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Scotland's Suicide  
Prevention Action Plan



**National Suicide Prevention Leadership Group  
Every Life Matters Suicide Prevention Action Plan  
Academic Advisory Group**

# **Risk and protective factors associated with suicidal and self-injurious behaviours in the Scottish population**

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## 1. Introduction

*Every Life Matters*, Scotland's Suicide Prevention Action Plan (SPAP) 2018 – 2021 (Scottish Government, 2018), sets out the Scottish Government's cross-sectoral plan to further reduce the suicide rate by 20% by 2022 (from the 2017 baseline). The SPAP contains 10 'Actions' and is being led by the National Suicide Prevention Leadership Group (NSPLG). The NSPLG was established in September 2018 by the Scottish Government to support the delivery of the SPAP. Membership reflects a broad range of delivery partners involved in suicide prevention and from key national (leadership) agencies and includes those with lived experience of the impacts of suicide. The NSPLG reports, and makes recommendations, to Scottish Ministers and CoSLA on matters under the responsibility of local government. Action 7 of the SPAP authorises the NSPLG to "identify and facilitate preventative actions targeted at risk groups." In November 2021, the Scottish Government Suicide Prevention and Self-harm Policy Team and Delivery Leads for Action 7 asked the Academic Advisory Group to undertake a review of the research literature, with a view to identifying risk and protective factors for self-injurious or suicidal behaviour in the Scottish context.

## 2. Methods

Three searches were conducted between 1 December 2021 and 17 February 2022. The first search was conducted on academic databases (CINAHL, Medline, PsychArticles, PsychInfo and Web of Knowledge) and refined by subject headings (e.g., MeSH) in order to identify relevant literature based on exclusively Scottish populations. The second search replicated the first, with the addition of identifying studies conducted by academic institutes and health boards based in Scotland, where the dominant nationality of the research population was likely to be Scottish. The third search screened literature published on the Suicidal Behaviour Research Laboratory website ([www.SBRL.info/](http://www.SBRL.info/)). A PRISMA statement, including a detailed summary of the search strategy and search terms, can be found in appendix 1.

### 2.1 Eligibility criteria

Studies were included if: i) they explored any form of suicidal or self-injurious behaviour (see table 1 for terminologies and definitions), including studies which explored suicidal/self-injurious behaviour in combination with suicidal ideation (where these were measured jointly as a single variable); ii) they included a Scottish sample; iii) they explored risk or protective factors in relation to suicidal or self-injurious behaviours, iv) they were written in English; v) they were published in an academic peer-reviewed journal; and vi) they were published since 2011. Studies were excluded if i) they were not peer reviewed, ii) they were a review or commentary, iii) data were pooled with other nationalities where Scotland was unlikely to be the dominant nationality, iv) the data explored non-Scottish nationalities only, v) there was no measure of self-harm or suicidal behaviour, vi) the study did not measure risk or protective factors in relation to suicidal/self-injurious outcomes, vi) data were collected based on second-hand accounts, and vii) the full-text publication was unavailable.

Title and abstract screenings were completed by three members of the team. Abstract and full-paper inter-rater checks were completed by two team members. Discrepancies in eligibility for inclusion were resolved following discussion between them, reaching 100% concordance. Findings are summarised by the risk/protective factors that have been identified. Where suitable data were provided (i.e., papers provided effect sizes), a meta-analysis (via Comprehensive Meta-Analysis) was conducted to identify the overall random effect size of each factor in relation to suicide and suicide attempt, compared to any other self-injurious/suicidal behaviour history or no history of self-injurious/suicidal behaviour.

We have standardised the terminology used in this review (see table 1). Where authors of included papers have used different terms or have used the same terms in a different way (compared to our usage), we have translated their terminology into our standardised terminology.

**Table 1. Standardised terminology used in the review**

<b>Terminology</b>	<b>Definition</b>
Suicide	Intentionally ending one's life
Suicide attempt	Self-injurious, non-fatal behaviour where death was the intended outcome
Non-suicidal self-harm (NSSH)	Self-injurious, non-fatal behaviour where death was not the intended outcome
Self-harm (SH)	Self-injurious behaviour with or without intent to die or where there is undetermined intent
Suicidal behaviour	Suicide or suicide attempt
Suicidal/self-harm ideation (SSHI)	Thoughts of suicide or of self-injurious behaviour
Suicidality	Suicide Attempt or SSHI, where the outcome is not defined

### 3. Results

Thirty-one papers were eligible for inclusion in this report. Findings are grouped below into two sections, based on their research method: studies using quantitative methods, followed by studies using qualitative methods.

#### 3.1 Quantitative studies

Overall, 105 risk and protective factors were identified from 28 quantitative studies (see appendix 2 for quantitative study summaries). All significant risk or protective factors associated with suicidal behaviour in Scottish populations are summarised below, grouped into the following subheadings: demographics and individual differences, pre-motivational factors, motivational factors, volitional factors, and other. Factors which were not significantly associated with self-injurious or suicidal behaviours are summarised in appendix 3. Factors relating to self-injurious/suicidal behaviour which were explored in non-general Scottish populations (ex-military) are reported in appendix 4. Where sufficient data are available, overall effect sizes have been calculated per factor based on NSSH (appendix 5) and suicide attempt and suicide (see appendix 6).

##### 3.1.1 Demographics and individual differences

###### Age

Twelve studies investigated current age in relation to SH or suicidal behaviour. Participants' age across these studies spanned the range 15 to 84 years.

Five of the six studies exploring age and SH concluded that a younger average age was significantly associated with SH. Over an 11-year period, Conlin et al. (2016) found that individuals admitted to

hospital with SH by burning were younger (mean 33.9 years, range 15-62 years) than those with accidental burn injuries (mean 42 years, range 19-84). Melson and O'Connor (2019) found that individuals who self-reported a lifetime history of SH were significantly younger than those who reported a lifetime history of SSHI. O'Connor et al. (2018) found that the prevalence of NSSH was significantly higher among 24-to-29-year-olds (17.1%) compared to 30-to-34-year-olds (11.7%). Hafferty et al. (2019) found that, compared to those aged 55-64, those aged 25 to 54 years were at significantly greater risk of hospital-treated SH. Hafferty et al. (2019) also identified that being aged  $\geq$  65 years was associated with significantly less risk of hospital-treated SH compared to those aged 55-64 years old. Only Cleare et al. (2018) found no significant difference in age between first and repeat SH lifetime history.

The seven remaining studies explored age in relation to suicidal behaviour or attempt. One study found no significant association between age and lifetime suicidal behaviour (O'Connor et al., 2013), while three studies found no association between age and hospital re-attendance following suicide attempt within 15 months of suicide attempt at baseline (De Beurs et al., 2016; O'Connor et al., 2015)<sup>1</sup> or within 24 months of baseline hospital attendance following a suicide attempt (O'Connor, O'Carroll et al., 2012). O'Connor et al. (2018) found that the lifetime prevalence of suicide attempts was significantly higher in 30–34-year-olds (13%) compared to 18-23 year olds (9%). Dhingra et al. (2015) and Wetherall et al. (2018) found that general population participants with a lifetime history of suicide attempt were significantly older than individuals with a history of SSHI only and individuals with no history of suicidality.

Three studies provided sufficient data to explore age in relation to suicide attempt (Cleare et al., 2021; Dhingra et al., 2015; Wetherall et al., 2018) with a significant association identified (OR= 1.03, 95% CI: 1.01 - 1.04) where 'younger' participants were more likely to report a suicide attempt than older. Although all participants were above 18 years old in this analysis, the upper age limit was variable.

### Sex

Fifteen studies examined sex differences (male/female) in relation to SH, suicide attempt or suicide.

Of the nine studies exploring SH, five found females were more likely to engage in SH than males (Cleare et al., 2018; Conlin et al., 2016; Hafferty et al., 2019; Melson & O'Connor, 2019; Riordan et al., 2012). In all studies except Hafferty et al. (2019), sex remained a significant factor after controlling for other factors. O'Connor et al. (2018) found that females were more likely to engage in NSSH than males. Two studies (O'Connor et al., 2013; Young et al., 2011) found no sex differences in the prevalence of lifetime SH. Similarly, Brody and Carson (2012), investigating lifetime NSSH in participants aged 16-19 years, found no significant association with sex.

Seven studies investigated suicide attempt in adults. Prevalence of lifetime suicide attempt was significantly more common in females than males of a similar age in most studies (Cleare et al., 2021; O'Connor et al., 2018; Wetherall et al., 2019; Young et al., 2011). However, after controlling for other factors (e.g., defeat and entrapment), Cleare et al. (2021) found that this association changed direction, i.e., prevalence of lifetime suicide attempt became more common among males. Significant sex differences in lifetime suicide attempt history were reported by Dhingra et al. (2015); however, the direction of this difference was not indicated. Dhingra et al. (2015) also found no significant sex differences between those with no history of suicidality and those who had a lifetime history of suicide attempt. Two longitudinal studies found no significant association between sex and suicide

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<sup>1</sup> De Beurs et al. (2016) and O'Connor et al. (2015) used the same participant sample.

attempt over 15 months (O'Connor et al., 2015) and over 24 months (O'Connor, O'Carroll et al., 2012) following a hospital-treated suicide attempt.

Two studies investigated suicide, with mixed results. Riordan et al. (2012) found suicide was more common in males than females when matched by age, whereas Värnik et al. (2011) found no significant sex difference for drug-related suicide (not age-matched).

Five studies provided sufficient data to explore the overall effect size of gender in relation to suicide attempt (Cleare et al., 2021; Dhingra et al., 2015; Riordan et al., 2012; Wetherall et al. 2018; Young et al., 2011). There was a significant overall association with women being more likely to report making a suicide attempt than men (OR= 1.99, 95% CI: 1.77- 2.5).

### Sexual orientation

Two studies explored sexual orientation in relation to SH (Cleare et al., 2018) and suicide attempt (Dhingra et al., 2015), with mixed results. Cleare et al. (2018) found no significant difference by sexual orientation (heterosexual versus non-heterosexual) between first and repeat SH lifetime history participants.

Suicide attempt was explored by Dhingra et al. (2015), who found non-heterosexual populations were significantly more likely to report a lifetime history of suicide attempt compared to a population with a history of SSHI only or with no lifetime history of suicidality.

### Relationship/marital status

Ten studies examined differences in relationship status in relation to NSSH, SH and suicidality, with mixed results. O'Connor et al. (2018) found that, among study participants aged 18-34 years, those who were unmarried were more likely to report a lifetime prevalence of NSSH than those who were married. In the two studies examining SH, Hafferty et al. (2019) found that patients admitted to hospital following SH were more likely to be single than patients attending hospital with no SH, whereas Cleare et al. (2018) found no significant difference in relationship status (married/unmarried) between first SH and repeat SH lifetime history participants. Grandison et al. (2020) found no significant association between marital status and lifetime history of suicidality.

Of the seven studies investigating suicide attempts, one study found unmarried participants (aged 18-34 years old) were more likely to report a lifetime history of suicide attempt compared to married participants of the same age (Wetherall et al., 2018). However, this relationship was no longer statistically significant after controlling for other factors (e.g., defeat, entrapment, age). The remaining six studies found no significant differences by relationship status (Cleare et al., 2021; De Beurs et al., 2016; Dhingra et al., 2015; O'Connor, O'Carroll et al., 2012; O'Connor et al., 2015; O'Connor et al., 2018)<sup>2</sup>.

Three studies (Dhingra et al., 2015; O'Connor et al., 2013; O'Connor, O'Carroll et al., 2012) were included in the meta-analysis to explore the overall association between the odds of being single and engaging in a suicide attempt. (De Beurs et al. (2016) and O'Connor et al. (2015) were excluded from this analysis due to sharing the same study sample.) The overall effect size was not significant (OR= 1.63, 95% CI: 0.92 – 2.01): there was no association between marital status and suicide attempt.

### Socioeconomic factors

#### *Social class & socioeconomic deprivation*

Four studies explore social class and socioeconomic deprivation in relation to SH, suicide attempt or suicide. Young et al. (2011) was the only study to explore individual-level social class via self-reported

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<sup>2</sup> De Beurs et al. (2016, 2017) and O'Connor et al. (2015) used the same participant sample.

socioeconomic deprivation. The results showed no significant association between self-reported social class and deprivation at baseline (11 years old), and self-reported lifetime SH or suicide attempt at follow up at (15 years old).

Four studies investigated social class and deprivation based on participant address postcode. Two studies found that a significant association between deprivation and hospital-treated lifetime SH (Hafferty et al., 2019; Riordan et al., 2012), whereas O'Connor, O'Carroll et al. (2012) found no significant association between deprivation and hospital re-presentation of suicide attempt within 24 months following baseline. When adjusted for other factors (e.g., parental background), Young et al. (2011) found deprivation measured at 15 years old was not significantly associated with lifetime history of suicide attempt at 15 years old or lifetime SH at 19 years old. Riordan et al. (2012) used the Carstairs and Morris deprivation scores (based on postcode) to group participants into five categories based on deprivation severity. The three lowest three groups were significantly associated with suicide.

A meta-analysis of the data by O'Connor, O'Carroll et al. (2012), Riordan et al. (2012) and Young et al. (2011) showed that social class was not significantly associated with suicide attempt (OR= 1.13, 95% CI: 0.61 – 2.10)

#### *Employment Status*

Nine studies explored employment status in relation to lifetime history of suicidality, SH or suicide attempt, with mixed results.

In a retrospective study with an 11-year follow-up, Conlin et al. (2016) found that subsequent unemployment was higher among patients admitted to hospital for SH (62%), compared to patients admitted for accidental injury (10%). Cleare et al. (2018) observed no significant difference in employment status between individuals with a lifetime history of one SH episode compared to individuals with a lifetime history of multiple SH episodes. In a sample of young adults, O'Connor et al. (2018) found that the lifetime prevalence of NSSH was significantly higher among those who were unemployed or economically inactive compared to those who were employed.

In a cross-sectional study, Grandison et al. (2020) found that unemployment was significantly more common in those with lifetime history of suicidality compared to individuals without a history of suicidality.

Six studies examined employment status in relation to suicide attempt. Cleare et al. (2021) found hospital patients presenting with a suicide attempt were more likely to be unemployed than those with NSSH. Based on a sample of young adults (aged 18-34 years old), O'Connor et al. (2018) found that, compared to participants with no suicidality history, participants with a lifetime history of suicide attempt were significantly more likely to be unemployed or economically inactive. This finding was consistent with the finding by Wetherall et al. (2018) that unemployment was significantly more common in adults with a lifetime history of suicide attempt, compared to participants with a self-reported lifetime history of SSHI or no suicidality history. However, these differences were no longer statistically significant after controlling for other factors (e.g., defeat, entrapment) (Wetherall et al., 2018). In contrast, three studies found no significant association between employment status and hospital re-attendance following suicide attempt within 15 months (De Beurs et al., 2016; O'Connor et al., 2015)<sup>3</sup> or 24 months (O'Connor, O'Carroll et al., 2012) of baseline hospital attendance following suicide attempt.

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<sup>3</sup> De Beurs et al. (2016) and O'Connor et al. (2015) used the same participant sample.



### Religion

Using a school-based sample, Young et al. (2011) explored religion in relation to both self-reported suicide attempt and SH over a four-year period. Compared to 'Protestant', 'other' or 'no religion', holding Catholic beliefs at 15 years old was cross-sectionally associated with significantly fewer instances of lifetime self-reported suicide attempts, and prospectively associated with lower prevalence of life-time SH at 19 years old. Attending a Catholic school at age 15, but not holding Catholic beliefs, was a risk factor for attempted suicide at age 15, and SH at follow-up age 19.

### Mental health diagnosis

Three studies examined mental health diagnosis in relation to SH, suicidality or suicide attempt.

