45-54	72.8%	27.2%
55-64	71.5%	28.5%
65-74	70.1%	29.9%
75+	69.4%	30.6%
Marital Status		
Single	76.7%	23.3%
Not Known	63.8%	36.4%
Widowed	56.4%	43.6%
Divorced	67.0%	33.0%
Married (ref)	74.9%	25.1%
Employment Status		
Students, Independent Means, No Occupation, Handicapped	66.7%	33.3%
Self-employed - without employees	83.5%	16.5%
Managers, Superintendents, Armed Forces- Officers	73.3%	26.7%
Foremen	68.8%	31.3%
Self-employed - with employees	79.8%	20.2%
Employees, Apprentices, Armed Forces - Other Ranks	76.2%	23.8%
Mood disorders	Diagnosis: 56.4% No diagnosis: 73.9%	Diagnosis: 43.6% No diagnosis: 26.1%
Disorders of adult personality and behaviour	Diagnosis: 33.3% No diagnosis: 73.8%	Diagnosis: 66.7% No diagnosis: 26.2%
Mental and behavioural disorders due to psychoactive substance use	Diagnosis: 68.7% No diagnosis: 73.7%	Diagnosis: 31.3% No diagnosis: 26.3%
Schizophrenia, schizotypal and delusional disorder	Diagnosis: 63.5% No diagnosis: 73.7%	Diagnosis: 36.5% No diagnosis: 26.3%

Neurotic, stress related and somatoform disorders	Diagnosis: 61.1% No diagnosis: 73.7%	Diagnosis: 38.9% No diagnosis: 26.3%
Place of Occurrence		
Home	72.7%	27.3%
Farm, Mine/Quarry, Place of Industry	81.3%	18.7%
Sport/Recreation Area, Street/Highway, Public Building	81.5%	18.5%
Residential Institution	96.3%	<5%
Other Unspecified Place (ref)	73.6%	26.4%
SIMD Decile	4.41 (2.74) 1: 72.4% 2: 76.3% 3: 74.2% 4: 73.9% 5: 73.0% 6: 73.2% 7: 72.2% 8: 73.8% 9: 71.5% 10: 72.1%	4.49 (2.78) 1: 27.6% 2: 23.7% 3: 25.8% 4: 26.1% 5: 27.0% 6: 26.8% 7: 27.8% 8: 26.2% 9: 28.5% 10: 27.9%
Urban-Rural Code		
Urban	74.3%	25.7%
Rural (ref)	73.0%	27.0%
Intent		
Self-Harm	75.2%	24.8%
Undetermined intent	69.4%	30.6%

Appendix 28 - Descriptive statistics of sex differences in self-poisoning

Primary Cause of Death (Self-Poisoning)	Males %	Females %
Non-opioid analgesics, antipyretics and antirheumatics		
- Yes	50.8%	49.2%
- No	74.2%	25.8%
Anti-epileptic, sedative- hypnotic, antiparkinsonism and psychotropic drugs		
- Yes	53.2%	48.6%
- No	75.2%	24.8%
Narcotics and psychodysleptics (hallucinogens)		
- Yes	62.0%	38.0%
- No	75.5%	24.5%
Drugs acting on the autonomic nervous system		
- Yes	42.5%	57.5%
- No	74.0%	26.0%
Alcohol		
- Yes	44.5%	55.6%
- No	73.7%	26.3%
Exposure to gases and vapours		
- Yes	86.5%	13.5%
- No	73.4%	26.6%
Pesticides		
- Yes	66.7%	33.3%
- No	73.7%	26.3%
Other and unspecified drugs, chemicals, medicaments and biological substances		
- Yes	65.3%	34.7%
- No	74.1%	25.9%

Appendix 29 - ScotSID Syntax

1. Read and Save Raw Data Files

```
**Deaths.  
GET DATA  
  /TYPE=ODBC  
  /CONNECT=!CONNECT  
  /SQL='SELECT * FROM SSID.NRS_DEATHS'.  
CACHE.  
EXECUTE.
```

```
save outfile = !Filepath + 'all deaths.sav'.
```

```
*****  
*Service files.  
*****
```

```
**A&E.  
GET DATA  
  /TYPE=ODBC  
  /CONNECT=!CONNECT  
  /SQL='SELECT * FROM SSID.AE2'.  
CACHE.  
EXECUTE.
```

```
save outfile = !Filepath + 'A&E.sav'.
```

```
*****  
**Prescription.  
GET DATA  
  /TYPE=ODBC  
  /CONNECT=!CONNECT  
  /SQL='SELECT * FROM SSID.PIS'.  
CACHE.  
EXECUTE.
```

```
save outfile = !Filepath + 'Prescriptions.sav'.
```

```
*****  
**Outpatients.  
GET DATA  
  /TYPE=ODBC  
  /CONNECT=!CONNECT  
  /SQL='SELECT * FROM SSID.OUTPATIENTS'.  
CACHE.  
EXECUTE.
```

```
save outfile = !Filepath + 'Outpatients.sav'.
```

```
*****.  
**SMR01 inpatients.  
GET DATA  
  /TYPE=ODBC  
  /CONNECT=!CONNECT  
  /SQL='SELECT * FROM SSID.INPATIENTS'.  
CACHE.  
EXECUTE.
```

```
save outfile = !Filepath + 'SMR01.sav'.
```

```
*****.  
**SMR04 inpatients.  
GET DATA  
  /TYPE=ODBC  
  /CONNECT=!CONNECT  
  /SQL='SELECT * FROM SSID.MENTAL_HEALTH'.  
CACHE.  
EXECUTE.
```

```
save outfile = !Filepath + 'SMR04.sav'.
```

```
*****.  
**SMR02 inpatients.  
GET DATA  
  /TYPE=ODBC  
  /CONNECT=!CONNECT  
  /SQL='SELECT * FROM SSID.PREGNANCY'.  
CACHE.  
EXECUTE.
```

```
save outfile = !Filepath + 'SMR02.sav'.
```

```
*****.  
**SMR25: drug misuse database.  
GET DATA  
  /TYPE=ODBC  
  /CONNECT=!CONNECT  
  /SQL='SELECT * FROM SSID.SMR25'.  
CACHE.  
EXECUTE.
```

```
save outfile = !Filepath + 'SMR25.sav'.
```

```
*****.
```

2. Recode Deaths File

```
* Encoding: UTF-8.
```

```
***.
```

*NOTE - when adapting for future publications, remember to change the file paths**.

```
DEFINE !Filepath()  
'/PHI_conf/MentalHealth1/SCOTSID/Projects/20201124-  
2019ContactInvestigation/Temp/'  
!ENDDDEFINE.
```

*Open up the deaths file which was taken from SMRA.
get file = !Filepath + 'all deaths.sav'.

sort cases by SID_ID.