Conlin et al. (2016) found that hospital patients admitted following SH were more likely to have a previous psychiatric diagnosis than hospital in-patients admitted for non-SH injuries. In a male-only sample, Lemaigre and Taylor (2019) found that participants with a current mental health diagnosis had significantly higher levels of suicidality. Similarly, over a 20-year follow-up, Kavalidou et al. (2019) found people with a mental health diagnosis were significantly more likely to report a suicide attempt during the past year.

### Mental wellbeing

Russell et al. (2020) found mental wellbeing to be significantly associated with decreased SH at six-month follow-up among adolescents aged 15-17 years.

### Depression (psychiatric diagnosis and depressive symptoms)

Overall, 12 studies investigated the association between depression and suicidal behaviour and SH, with mixed results.

Five studies explored depression in relation to SH. Young et al. (2011) found that a lifetime history of depression at age 11 was not prospectively associated with a self-reported lifetime history of SH at age 19. Hafferty et al. (2019) found adult participants with a lifetime history of hospital-treated SH (47.5%) had a significantly higher prevalence of lifetime history of depression diagnosis than individuals with no lifetime history of SH (12%). Cleare et al. (2018) found that those who had a history of multiple SH reported significantly higher depressive symptoms than participants who had only engaged once in SH. Melson and O'Connor (2019) found that adults (aged  $\geq 18$  years) with a lifetime history of SH experienced greater depressive symptoms than adults with no lifetime history of suicidality. In contrast, O'Connor, O'Carroll et al. (2012) found that depressive symptoms did not differ significantly between people with a lifetime history of SH thoughts compared to people with a lifetime history of SH behaviour, after controlling for other factors (e.g., defeat, entrapment)

Three prospective studies found significantly higher levels of baseline depression symptoms in participants who re-presented at hospital with a suicide attempt within 15 months (O'Connor et al., 2015; De Beurs et al., 2016)<sup>4</sup> and 48 months (O'Connor et al., 2013) of a baseline suicide attempt, compared to participants who made no new suicide attempt. However, no significant difference in baseline depression scores were observed in relation to hospital re-presentation within 24 months of an index hospital presentation following a suicide attempt (O'Connor et al., 2012). Prior lifetime history of depression symptoms at age 11 was significantly associated with a self-reported lifetime suicide attempt at age 15 (Young et al., 2011). Cross-sectionally, those who reported a lifetime history of suicide attempt showed significantly higher depressive symptoms than those with a self-reported

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<sup>4</sup> De Beurs et al. (2016) and O'Connor et al. (2015) used the same participant sample.

lifetime history of NSSH (Cleare, et al., 2021), SSHI only (Dhingra et al., 2015; Wetherall, et al., 2018) or no history of suicidality (Dhingra et al., 2015; Wetherall et al., 2018).

In one study investigating suicide, Gilchrist et al. (2019) found that individuals who died by suicide were significantly more likely to have a diagnosis of depression than no depression diagnosis.

Five studies (De Beurs et al., 2016; O'Connor et al. (2013); O'Connor et al., 2012; O'Connor et al., 2015; Young et al., 2011) provided sufficient data to explore the overall effect of depression on suicide attempt, with findings revealing that people with depression or depressive symptoms were 1.5 times more likely to make a suicide attempt than those without depression or depressive symptoms (OR= 1.05, 95% CI: 1.06 – 1.08).

### Anxiety symptoms

Three studies explored the association between self-reported anxiety symptoms and SH or suicide attempt.

Cleare et al. (2018) found participants with a lifetime history of multiple SH episodes reported greater anxiety symptoms than those with a lifetime history of one SH episode. However, the results were no longer significant after controlling for other factors (e.g., depression, gender).

Two studies investigated anxiety in relation to suicide attempt. Anxiety did not differ significantly between individuals with a history of suicide attempt (Dhingra et al., 2015; O'Connor et al., 2012) and those with a lifetime history of SSHI only or no lifetime history of suicidality (Dhingra et al., 2015).

### Post-traumatic stress-disorder (PTSD)

PTSD was investigated in one study based on a female prison population. Howard et al. (2017) found significantly more PTSD symptoms in participants with a lifetime history of SH compared to participants with no lifetime history of SH.

### Multimorbidity

Kavalidou et al. (2019) assessed participants using a prospective design across five waves of data collection spanning 20 years. Multimorbidity (defined as the co-occurrence of at least one physical condition and one mental health condition) predicted self-reported lifetime history of suicide attempt within 17 years (Waves 2 to 5). This association remained significant after controlling for other factors (e.g., gender, age, employment status).

### *3.1.2. Pre-motivational factors*

#### Gestation

Riordan et al. (2012) found a significant association between increasing gestational age at birth and later hospital-treated SH by 32 years of age. This remained significant after controlling for other factors (e.g., family size, deprivation). However, there was no significant association between gestational age at birth and suicide by 32 years of age.

#### Birthweight

Using a prospective cohort study design, Riordan et al. (2012) found that, compared to average birthweight (3.25-3.75kg), low birthweight (<3.25kg) was significantly associated with increased risk of SH by 32 years of age, while high birthweight (3.75-4.45kg) was associated with decreased risk of SH by 32 years old, when compared to average birthweights. No association was found between birthweights over 4.5kg and later lifetime SH. There was no significant association between birthweight and suicide attempt by 32 years old (Riordan et al., 2012).

### Maternal age at birth

Maternal age was investigated in relation to SH and suicide in one retrospective study. Riordan et al. (2012) found that, compared to individuals born to mothers aged 25-29 years, those born to younger mothers (15-24 years old) were significantly more likely to die by suicide or present to hospital following self-harm by 32 years of age. The same study also found that, compared to individuals born to mothers aged 25-29 years old, those with older mothers at time of birth (30-45 years old) were less likely to present to hospital with SH by 32 years of age.

### Family size

One study explored family size in relation to lifetime SH and suicide attempt (Riordan et al., 2012). Compared to single-child families (i.e., no younger siblings), families with one or two younger siblings were significantly less likely to engage in lifetime SH by the age of 32 years. No prospective association was identified between families with three or more younger siblings and later SH. Furthermore, Riordan et al. (2012) found that, compared to single-child families, families with at least two younger siblings were significantly more likely to engage in suicide by the age of 32 years.

### Maternal parity

One study investigated maternal parity at birth in relation to hospital-treated SH and suicide of offspring by 32 years old. Riordan et al. (2012) found that having three or more maternal siblings was significantly associated with increased risk of offspring suicide and/or lifetime history of hospital-treated SH. Suicide and self-harm risk were observed to increase gradually as maternal parity increased from one sibling.

### Parental control

Parental control was investigated in one study using the single item "My parents treat me like a baby". Young et al. (2011) found parental control was cross-sectionally associated with self-reported lifetime suicide attempt in adolescents aged 15 years and lifetime SH in adolescents by 19 years old. These relationships were no longer significant after controlling for other factors (e.g., lifetime self-reported suicide attempts at 15 years).

### Parental care

Parental care was investigated in one study using the single-item "My parents help me as much as I need". Young et al. (2011) found parental care to be significantly negatively associated with suicide attempts in adolescents aged 15 years and lifetime SH in adolescents aged 19 years. However, these relationships did not remain significant when controlling for other factors (e.g., lifetime self-reported suicide attempts at 15 years).

### Parental attachment

Parental attachment was investigated in one study. Cleare et al. (2018) found no significant difference in the prevalence of parental separation between participants with a history of first SH compared to those with a history of repeated SH.

### Childhood trauma

Five studies investigated childhood trauma in relation to suicidality or SH.

Four studies explored childhood trauma using the Childhood Trauma Questionnaire (which includes items on emotional abuse, emotional neglect, physical abuse, physical neglect and sexual abuse) in relation to suicidality (Grandison et al, 2020; Lemaigre & Taylor, 2019) and SH (Howard et al., 2017; McClelland et al., 2021). In a male-only study, Lemaigre and Taylor (2019) found that childhood

trauma was significantly associated with self-reported lifetime history of suicidality (but not after controlling for emotion dysregulation or interpersonal difficulties).

Grandison et al. (2020) found that individuals with a self-reported lifetime history of suicidality scored significantly higher on childhood trauma subscales than individuals without a history of suicidality. Specifically, those with a history of suicidality scored higher in relation to childhood histories of emotional neglect and abuse, but not in relation to physical or sexual abuse or physical neglect. When other factors (e.g., emotional deactivation, employment status) were controlled for, only childhood emotional abuse remained significantly associated with lifetime suicidality.

Both Howard et al. (2017) and McClelland et al. (2021) found that childhood emotional and sexual abuse was significantly more common among those with a history of SH compared to those with no history of SH. However, Howard et al., (2017) found no significant differences between those with and without a history of SH in respect of physical abuse, or emotional or physical neglect. Furthermore, McClelland et al. (2021) found that emotional abuse, emotional neglect, physical abuse, physical neglect and sexual abuse were more common in adults ( $\geq 18$  years) with lifetime history of SH compared to those with SSHI or no history of suicidality. However, when controlling for other factors, only the prevalence of emotional abuse remained significantly higher in the SH group compared to those with no SH history. Additionally, Cleare et al. (2018) found that, compared to individuals with a lifetime history of one SH episode, individuals with multiple SH episodes were significantly more likely to report childhood experiences of verbal, physical and sexual abuse, as well as emotional neglect. No other forms of childhood trauma were assessed by Cleare et al. (2018).

#### Adverse childhood experiences (ACEs)

ACEs were investigated in one study. Cleare et al. (2018) found that participants with a lifetime history of repeated SH were over three times more likely to report four or more adverse childhood experiences compared to individuals with a lifetime history of a single episode of SH.

#### Victimised in childhood

Being victimised in childhood was investigated in one study. Young et al. (2011) found that weekly victimisation at 11 years old was significantly associated with lifetime history of suicide attempts by 15 years old when compared to less frequent victimisation experiences. Victimization less than weekly was significantly associated with lifetime SH at 19 years old compared to weekly victimisation experiences at age 11. However, these relationships were not statistically significant when controlling for other factors.

#### Personality traits

Two forms of personality traits were explored in the papers included in this review: neuroticism and socially prescribed perfectionism.

##### *Neuroticism*

Two studies explored neurotic traits in relation to SH. Using hospital records, Hafferty et al. (2019) found that a lifetime history SH was significantly associated with later neuroticism, even after controlling for other factors (e.g., age, gender, and relationship status). Brody and Carson (2012) found lower neurotic subconscious defence mechanisms (to protect the individual from feelings of shame and guilt) among participants (aged 16-19 years) with a lifetime history of SH compared to those without.

##### *Socially prescribed perfectionism*

Three cross-sectional studies investigated socially prescribed perfectionism.

Two studies found that those with a history of SH reported higher levels of socially prescribed perfectionism than those with no lifetime history of SH behaviour or thoughts in adolescents aged 15-16 years (O'Connor et al., 2012) and adults (McClelland et al., 2021). McClelland et al. (2021) found that this relationship was not significant after controlling for other factors (e.g., SSHI). In addition, O'Connor et al. (2012) found no significant difference in socially prescribed perfectionism between those who engaged in SH and those who had thoughts of SH.

Cleare et al. (2021) found that people with a history of lifetime suicide attempts reported significantly higher levels of socially prescribed perfectionism compared to a NSSH-only group. This finding was no longer statistically significant when other factors were controlled for (e.g., entrapment).

#### Self-criticism

Self-criticism was investigated in one study. Harkness-Murphy et al. (2012) found that 11-17-year-olds in public care (e.g., foster homes) who engaged in lifetime SH were more likely to report greater self-criticism than those with no history of SH. However, only the 'hated' subscale of this construct remained statistically significant after controlling for other factors.

#### Stress

Three studies found that participants who had engaged in lifetime SH reported significantly greater stress than participants with no lifetime history of SH in adults (aged  $\geq 18$  years; McClelland et al., 2021; Melson & O'Connor, 2019) and adolescents (aged 15-16; O'Connor et al., 2012). After controlling for other factors (e.g., entrapment), McClelland et al. (2021) found this relationship to be non-significant. Additionally, both McClelland et al. (2021) and O'Connor et al. (2012) found that those who engaged in lifetime SH had significantly greater stress than those with SSHI only. O'Connor et al. (2012) found that this relationship remained significant when controlling for other factors, while McClelland et al. (2021) did not.

#### Defence mechanisms

Defence mechanisms were investigated in one study. Brody and Carson (2012) found more immature defence mechanisms and fewer mature defence mechanisms among participants with a history of SH compared to those without.

### *3.1.3. Motivational factors*

#### *Key drivers*

##### Defeat

Six studies investigated defeat in relation to lifetime SH or suicide attempt.

Two studies investigated adolescent defeat and SH. In a school-based sample of adolescents aged 11-17 years, del Carpio et al. (2020) found those who reported greater defeat at baseline were significantly more likely to report a lifetime history of SH six months later when compared to adolescents of the same age with no history of SH thoughts or behaviours. This difference remained significant after controlling for other factors (e.g., age, defeat). However, Russell et al. (2020) found that defeat was not significantly associated with SH cross-sectionally in a sample of adolescents. In an adult sample ( $\geq 18$  years), McClelland et al. (2021) found that participants who had engaged in SH reported significantly higher levels of defeat than participants with lifetime histories of SSHI or no suicidality. However, these results were no longer statistically significant after controlling for other factors (e.g., emotional abuse).

Three studies investigated defeat in relation to suicide attempt. O'Connor et al. (2013) found that baseline defeat was significantly associated with suicide attempt four years later among inpatients

admitted following a suicide attempt at baseline. This association was no longer significant after controlling for other factors (e.g., SSHI). Two studies found that adults who reported lifetime suicide attempts experienced greater defeat than participants with either a lifetime history of NSSH only (Cleare et al., 2021), or no history of NSSH or suicide attempt (Wetherall et al., 2018). Both Cleare et al. (2021) and Wetherall et al. (2018) found these results remained significant after controlling for other factors (e.g., gender, psychological variables).

### Entrapment

Six studies investigated entrapment in relation to lifetime SH (del Carpio et al., 2020; McClelland et al., 2021; Russell et al., 2020) and suicide attempts (Cleare et al., 2021; O'Connor et al., 2013; Wetherall et al., 2018).

Two studies found that those who self-reported a lifetime history of SH reported greater entrapment than participants with no lifetime history of SSHI or SH behaviour among adolescents (aged 11-17 years; del Carpio et al., 2020) and adults (aged  $\geq 18$  years; McClelland et al., 2021). However, only McClelland et al. (2021) found that those with a lifetime history of SH reported significantly greater entrapment in comparison to a SSHI group. The findings of both studies were no longer significant after controlling for other factors (e.g., defeat and social support). Additionally, Russell et al. (2020) found that internal entrapment, but not external entrapment, significantly predicted SH in a sample of adolescents.

Four studies explored entrapment in relation to suicide attempt. In a sample of in-patients admitted following a suicide attempt, O'Connor et al. (2013) found that entrapment was associated with suicide attempts both cross-sectionally (at baseline) and at follow-up four years later, even after controlling for other factors (e.g., depression, defeat). The remaining three studies found that adults with a lifetime history of suicide attempts reported greater entrapment than individuals with a lifetime history of NSSH (Cleare et al., 2021), non-suicidal behaviour (Wetherall et al., 2018) or no history of SSHI or suicide attempt (Dhingra et al., 2015). These findings did not remain significant when controlling for other factors. When exploring differences between internal and external entrapment, Cleare et al. (2021) found that adults with a lifetime history of suicide attempts reported lower internal entrapment than the adults with a history of NSSH, after controlling for other factors.

### Suicidal ideation

Six studies investigated suicidal ideation in relation to SH or suicide attempt<sup>5</sup>.

When exploring SH, McClelland et al. (2021) found that adults with lifetime SH histories reported significantly higher suicidal ideation than those with SSHI or no suicidality history. This finding remained significant after controlling for other factors (e.g., defeat, and entrapment).