**Create new Health Boards for the ScotSID report.

*based on new NHS board code.

*first allocate unknown health boards by CA (may want to change this in future reports).

```
do if HB_RESIDENCE_9 = "S08200003".  
if (council_area="01") HB_RESIDENCE_9="S08000020".  
if (council_area="02") HB_RESIDENCE_9="S08000020".  
if (council_area="03") HB_RESIDENCE_9="S08000027".  
if (council_area="04") HB_RESIDENCE_9="S08000022".  
if (council_area="05") HB_RESIDENCE_9="S08000016".  
if (council_area="06") HB_RESIDENCE_9="S08000019".  
if (council_area="07") HB_RESIDENCE_9="S08000021".  
if (council_area="08") HB_RESIDENCE_9="S08000017".  
if (council_area="09") HB_RESIDENCE_9="S08000027".  
if (council_area="10") HB_RESIDENCE_9="S08000015".  
if (council_area="11") HB_RESIDENCE_9="S08000021".  
if (council_area="12") HB_RESIDENCE_9="S08000024".  
if (council_area="13") HB_RESIDENCE_9="S08000021".  
if (council_area="14") HB_RESIDENCE_9="S08000024".  
if (council_area="15") HB_RESIDENCE_9="S08000019".  
if (council_area="16") HB_RESIDENCE_9="S08000018".  
if (council_area="17") HB_RESIDENCE_9="S08000021".  
if (council_area="18") HB_RESIDENCE_9="S08000022".  
if (council_area="19") HB_RESIDENCE_9="S08000021".  
if (council_area="20") HB_RESIDENCE_9="S08000024".  
if (council_area="21") HB_RESIDENCE_9="S08000020".  
if (council_area="22") HB_RESIDENCE_9="S08000015".  
if (council_area="23") HB_RESIDENCE_9="S08000023".  
if (council_area="24") HB_RESIDENCE_9="S08000025".  
if (council_area="25") HB_RESIDENCE_9="S08000027".  
if (council_area="26") HB_RESIDENCE_9="S08000021".  
if (council_area="27") HB_RESIDENCE_9="S08000026".  
if (council_area="28") HB_RESIDENCE_9="S08000015".  
if (council_area="29") HB_RESIDENCE_9="S08000023".  
if (council_area="30") HB_RESIDENCE_9="S08000019".  
if (council_area="31") HB_RESIDENCE_9="S08000024".  
if (council_area="32") HB_RESIDENCE_9="S08000028".  
end if.  
EXECUTE.
```



```

value labels HB_RESIDENCE_9
  "S08000015" "Ayrshire & Arran"
  "S08000016" "Borders"
  "S08000017" "Dumfries & Galloway"
  "S08000018" "Fife"
  "S08000019" "Forth Valley"
  "S08000020" "Grampian"
  "S08000021" "Greater Glasgow & Clyde"
  "S08000022" "Highland"
  "S08000023" "Lanarkshire"
  "S08000024" "Lothian"
  "S08000025" "Orkney"
  "S08000026" "Shetland"
  "S08000027" "Tayside"
  "S08000028" "Western Isles".

```

```
freq HB_RESIDENCE_9.
```

**Council areas in the deaths file are numbered differently to standard council areas that i've used before (CB in drugs misuse work)

**Convert to standard coding.

```
string CA2011 (a9).
```

```

if council_area = "01" CA2011 = "S12000033".
if council_area = "02" CA2011 = "S12000034".
if council_area = "03" CA2011 = "S12000041".
if council_area = "04" CA2011 = "S12000035".
if council_area = "05" CA2011 = "S12000026".
if council_area = "06" CA2011 = "S12000005".
if council_area = "07" CA2011 = "S12000039".
if council_area = "08" CA2011 = "S12000006".
if council_area = "09" CA2011 = "S12000042".
if council_area = "10" CA2011 = "S12000008".
if council_area = "11" CA2011 = "S12000045".
if council_area = "12" CA2011 = "S12000010".
if council_area = "13" CA2011 = "S12000011".
if council_area = "14" CA2011 = "S12000036".
if council_area = "15" CA2011 = "S12000014".
if council_area = "16" CA2011 = "S12000015".
if council_area = "17" CA2011 = "S12000046".
if council_area = "18" CA2011 = "S12000017".
if council_area = "19" CA2011 = "S12000018".
if council_area = "20" CA2011 = "S12000019".
if council_area = "21" CA2011 = "S12000020".
if council_area = "22" CA2011 = "S12000021".
if council_area = "23" CA2011 = "S12000044".
if council_area = "24" CA2011 = "S12000023".
if council_area = "25" CA2011 = "S12000024".
if council_area = "26" CA2011 = "S12000038".
if council_area = "27" CA2011 = "S12000027".

```

```

if council_area = "28" CA2011 = "S12000028".
if council_area = "29" CA2011 = "S12000029".
if council_area = "30" CA2011 = "S12000030".
if council_area = "31" CA2011 = "S12000040".
if council_area = "32" CA2011 = "S12000013".
exe.

```

```

value labels CA2011

```

```

"S12000005"      "Clackmannanshire"
"S12000006"      "Dumfries and Galloway"
"S12000008"      "East Ayrshire"
"S12000010"      "East Lothian"
"S12000011"      "East Renfrewshire"
"S12000013"      "Na h-Eileanan Siar"
"S12000014"      "Falkirk"
"S12000015"      "Fife"
"S12000017"      "Highland"
"S12000018"      "Inverclyde"
"S12000019"      "Midlothian"
"S12000020"      "Moray"
"S12000021"      "North Ayrshire"
"S12000023"      "Orkney Islands"
"S12000024"      "Perth and Kinross"
"S12000026"      "Scottish Borders"
"S12000027"      "Shetland Islands"
"S12000028"      "South Ayrshire"
"S12000029"      "South Lanarkshire"
"S12000030"      "Stirling"
"S12000033"      "Aberdeen City"
"S12000034"      "Aberdeenshire"
"S12000035"      "Argyll and Bute"
"S12000036"      "Edinburgh City"
"S12000038"      "Renfrewshire"
"S12000039"      "West Dunbartonshire"
"S12000040"      "West Lothian"
"S12000041"      "Angus"
"S12000042"      "Dundee City"
"S12000044"      "North Lanarkshire"
"S12000045"      "East Dunbartonshire"
"S12000046"      "Glasgow City".

```

```

freq CA2011.

```

```

**create age group (20 year).

```

```

if AGE_AT_DEATH <25 Agegroup20 = 1.

```

```

if AGE_AT_DEATH >=25 and AGE_AT_DEATH <=44 Agegroup20 = 2.

```

```

if AGE_AT_DEATH >=45 and AGE_AT_DEATH <=64 Agegroup20 = 3.

```

```

if AGE_AT_DEATH >=65 Agegroup20 = 4.

```

```

value labels Agegroup20 1 'Age < 25' 2 'Age 25-44' 3 'Age 45-64' 4 'Age 65+'.

```

```

* Calculate Age Group (10 year)

```

```

if AGE_AT_DEATH <15 Agegroup10 = 1.
if AGE_AT_DEATH >=15 and AGE_AT_DEATH <=24 Agegroup10 = 2.
if AGE_AT_DEATH >=25 and AGE_AT_DEATH <=34 Agegroup10 = 3.
if AGE_AT_DEATH >=35 and AGE_AT_DEATH <=44 Agegroup10 = 4.
if AGE_AT_DEATH >=45 and AGE_AT_DEATH <=54 Agegroup10 = 5.
if AGE_AT_DEATH >=55 and AGE_AT_DEATH <=64 Agegroup10 = 6.
if AGE_AT_DEATH >=65 and AGE_AT_DEATH <=74 Agegroup10 = 7.
if AGE_AT_DEATH >=75 Agegroup10 = 8.

```

```

value labels Agegroup10 1 'Age < 15' 2 'Age 15-24' 3 'Age 25-34' 4 'Age 35-44'
5 'Age 45-54' 6 'Age 55-64' 7 'Age 65-74' 8 'Age 75+'.

```

```

** Create age group (5 year).

```

```

if range(AGE_AT_DEATH,0,4) AgeGroup5 = 1.
if range(AGE_AT_DEATH,5,9) AgeGroup5 = 2.
if range(AGE_AT_DEATH,10,14) AgeGroup5 = 3.
if range(AGE_AT_DEATH,15,19) AgeGroup5 = 4.
if range(AGE_AT_DEATH,20,24) AgeGroup5 = 5.
if range(AGE_AT_DEATH,25,29) AgeGroup5 = 6.
if range(AGE_AT_DEATH,30,34) AgeGroup5 = 7.
if range(AGE_AT_DEATH,35,39) AgeGroup5 = 8.
if range(AGE_AT_DEATH,40,44) AgeGroup5 = 9.
if range(AGE_AT_DEATH,45,49) AgeGroup5 = 10.
if range(AGE_AT_DEATH,50,54) AgeGroup5 = 11.
if range(AGE_AT_DEATH,55,59) AgeGroup5 = 12.
if range(AGE_AT_DEATH,60,64) AgeGroup5 = 13.
if range(AGE_AT_DEATH,65,69) AgeGroup5 = 14.
if range(AGE_AT_DEATH,70,74) AgeGroup5 = 15.
if range(AGE_AT_DEATH,75,79) AgeGroup5 = 16.
if range(AGE_AT_DEATH,80,84) AgeGroup5 = 17.
if range(AGE_AT_DEATH,85,89) AgeGroup5 = 18.
if AGE_AT_DEATH ge 90 AgeGroup5 = 19.

```

```

EXECUTE.

```

```

value labels AgeGroup5 1 "0-4" 2 "5-9" 3 "10-14" 4 "15-19" 5 "20-
24" 6 "25-29" 7 "30-34" 8 "35-39" 9 "40-44"
10 "45-49" 11 "50-54" 12 "55-59" 13 "60-64" 14 "65-69" 15 "70-
74" 16 "75-79" 17 "80-84" 18 "85-89" 19 "90+".

```

```

* Get death date in date format:

```

```

*****

```

```

* 1. make date of death into date format (dd/mm/yyyy) by splitting string into
day,month,year.

```

```

compute day_death = number(char.substr(AGE_AT_DEATH,7,2),F2.0).
compute month_death = number(char.substr(AGE_AT_DEATH,5,2),F2.0).
compute year_death = number(char.substr(AGE_AT_DEATH,1,4),F4.0).

```

```

* 2. convert numeric date variables to date format.

```

```

compute DEATH_DMY=DATE.DMY(day_death,month_death,year_death).
formats DEATH_DMY (EDATE10).
execute.

```

```
freq year_death.
```

```
*define calendar years (based on date death was registered). This is what we  
are moving to for this publication.
```

```
compute year = number(char.substr(date_of_registration,1,4),F4.0).
```

```
freq year.
```

```
**highlight the non Scottish Residents.
```

```
compute Scotland=0.
```

```
if country_of_residence = 'XS' Scotland=1.
```

```
freq Scotland.
```

```
crosstabs Scotland by year.
```

```
** Identify deaths in age < 5.
```

```
temp.
```

```
select if age_at_death < 5.
```

```
ctables /table year [c] by age_at_death [c].
```

```
** There are two records with an age of 0.
```

```
** Remove them for the moment, but I think these are acutally unknown age  
rather than zero.
```

```
select if age_at_death>4.
```

```
execute.
```

```
*create a flag to highlight the cases that are Intentional self harm as opposed to  
undetermined intent.
```

```
if range(primary_cod,'X60','X84') or primary_cod = 'Y870' selfharm=1.
```

```
if range(primary_cod,'Y10','Y34') or primary_cod = 'Y872' selfharm=0.
```

```
value labels selfharm 0 'Undetermined Intent' 1 'Self Harm'.
```

```
freq selfharm.
```

```
tables /table year by selfharm.
```

```
*label coding variable.
```

```
alter type why_counted (F1.0).
```

```
value labels Why_counted 1 'Old coding' 2 'New coding'.
```

```
ctables /table year [c] by why_counted [c].
```

```
*Save file as 'all deaths_updated.sav' ready for being picked up in later syntax  
files.
```

```
save outfile = !Filepath + 'all deaths_updated.sav'.
```

```
*****  
*****
```

3. Prepare Individual Service Files

```
* Encoding: UTF-8.
```

```
***
```

*Syntax to look at suicide deaths that had an event within the 5 years prior to death.

*Updated by Cormac Murray August 2018.

NOTE - when adapting for future publications, remember to change the file paths.

DEFINE !Filepath()

'/PHI_conf/MentalHealth1/SCOTSID/Projects/20201124-2019ContactInvestigation/Temp/'

!ENDDDEFINE.

*****.

SMR01*.

*****.

*****.

*-----Section 1 - Open the SMR01 file from ScotSID and prepare file for matching to deaths file-----.

*****.

**Open the SMR01 ScotSID file extracted from SMRA.
Get file = !Filepath + 'SMR01.sav'.

SORT CASES BY SID_ID(A) DISCHARGE_DATE(D).