Cleare et al. (2021) found that, compared to participants who self-reported a lifetime history of NSSH, individuals with a lifetime history of suicide attempt reported higher levels of suicidal ideation within the past seven days. This association remained significant after controlling for other factors (e.g., defeat, entrapment). In studies using a longitudinal design, baseline suicidal ideation significantly predicted a re-presentation of suicide attempt to hospital within 15 months (De Beurs et al., 2016; O'Connor et al., 2015), 24 months (O'Connor, O'Carroll et al., 2012) and 48 months (O'Connor et al. 2013) of a baseline suicide attempt. Findings by De Beurs et al. (2016), O'Connor, O'Carroll et al. (2012) and O'Connor et al. (2015) remained significant after controlling for other factors (e.g., goal reengagement, goal disengagement). Furthermore, De Beurs et al. (2017) found that duration and

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<sup>5</sup> De Beurs et al. (2016, 2017) and O'Connor et al. (2015) used the same participant sample.

frequency of suicidal ideation were greater in individuals with a lifetime history of repeated suicide attempts compared to individuals with a single suicide attempt.

### *Threat to self-moderators*

#### *Brooding rumination*

Two studies explored rumination in relation to SH and suicide attempt, with mixed results. O'Connor et al. (2012) found that individuals with a lifetime history of SH reported higher brooding than participants with no history of SH or thoughts of SH (15-16 years old). The same study found no significant distinction in brooding rumination between those with a history of SH ideation and those with a history of SH. Dhingra et al. (2015) found no significant difference in brooding rumination between adults with a lifetime history of suicide attempt compared to those with a lifetime history of SSHI only or no history of suicidality.

#### *Resilience*

Wetherall et al. (2018) explored resilience in relation to suicide attempt. Adults (aged 18 – 34 years) who reported lower resilience were significantly more likely to report a lifetime history of suicide attempt, when compared to individuals with no history of suicidal behaviour, although this finding was no longer significant after controlling for other factors.

#### *Emotional dysregulation*

Two studies explored emotional dysregulation. In a study of 86 adult men, Lemaigre and Taylor (2019) found that participants who reported emotional dysregulation were significantly more likely to report a history of suicidality. Howard et al. (2017) found emotional dysregulation symptoms were significantly higher in prisoners with a history of SH than prisoners with no such history.

#### *Emotional hyperactivation/deactivation*

Emotional hyperactivation/deactivation was measured in one study. Using a cross-sectional design, Grandison et al (2020) found that those with a self-reported history of suicidality reported significantly greater emotional deactivation than those without a history of suicidality. This effect was no longer significant after controlling for other factors (e.g., childhood emotional neglect, employment status). There were no significant differences in emotional hyperactivation between those with and without a history of suicidality.

#### *Negative mood regulation expectancies*

Negative mood regulation expectancies were measured in one study. Melson and O'Connor (2019) found that adults (aged  $\geq 18$  years) with lifetime history of SH were significantly less likely to believe in their ability to control their negative mood states than adults with no lifetime history of SH or SSHI.

#### *Optimism*

Optimism was measured in one study. Melson and O'Connor (2019) found that adults ( $\geq 18$  years old) with a lifetime history of SH were likely to report significantly lower optimism scores when compared to adults with no lifetime history of SH or SSHI.

#### *Academic self-esteem*

Academic self-esteem was measured in one study. Harkness-Murphy et al. (2012) found that looked after and accommodated (LAAC) adolescents aged 11 to 17 years old with a lifetime history of SH reported significantly lower academic self-esteem compared to non-LAAC adolescent age peers.

#### *Coping*

Coping was explored in relation to SH in two studies using the Brief COPE measure in an adolescent sample (aged 11-17 years old; del Carpio et al., 2020) and an adult sample (aged  $\geq 18$  years old;

McClelland et al., 2021). Using cross-sectional designs, both studies found that those with a lifetime history of SH reported significantly greater use of maladaptive coping styles than those with no lifetime history of SH or SSHI. This finding remained significant after controlling for other factors (e.g., defeat, entrapment, social support from family). However, del Carpio et al (2020) found no significant association at follow-up six months later. Adaptive coping styles did not significantly differ cross-sectionally (del Carpio et al., 2020; McClelland et al., 2021) or at six-month follow-up (del Carpio et al., 2020) between participants with a lifetime history of SH compared to participants with no lifetime history of suicidality.

### Alcohol

Five studies explored the association between alcohol-related factors and lifetime history of NSSH, SH, suicide attempt or suicide. Brody and Carson (2012) found that alcohol use was not significantly associated with NSSH in adolescents aged 16-19 years old. In contrast, Melson and O'Connor (2019) found that, compared to adults with no suicidality history, adults with a lifetime history of SH were significantly more likely to report greater alcohol-related negative urgency (i.e., becoming more impulsive in response to negative affect during drinking episodes), frequently drinking heavily, and having stronger expectancies that alcohol would lead to negative self-perceptions and self-harm. Except for alcohol expectancies, the findings by Melson and O'Connor (2019) remained significant after controlling for age, gender and depression. However, Conlin et al. (2016) found no significant differences in alcohol consumption between a SH and an accidental injury group.

Cleare et al. (2021) found no significant difference in alcohol consumption between participants with a lifetime history of suicide attempts and those with a lifetime history of NSSH. In contrast, Gilchrist and Sadler (2019) found that adults with a diagnosis of alcohol abuse were significantly more likely to die by suicide compared to other non-natural deaths.

### Substance abuse (drugs)

Three studies investigated substance abuse in relation to SH or suicidal behaviour. Substance abuse was significantly correlated with a lifetime history of SH in adolescents aged 16-19 years old (Brody & Carson., 2012). Conlin et al. (2016) noted that individuals admitted to hospital for SH had higher current or previous illegal drug use than participants admitted with accidental injuries. Adults who died by suicide were significantly more likely to have a history of substance abuse than adults who had non-natural deaths (Gilchrist & Sadler, 2019).

### Motivational moderators

#### Social support

Five studies examined social support in relation to lifetime history of SH (three studies) and suicide attempt (two studies).

All studies examining life-time history of SH (del Carpio et al., 2020; McClelland et al., 2021; Melson & O'Connor, 2019) found that social support was significantly lower in those with a lifetime history of SH than in those with no history of suicidality. Only del Carpio et al. (2020) found this difference remained significant within the social support from family subscale, both at baseline and six-month follow-up, but not from friends or significant others, after controlling for other factors (e.g., maladaptive coping, defeat, and entrapment).

Two studies examined social support in relation to suicide attempt. Both Cleare et al. (2021) and Wetherall et al. (2018) found that adults with a lifetime history of suicide attempts reported lower social support than adults with NSSH (Cleare et al. 2021) and those no history of suicidal behaviour (Wetherall et al., 2018). These findings were no longer significant after controlling for other factors.



### Living arrangements

Four studies explored living arrangements in relation to SH, suicidality, NSSH and suicide attempt.

Conlin et al. (2016) found that hospital-admitted patients who engaged in SH were more likely to be homeless, institutionalised or live alone compared to non-SH participants over an 11-year period. However, Cleare et al. (2018) found no statistically significant difference between first- and repeat-SH lifetime history participants based on whether the participants lived alone or cohabited. Similarly, Grandison et al. (2020) found no significant association between suicidality and living arrangements in a sample of adults referred for psychological therapy for trauma. O'Connor et al. (2018) found that, compared to those who owned their own home, those who lived in rental accommodation were more likely to report NSSH and suicide attempts.

### Thwarted belongingness

Three studies examined thwarted belongingness in relation to suicide attempts in adults (Cleare et al., 2021; Dhingra et al., 2015; Wetherall et al., 2018). Participants with a self-reported lifetime history of suicide attempts were significantly more likely to report greater thwarted belongingness than participants with a self-reported lifetime history of NSSH (18-88 years, Cleare et al., 2021), SSHI (Dhingra et al., 2015) or no history of SH (18-34 years, Wetherall et al., 2018; Dhingra et al., 2015). However, these findings were no longer significant after controlling for other factors.

### Loneliness

Loneliness was investigated in one study. McClelland et al. (2020) found that, compared to those with no lifetime history of SH or SSHI, individuals with a history of SH experienced significantly greater loneliness.

### Attachment style with others

Cleare et al. (2018) found that, compared to those with a lifetime history of one SH episode, individuals with a history of multiple SH episodes were significantly more likely to report dependent attachment styles. Forming close relationships easily, or having an anxious attachment traits, did not significantly distinguish between participants with a history of one or multiple SH episodes.

### Perceived burdensomeness

Three studies examined perceived burdensomeness in relation to SH and suicide attempt in adults. All studies reported significant results. Individuals with a self-reported lifetime history of suicide attempts experienced greater self-reported perceived burdensomeness than those with self-reported lifetime history of NSSH (Cleare et al., 2021), no history of SH (Wetherall et al., 2018), lifetime history of SH thoughts only (Dhingra et al., 2015) or no history of SH thoughts or behaviours (Dhingra et al., 2015). Findings remained significant across all studies after controlling for other factors (e.g., other psychological variables and gender).

### Interpersonal difficulties

One study investigated interpersonal difficulties. Lemaigre and Taylor (2019) found social inhibition (i.e., being avoidant and detached from social relationships) was significantly associated with a history of suicidality in an all-male sample.

### Stigma

Stigma was investigated in one study. Among adolescents (aged 11-17 years) across a six-month period, del Carpio et al. (2020) found that self-reported stigmatising beliefs about suicide at baseline were significantly less common in those with a lifetime history of SH at six-month follow-up, compared to adolescents with no reported lifetime history of suicidality. This association remained

significant after controlling for other factors (e.g., defeat, entrapment). No significant difference was observed between adolescents who reported SSHI compared to SH behaviour groups.

#### Goal reengagement

Four studies explored goal reengagement in association with SH or suicide attempt.

In a prospective study, O'Connor et al. (2012) found that baseline goal reengagement was significantly associated with a hospital re-representation of suicide re-attempt by follow-up 24 months later. This finding remained significant after controlling for other factors (e.g., SSHI, goal disengagement). Three studies found that self-reported goal reengagement was lower in individuals with a self-reported lifetime history of suicide attempt compared to those with a lifetime history of SSHI or no lifetime history of suicidality (Dhingra et al., 2015; Wetherall, et al. 2018), or lifetime history of NSSH (Cleare, et al. 2021). In both studies these differences were no longer significant after controlling for other factors (e.g., defeat, entrapment).

#### Hopelessness

Four longitudinal studies investigated hopelessness and suicide attempt over 15 months (de Beurs et al., 2016; O'Connor et al., 2015)<sup>6</sup>, 24 months (O'Connor, O'Carroll et al., 2012) and 48 months (O'Connor et al., 2013) following a hospital-treated suicide attempt.

Three studies found a significant association between baseline hopelessness and hospital re-representation following a suicide attempt 15 months (O'Connor et al., 2013) and 48 months (de Beurs et al., 2016; O'Connor et al., 2015) later. However, after controlling for other factors, none of the results remained significant. O'Connor, O'Carroll et al. (2012) found that hopelessness at baseline did not significantly predict re-representation at hospital for suicide attempt 24 months after a baseline suicide attempt.

#### Future thinking

Future thinking was measured in one study (O'Connor et al., 2015) using seven subscales ('social/interpersonal', 'intrapersonal', 'achievement', 'leisure/please', 'health of others', 'financial and home' and 'other'). Greater positive future thinking (including achievement, intrapersonal and financial future thinking) was significantly associated with hospital re-representation following a suicide re-attempt within the following 15 months, based on patients admitted to hospital following a suicide attempt at baseline. However, only intrapersonal future thinking remained significant after controlling for other factors (e.g., hopelessness, entrapment)

#### Wish to live/ die

In a 15-month follow-up study, de Beurs et al. (2017) found that both wish to die and wish to live were highest in those who re-engaged in SH within 15 months of the index hospital SH presentation, compared to those who did not.

#### Reasons for living

Two studies explored reasons for living in relation to SH only. In a sample of 11–17-year-old looked after and accommodated (LAAC) adolescents, Harkness-Murphy et al. (2013) found that individuals with a self-reported lifetime history of SH showed significantly fewer reasons for living than young people who reported no lifetime SH. Similarly, de Beurs et al. (2017) found that those who re-engaged in SH during 15-months post-hospital discharge following a suicide attempt reported significantly fewer reasons for living, compared to those who did not re-engage.

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<sup>6</sup> De Beurs et al. (2016) and O'Connor et al. (2015) used the same participant sample.

### Desire for active/passive suicide attempt

De Beurs et al. (2017) found that individuals admitted to hospital following a suicide attempt who re-presented to hospital with SH within 15 months of discharge reported significantly greater active and passive desire for suicide attempt at baseline than those who did not re-present with SH to hospital.

### Attitude to suicidal behaviour

Openness to engaging in suicidal behaviour was greater in those who re-presented to hospital with SH within 15 months post-discharge from hospital following suicide attempt, compared to those who did not re-present with SH (De Beurs et al. 2017)

### *3.1.4. Volitional factors*

#### Acquired capability for suicide

Two studies investigated acquired capability in relation to the onset of suicidal behaviour. Cleare et al. (2021) found that acquired capability was significantly greater in individuals with a history of suicide attempt compared to those with a self-reported lifetime history of NSSH and those with no suicide attempt history. Similarly, Wetherall et al. (2018) found that individuals with a lifetime history of suicide attempt were significantly more likely to report greater acquired capability than those with a lifetime history of SSHI and those with no lifetime history of suicidality. After controlling for other factors (e.g., defeat, entrapment), differences remained only between suicide attempt and SSHI groups and suicide attempt and non-suicidality history groups (Wetherall et al., 2018).

#### Suicidal intent

Suicidal intent was explored in three studies (Cleare et al., 2018; De Beurs et al., 2016; O'Connor et al., 2015).

In a cross-sectional study, Cleare et al. (2018) found that individuals with repeated episodes of SH were 2.5 times more likely to express intent to die associated with their current self-harm episode, compared to those admitted to hospital following their first episode of SH.

Two prospective studies (De Beurs et al., 2016; O'Connor et al., 2015)<sup>7</sup>, investigating suicidal intent in individuals who presented at hospital with a suicide attempt at baseline and whether or not they re-presented to hospital following a suicide attempt within 15 months, reported contrasting results. De Beurs et al. (2016) found that participants who re-presented at hospital with a suicide attempt within 15 months reported significantly greater suicidal intent at baseline, compared to individuals who did not re-present at hospital following a suicide attempt. Conversely, O'Connor et al. (2015) found no significant differences between individuals' baseline suicidal intent and re-presentation of suicide attempt at hospital within 15 months compared to participants who did not re-present at hospital.

#### Exposure to death or self-harm

Two studies investigated exposure to suicide or self-harm by others. Results are organised into three sections: exposure to the suicide of a friend/family member; exposure to the suicide attempt of a friend/family member; and exposure to SH of a friend/family member.

#### *Exposure to suicide of friend/family*

Two studies investigated exposure to friend or family suicide in relation to suicidal behaviour (Wetherall et al., 2018; del Carpio et al., 2020). Compared to individuals with self-reported lifetime history of SSHI and participants with no history of suicidality, Wetherall et al. (2018) found that those who had a self-reported lifetime history of a suicide attempt were significantly more likely to know a friend or relative who had died by suicide. This association was not statistically significant after

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<sup>7</sup> De Beurs et al. (2016) and O'Connor et al. (2015) used the same participant sample.

controlling for other factors (e.g., defeat, entrapment). del Carpio et al. (2020) found that, cross-sectionally and prospectively (six months), exposure to a suicide was not significantly associated with lifetime history of SH.

#### *Exposure to suicide attempt of friend/family*

Wetherall et al. (2018) found that individuals with a lifetime history of self-reported suicide attempt were significantly more likely to have been exposed to a suicide attempt in a family member than those with self-reported lifetime SSHI or with no lifetime history of suicidality. Individuals exposed to a suicide attempt in a friend were significantly more likely to report a history of suicide attempt compared to the SSHI and no history of suicidality groups. The differences between the suicide attempt and no history of suicidality groups remained significant after controlling for other factors (e.g., defeat, entrapment). Those in the suicide attempt group were significantly more likely to have been exposed to a friend's suicide attempt than those in the SSHI group. However, exposure to a family suicide attempt did not significantly differentiate between the suicide attempt and SSHI groups.