* 1. make str date into date format (dd/mm/yyyy) by splitting string into day,month,year.

compute dateday = number(char.substr(DISCHARGE_DATE,7,2),F2.0).

compute datemo = number(char.substr(DISCHARGE_DATE,5,2),F2.0).

compute dateyr = number(char.substr(DISCHARGE_DATE,1,4),F4.0).

* 2. convert numeric format to date format.

compute DISCHARGE_DMY=DATE.DMY(dateday, datemo, dateyr).

formats DISCHARGE_DMY (EDATE10).

execute.

*4. deletes unnecessary variables created in steps 1 - 3 above.

DELETE variables dateday datemo dateyr.

* Match date of death onto psych inpatients file so that we can calculate how long before death the most recent episode was.

MATCH FILES /FILE=*

/TABLE= !Filepath + '/all deaths_updated.sav'

/rename HB_RESIDENCE = HB_RESIDENCE_DEATH

/BY SID_ID.

EXECUTE.

*Select only those with a death date (to exclude cases where no suicide occurred), there shouldn't be any of these though.

select if (date_of_death ne "").

exe.

*-----Section 2 - Compute difference(in days) between 2 dates - date of death and date of discharge. -----.

** and Investigate some of the episodes appearing after death.

compute diff=ctime.days(death_dmy - discharge_DMY).

EXE.

temp.

select if diff < 11.

freq diff.

**maybe choose year and change diff to diff <2

*There are 33 records where a patient was discharged one day after their date of death, and 2 records where a patient was discharged two days after their date of death.

*There is also one record where the discharge is 14 days after death and another where the gap is 68 days.

*flag the Episodes that are on the same day as death or after the date of death (this happened in a few cases).

**we dont want to look at CISs where the date of discharge is the same as the date of death because this CIS is not likely to tell us anything about

**how to prevent future suicides. By this point it is too late and the diagnosis info related to this discharge is going to relate to the attempted suicide rather than

**anything more related to their mental health condition.

compute death_discharge=0.

if diff <= 0 death_discharge=1.

exe.

aggregate /break sid_id cis_marker /temp = max(death_discharge).

compute death_discharge = temp.

execute.

delete variables temp.

freq death_discharge.

select if death_discharge = 0.

*Calculate which cases had the date of interest within 30 days, last 12 months, last 5 years, last 10 years.

if range(diff,1,30) discharge_to_death = 1.

if range(diff,31,365) discharge_to_death = 2.

if range(diff,366,1827) discharge_to_death = 3.

```
if diff>1827 discharge_to_death = 4.
if missing(diff) discharge_to_death = 9.
if diff<=0 discharge_to_death = 0.
exe.
```

```
value labels discharge_to_death 1 "1-30 days" 2 "31-365 days" 3 "366 to 1827
days" 4 ">1827 days" 0 "<1 day" 9 "unknown".
```

```
freq discharge_to_death.
```

* Identify most recent episode for each patient.

```
sort cases by sid_id diff.
compute most_recent = 1.
if sid_id = lag(sid_id) most_recent = 0.
execute.
```

```
save outfile = !Filepath + 'SMR01+deaths.sav'.
```

```
*****.
**SMR04**.
```

```
**Open the SMR04 ScotSID file extracted from SMRA.
Get file = !Filepath + 'SMR04.sav'.
```

```
rename variables DISCHAGE_DATE = DISCHARGE_DATE.
```

*Note - Learning disability specialties are excluded from the central stats presented in the SMR04 publication but they are not excluded here.
**in the 2014 report one person in the 2009-2012 suicide cohort had had a learning disability SMR04 episode in the 5 years before death.

```
SORT CASES BY SID_ID(A) DISCHARGE_DATE(D).
```

*Some SMR04 records have no discharge date. Avoid them for the moment and assess after matching.

```
do if discharge_date ne "".
```

* 1. make str date into date format (dd/mm/yyyy) by splitting string into day,month,year.

```
compute dateday = number(char.substr(DISCHARGE_DATE,7,2),F2.0).
compute datemo = number(char.substr(DISCHARGE_DATE,5,2),F2.0).
compute dateyr = number(char.substr(DISCHARGE_DATE,1,4),F4.0).
```

```
end if.
```

* 2. convert numeric format to date format.

```
compute DISCHARGE_DMY=DATE.DMY(dateday, datemo, dateyr).
formats DISCHARGE_DMY (EDATE10).
execute.
```

*4. deletes unnecessary variables created in steps 1 - 3 above.
DELETE variables dateday datemo dateyr.

* Match date of death onto psych inpatients file so that we can calculate how long before death the most recent episode was.

```
MATCH FILES /FILE=*  
  /TABLE= !Filepath + '/all deaths_updated.sav'  
  /rename HB_RESIDENCE = HB_RESIDENCE_DEATH  
  /BY SID_ID.  
EXECUTE.
```

*Select only those with a death date (to exclude cases where no suicide occurred), there shouldn't be any of these though.

```
select if (date_of_death ne "").  
exe.
```

```
*****
```

```
*****  
*****
```

*-----Section 2 - Compute difference(in days) between 2 dates - date of death and date of discharge. -----.

** and Investigate some of the episodes appearing after death.

```
*****
```

```
*****
```

```
compute diff=ctime.days(death_dmy - discharge_DMY).
```

```
EXE.
```

```
temp.
```

```
select if diff < 11.
```

```
freq diff.
```

*May 2015 - the 6 cases (in 2010-2012, 1 is 2 days after death and the rest are 1 day after death) appearing after death were investigated and found to be legitimate records so they should not be removed from the analysis.

**These should be treated in the same way as cases discharged on the same day as death. In SMR04 discharges on day of death are included .

**as individuals are not admitted to a psychiatric unit after significant self harm, and therefore these admissions are not in response to a suicidal act.

*April 2016 - there are 4 further cases, as well as two records where the discharge date is missing.

```
select if diff >= -2.
```

*Calculate which cases had the date of interest within 30 days, last 12 months, last 5 years, last 10 years.

```
if range(diff,0,30) discharge_to_death = 1.
```

```
if range(diff,31,365) discharge_to_death = 2.
```

```
if range(diff,366,1827) discharge_to_death = 3.
```

```
if diff>1827 discharge_to_death = 4.
```

```
if missing(diff) discharge_to_death = 9.
```


* include discharges after death with a difference of zero.

if diff<0 discharge_to_death = 1.

exe.

value labels discharge_to_death 1 "0-30 days" 2 "31-365 days" 3 "366 to 1827 days" 4 ">1827 days" 0 "<1 day" 9 "unknown".

freq discharge_to_death.

* Identify most recent episode for each patient.

sort cases by sid_id diff.

compute most_recent = 1.

if sid_id = lag(sid_id) most_recent = 0.

execute.

alter type status_on_admission (F2.0).

recode status_on_admission (1,2,4 = 4) (3 = 3) (else = 9).

value labels status_on_admission 3 'Formal' 4 'Informal' 9 'Unknown'.

freq status_on_admission.

save outfile = !Filepath + 'SMR04+deaths.sav'.

```
*****.  
***SMR00**.  
*****.
```

**Open the SMR00 ScotSID file extracted from SMRA.

Get file = !Filepath + 'Outpatients.sav'.

SORT CASES BY SID_ID(A) CLINIC_DATE(D).

* 1. make str date into date format (dd/mm/yyyy) by splitting string into day,month,year.

compute dateday = number(char.substr(CLINIC_DATE,7,2),F2.0).

compute datemo = number(char.substr(CLINIC_DATE,5,2),F2.0).

compute dateyr = number(char.substr(CLINIC_DATE,1,4),F4.0).

* 2. convert numeric format to date format.

compute CLINIC_DMY=DATE.DMY(dateday, datemo, dateyr).

formats CLINIC_DMY (EDATE10).

execute.

*4. deletes unnecessary variables created in steps 1 - 3 above.

DELETE variables dateday datemo dateyr.

* Match date of death onto psych inpatients file so that we can calculate how long before death the most recent episode was.

MATCH FILES /FILE=*

/TABLE= !Filepath + '/all deaths_updated.sav'

/BY SID_ID.

EXECUTE.

```
*****
*****
*****
*-----Section 2 - Compute difference(in days) between 2 dates - date of
death and date of clinic. -----
*****
*****
compute diff=ctime.days(death_dmy - clinic_dmy).
EXE.
```

```
temp.
select if diff < 11.
freq diff.
```

- *There are 0 records where the clinic date is after the death date, or where either date is missing.
- *There are 12 records where the clinic date is the same as the death date. At the moment these are included.
- *Calculate which cases had the date of interest within 30 days, last 12 months.
- *Looking at the data, we don't get records longer than 1 year prior to death.

```
if range(diff,0,30) contact_to_death = 1.
if range(diff,31,365) contact_to_death = 2.
if diff>365 contact_to_death = 3.
if missing(diff) contact_to_death = 9.
if diff<0 contact_to_death = 0.
exe.
```

```
value labels contact_to_death 1 "0-30 days" 2 "31-365 days" 3 ">365 days" 0 "<1
day" 9 "unknown".
```

```
freq contact_to_death.
```

* Identify most recent episode for each patient.

```
sort cases by sid_id diff.
compute most_recent = 1.
if sid_id = lag(sid_id) most_recent = 0.
execute.
```

```
alter type referral_type clinic_attendance (F2.0).
```

```
value labels referral_type
  1 'New Outpatient: Consultation and Management'
  2 'New Outpatient: Consultation only'
  3 'Follow-up/Return Outpatient'
/clinic_attendance
  1 'Patient was seen'
```

- 5 'Patient attended but was not seen (CNW: Could Not Wait)'
- 8 'Patient did not attend and gave no prior warning (DNA)'.

save outfile = !Filepath + 'Outpatients+deaths.sav'.

```
*****.
*****A&E*****.
*****.
```

**Open the A&E ScotSID file extracted from SMRA.
Get file = !Filepath + 'A&E.sav'.

SORT CASES BY SID_ID(A) DAT_DATE(D).

* 1. make str date into date format (dd/mm/yyyy) by splitting string into day,month,year.

```
compute dateday = number(char.substr(DAT_DATE,7,2),F2.0).
compute datemo = number(char.substr(DAT_DATE,5,2),F2.0).
compute dateyr = number(char.substr(DAT_DATE,1,4),F4.0).
```

* 2. convert numeric format to date format.

```
compute DISCHARGE_DMY=DATE.DMY(dateday, datemo, dateyr).
formats DISCHARGE_DMY (EDATE10).
execute.
```

*4. deletes unnecessary variables created in steps 1 - 3 above.

```
DELETE variables dateday datemo dateyr.
```

* Match on deaths file.

```
MATCH FILES /FILE=*
  /TABLE= !Filepath + '/all deaths_updated.sav'
  /BY SID_ID.
EXECUTE.
```

*Select only those with a death date (to exclude cases where no suicide occurred), there shouldn't be any of these though.

```
select if (date_of_death ne "").
```

exe.

```
*****.
```

```
*****.
```

```
*****.
```

*-----Section 2 - Compute difference(in days) between 2 dates - date of death and date of discharge. -----.

** and Investigate some of the episodes appearing after death.

```
*****.
```

```
*****.
```

```
compute diff=ctime.days(death_dmy - discharge_DMY).
```

EXE.

temp.

```
select if diff <11.
```

freq diff.

**There are a number of cases which are negative presumably due to incorrect info. held on A&E datamart.

**The 27 with a difference of -1 look okay as they mostly have a destination of 00, but the most negative differences look like errors.

select if diff >= -1.

*****remove cases that died on their day of attendance (or the day after) - just as we do for SMR01.

*one difference from what we do with SMR01 is we look the discharge destination code as well as the day of death from the NRS

*Record. so we flag cases where the day of death is = to or 1 day before date of discharge from A&E and their discharge destination is coded as either 'death'

*or 'Admission to same NHS healthcare provider'.

compute death_discharge=0.

if diff <= 0 and any(char.substr(discharge_destination_code,1,2),'00','04')

death_discharge=1.

exe.

freq death_discharge.

select if death_discharge = 0.

*Calculate which cases had the date of interest within 30 days, last 12 months, last 5 years, last 10 years.

if diff <= 1 discharge_to_death = 1.

if diff = 2 discharge_to_death = 2.

if range(diff,3,7) discharge_to_death = 3.

if range(diff,8,27) discharge_to_death = 4.

if range(diff,28,55) discharge_to_death = 5.

if range(diff,56,90) discharge_to_death = 6.

if diff>90 discharge_to_death = 7.

if missing(diff) discharge_to_death = 9.

exe.

value labels discharge_to_death 1 "0 to 1 days" 2 "2 days" 3 "3 to 7 days" 4 ">1 to <4 weeks"

5 "4 to <8 weeks" 6 "8 to 13 weeks" 7 ">90 days" 9 "unknown".

freq discharge_to_death.