#### *Exposure to SH (suicide attempt or NSSH) of friend/family*

Three studies explored exposure to SH (suicide attempt or NSSH) by a family member or friend, in relation to a lifetime history of SH (O'Connor et al., 2012; Del Carpio et al., 2020) or suicide attempt (Dhingra et al., 2015).

O'Connor et al. (2012) found that adolescents (aged 15-16 years) with a lifetime history of SH were significantly more likely to know a friend or relative who had engaged in SH than adolescents with either SSHI or no history of suicidality. These results remained significant after controlling for other factors (e.g., stress, gender).

Using a cross-sectional design, del Carpio et al. (2020) found that adolescents (11-17 years old) who self-reported a lifetime history of SH were significantly more likely to report having been exposed to SH by a family member, compared to those who reported a lifetime history of SSHI, but not those with no history of SH thoughts or behaviours. Furthermore, exposure to a friend's SH did not significantly differentiate between those who engaged in SH, those with SSHI and those with no suicidality history. Del Carpio et al. (2020) also investigated these associations longitudinally over six months and found that exposure to SH by a relative or friend at baseline did not predict self-reported lifetime SH at follow up.

In an adult sample, Dhingra et al. (2015) found that participants who had a lifetime history of suicide attempt were significantly more likely to have been exposed to SH in a family member or a friend, compared to those with a history of SSHI or no history of suicidality.

#### *Impulsivity*

Impulsivity was investigated in six studies covering lifetime suicidality (Grandison et al., 2020), lifetime SH (O'Connor et al., 2012) and lifetime history of suicide attempt (Cleare et al., 2021; de Beurs et al., 2017; Dhingra et al., 2015; Wetherall et al., 2018). The results were mixed.

Grandison et al (2020) found no significant difference in impulsivity between adults with a lifetime history of self-reported suicidality and those without. In contrast, O'Connor et al. (2012) found that adolescents aged 15-16 with a lifetime history of SH reported higher levels of impulsivity than those with SSHI and those with no history of suicidality. When O'Connor et al. (2012) controlled for other factors, the results were no longer significant.

In a sample of patients admitted to hospital following a suicide attempt, De Beurs et al. (2017) found that self-reported ability to control actions at baseline was significantly greater in those who re-presented to hospital with suicide attempt across the following 15 months, compared to those who did not re-present with suicide attempt within the same follow-up period. Cleare et al. (2021) found that those with a lifetime history of suicide attempt reported significantly greater impulsivity than those with a self-reported lifetime history of NSSH. Two studies found impulsivity was significantly greater in those with a self-reported lifetime history of suicide attempt compared to those with a self-reported lifetime history of SSHI or of suicidality (Wetherall et al., 2018; Dhingra et al., 2015). When controlling for other factors (e.g., defeat, entrapment), the findings reported by Wetherall et al. (2018) and Dhingra et al (2015) remained significant, but not those reported by Cleare et al. (2021).

#### Mental imagery

Mental imagery was investigated in one study. Wetherall et al. (2018) found that individuals with a self-reported lifetime history of suicide attempt experienced a higher prevalence of death-related mental imagery when feeling distressed than participants with a self-reported lifetime history of SSHI or participants with no history of suicidality. Results remained significant after controlling for other factors (e.g., defeat and entrapment).

#### Self-harm history

Four studies investigated self-harm history in subsequent SH and suicidal behaviour (Cleare et al., 2021; O'Connor et al., 2012; O'Connor et al., 2013; O'Connor et al., 2015).

Two of the four studies found that a lifetime history of hospital-treated suicide attempt at baseline was significantly associated with a suicide re-attempt 15 months (O'Connor et al., 2015) and 48 months after baseline (O'Connor et al., 2013). These results remained significant after controlling for other factors. Similarly, O'Connor et al. (2012) found that being hospitalised for a suicide attempt in the previous 10 years was significantly associated with re-admission following a suicide attempt in the 24 months after a baseline suicide attempt. This result remained significant after controlling for other factors.

Cleare et al. (2021) found no significant difference in the number of previous self-harm events between individuals admitted to hospital for NSSH compared to those admitted for a suicide attempt.

#### Beliefs of self-harm

Beliefs about self-harm were explored in one study. Using a cross-sectional design, O'Connor et al. (2012) found that adolescents aged 15-16 with a lifetime history of SH reported more beliefs that those around them also self-harm (referred to by O'Connor et al. (2012) as 'descriptive norm beliefs'), than those with a lifetime history of SSHI only, or no history of suicidality. This association was no longer significant after controlling for other factors (e.g., stress, self-harm in a family or friend).

#### Deterrents of attempt

de Beurs et al. (2017) examined deterrents of suicide attempt (i.e., factors which deter an individual from making a suicide attempt, such as impact on family) at baseline among individuals admitted to hospital following a suicide attempt. Deterrents were significantly lower in those who re-attended hospital with SH within the following 15-months, compared to those who did not re-attend hospital with SH.

#### Planning behaviour

Individuals who re-attended hospital with SH within 15 months of a suicide attempt reported significantly less planning in relation to suicidal behaviour when compared to those who did not re-attend hospital with SH (de Beurs et al., 2017).

#### Availability of methods

Individuals who re-attended hospital with SH within 15 months of a suicide attempt reported significantly fewer suicide methods **being available to them** than those who did not re-attend hospital with SH (de Beurs et al., 2017).

#### Courage for suicidal behaviour

Individuals who re-attended hospital with SH within 15 months of a suicide attempt reported significantly greater courage for suicidal behaviour than those who did not re-attend hospital with SH (de Beurs et al., 2017).

#### Expectancy of actual attempt

Individuals who re-attended hospital with SH within 15 months of a suicide attempt reported significantly greater expectancy of making a suicide attempt in future when compared those who did not re-attend hospital with SH (de Beurs et al., 2017).

#### Actual preparation

Individuals who re-attended hospital with SH within 15 months of a suicide attempt reported significantly greater suicide preparation than those who did not re-attend hospital with SH (de Beurs et al., 2017).

#### Arrangements after death

Individuals who re-attended hospital with SH within 15 months of a suicide attempt were more likely to make arrangements after their death, compared to those who did not re-attend hospital with SH (de Beurs et al., 2017).

#### Concealment of ideation

Individuals who re-attended hospital with SH within 15 months of a suicide attempt were more likely to conceal their suicidal thoughts than those who did not re-attend hospital with SH (de Beurs et al., 2017).

#### Fearlessness about death

Fearlessness about death was significantly more prevalent in individuals with a lifetime history of suicide attempt compared to individuals with a history of SSHI, or no history of suicidality (Dhingra et al., 2015).

### *3.1.5. Other factors*

#### Cognitive ability

Hafferty et al. (2019) found a significant association between lower cognitive ability and a history of hospital-treated SH.

#### Academic qualifications

Academic qualifications were investigated in relation to SH in two studies, with mixed results.

Hafferty et al. (2019) found that having no academic qualifications was significantly associated with a history of hospital-treated SH. In contrast, Cleare et al. (2018) found no significant difference between those with and without qualifications in relation to first and repeat SH episodes treated in hospital.

#### Previous criminal convictions

In one study of individuals in a burns unit, previous criminal convictions were significantly more associated with patients admitted following SH compared to the non-SH group (Conlin et al. 2016).

### Dissociative experiences

Howard et al. (2017) conducted the only study that explored dissociative experiences. In a female prison population, women with a history of SH reported significantly greater dissociative experiences than women with no SH lifetime history.

### Common problems

Common problems (problem with girlfriends/boyfriend, home/parents or with school/schoolwork) were investigated in one study. In a sample of looked after and accommodated (LAAC) young people (aged 11-17 years), Harkness-Murphy et al. (2013) found that individuals with a self-reported lifetime history of SH experienced greater problems with their girlfriends/boyfriends than young people who reported no lifetime SH. However, this relationship did not remain significant after controlling for other factors (e.g., self-criticism, and self-acceptance). No significant association was identified between SH and problems at home/parents or with school/schoolwork.

### *3.2. Qualitative studies*

Three qualitative studies met the eligibility criteria for this report. Richardson et al. (2021) and Zortea et al. (2019) explored suicide attempt experiences in the general population, while Marzetti et al. (in press) explored suicidality in LGBT+ populations. The overarching themes are summarised below, with sub-themes listed in appendix 7.

In a sample of LGBT+ young people (aged 16-24), Marzetti et al. (in press) identified a theme of 'queerphobia as inescapably everyday', which includes how societal expectations of cis-heteronormality can create an environment of queerphobic bullying and family rejection. Within this theme, Marzetti et al. (in press) reported that LGBT+ young people identified stigma in relation to their gender and/or sexuality as contributory factors to their experiences of SSHI and SH. Marzetti et al. (in press) also highlighted 'understanding suicide as a response' as a major theme, where queer young adults used SH a potential means of escape from feelings of stigma-related entrapment, where SH was a means of expressing their rejection.

In a male-only study sample with a history of suicide attempt, Richardson et al. (2021) identified themes which correspond with factors listed in the quantitative section of this report. 'Characteristics of attempt/volitional factors', included traits of impulsivity ('unplanned') and self-harm histories ('lived experience'), 'dealing with suicidal thoughts/negative emotions' included traits of maladaptive coping ('avoidance') and entrapment ('reached his limit') and 'protective factors' included social support ('importance of relationships', 'importance of talking'). However, other unique sub-themes also emerged in this study, including 'change in thinking', which identified a shift in thinking style prior to suicide attempt towards less flexibility and a more resolute decision to attempt suicide.

In a general population sample, Zortea et al. (2019) identified 'challenging relationships' as a risk factor for suicide attempt, while 'positive relationships as buffers' were found to be a protective factor. 'Challenging relationships' included 'exposure to inescapable turbulent relationships', which correspond to entrapment (see the quantitative section above), while 'positive relationships as buffers' relates to social support and having someone to whom they can express their thoughts and feelings.

## **4. Discussion**

Our review has identified 105 quantitative factors and eight qualitative themes relating to self-harm and suicidal behaviour. These data were derived from peer-reviewed publications since 2011 and limited to participants based in Scotland (see appendix 1 for inclusion criteria).

Summaries of the number of studies which quantitatively explored the association (significant or not significant) of each factor in relation to suicide (table 2), suicide attempt (table 3), SH (table 4), NSSH (table 5) and suicidality (table 6) are listed below.

Table 7 summarises which factors were significantly associated with each self-harm outcome. Where available, the findings are based on multivariate analyses; otherwise, univariate results were used. Findings based on multivariate analysis were privileged, where possible, because this enabled identification of the independent effect of each factor in relation to each self-harm outcome variable after controlling for other factors. To keep the focus on these findings specifically on SH and suicidal behaviour, suicidality was not included in this table. (Please refer to table 6 for significant factors relating to suicidality). Themes identified within the qualitative studies were also excluded from table 7 as their generalisability could not be established.

Based on the findings of this review, we can report that suicide was significantly associated with 10 factors related to individual differences, pre-motivational factors and substance abuse, whereas suicide attempt related to almost every individual difference and motivational factor. SH was significantly associated with almost every factor listed in table 7, while NSSH was only significantly associated with age, sex, relationship status and living arrangements.

A subset of the studies was included in a series of meta-analyses which were intended to investigate the overall effect size of factors in relation to both suicide and suicide attempt combined (appendix 5). Eligible factors for analysis were age (three studies) and sex (five studies). None of these studies measured suicide as an outcome. With regard to suicide attempt, significant effects were observed for both age and sex, with sex having the greater influence. Being female was associated with approximately twice the risk of attempting suicide compared to being male (non-binary data were not available). This finding is consistent with global evidence of a higher prevalence of suicide attempt in females than in males.

A meta-analysis exploring the overall effect size of factors in relation to SH, NSSH and suicidality combined was conducted, with five factors having sufficient data for investigation (appendix 6). There were significant effect sizes in relation to age (three studies), marital status (five studies) and depression (three studies), whereas there was no significant overall effect size in relation to sex (three studies) or employment status (three studies). The greatest effect size was in relation to marital status: being single or unmarried was associated with up to double the prevalence of lifetime SH, NSSH and suicidality.

Overall, the review has identified numerous factors that are significantly associated with suicide and SH. Statistical sub-analysis indicates that age is consistently associated with all suicide outcomes, in addition to sex and marital status also having considerable effects on physical wellbeing. However, suicide behaviour research (Hawton and Pirkis, 2017) has shown that determinants of suicidal behaviour are multi-factorial and complex, with no singular factor making suicidal behaviour inevitable. As illustrated by the Integrated Motivational Volitional (IMV) Model of Suicidal Behaviour (O'Connor and Kirtley, 2018; O'Connor, 2018), the interplay of various demographic, contextual and psychological factors influences the propensity for suicide. The current review identified significant associations between age, sex and marital status, on the one hand, and suicide attempt and suicide, on the other. These non-modifiable risk factors are not directly amenable to change via psychological interventions. Modifiable risk factors, including cognitions (e.g., rumination, automatic thoughts) and behaviour (e.g., substance use, aggression), should be targeted to reduce risk of suicidal behaviour (and, more generally, psychological distress) in vulnerable individuals, groups and communities.



Although insufficient data were available for a meta-analysis in the studies included in this review, interpersonal factors, including 'common problems with romantic partner', low social support, stigma and social comparison (e.g., low academic self-esteem, low social class), were found to be significantly associated with SH and suicide attempt in studies using both quantitative and qualitative methods. Based on these findings, we make two broad sets of recommendations for policy and practice. The first set relates to reduction of suicide risk through focusing on 'motivational factors' (according to the IMV model). Possible interventions include the introduction and/or enhancement of interventions to improve interpersonal communication, emotional literacy, attitude towards one's own achievements and self-esteem, with a view to reducing negative comparison with others and mitigating the risk of SH among those who may already have a predisposition for suicide. The second approach focuses on early interventions to reduce predispositions for suicide ('pre-motivational factors', according to the IMV model). These interventions should begin pre-birth, thereby addressing risk factors inter-generationally. For example, as identified in this review, birth weight, gestation length and ACEs can adversely influence the propensity for SH in later life. Improved mental health and antenatal care, delivered by health professionals and through psycho-education of the general population (e.g., information included within the Scotland's 'Baby Box' initiative), could provide individuals with the tools and knowledge to give children the best start in life to support their mental and physical wellbeing. These strategies have the potential to make suicidal behaviour less likely in later life.

Future work would benefit from replication of existing studies, as well as exploring the mediating and moderating interactive effects of different factors in association with later suicide attempt and suicide. Furthermore, to contextualise these findings, the associations between risk factors and suicidal behaviour and SH in the Scottish population should be explored in other nations (e.g., England, Wales).

Table 2. Risk and protective factors in relation to suicide

Variables	Protective	Risk	Univariate level	Multivariate level
<i>Demographics</i>				
Age	Recent birth cohort	Distant birth cohort	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 1 Not sig. n= 0 No stat.: n= 0
Sex	Being female	Being male	Sig. n= 1 Not sig. n= 1 No stat.: n= 1	Sig. n= 1 <sup>a</sup> Not sig. n= 0 No stat.: n= 2
Social class and deprivation	Lower deprivation.	Greater deprivation.	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 1 Not sig. n= 0 No stat.: n= 0
Depression	Lower depressive symptoms	Greater depressive symptoms	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
<i>Pre-motivational factors</i>				
Gestation			Sig. n= 0 Not sig. n= 1 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Birth weight			Sig. n= 0 Not sig. n= 0 No stat.: n= 1	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Maternal age at birth	Greater maternal age at birth	Lower maternal age at birth	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 1 Not sig. n= 0 No stat.: n= 0
Family size	No siblings.	Two or more siblings	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 1 No stat.: n= 0
Maternal parity	Lower maternal parity	Greater maternal parity	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 1 Not sig. n= 0 No stat.: n= 0
<i>Motivational phase – Key drivers</i>				
NA				
<i>Motivational phase – Threat-to-self moderators</i>				

Alcohol abuse	No alcohol abuse	Alcohol abuse	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Substance abuse	No substance abuse	Substance abuse	Sig. n =1 Not sig. n=0 No stat. n= 0.	Sig. n= 0 Not sig. n= 0 No stat.: n= 1

*Volitional factors*

NA

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Sig.= significant; Not sig.= not significant; No stat= studies which included this factor but no statistical comparison was made; NA= no data available; n = number of studies.

<sup>a</sup> Includes at least one study which opposes the proposed direction of risk/ protective factors

Factors are summarised regardless of comparison group, including SSHI and no history of suicidality.

Table 3. Risk and protective factors in relation to suicide attempt

Factor	Protective	Risk	Univariate level	Multivariate level
<i>Demographics</i>				
Age		No consensus reached (n= 8 studies)		
Older than peers			1 study – NS.	NA
Sex	Being male	Being female	Sig. n= 5 Not sig. n=2 No stat. n= 0	Sig: n= 3 <sup>aB</sup> Not sig. n= 0 No stat. n= 4
Relationship/ marital status	Married/ in a relationship	Unmarried/ single	Sig. n= 1 Not sig. n= 6 No stat.: n= 0	Sig. n= 0 Not sig. n= 1 No stat. n= 0
Sexual orientation	Heterosexual	Non- heterosexual	NA No stat. n= 1	Sig. n=1 Not sig. n= 0 No stat. n= 0
Ethnicity	No significant results		Sig. n= 0 Not sig. n=1 No stat.: n= 1	Sig. n= 0 Not sig. n=1 No stat. n= 1
Social class and deprivation			Sig. n= 0 Not sig. n= 2 No stat. n= 0	Sig. n= 1 Not sig. n=1 No stat. n= 0
Employment status	Employed	Unemployed	Sig. n= 3 Not sig. n= 3 No stat. n= 0	Sig. n= 0 Not sig. n=1 No stat. n= 5
Religion	No mismatch between religion and school denomination	Mismatch between religion and school denomination	Sig. n=1 Not sig n= 0 No stat.: n= 0	NA No stat. n= 1
	Catholic	Not Catholic	Sig. n= 0 Not sig. n= 1 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Previous mental health diagnosis				
Mental health diagnosis.	No previous diagnosis	Previous diagnosis	Sig. n=1 Not sig. n= 0	Sig. n=1 Not sig. n= 0

<b>Factor</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
Depression	Lower depressive symptoms/ no history of depression	Greater depressive symptoms/ history of depression	Sig. n=7 Not sig. n= 1 No stat.: n= 0	Sig. n=1 Not sig. n= 5 No stat.: n= 2
Anxiety			Sig. n= 0 Not sig. n= 2 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 1
Multimorbidity	Absence of multimorbidity	Presence of multimorbidity	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
<i>Pre-motivational factors</i>				
Parental control	Lower parental control	Greater parental control	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0
Parental care	Greater parental care	Lower parental care	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0
Victimised in childhood	Less than weekly	Weekly	Sig. n=1 Not sig. n= 0 No stat. n= 0	Sig. n=0 Not sig. n= 1 No stat. n= 0
Personality factor: Socially prescribed perfectionism	Lower socially prescribed perfectionism	Greater socially prescribed perfectionism	Sig. n=1 Not sig. n= 0 No stat. n= 0	Sig. n=0 Not sig. n= 1 No stat. n= 0
<i>Motivational phase – Key drivers</i>				
Defeat	Lower defeat	Greater defeat	Sig. n=3 Not sig. n= 0 No stat. n= 0	Sig. n=2 Not sig n= 0 No stat. n= 0
Entrapment	Lower entrapment	Greater entrapment	Sig. n=1 Not sig n= 0 No stat. n= 0	Sig. n=1 <sup>B</sup> Not sig n= 1 <sup>a</sup> No stat. n= 0
Suicidal Ideation	Lower suicidal ideation	Greater suicidal ideation	Sig. n=6 Not sig n= 0 No stat.: n= 0	Sig. n=3 Not sig. n= 1 No stat.: n= 2
<i>Motivational phase – Threat-to-self moderators</i>				

<b>Factor</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
Brooding rumination	Lower brooding rumination	Higher brooding rumination	Sig. n=0 Not sig. n= 0 No stat.: n= 1	Sig. n= Not sig. n= 0 No stat.: n= 1
Resilience	Lower resilience	Greater resilience	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0
Alcohol	Lower engagement in alcohol related factors	Greater engagement in alcohol related factors	Sig. n=0 Not sig n= 1 No stat. n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
<i>Motivational moderators</i>				
Social support	Greater social support	Lower social support	Sig. n=2 Not sig n= 0 No stat. n= 0	Sig. n=0 Not sig n= 2 No stat. n= 0
Living arrangements	Own their own home	Living in rental accommodation	Sig. n=1 Not sig n= 0 No stat.: n= 0	Sig. n=0 Not sig n= 0 No stat.: n= 1
Thwarted belongingness	Lower thwarted belongingness	Greater thwarted belongingness	Sig. n=3 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 2
Perceived burdensomeness	Lower perceived burdensomeness	Higher perceived burdensomeness	Sig. n=3 Not sig. n= 0 No stat.: n= 0	Sig. n=3 <sup>a</sup> Not sig. n= 0 No stat.: n= 0
Goal reengagement	Higher goal reengagement	Lower goal reengagement	Sig. n=4 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 3 No stat.: n= 0
Hopelessness	Lower hopelessness	Greater hopelessness	Sig. n=3 Not sig. n= 1 No stat.: n= 0	Sig. n= 0 Not sig. n= 2 No stat.: n= 2
Future thinking	Mixed findings	Mixed findings	Sig. n=1 <sup>d</sup> Not sig. n= 0 No stat.: n= 0	Sig. n= 1 Not sig. n= 0 No stat.: n= 0
Reasons for living	Higher reason for living	Lower reason for living	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1

<b>Factor</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
Desire for active/ passive suicide attempt	Lower desire for active/passive suicide attempt	Greater desire for active/passive suicide attempt	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Attitude suicidal behaviour	Lower attitude suicidal behaviour	Greater attitude suicidal behaviour	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
<i>Volitional factors</i>				
Acquired capability for suicide	Lower acquired capability	Greater acquired capability	Sig. n= 2 Not sig. n= 0 No stat.: n= 0	Sig. n= 1 Not sig. n= 1 No stat.: n= 0
Suicidal intent	Lower intent to die	Greater intent to die	Sig. n= 0 Not sig. n= 2 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 2
Exposure to friend/ family suicide death	Less likely to have known a friend or relative who died by suicide.	More likely to have known a friend or relative who died by suicide.	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 1 No stat.: n= 0
Exposure to suicide attempt in friend/ family	Less likely to have been exposed to a suicide attempt in a friend/ family member.	More likely to have been exposed to a suicide attempt in a friend/ family member.	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 1 Not sig. n= 0 No stat.: n= 0
Exposure to SH (suicide attempt or NSSH) in friend/family	Less likely to have been exposed to SH.	More likely to have been exposed to SH.	Sig. n= 0 Not sig. n= 0 No stat.: n= 1	Sig. n= 1 Not sig. n= 0 No stat.: n= 0
Impulsivity	Lower impulsivity	Greater impulsivity.	Sig. n= 3 Not sig. n= 0 No stat.: n= 0	Sig. n= 2 Not sig. n= 1 No stat.: n= 0
Self-harm history	Less history of self-harm.	Greater history of self-harm.	Sig. n= 3 Not sig. n= 0 No stat.: n= 0	Sig. n= 3 Not sig. n= 0 No stat.: n= 0
Fearlessness about death	Lower fearlessness of death.	Greater fearlessness of death.	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 1 No stat.: n= 0

<b>Factor</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
Discomfort tolerance			Sig. n= 0 Not sig. n= 1 No stat.: n= 0	Sig. n= 0 Not sig. n= 1 No stat.: n= 0

Sig.= total number of significant studies; Not sig.= total number of studies not significant; No stat.= studies which explored this factor but no statistical comparison was made; NA= no data available; n = number of studies.

<sup>a</sup> Includes at least one study which opposes the proposed direction of risk/ protective factors

<sup>b</sup> Includes at least one study with two results where no suicidality vs suicide attempt pairwise comparison revealed a significantly differing result to a SSHI vs suicide attempt pairwise comparison.

<sup>d</sup> result (sig. or not sig) applies to only a subscale(s) of the measure used to assess this factor in at least one study. Factors are summarised regardless of comparison group, including SSHI and no history of suicidality.



Table 4. Risk and protective factors in relation to self-harm (SH)

Variables	Protective	Risk	Univariate level	Multivariate level
<i>Demographics</i>				
Age	Older age	Younger age	Sig. n=4 Not sig. n= 1 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 4
Older than peers			Sig. n=0 Not sig. n= 1 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
Sex	Being male	Being female	Sig. n=5 Not sig. n= 2 No stat.: n= 0	Sig. n= 4 Not sig. n= 3 No stat.: n= 0
Relationship/ marital status	Married/ in a relationship	Unmarried/ single	Sig. n=1 Not sig. n= 1 No stat.: n= 0	Sig. n=1 Not sig. n= 1 No stat.: n= 0
Sexual orientation	Heterosexual	Non- heterosexual	Sig. n=0 Not sig. n= 1 No stat.: n= 1	Sig. n=1 Not sig. n= 0 No stat.: n= 1
Ethnicity			Sig. n=0 Not sig. n= 1 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Social class and deprivation	Lower deprivation.	Greater deprivation.	Sig. n=2 Not sig. n= 1 No stat.: n= 0	Sig. n=2 Not sig. n= 1 No stat.: n= 0
Employment status	Employed	Unemployed	Sig. n=1 Not sig. n= 1 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 2
Religion	No mismatch between religion and school denomination	Mismatch between religion and school denomination	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
<i>Previous mental health diagnoses</i>				
Mental health diagnosis.	No previous diagnosis	Previous diagnosis	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0

<b>Variables</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
Mental health wellbeing.	Greater wellbeing	Lower wellbeing	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Depression	Lower depressive symptoms/ no history of depression	Greater depressive symptoms/ history of depression	Sig. n= 3 Not sig. n= 2 No stat.: n= 0	Sig. n=1 Not sig. n= 2 No stat.: n= 2
Anxiety	Lower anxiety	Greater anxiety	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0
Post-traumatic stress disorder.	Lower PTSD symptoms	Greater PTSD symptoms	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
<i>Pre-motivational factors</i>				
Gestation	Lower gestational age	Greater gestational age	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Birth weight	Greater birth weight	Lower birth weight	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Maternal age at birth	Greater maternal age at birth	Lower maternal age at birth	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Family size	One or two siblings	No siblings or more than three siblings	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Maternal parity	Lower maternal parity	Greater maternal parity	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Parental control	Lower parental control	Greater parental control	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0
Parental care	Greater parental care	Lower parental care	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0

<b>Variables</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
Parental attachment	No significant association		Sig. n=0 Not sig. n= 1 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
Childhood trauma	None	Physical, sexual and emotional trauma	Sig. n=3 Not sig. n= 0 No stat.: n= 0	Sig. n=2 Not sig. n= 0 No stat.: n= 1
Adverse childhood experiences	Lower adverse childhood experiences	Greater adverse childhood experiences	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Victimised in childhood	Weekly	Less than weekly	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0
Personality factor: Neuroticism	Lower neuroticism	Greater neuroticism	Sig. n=2 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Personality factor: Socially prescribed perfectionism	Lower socially prescribed perfectionism	Greater socially prescribed perfectionism	Sig. n= 2 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 1
Self-criticism	Lower self-criticism	Greater self-criticism	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Stress	Lower stress	Greater stress	Sig. n=3 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 2
Defense mechanisms	Lower immature and greater mature defense mechanisms	Greater immature and lower mature defense mechanisms	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
<b>Motivational phase – Key drivers</b>				
Defeat	Lower defeat	Greater defeat	Sig. n=2 Not sig. n= 1 No stat.: n= 0	Sig. n=1 Not sig. n= 2 No stat.: n= 0

<b>Variables</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
Entrapment	Lower entrapment	Greater entrapment	Sig. n=2 Not sig. n= 1 No stat.: n= 0	Sig. n=1 Not sig. n= 2 No stat.: n= 0
Suicidal ideation	Lower suicidal ideation.	Greater suicidal ideation.	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
<i>Motivational phase–Threat-to-self moderators</i>				
Brooding rumination	Lower brooding rumination	Greater brooding rumination	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
Emotional dysregulation	Lower emotional dysregulation.	Greater emotional dysregulation	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
Negative mood regulation expectancies	Greater ability in controlling negative mood	Lower ability in controlling negative mood	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
Optimism	Greater optimism	Lower optimism	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
Academic self-esteem	Greater academic self-esteem	Lower academic self-esteem	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
Coping	Lower maladaptive coping	Greater maladaptive coping	Sig. n= 2 Not sig. n= 0 No stat.: n= 0	Sig. n=2 Not sig. n= 0 No stat.: n= 0
Alcohol	Lower engagement in alcohol-related factors	Greater engagement in alcohol-related factors	Sig. n=1 Not sig. n= 1 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Substance abuse	Lower substance abuse.	Greater substance abuse.	Sig. n=1 Not sig. n= 0 No stat.: n= 1	Sig. n=0 Not sig. n= 0 No stat.: n= 2
<i>Motivational phase–Motivational moderators</i>				

<b>Variables</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
Social support	Greater social support.	Lower social support.	Sig. n=3 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 1 No stat.: n= 1
Living arrangements	Live with others, not homeless or institutionalized.	Live alone, homeless, or institutionalized.	Sig. n=1 Not sig. n= 1 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 2
Loneliness	Lower loneliness.	Greater loneliness.	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0
Attachment style with others	Greater support.	Less support.	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
Stigma	Higher stigmatising beliefs	Lower stigmatising beliefs	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Wish to live/ die	Lower wish to die and wish to live	Greater wish to die and wish to live	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Reasons for living	Greater reasons for living	Fewer reasons for living	Sig. n=2 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 1
Attitude suicidal behaviour	Lower attitude for suicidal behaviour.	Greater attitude for suicidal behaviour.	Sig. n=1 Not sig. n= 0 No stat.: n= 0	No stat.: n=1.
<i>Volitional phase</i>				
Suicidal intent	Lower intent to die	Greater intent to die	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0
Exposure to friend/ family suicide death			Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 1

<b>Variables</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
Exposure to SH (suicide attempt or NSSH) in friend/family	Less likely to have been exposed to SH.	More likely to have been exposed to SH.	Sig. n= 2 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 1 No stat.: n= 0
Impulsivity	Lower impulsivity	Greater impulsivity	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 1 No stat.: n= 0
Beliefs about self-harm.	Less beliefs about self-harm and beliefs of self-harm behaviour of peers and friends.	Greater beliefs about self-harm and beliefs of self-harm behaviour of peers and friends.	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0
Deterrents of attempt	Greater deterrent of attempts	Lower deterrent of attempts	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Planning behaviour	Greater planning behaviour	Less planning behaviour	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Availability of methods	Greater availability of methods.	Less availability of methods.	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Courage for actual behaviour	Lower courage	Greater courage	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Expectancy of actual attempt	Lower expectancy of making a suicide attempt.	Greater expectancy of making a suicide attempt	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Actual preparation	Less suicide preparation	Greater suicide preparation	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Arrangements after death	Less likelihood of making arrangements after death.	Greater likelihood of making arrangements after death.	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1

<b>Variables</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
Concealment about ideation	Less likely to conceal thoughts.	More likely to conceal thoughts.	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
<i>Other</i>				
Cognitive ability	Greater cognitive ability.	Lower cognitive ability	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 0
Academic qualifications	Greater academic qualifications	No or lower academic qualifications	Sig. n=1 Not sig. n= 1 No stat.: n= 0	Sig. n=1 Not sig. n= 0 No stat.: n= 1
Previous criminal convictions	No previous criminal convictions.	Previous criminal convictions.	Sig. n=0 Not sig. n= 0 No stat.: n= 1	Sig. n=0 Not sig. n= 0 No stat.: n= 1
Dissociative experiences	Less dissociative experiences.	Greater dissociative experiences.	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 0 No stat.: n= 1
Common problems	Less problems with girlfriends/ boyfriends.	Greater problems with girlfriends/ boyfriends.	Sig. n=1 Not sig. n= 0 No stat.: n= 0	Sig. n=0 Not sig. n= 1 No stat.: n= 0

Sig.= significant; Not sig.= not significant; No stat= studies which included this factor, but no statistical comparison was made; NA= no data available; n = number of studies. Factors are summarised regardless of comparison group, including SSHI and no history of suicidality.