* Identify most recent episode for each patient.

sort cases by sid_id diff.

compute most_recent = 1.

if sid_id = lag(sid_id) most_recent = 0.

execute.

```
save outfile = !Filepath + 'A&E+deaths.sav'.
```

```
*****.  
***SMR02*****.  
*****.
```

```
**Open the SMR02 ScotSID file extracted from SMRA.  
Get file = !Filepath + 'SMR02.sav'.
```

```
SORT CASES BY SID_ID(A) DATE_OF_DELIVERY(D).
```

```
do if date_of_delivery ne "".
```

```
* 1. make str date into date format (dd/mm/yyyy) by splitting string into  
day,month,year.
```

```
compute dateday = number(char.substr(date_of_delivery,7,2),F2.0).
```

```
compute datemo = number(char.substr(date_of_delivery,5,2),F2.0).
```

```
compute dateyr = number(char.substr(date_of_delivery,1,4),F4.0).
```

```
end if.
```

```
* 2. convert numeric format to date format.
```

```
compute delivery_DMY=DATE.DMY(dateday, datemo, dateyr).
```

```
formats delivery_DMY (EDATE10).
```

```
execute.
```

```
*4. deletes unnecessary variables created in steps 1 - 3 above.
```

```
DELETE variables dateday datemo dateyr.
```

```
* Match date of death onto psych inpatients file so that we can calculate how  
long before death the most recent episode was.
```

```
MATCH FILES /FILE=*
```

```
  /TABLE= !Filepath + '/all deaths_updated.sav'
```

```
  /BY SID_ID.
```

```
EXECUTE.
```

```
*Select only those with a death date (to exclude cases where no suicide  
occurred), there shouldn't be any of these though.
```

```
select if (date_of_death ne "").
```

```
exe.
```

```
*****.
```

```
*****.  
*****.
```

```
*-----Section 2 - Compute difference(in days) between 2 dates - date of  
death and date of delivery. -----.
```

```
** and Investigate some of the episodes appearing after death.
```

```
*****
```

```
*****.
```

```
compute diff=ctime.days(death_dmy - delivery_DMY).
```

```
EXE.
```

```
temp.  
select if diff < 91.  
freq diff.
```

*All deliveries are before death.

*Calculate which cases had the date of interest within 30 days, last 12 months, last 5 years, last 10 years.

```
if range(diff,0,30) delivery_to_death = 1.  
if range(diff,31,365) delivery_to_death = 2.  
if range(diff,366,1826) delivery_to_death = 3.  
if range(diff,1827,5844) delivery_to_death = 4.  
if diff > 5844 delivery_to_death = 5.  
if missing(diff) delivery_to_death = 9.  
if diff<0 delivery_to_death = 0.  
exe.
```

```
value labels delivery_to_death 1 "1-30 days" 2 "31-365 days" 3 "1 to 5 years" 4 "5  
to 16 years" 5 ">16 years" 0 "<0 days" 9 "unknown".
```

```
freq delivery_to_death.
```

* Identify most recent episode for each patient.

```
sort cases by sid_id diff.  
compute most_recent = 1.  
if sid_id = lag(sid_id) most_recent = 0.  
execute.
```

```
alter type pregnancy_outcome_1 to pregnancy_outcome_3 (F2.0).
```

```
value labels pregnancy_outcome_1 to pregnancy_outcome_3
```

```
  1 "Livebirth"  
  2 "Stillbirth"  
  3 "Early neonatal death"  
  4 "Late neonatal death"  
  5 "Post-neonatal death"  
  8 "Abortion of a dead fetus of a multiple pregnancy in which the other babies  
are live born".
```

```
save outfile = !Filepath + 'Maternity+deaths.sav'.
```

```
*****  
***SMR25***  
*****
```

```
**Open the SMR25 ScotSID file extracted from SMRA.  
Get file = !Filepath + 'SMR25.sav'.
```

```
SORT CASES BY SID_ID(A) DATEASS(D).
```

```

* 1. make str date into date format (dd/mm/yyyy) by splitting string into
day,month,year.
compute dateday = number(char.substr(ATEASS,7,2),F2.0).
compute datemo = number(char.substr(ATEASS,5,2),F2.0).
compute dateyr = number(char.substr(ATEASS,1,4),F4.0).

```

```

* 2. convert numeric format to date format.
compute ASSESSMENT_DMY=DATE.DMY(dateday, datemo, dateyr).
formats ASSESSMENT_DMY (EDATE10).
execute.

```

```

*4. deletes unnecessary variables created in steps 1 - 3 above.
DELETE variables dateday datemo dateyr.

```

```

* Match date of death onto psych inpatients file so that we can calculate how
long before death the most recent episode was.

```

```

MATCH FILES /FILE=*
  /TABLE= !Filepath + '/all deaths_updated.sav'
  /rename HB_RESIDENCE = HB_RESIDENCE_DEATH
  /BY SID_ID.
EXECUTE.

```

```

*****

```

```

*****

```

```

*****

```

```

*-----Section 2 - Compute difference(in days) between 2 dates - date of
death and date of assessment. -----

```

```

**          and Investigate some of the episodes appearing after death.

```

```

*****

```

```

*****

```

```

compute diff=ctime.days(death_dmy - assessment_DMY).
EXE.

```

```

*There are no records with an assessment date after death.

```

```

*Calculate which cases had the date of interest within 30 days, last 12 months,
last 5 years, last 10 years.

```

```

if range(diff,0,182) assessment_to_death = 1.
if range(diff,183,364) assessment_to_death = 2.
if range(diff,365,730) assessment_to_death = 3.
if diff>730 assessment_to_death = 4.
if missing(diff) assessment_to_death = 9.
if diff<0 assessment_to_death = 0.
exe.

```

```

value labels assessment_to_death 1 "<6 months" 2 "6-12 months" 3 "1-2 years" 4
">2 years" 0 "<0 days" 9 "unknown".

```

freq assessment_to_death.

* Identify most recent episode for each patient.

sort cases by sid_id diff.
compute most_recent = 1.
if sid_id = lag(sid_id) most_recent = 0.
execute.

*save outfile = !Filepath + 'SMR25+deaths.sav'.
save outfile = !Filepath + 'SMR25+deaths.sav'.

```
*****.  
***Prescribing*****.  
*****.
```

**Open the Prescribing ScotSID file extracted from SMRA.
Get file = !Filepath + 'Prescriptions.sav'.

SORT CASES BY SID_ID(A) PRESCRIBED_DATE(D).

* 1. make str date into date format (dd/mm/yyyy) by splitting string into
day,month,year.

compute dateday = number(char.substr(PRESCRIBED_DATE,7,2),F2.0).
compute datemo = number(char.substr(PRESCRIBED_DATE,5,2),F2.0).
compute dateyr = number(char.substr(PRESCRIBED_DATE,1,4),F4.0).

* 2. convert numeric format to date format.

compute PRESCRIPTION_DMY=DATE.DMY(dateday, datemo, dateyr).
formats PRESCRIPTION_DMY (EDATE10).
execute.

*4. deletes unnecessary variables created in steps 1 - 3 above.
DELETE variables dateday datemo dateyr.

* Match date of death onto psych inpatients file so that we can calculate how
long before death the most recent episode was.

```
MATCH FILES /FILE=*  
  /TABLE= !Filepath + '/all deaths_updated.sav'  
  /BY SID_ID.  
EXECUTE.
```

*Select only those with a death date (to exclude cases where no suicide
occurred), there shouldn't be any of these though.

```
select if (date_of_death ne "").  
exe.
```

CROSSTABS

```
/TABLES=year BY WHY_COUNTED  
/FORMAT=AVALUE TABLES  
/CELLS=COUNT  
/COUNT ROUND CELL.
```



```

*****
*****
*****
*-----Section 2 - Compute difference(in days) between 2 dates - date of
death and date of prescription. -----
**          and Investigate some of the episodes appearing after death.
*****
*****
compute diff=ctime.days(death_dmy - prescription_DMY).
EXE.

temp.
select if diff < 11.
freq diff.

*There are a large number of records with a prescribing date after death.
*Some of these (particularly some of these with a difference < 31 days) are
attributable to the prescribing date
*being set to the payment date if unknown.

*However there are a number with a very large (>1 year) difference.

*Remove some of the post-death prescriptions.
select if diff > -31.

*Calculate which cases had the date of interest within 30 days, last 12 months,
last 5 years, last 10 years.

if range(diff,0,30) prescription_to_death = 1.
if range(diff,31,365) prescription_to_death = 2.
if range(diff,366,1827) prescription_to_death = 3.
if diff>1827 prescription_to_death = 4.
if missing(diff) prescription_to_death = 9.
if diff<0 prescription_to_death = 0.
exe.

value labels prescription_to_death 1 "0-30 days" 2 "31-365 days" 3 "366 to 1827
days" 4 ">1827 days" 0 "<0 days" 9 "unknown".

freq prescription_to_death.

* Identify most recent prescription for each patient.

sort cases by sid_id diff.
compute most_recent = 1.
if sid_id = lag(sid_id) most_recent = 0.
execute.

save outfile = !Filepath + 'Prescribing+deaths.sav'.

```

4. Syntax for New Cause of Death Variables

```
5.
6. GET
7. FILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Deaths 30-10-20_1.sav'.
8. DATASET NAME DataSet1 WINDOW=FRONT.
9. GET
10. FILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Deaths and Helpseeking.sav'.
11. DATASET NAME DataSet2 WINDOW=FRONT.
12.
13. SAVE OUTFILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Full Dataset 18-
    01.sav'
14. /COMPRESSED.
15. FREQUENCIES VARIABLES=COD_New
16. /ORDER=ANALYSIS.
17.
18.
19.
20. FREQUENCIES VARIABLES=COD_New
21. /STATISTICS=RANGE MINIMUM MAXIMUM STDDEV MEAN MEDIAN
22. /FORMAT=NOTABLE
23. /ORDER=ANALYSIS.
24.
25.
26.
27. DESCRIPTIVES VARIABLES=COD_New
28. /STATISTICS=MEAN STDDEV MIN MAX.
29.
30.
31.
32. FREQUENCIES VARIABLES=COD_New
33. /STATISTICS=RANGE MINIMUM MAXIMUM STDDEV MEAN MEDIAN
34. /FORMAT=NOTABLE
35. /ORDER=ANALYSIS.
36.
37.
38.
39. COUNT Self_Poisoning=COD_New(10).
40. VARIABLE LABELS Self_Poisoning 'COD: Self-Poisoning '.
41. EXECUTE.
42. FREQUENCIES VARIABLES=Self_Poisoning
43. /STATISTICS=RANGE MINIMUM MAXIMUM MODE
44. /ORDER=ANALYSIS.
45.
46.
47.
48. FREQUENCIES VARIABLES=Self_Poisoning
49. /STATISTICS=RANGE MINIMUM MAXIMUM MODE
50. /ORDER=ANALYSIS.
51.
52.
53.
54. FREQUENCIES VARIABLES=COD_New
55. /ORDER=ANALYSIS.
56.
```