Table 5. Risk and protective factors in relation to non-suicidal self-harm (NSSH)

Variables	Protective	Risk	Univariate level	Multivariate level
<i>Demographics</i>				
Age	Older age	Younger age	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Sex	Being male	Being female	Sig. n= 1 Not sig. n= 1 No stat.: n= 0	NA
Relationship/ marital status	Married/ in a relationship	Unmarried/ single	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
Ethnicity			Sig. n= 0 Not sig. n= 1 No stat.: n= 0	NA
Employment status	Employed	Unemployed	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 1 No stat.: n= 0
<i>Motivational phase – Threat-to-self moderators</i>				
Alcohol			Sig. n= 0 Not sig. n= 1 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1
<i>Motivational moderators</i>				
Living arrangements	Live with others, not homeless or institutionalized.	Live alone, homeless, or institutionalized.	Sig. n= 1 Not sig. n= 0 No stat.: n= 0	Sig. n= 0 Not sig. n= 0 No stat.: n= 1

Sig.= significant; Not sig.= not significant; No stat= studies which included this factor but no statistical comparison was made; NA= no data available; n = number of studies. Factors are summarised regardless of comparison group, including SSHI and no history of suicidality.



Table 6. Risk and protective factors in relation to suicidality

<b>Variables</b>	<b>Protective</b>	<b>Risk</b>	<b>Univariate level</b>	<b>Multivariate level</b>
<i>Demographics</i>				
Relationship/ marital status	Married/ in a relationship	Unmarried/ single	Sig. n=0 Not sig. n=1 No stat. n = 0	Sig. n=0 Not sig. n=0 No stat. n = 1
Employment status	Employed	Unemployed	Sig. n=1 Not sig. n=0 No stat. n = 0	Sig. n=1 Not sig. n=0 No stat. n = 0
<i>Previous mental health diagnoses</i>				
Mental health diagnosis.	No previous diagnosis	Previous diagnosis	Sig. n=0 Not sig. n=0 No stat. n = 1	Sig. n=0 Not sig. n=0 No stat. n = 1
<i>Pre-motivational factors</i>				
Childhood trauma	Lower childhood trauma	Greater childhood trauma	Sig. n=2 Not sig. n=0 No stat. n = 0	Sig. n=1 Not sig. n=1 No stat. n = 0
<i>Motivational phase– Threat-to-self moderators</i>				
Emotional dysregulation	Lower emotional dysregulation	Greater emotional dysregulation	Sig. n=1 Not sig. n=1 No stat. n=0	Sig. n=0 Not sig. n=0 No stat. n=2
Emotion deactivation	Lower emotion deactivation	Greater emotion deactivation	Sig. n=1 Not sig. n=0 No stat. n=0	Sig. n=0 Not sig. n=0 No stat. n=1

Sig.= significant; Not sig.= not significant; No stat= studies which included this factor but no statistical comparison was made; NA= no data available; n = number of studies. Factors are summarised regardless of comparison group, including SSHI and no history of suicidality.

Table 7. Summary of significant factors in relation to self-harm or suicidal behaviour outcome

Factor	Protective	Risk	Suicide	Suicide attempt	SH	NSSH
<i>Individual differences</i>						
Age	Older age	Younger age	✓	*	✓ <sup>a</sup>	✓
Older than peers		<i>No consensus</i>			✓	
Sex	Being male	Being female	✓ <sup>a</sup>	✓	✓	*
Ethnicity		<i>No consensus</i>			*	
Sexual orientation	Heterosexual	Non-heterosexual		✓	✓	
Relationship/ marital status	Married/ in a relationship	Unmarried/ single			*	✓
Social class and deprivation	Lower deprivation	Greater deprivation	✓	*	✓	
Employment status	Employed	Unemployed		✓	✓	
Religion	No mismatch between religion and school denomination	Mismatch between religion and school denomination		✓	✓	
Mental health diagnosis (current)	No current diagnosis	Current diagnosis		✓	✓	
Mental health diagnosis (past)	No previous diagnosis	Previous diagnosis		✓	✓	
Mental wellbeing	Greater wellbeing	Lower wellbeing			✓	
Depression (history of)	No history of depression	History of depression	✓		✓	

Factor	Protective	Risk	Suicide	Suicide attempt	SH	NSSH
Depression (current symptoms)	Lower depressive symptoms	Greater depressive symptoms		✓	*	
Anxiety symptoms (current)	Few anxiety symptoms	More anxiety		*	*	
Post-traumatic stress disorder	Lower PTSD symptoms	Greater PTSD symptoms				✓
Multimorbidity	Absence of multimorbidity	Presence of multimorbidity		✓		
<i>Pre-motivational factors</i>						
Gestation	Lower gestational age	Greater gestational age	✓			✓
Birth weight	Greater birth weight	Lower birth weight	✓			✓
Maternal age at birth	Greater maternal age at birth	Lower maternal age at birth	✓			✓
Family size	1 or 2 siblings	No siblings or more than 3 siblings				✓
Maternal parity	Lower maternal parity	Greater maternal parity	✓			✓
Parental attachment						
Childhood trauma	None	Physical, sexual and emotional trauma				✓
Adverse childhood experiences	Lower adverse childhood experiences	Greater adverse childhood experiences				✓
Neuroticism	Lower neuroticism	Greater neuroticism				✓

Factor	Protective	Risk	Suicide	Suicide attempt	SH	NSSH
Socially prescribed perfectionism	Lower socially prescribed perfectionism	Greater socially prescribed perfectionism			*	
Self-criticism	Lower self-criticism	Greater self-criticism			✓	
Stress	Low stress	High stress			*	
Defense mechanisms	Lower immature defense mechanisms/ greater mature defense mechanisms	Lower immature defense mechanisms/ lower mature defense mechanisms				✓
<i>Motivational factors</i>						
<u>Key drivers</u>						
Defeat	Lower defeat	Greater defeat		✓	*	
Entrapment	Lower entrapment	Greater entrapment		✓	*	
Suicidal ideation present	No suicidal ideation	Suicidal ideation experienced				✓
Suicidal ideation (severity)	Lower suicidal ideation	Greater suicidal ideation		✓		✓
<u>Threat to self-motivators</u>						
Brooding and rumination	Lower brooding rumination	Greater brooding rumination		✓		✓
Resilience						
Emotional dysregulation	Lower emotional dysregulation	Greater emotional dysregulation				✓
Emotional/ hyper activation						

Factor	Protective	Risk	Suicide	Suicide attempt	SH	NSSH
Negative mood regulation expectancies	Greater ability in controlling negative mood	Lower ability in controlling negative mood			✓	
Optimism	Greater optimism	Lower optimism			✓	
Academic self-esteem	Greater academic self-esteem	Lower academic self-esteem			✓	
Coping	Lower maladaptive coping	Greater maladaptive coping			✓	
Alcohol	Lower engagement in alcohol-related factors	Greater engagement in alcohol-related factors	✓		✓	
Substance abuse (drugs)	Lower substance abuse	Greater substance abuse	✓		✓	
<b>Motivational moderators</b>						
Social support	Greater social support	Lower social support			*	
Living arrangements	Live with others, not homeless or institutionalized.	Live alone, homeless, or institutionalized.		✓	✓	✓
Thwarted belongingness	Lower thwarted belongingness	Greater thwarted belongingness		✓		
Loneliness	Low loneliness	High loneliness			✓	
Attachment style with others	Not dependently attached	Dependently attached			✓	
Perceived burdensomeness	Lower perceived burdensomeness	Higher perceived burdensomeness		✓		
Stigma	Higher stigmatising beliefs	Lower stigmatising beliefs			✓	
Goal re-engagement	Higher goal re-engagement	Lower goal re-engagement		*		

<b>Factor</b>	<b>Protective</b>	<b>Risk</b>	<b>Suicide</b>	<b>Suicide attempt</b>	<b>SH</b>	<b>NSSH</b>
Hopelessness	Lower hopelessness	Greater hopelessness		*		
Future thinking	No consensus			✓		
Wish to live/ die	Lower wish to die and wish to live	Greater wish to die and wish to live			✓	
Reasons for living	Greater reasons for living	Fewer reasons for living		✓	*	
Desire for active/ passive suicide attempt	Lower desire for active/passive suicide attempt	Greater desire for active/passive suicide attempt		✓		
Attitude to suicidal behaviour	Lower attitude for suicidal behaviour.	Greater attitude for suicidal behaviour.		✓	✓	
<i>Volitional factors</i>						
Acquired capability for suicide	Lower acquired capability	Greater acquired capability		*		
Suicidal intent	Lower intent to die	Greater intent to die		✓	*	
Exposure to friend/ family suicide death	Less likely to have known a friend or relative who died by suicide.	More likely to have known a friend or relative who died by suicide.			*	
Exposure to SH (suicide attempt or NSSH) in friend/family	Less likely to have been exposed to SH.	More likely to have been exposed to SH.		✓		
Impulsivity	Lower impulsivity	Greater impulsivity		✓		
Self-harm of history	Less history of self-harm.	Greater history of self-harm.		✓		

<b>Factor</b>	<b>Protective</b>	<b>Risk</b>	<b>Suicide</b>	<b>Suicide attempt</b>	<b>SH</b>	<b>NSSH</b>
Deterrents of attempt	Greater deterrent of attempts	Lower deterrent of attempts			✓	
Planning behaviour	Less planning behaviour	Greater planning behaviour			✓	
Availability of methods	Greater availability of methods.	Less availability of methods.			✓	
Courage for suicidal behaviour	Lower courage	Greater courage			✓	
Expectancy of actual attempts	Lower expectancy of making a suicide attempt.	Greater expectancy of making a suicide attempt			✓	
Actual preparation	Less suicide preparation	Greater suicide preparation			✓	
Arrangements after death	Less likelihood of making arrangements after death.	Greater likelihood of making arrangements after death.			✓	
Concealment of ideation	Less likely to conceal thoughts.	More likely to conceal thoughts.			✓	
Discomfort tolerance	Low discomfort tolerance	High discomfort tolerance		✓		
<i>Other</i>						
Cognitive availability	Greater cognitive ability.	Lower cognitive ability			✓	
Academic qualifications	Greater academic qualifications	No or lower academic qualifications			✓	
Previous criminal convictions	No previous criminal convictions	Previous criminal convictions			✓	
Dissociative experiences	Less dissociative experiences.	Greater dissociative experiences.			✓	

<b>Factor</b>	<b>Protective</b>	<b>Risk</b>	<b>Suicide</b>	<b>Suicide attempt</b>	<b>SH</b>	<b>NSSH</b>
Common problems with romantic partner	Fewer problems with romantic partner.	Greater problems with romantic partner.			✓	

<sup>a</sup> Results are contradictory to findings relating to suicide attempt, SH and NSSH (i.e., suicide death was significantly more common in males than females)

✓ = majority of studies found a significant association between the factor and self-harm outcome measure.

\* = mixed results, some studies found a significant association while others did not.



#### 4.1 Limitations

Several limitations should be noted when interpreting the findings of this review. These limitations include:

- Eligibility for inclusion in the review was limited to studies involving Scottish populations/samples only. Inclusion of UK-wide data might have provided the opportunity to identify additional risk and/or protective factors relating to suicidal/self-injurious behaviour. However, the relevance of findings based on non-Scottish populations to the Scottish context cannot be assumed.
- Only studies published since 2011 were considered potentially eligible for inclusion in the review. The inclusion of studies published prior to 2011 might have resulted in the identification of additional risk and/or protective factors, and enabled further replication of the current review findings. However, the relevance of findings based on research carried out during a different historical period cannot be assumed.
- The association between biological sex (male/ female) and suicidal/self-injurious behaviour was explored in several studies. However, no quantitative study which met the eligibility criteria of this review explored gender or gender identity in relation to suicidal/self-injurious behaviour.
- Although the vast majority of factors explored in the included studies were related to risk of suicidal/self-injurious behaviour, it would be reasonable to conceptualise the absence (or low level) of a specific risk factor as evidence of a potential protective factor.
- In one study (Riordan et al., 2012), family size was based on subsequent children after the index child being followed and did not take into consideration the index child's older siblings (if there were any).
- Despite the high prevalence of alcohol consumption and alcohol misuse in Scotland, Gilchrist and Sadler (2019) was the only study to explore this behaviour in relation to suicide. Unfortunately, no demographic details of the sample of deaths were provided.
- In many studies using quantitative methods, significant findings using univariate analysis were not confirmed by multivariate analysis. This suggests that findings based on univariate analysis may not be reliable and should therefore be treated with caution, especially with respect to drawing firm conclusions for policy making and practice.
- The samples in some studies comprise individuals presenting at or admitted to hospital following an episode of SH, omitting persons in the community who self-harm but do not seek or receive treatment in hospital. There is evidence of important differences between such hospital samples and community samples of people who self-harm, e.g., with respect to method, thereby calling into question the generalisability of study findings to the wider population of people who self-harm.
- Due to the considerable methodological heterogeneity of the included papers (e.g., cross-sectional versus longitudinal design), as well as the inconsistent reporting style (e.g., not all studies reported effect sizes), it was not possible to calculate overall effect sizes for most of the factors explored in this review or per individual suicidal/self-injurious behaviour outcome.
- Findings based on the use of qualitative methods, typically with small participant samples, cannot be assumed to be statistically generalisable to the wider population from which the

sample was drawn. Other limitations of qualitative methods include response bias and self-selection bias.

- There was no quality assessment of papers included in this review.