57.
58.
59. DATASET ACTIVATE DataSet2.
60. DATASET CLOSE DataSet1.
61. COUNT Hanging_Strangulation_or_Suffocation=COD_New(20).
62. VARIABLE LABELS Hanging_Strangulation_or_Suffocation 'COD: hanging, strangulation or poisoning'.
63. EXECUTE.
64. FREQUENCIES VARIABLES=Hanging_Strangulation_or_Suffocation
65. /STATISTICS=RANGE MINIMUM MAXIMUM MODE
66. /ORDER=ANALYSIS.
67.
68.
69.
70. DATASET ACTIVATE DataSet2.
71.
72. SAVE OUTFILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Full Dataset 18-01.sav'
73. /COMPRESSED.
74. COUNT Drowning_or_Submersion=COD_New(21).
75. VARIABLE LABELS Drowning_or_Submersion 'COD: drowning or submersion'.
76. EXECUTE.
77. FREQUENCIES VARIABLES=Drowning_or_Submersion
78. /STATISTICS=RANGE MINIMUM MAXIMUM MODE
79. /ORDER=ANALYSIS.
80.
81.
82.
83. COUNT Firearm_or_Handgun=COD_New(22).
84. VARIABLE LABELS Firearm_or_Handgun 'COD: firearm//handgun'.
85. EXECUTE.
86. FREQUENCIES VARIABLES=Firearm_or_Handgun
87. /STATISTICS=RANGE MINIMUM MAXIMUM MODE
88. /ORDER=ANALYSIS.
89.
90.
91.
92. DATASET ACTIVATE DataSet2.
93.
94. SAVE OUTFILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Full Dataset 18-01.sav'
95. /COMPRESSED.
96. COUNT Exposore_or_Contact_with_smoke_fire_flames=COD_New(26).
97. VARIABLE LABELS Exposore_or_Contact_with_smoke_fire_flames 'COD: Exposure to smoke, fire and '+
98. 'flames/ Contact with steam, hot vapours or hot objects'.
99. EXECUTE.
100. FREQUENCIES VARIABLES=Exposore_or_Contact_with_smoke_fire_flames
101. /STATISTICS=RANGE MINIMUM MAXIMUM MODE
102. /ORDER=ANALYSIS.
103.
104.
105.
106. DATASET ACTIVATE DataSet2.
107.
108. SAVE OUTFILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Full Dataset 18-01.sav'
109. /COMPRESSED.

```

110.     COUNT Contact_with_sharp_or_blunt_object=COD_New(28).
111.     VARIABLE LABELS Contact_with_sharp_or_blunt_object 'COD: Contact with sharp
or blunt object'.
112.     EXECUTE.
113.     FREQUENCIES VARIABLES=Contact_with_sharp_or_blunt_object
114.     /STATISTICS=RANGE MINIMUM MAXIMUM MODE
115.     /ORDER=ANALYSIS.
116.

117.
118.
119.     DATASET ACTIVATE DataSet2.
120.
121.     SAVE OUTFILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Full Dataset
18-01.sav'
122.     /COMPRESSED.
123.     COUNT
Falling_jumping_pushed_fromhighplace_or_into_movingvehicle=COD_New(30).
124.     VARIABLE LABELS
Falling_jumping_pushed_fromhighplace_or_into_movingvehicle 'COD: Falling, '+
125.     'jumping or pushed from a high place/Falling, lying or running before or into a
moving vehicle'.
126.     EXECUTE.
127.     FREQUENCIES VARIABLES=Expsosure_or_Contact_with_smoke_fire_flames
128.     /STATISTICS=RANGE MINIMUM MAXIMUM MODE
129.     /ORDER=ANALYSIS.
130.

131.
132.
133.     FREQUENCIES
VARIABLES=Falling_jumping_pushed_fromhighplace_or_into_movingvehicle
134.     /STATISTICS=RANGE MINIMUM MAXIMUM MODE
135.     /ORDER=ANALYSIS.
136.

137.
138.
139.     DATASET ACTIVATE DataSet2.
140.
141.     SAVE OUTFILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Full Dataset
18-01.sav'
142.     /COMPRESSED.
143.     COUNT Crashing_of_motor_vehicle=COD_New(32).
144.     VARIABLE LABELS Crashing_of_motor_vehicle 'COD: crashing of motor vehicle'.
145.     EXECUTE.
146.     FREQUENCIES VARIABLES=Crashing_of_motor_vehicle
147.     /STATISTICS=RANGE MINIMUM MAXIMUM MODE
148.     /ORDER=ANALYSIS.
149.

150.
151.
152.     DATASET ACTIVATE DataSet2.
153.
154.     SAVE OUTFILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Full Dataset
18-01.sav'
155.     /COMPRESSED.
156.     COUNT Other_unspecified_events=COD_New(33).
157.     VARIABLE LABELS Other_unspecified_events 'COD: other unspecified events'.
158.     EXECUTE.
159.     FREQUENCIES VARIABLES=Other_unspecified_events
160.     /STATISTICS=RANGE MINIMUM MAXIMUM MODE

```

```

161.         /ORDER=ANALYSIS.
162.
163.
164.
165.         DATASET ACTIVATE DataSet2.
166.
167.         SAVE OUTFILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Full Dataset
18-01.sav'
168.         /COMPRESSED.
169.         RECODE Self_Poisoning Hanging_Strangulation_or_Suffocation
Drowning_or_Submersion
170.             Firearm_or_Handgun Exposure_or_Contact_with_smoke_fire_flames
Contact_with_sharp_or_blunt_object
171.             Falling_jumping_pushed_fromhighplace_or_into_movingvehicle
Crashing_of_motor_vehicle
172.             Other_unspecified_events (0=2) (1=1).
173.         EXECUTE.
174.         FREQUENCIES VARIABLES=Self_Poisoning Hanging_Strangulation_or_Suffocation
Drowning_or_Submersion Firearm_or_Handgun
Exposure_or_Contact_with_smoke_fire_flames Contact_with_sharp_or_blunt_object
Falling_jumping_pushed_fromhighplace_or_into_movingvehicle
Crashing_of_motor_vehicle Other_unspecified_events
175.         /STATISTICS=RANGE MINIMUM MAXIMUM MODE
176.         /ORDER=ANALYSIS.
177.
178.
179.
180.         DATASET ACTIVATE DataSet2.
181.
182.         SAVE OUTFILE='\\Farr-FS1\Study Data\1819-0276\Results\Full Dataset\Full Dataset
18-01.sav'
183.         /COMPRESSED.
184.
185.
186.

```

Appendix 30 - Complementary activities developed during the PhD

Conferences

June 2019 Early & Mid-Career Researchers' (EMCR) Forum
"Towards an Enhanced Understanding of Suicide Risk in Men" (Oral Presentation)

September 2019 International Association for Suicide Prevention (IASP) Congress
"A Systematic Review of the Factors Associated with Suicidal Thinking and Behaviours in Men" (Poster Presentation)

November 2020 NRS Mental Health 2020 Annual Scientific Meeting
"The Male Experience of Suicide Attempts and Recovery: An Interpretative Phenomenological Analysis" (Poster)

November 2020 netECR e-Conference 2020
"The Male Experience of Suicide Attempts and Recovery: An Interpretative Phenomenological Analysis" (Oral Presentation)

March 2021 3 Minute Thesis Competitor
"Understanding Suicide Risk in Men" (Oral Presentation)

June 2021 Early and Mid-Career Researchers' Forum 2021 (EMCRF21)
"The Male Experience of Suicide Attempts and Recovery: An Interpretative Phenomenological Analysis" (Oral Presentation and Chair of Session F)

July 2021 PsyPAG Virtual Conference
"A systematic review of suicidal behaviour in men: a narrative synthesis of risk factors" (Oral Presentation)

September 2021 International Association for Suicide Prevention (IASP) 31st World Congress
"A systematic review of suicidal behaviour in men: a narrative synthesis of risk factors" (Oral Presentation)

November 2021 IASP SIG Suicide Prevention for Boys and Men November Seminar
"Towards an enhanced understanding of suicide risk in men" (Invited Speaker)

Blogs

Mental elf blogs:

- <https://www.nationalelfservice.net/mental-health/suicide/masculinity-depression-suicide/>
- <https://www.nationalelfservice.net/mental-health/suicide/male-suicide-help-seeking/>
- <https://www.nationalelfservice.net/mental-health/suicide/suicide-awareness-campaign/>
- <https://www.nationalelfservice.net/mental-health/eating-disorders/eating-disorders-tiktok/>

- <https://www.nationalelfservice.net/mental-health/suicide/male-suicide-prevention/>

IHAWKES blog:

- <http://ihawkes.academicblogs.co.uk/2021/03/31/understanding-suicide-risk-in-men/>

Reviewer for Other PhD Student's Systematic Reviews:

- What Factors Explain the Relationship between Perfectionism and Suicide Risk?
- Male Suicide Risk and Recovery Factors: A 20-Year Systematic Review and Meta-Synthesis of Qualitative Studies.
- A Systematic Review of The Dynamic Nature of Suicidal Ideation.

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