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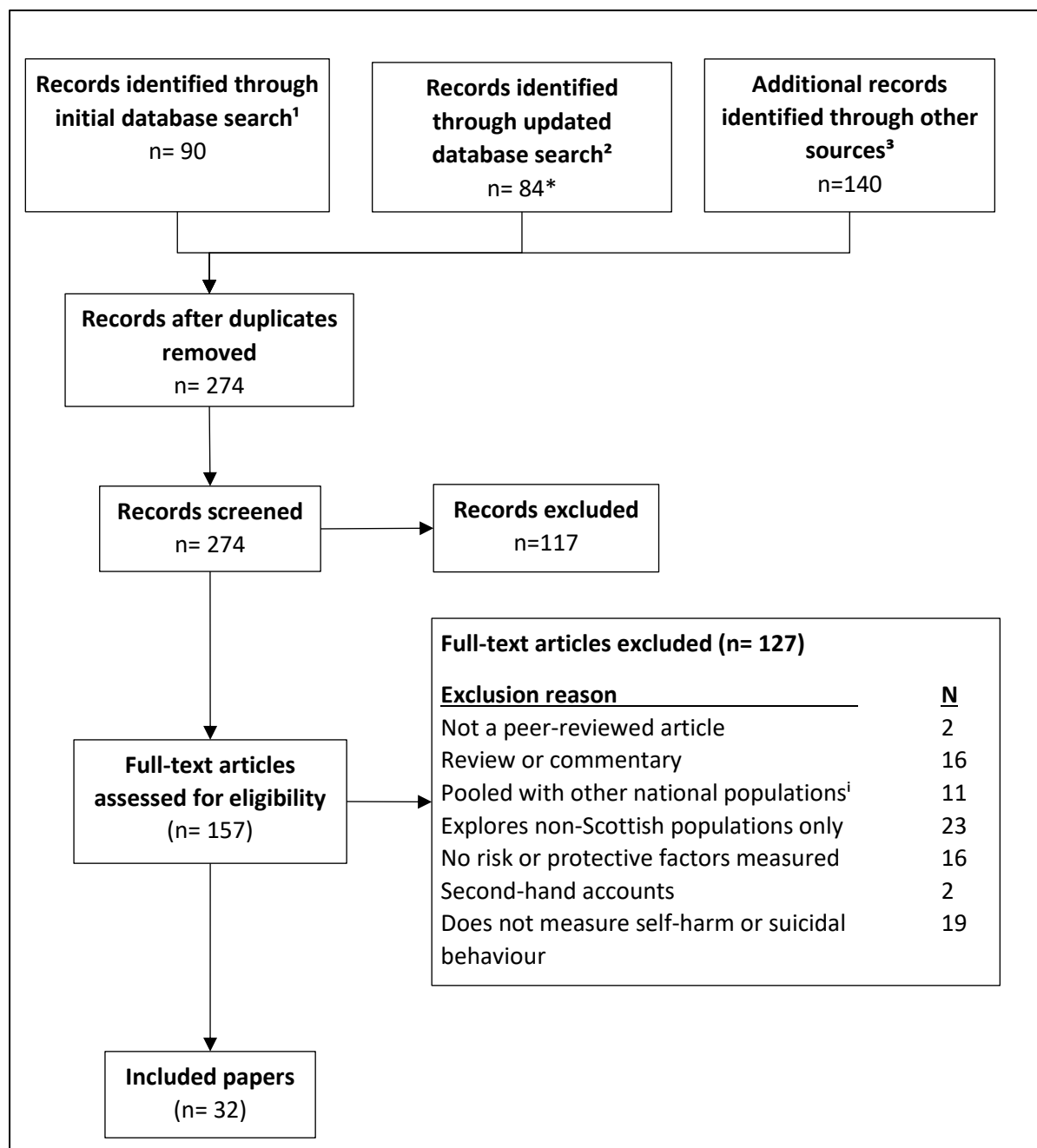
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## Appendix 1. PRISMA statement and search strategy



<sup>1</sup> Search conducted on 1<sup>st</sup> December 2021, included databases were CINHAL, Medline, PsychArticles, PsychInfo, Web of Knowledge. Search terms were: (“Risk Factors” OR “Protective Factors” OR “Socioeconomic Factors” OR “Geographic Factors” OR “Age Factors” OR “Risk for Self-Mutilation” OR “Risk for Poisoning” OR “Suicide Risk” OR “Self Mutilation Risk” OR “Risk” OR “Risk-Taking” OR “Economic Factors” OR “Socioeconomic Factors” OR “Sociological Factors” OR “Protective Factors” OR “Sex Factors” OR “Sexuality” OR “Sexual Orientation” OR “Epidemiologic Factors” OR “Age Factors” OR “Social Factors”) AND (“Suicide” OR “suicide” OR “Suicide, Completed” OR “Self-Injurious Behavior” OR “Suicide, Attempted” OR “Suicidal Ideation” OR “Self Mutilation” OR “Risk Reduction Behavior” OR “Self-injurious Behaviour” OR “Risk Reduction Behaviour”) AND (Scotland OR Scottish OR Scot\*). Search terms were selected using Subject Heading terms (e.g., MedLine Subject Headings “MeSH”)

<sup>2</sup> Search was conducted on 4<sup>th</sup> of February, 2022, included databases were CINHAL, Medline, PsychArticles, PsychInfo. Search terms were: (“Risk Factors” OR “Protective Factors” OR “Socioeconomic Factors” OR “Geographic Factors” OR “Age Factors” OR “Risk for Self-Mutilation” OR “Risk for Poisoning” OR “Suicide Risk” OR “Self Mutilation Risk” OR “Risk” OR “Risk-Taking” OR “Economic Factors” OR “Socioeconomic Factors” OR “Sociological Factors” OR “Protective Factors” OR “Sex Factors” OR “Sexuality” OR “Sexual Orientation” OR “Epidemiologic Factors” OR “Age Factors” OR “Social Factors”) AND (“Suicide” OR “suicide” OR “Suicide, Completed” OR “Self-Injurious Behavior” OR “Suicide, Attempted” OR “Suicidal Ideation” OR “Self Mutilation” OR “Risk Reduction Behavior” OR “Self-injurious Behaviour” OR “Risk Reduction Behaviour”) AND (Scotland OR Scottish OR Scot\*) AND (“Edinburgh” OR “West of Scotland” OR “Glasgow” OR “Aberdeen” OR “St Andrews” OR “Strathclyde” OR “Stirling” OR “Dundee” OR “Inverness” OR “Ayrshire” OR “Arran” OR “Borders” OR “Dumfries” OR “Galloway” OR “Fife” OR “Forth Valley” OR “Grampian” OR “Greater Glasgow” OR “Clyde” OR “Highland” OR “Lanarkshire” OR “Lanark” OR “Lothian” OR “Orkney” OR “Shetland” OR “Tayside” OR “Western Isles”.) Search terms were selected using Subject Heading terms (e.g., MedLine Subject Headings “MeSH”)

<sup>3</sup> Search conducted on the 17<sup>th</sup> of February 2022, included all publications on the Suicide Behaviour Research Laboratory (SBRL) website (SBRL.info)

\* Decline in the second database search compared to the first was attributed to a database deduplication during the period between the two searches.

<sup>i</sup> Only applies to search strategy 2 and 3.

## Appendix 2. Quantitative study summary table

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
Bergman et al (2019) <sup>2</sup>	<p>Scottish Military Veterans N = 56,205 Age: Cohort born between 1945-1985 Gender: Male (N = 50,970, 90.7%, Female (N = 5235, 9.3%)</p> <p>Non-veterans N= 172,753 Age: 3:1 matched with sample above Gender: 3:1 matched with sample above</p>	30-year retrospective cohort	SH and suicide  Data retrieved from Scottish NHS patient records and Scottish Morbidity Records	Age: Birth Cohort+	<p>SH only Birth cohort 1945-1959: HR = 1.55, 95% CI: 1.42-1.69</p> <p>Birth cohort 1960-1985: HR= 1.19, 95% CI: 1.10-1.30</p>	<p>SH only Birth cohort 1945-1959: HR = 1.43, 95% CI:1.31-1.56,</p> <p>Birth cohort 1960-1985: HR= 1.17, 95% CI: 1.08-1.27,</p>
				Age at suicide	<p>Suicide No effect size calculated</p> <p>Age (years (Mean, sd)):</p> <p>Veterans: SH history: 45.5 (7.9) No SH history: 43.6 (8.1)</p> <p>Non-veterans: SH history: 41.6 (8.6) No SH history: 41.1 (9.8)</p>	No effect size calculated.
				Sex	<p>SH Male veterans&gt;Female veterans OR = 1.38, 95% CI 1.30–1.47</p>	No effect size calculated.



Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Self-harm history	Veterans vs non-veterans, p= NS	No effect size calculated.
				Time between index self-harm and fatal self-harm†	Years (Median, IQR): Veterans: 2.0 (0.4-4.3) Non-veterans: 2.4 (0.5-5.8)	No effect size calculated.
				Length of military service†	Untrained early service leavers: HR= 1.69, 95% CI: 1.50–1.91  Trained, early service leavers: HR = 1.59, 95% CI: 1.46-1.74,  Trained 4-6 years service: HR= 1.33, 95% CI: 1.20-1.47,  Trained 7-9 years service: HR =1.19, 95% CI: 1.04-1.36 Trained 10-12 years service: Not significant,  13-16 years service: Not significant	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					17-22 years service: Not significant  23 years service: HR= 0.40, 95% CI: 0.28 – 0.57	
Bergman et al. (2017) <sup>2</sup>	<p>Scottish Military Veterans N = 56,205 Age: Cohort born between 1945-1985 Gender: Male (N = 50,970, 90.7%, Female (N = 5235, 9.3%)</p> <p>Non-veterans N= 172,753 Age: 3:1 matched with sample above Gender: 3:1 matched with sample above</p>	30-year retrospective cohort study	<p>Suicide</p> <p>Data retrieved from Scottish linked health records and from Scottish Morbidity Records (SMRO1 and SMRO4).</p>	Age: Birth Cohort+	<p>Suicide Birth cohort 1945-1949: Not significant</p> <p>Birth cohort 1950-1954: HR = 1.51, 95% CI = 1.11-2.06</p> <p>Birth cohort 1955-1959, not significant</p> <p>Birth cohort 1960-1954, not significant</p> <p>Birth cohort 1965-1969, not significant</p> <p>Birth cohort 1970-1974, not significant</p> <p>Birth cohort 1975-1979, not significant</p>	<p>Suicide Birth cohort 1945-1949, not significant</p> <p>Birth cohort 1950-1954, HR= 1.44, 95% CI = 1.06-1.97</p> <p>Birth cohort 1955-1959, not significant</p> <p>Birth cohort 1960-1954, not significant</p> <p>Birth cohort 1965-1969, not significant</p> <p>Birth cohort 1970-1974, not significant</p> <p>Birth cohort 1975-1979, not significant</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Age at suicide+	Suicide (No effect sizes calculated)  Under 30 years old (per 100,000): Veterans: 5.2 Non-veterans: 10.1  30 – 40 years old (per 100,000) Veterans: 18.2 Non-veterans: 18.4  40- to 50 years old (per 100,000): Veterans: 30.6 Non-veterans: 26.6  >50 years old (per 100,000): Veterans: 20.2 Non-veterans: 16.9	No effect sizes calculated.
				Sex	<u>Suicide</u> Women Veterans> non-veterans: HR = 2.52, 95% CI:1.36–4.66	<u>Suicide</u> Women: Veterans> non-veterans: HR = 2.44, 95% CI: 1.32–4.51

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Length of military service <sup>+</sup>	Basic training: Not significant  Early service leaver: not significant  Non-early service leaver: not significant	<u>Suicide</u> Basic training, not significant  Early service leaver, not significant  Non-early service leaver, not significant
Brody & Carson (2012)	General population adolescents  N = 114 Age: 16–19 years Gender: Female (N = 65; 57%), Male (N= 49; 43%).	Cross-sectional	Lifetime NSSH  “Have you ever deliberately injured your own body without wanting to commit suicide”	Sex	NSSH vs no NSSH: No significant difference	No effect size calculated.
				Neuroticism	NSSH vs no NSSH: No significant difference	No effect size calculated.
				Defence mechanisms	Immature defenses (yes): r = 0.37, p < 0.01; OR = 6.3 (95% CI 2.8–14.3)  Mature defenses (yes): r = -0.32, p < .01; OR = 0.24 (95% CI 0.12–0.48)	No effect size calculated.
				Alcohol	NSSH vs no NSSH: No significant difference	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Substance abuse	Lifetime drug use: r = 0.28, p < 0.01	No effect size calculated.
Cleare et al. (2021)	<p>Participants recruited from Scottish Hospitals after being admitted for an incidence of self-harm</p> <p>N = 500 Age: Mean = 37.10 years (SD =13.8), over 18 Gender: Female (N = 303; 60.6%), Male (N = 197; 39.4%).</p>	Cross-sectional	<p>Self-reported history of NSSH: “Have you ever harmed yourself without wanting to die, by taking an overdose of tablets or in some other way?”</p> <p>Suicide attempt: “Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?”</p>	Sex	Suicide attempt > NSSH : Male < Female OR = 0.49 (95% CI .33-.74)	Suicide attempt > NSSH Male > Female OR = 2.90 (95% CI 1.75-4.81)
				Relationship status	NSSH vs Suicide attempt Not significant	No effect size calculated.
				Employment status	Suicide attempt > NSSH OR = 0.43, 95% CI = 0.23 – 0.81	No effect size calculated.
				Depression	Suicide attempt > NSSH OR = 1.04 (95% CI = 1.03 – 1.06)	Not significant, OR = 0.98 (95% CI = 0.96 – 1.01)
				Socially prescribed perfectionism	Suicide attempt>NSSH OR = 1.02 (95% CI 1.01–1.03)	Suicide attempt>NSSH OR = 1.00 (95% CI: 0.98–1.01)
				Defeat	Suicide attempt>NSSH OR = 1.05 (95% CI: 1.04–1.07)	Suicide attempt>NSSH OR = 1.04 (95% CI: 1.01–1.08)

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Internal Entrapment	Suicide attempt>NSSH OR = 1.06 (95% CI: 1.04–1.08)	Suicide attempt < NSSH: OR = 0.93 (95% CI : 0.87–0.99)
				External Entrapment	Suicide attempt>NSSH OR = 1.08 (95% CI: 1.05–1.11)	Suicide attempt vs NSSH Not significant
				Suicidal ideation	Suicide attempt > NSSH : OR = 1.08 (95% CI : 1.06 – 1.10)	Suicide attempt > NSSH : OR = 1.08 (95% CI : 1.06 – 1.10)
				Social support	Suicide attempt < NSSH: OR = 0.94 (95% CI 0.91–0.97)	Suicide attempt vs NSSH: Not significant
				Alcohol	NSSH vs Suicide attempt: Not significant	No effect size calculated.
				Thwarted belongingness	Suicide attempt > NSSH: OR = 1.07 (95% CI: 1.04–1.10)	Not significant
				Perceived burdensomeness	Suicide attempt > NSSH: OR = 1.07 (95% CI 1.05–1.09)	Suicide attempt>NSSH OR = 1.04, 95% CI 1.01–1.07.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Goal Disengagement	Suicide attempt vs NSSH: Not significant	No effect size calculated.
				Goal Reengagement	Suicide attempt < NSSH: OR =0.96 (95% CI : 0.93 – 0.99)	Not significant
				Acquired capability for suicide	Suicide attempt > NSSH : OR = 1.07 (95% CI : 1.03 – 1.11)	Not significant
				Impulsivity	Suicide attempt > NSSH : OR = 1.03 (95% CI : 1.02 – 1.05)	Not significant
				Self-harm history	No effect size calculated.	Number of previous self-harm episodes (1 <sup>st</sup> , 1-3 previous or 4+ previous episodes): Not significant
Cleare et al. (2018)	Patients admitted to hospital Emergency Departments in Glasgow	Cross-sectional	1 <sup>st</sup> SH event versus subsequent (repeat) SH event	Age	1 <sup>st</sup> SH episode> Repeat SH: Not significant	No effect size calculated.
				Sex	1 <sup>st</sup> SH episode> Repeat SH: OR= 2.36 (95% CI: 1.15– 4.84)	1 <sup>st</sup> SH episode> Repeat SH: OR= 2.2 (95% CI: 1.0–4.83)

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
	following an episode of self-harm.  N = 198 Age: Mean = 35.9 years, SD = 13.04) Gender: Female (N = 128, 68%), Male (N = 60, 32%).		“Have you made an attempt to take your life, by taking an overdose of tablets or in some other way?” And; “Have you ever harmed yourself without wanting to die, by taking an overdose of tablets or in some other way?”  (adapted from the Adult Psychiatric Morbidity Survey)	Relationship/ Marital status	Single/ not married: 1 <sup>st</sup> episode SH < repeat SH: OR= 1.39 (95% CI: 0.57–3.43)	Not significant
				Sexual orientation	Heterosexual vs. Non-Heterosexual: Not significant	No effect size calculated.
				Ethnicity	White vs non-White: Not significant.	No effect size calculated.
				Employment status	Employed participants: 1 <sup>st</sup> episode SH vs. repeat SH: Not significant.  Unemployed participants: Not significant.  Inactive participants: Not significant.	No effect size calculated.
				Depression	1 <sup>st</sup> episode SH < repeat SH: OR= 1.11 (95% CI: 1.05–1.17)	1 <sup>st</sup> episode SH < repeat SH: OR= 1.10, 95% CI: 1.00–1.21



Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Anxiety	1 <sup>st</sup> episode SH < repeat SH: OR= 1.08, 95% CI: 1.01–1.16	Not significant
				Parental attachment	Parental separation Not significant	
				Childhood trauma	Verbal/fear of physical abuse 1 <sup>st</sup> episode SH < repeat SH: OR= 2.55, 95% CI: 1.22–5.33  Physical abuse 1 <sup>st</sup> episode SH < repeat SH: OR= 2.95, 95% CI: 1.38–6.34  Sexual abuse 1 <sup>st</sup> episode SH < repeat SH: OR= 3.01, 95% CI: 1.19–7.65  Emotional neglect 1 <sup>st</sup> episode SH < repeat SH: OR= 2.88, 95% CI: 1.39–5.94	Included in Adverse childhood experiences section below.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					Neglect 1 <sup>st</sup> episode SH < repeat SH: Not significant	
				Adverse childhood experiences	1 <sup>st</sup> episode SH < repeat SH: OR= 1.22 (95% CI: 1.06–1.40)	Binary Adverse childhood experiences total (0-3 versus 4+) 1 <sup>st</sup> episode SH < repeat SH: OR= 2.4 (1.05–5.40)
				Living arrangements	Living alone: Not significant.	No effect size calculated.
				Attachment style with others	Close: 1 <sup>st</sup> episode SH vs. repeat SH: Not significant.  Dependent: 1 <sup>st</sup> episode SH vs. repeat SH: Not significant.  Anxiety: 1 <sup>st</sup> episode SH vs. repeat SH: Not significant.	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Suicidal intent	1 <sup>st</sup> episode SH < subsequent SH: OR= 2.5, 95% CI: 1.22–5.03	1 <sup>st</sup> episode SH < repeat SH:
				Academic qualifications	No qualifications: 1 <sup>st</sup> episode SH vs. subsequent SH: Not significant.  High school qualifications: 1 <sup>st</sup> episode SH vs. subsequent SH: Not significant.  Further education: 1 <sup>st</sup> episode SH vs. subsequent SH: Not significant.	No effect size calculated.
Conlin, Littlechild, Aditya, & Bahia, (2016)	Hospital treated self-harm by burns N = 53 Age: Mean = 33.9 years,	11-year retrospective study	SH  Patients admitted to hospital as a result of SH – identified by the burn unit	Age	No effect size calculated.  Years (mean) SH = 33.9 years Accidental harm = 42 years p <.0.01	No effect size calculated.
				Sex	Female:	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
	Range 15-62 years Gender: Female (N = 38; 71.70%), Male (N = 15; 28.30%)  Hospital-treated accidental injury by burns N= 49 Age: Range 19-84 years Gender: Female (N = 11, 22.45%), Male (N = 38, 77.55%)		admission register.		SH>Accidental harm p< 0.01	
		Employment status		Unemployed No effect size calculated.  SH (62%) Accidental harm (10%) unemployed, p<0.01	No effect size calculated.	
		Mental Health diagnosis		SH>Accidental harm p < 0.01	No effect size calculated.	
		Cigarette smoking		Not significant	No effect size calculated.	
		Alcohol		Not significant	No effect size calculated.	
		Substance abuse		Not significant	No effect size calculated.	
		Living arrangements		Homeless, institutionalized or live alone: SH>Accidental harm p< 0.01	No effect size calculated.	

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Self-harm history (SH and Suicide attempt).	<p>No effect size calculated.</p> <p>Previous burn self-harm SH= 36%, Accidental harm= 0%, (p&lt;0.01)</p> <p>Previous SH 'other SH= 68%, accidental burn= 0%, (p&lt;0.01)</p> <p>Previous Suicide attempt, SH 49%, accidental harm 0%, p&lt;0.01</p>	No effect size calculated.
				Previous criminal convictions	<p>No effect size calculated. SH 7.5%, 2% accidental burns.</p> <p>No effect size calculated.</p>	No effect size calculated.
De Beurs et al. (2017) <sup>1</sup>	Re-represented to hospital by follow-up: N= 94 (m=44, f= 50)	15-month prospective study	Patients re-admitted to an Edinburgh hospital following Suicide attempt.	Suicidal ideation	<p>Duration: Repeated Suicide attempt &gt; non-repeated t= 0.5, p= 0.002</p> <p>Frequency:</p>	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
	Did not re-represented to hospital by follow-up: N=272 (m= 114, f= 158)				Repeated Suicide attempt > non-repeated t= 0.5, p= <0.001	
				Wish to live/ die	Live: Repeated Suicide attempt > non-repeated t= 0.6, p= 0.003  Die: Repeated Suicide attempt > non-repeated t= 0.7, p= 0.003	No effect size calculated.
				Reasons for living	Repeated Suicide attempt > non-repeated t= 0.6, p= 0.001	No effect size calculated.
				Desire for active/ passive Suicide attempt	Active: Repeated Suicide attempt > non-repeated t= 0.7, p= <0.001  Passive: Repeated Suicide attempt > non-repeated t= 0.5, p= 0.007	No effect size calculated.
				Impulsivity	Repeated Suicide attempt > non-repeated t= 0.5, p= <0.001	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Deterrents of attempt	Repeated Suicide attempt > non-repeated t= 0.5, p= <0.001	No effect size calculated.
				Planning behaviour	Repeated Suicide attempt > non-repeated t= 0.4, p= <0.001	No effect size calculated.
				Availability of methods	Repeated Suicide attempt > non-repeated t= 0.5, p= 0.001	No effect size calculated.
				Courage for actual behaviour	Repeated Suicide attempt > non-repeated t= 0.6, p= 0.001	No effect size calculated.
				Expectancy of actual attempt	Repeated Suicide attempt > non-repeated t= 0.5, p= <0.001	No effect size calculated.
				Actual preparation	Repeated Suicide attempt > non-repeated t= 0.2, p= 0.001	No effect size calculated.
				Arrangements after death	Repeated Suicide attempt > non-repeated	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					t= 0.0, p= 0.008	
				Concealment about ideation	Repeated Suicide attempt > non-repeated t= 0.5, p= <0.048	No effect size calculated.
				Cry for Help	Not significant	No effect size calculated.
				Suicide note	Not significant	No effect size calculated.
De Beurs et al. (2016) <sup>1</sup>	Individuals seen by psychiatry service after a Suicide attempt  N= 366 Age: Mean = 33 years (SD 13.2) Gender: Female (N=208, 56.83%), Male (N = 158, 43.17%).	15-month longitudinal study	Hospital re-presentation of Suicide attempt	Age	Presentation vs. no re-presentation: Not significant	No effect size calculated.
				Sex	Presentation vs. no re-presentation: Not significant	No effect size calculated.
				Relationship status	Not significant	No effect size calculated.
				Employment status	Presentation vs. no re-presentation: Not significant	No effect size calculated.
				Depression	Presentation > no re-presentation: OR=1.04, 95% CI=1.02–1.06	No effect size calculated.



Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Suicidal Ideation	No effect size calculated. Mean (sd): Representation: 23 (8.4) No re-presentation: 18 (10.6)	No effect size calculated.
				Hopelessness	Presentation > no re- presentation: OR=1.07 (95% CI=1.02– 1.13)	No effect size calculated.
				Suicidal Intent	Presentation vs. no re- presentation: Not significant	No effect size calculated.
Del Carpio, Rasmussen, & Paul (2020)	General population adolescents N = 185 Age: Mean = 13.16 years, SD = 1.49, Range = 11-17 years  Gender: Female (N = 97,	6-month longitudinal study	Self-reported history of SH  “Have you ever deliberately taken an overdose (e.g., of pills or other medication) or tried to harm yourself in some	Defeat	<u>Baseline:</u> SH> No lifetime history of SH or SSHI: OR = 1.10 (95% CI 1.04-1.18)  SH vs SSHI: Not significant  <u>Six-month follow-up:</u> SH> No lifetime history of SH or SSHI:	<u>Baseline:</u> Not significant  <u>Six-month follow-up:</u> No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
	52.43%), Male (N = 85, 45.95%), Undisclosed (N = 3, 1.62%)		other way (such as cut yourself)?"		Not significant SH vs SSHI: Not significant	
				Entrapment	<u>Baseline:</u> SH> No lifetime history of SH or SSHI: OR = 1.09 (95% CI 1.04-1.15)  SH vs SSHI: Not significant  <u>Six-month follow-up:</u> SH> No lifetime history of SH or SSHI: Not significant  SH vs SSHI: Not significant	<u>Baseline:</u> Not significant  <u>Six-month follow-up:</u> No effect size calculated.
				Suicidal ideation	<u>Baseline</u> Not calculated  <u>Six-month follow up:</u> SH > no history of SH or SSHI:	<u>Baseline</u> Not calculated  <u>Six-month follow up:</u> SH > no history of SH or SSHI

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					OR = 0.06 (95% CI = 0.01-0.26) SH vs SSHI: Not significant	OR = 0.02, 95% CI = 0.00 – 0.22 SH vs SSHI Not significant
				Maladaptive coping	Baseline: SH> No lifetime history of SH or SSHI: OR = 1.22 (95% 1.07–1.40)  SH vs SSHI: Not significant  Six-month follow-up: SH vs No lifetime history of SH or SSHI: Not significant  SH vs SSHI: Not significant	Baseline: SH> No lifetime history of SH or SSHI: OR = 1.22 (95% 1.04–1.42)  <u>Six-month follow-up:</u> No effect size calculated.
				Adaptive coping	Baseline: SH> No lifetime history of SH or SSHI: Not significant  SH vs SSHI:	Baseline: No effect size calculated.  <u>Six-month follow-up:</u> No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p>Not significant</p> <p><u>Six-month follow-up:</u> SH&gt; No lifetime history of SH or SSHI Not significant SH vs SSHI Not significant</p>	
				<p>Social support</p>	<p><b>Social support from family</b> <u>Baseline:</u> SH&lt; No lifetime history of SH or SSHI: OR = 0.57 95% CI 0.40-0.81</p> <p><u>Six-month follow-up:</u> SH&lt; No lifetime history of SH or SSHI: OR = 0.53, 95% CI 0.33–0.87</p> <p>SH vs SSHI: Not significant</p> <p><b>Social support from friends</b> <u>Baseline:</u> SH vs No lifetime history of SH or SSHI: Not significant</p>	<p><b>Social support from family</b> <u>Baseline:</u> SH&lt; No lifetime history of SH or SSHI: OR = 0.60, 95% CI 0.39-0.91</p> <p><u>SH vs SSHI:</u> Not significant</p> <p><u>Six-month follow-up:</u> SH&lt; No lifetime history of SH or SSHI: Not significant</p> <p>SH vs SSHI Not significant</p> <p><b>Social support from friends</b> <u>Baseline:</u> No effect size calculated.</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p>SH vs SSHI: Not significant</p> <p><u>Six-month follow-up:</u> SH vs No lifetime history of SH or SSHI: Not significant</p> <p>SH vs SSHI: Not significant</p> <p><b>Social support from significant others</b> <u>Baseline:</u> SH vs No lifetime history of SH or SSHI: Not significant</p> <p>SH vs SSHI Not significant</p> <p><u>Six-month follow-up:</u> SH vs No lifetime history of SH or SSHI: Not significant</p> <p>SH vs SSHI: Not significant</p>	<p><u>Six-month follow-up:</u> No effect size calculated.</p> <p><b>Social support from significant others</b> No effect size calculated.</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Stigma	<p><u>Baseline:</u> SH vs no history of SH enaction or ideation Not significant, SH vs SSHI Not significant</p> <p>Isolation/depression SH vs no history of SH enaction or ideation Not significant SH vs SSHI Not significant</p> <p>Glorification/ normalisation SH enaction &gt; SSHI OR = 0.46, 95% CI = 0.25 – 0.85 SH vs no history of SH or SSHI Not significant</p> <p>Six-month follow up: Stigma SH &gt; no history of SH or SSHI OR = 0.27, 95% CI = 0.09-0.78,  SH vs SSHI Not significant</p>	<p><u>Baseline</u> Glorification/normalisation SH &gt; SSHI OR = 0.42, 95% CI = 0.22 – 0.80</p> <p>Glorification/ normalisation SH vs no history of SH or SSHI Not significant</p> <p>Six-month follow up: Stigma SH &gt; No history of SH or SSHI OR = 0.18, 95% CI = 0.05-0.74,  SH vs SSHI Not significant</p> <p>Glorification/normalisation, SH &gt; No history of SH or SSHI OR = 0.11, 95% CI = 0.03-0.46,  Glorification/normalisation SH vs SSHI Not significant Isolation/depression No effect size calculated.</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p>Isolation/depression SH vs no SSHI or enaction Not significant SH vs SSHI Not significant</p> <p>Glorification/normalisation SH &gt; No history of SH or SSHI OR = 0.31, 95% CI = 0.12 – 0.76,</p> <p>Glorification/normalisation SH vs SSHI Not significant</p>	
				<p>Exposure to self-harm in friend</p>	<p>Baseline SH vs No history of SH enaction or ideation Not significant</p> <p>SH vs SSHI Not significant</p> <p>6 month follow up SH vs SSHI Not significant</p>	<p>Baseline No effect size calculated.</p> <p>Follow up: No effect size calculated.</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					Not significant SH vs No history of SH enaction or ideation	
				Exposure to self-harm in family	<p><u>Baseline</u> SH vs No history of SH or ideation: Not significant</p> <p>SH &lt; SSHI OR = 0.17 (95% CI = 0.04 – 0.70)</p> <p><u>6 month follow up</u> SH vs SSHI Not significant</p> <p>SH vs No history of SH or ideation: Not significant</p>	None calculated
				Self-esteem	<p><u>Baseline:</u> SH &gt; No lifetime history of SH or SSHI: Not significant</p> <p>SH vs SSHI: Not significant</p>	None calculated



Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p><u>Six-month follow-up:</u> SH&gt; No lifetime history of SH or SSHI: Not significant</p> <p>SH vs SSHI: Not significant</p>	
				<p>Exposure to friend/family suicide death</p>	<p><u>Baseline</u> SH vs SSHI: Not significant</p> <p>SH vs no history of SH or ideation: Not significant</p> <p><u>Six-month follow up</u> SH vs SSHI: Not significant</p> <p>SH vs No history of SH or ideation Not significant</p>	<p>None calculated</p>
				<p>Bereavement</p>	<p><u>Baseline</u> SH vs SSHI: Not significant</p>	<p>None calculated</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p>SH vs No history of SH enaction or ideation: Not significant</p> <p><u>Six-month follow up:</u> SH vs SSHI: Not significant</p> <p>SH vs No history of SH enaction or ideation: Not significant</p>	
Dhingra et al. (2015)	<p>University students Age: Mean = 24.29 years, SD = 8.30. 18 – 63 years Gender: Female (N = 960, 74.53%), Male (N = 328, 25.47%)</p>	Cross-sectional	<p>Suicide attempt: “Have you ever made an actual attempt to kill yourself in which you had at least some intent to die?” (yes)</p> <p>SSHI group: ‘Have you ever had thoughts of killing yourself?’ (yes) and ‘no’ to</p>	Age	<p>No suicidality &lt; Attempt (<math>d = 1.54</math>).</p> <p>Ideation &lt; attempt (<math>d = 0.57</math>).</p>	<p>No suicidality &gt; Attempt OR= 1.04 (95% CI: 1.02 – 1.07) Ideation &gt; attempt OR= 0.53 (95% CI: 0.35-79)</p>
				Sex	No effect size calculated.	<p>No suicidality &lt; Attempt: Not significant</p> <p>Ideation &lt; attempt: OR= 0.48 (95% CI: 0.30 – 0.78)</p>
				Relationship/ marital status	No effect size calculated.	No suicidality vs. Attempt Not significant

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
			the Suicide attempt question.			Ideation vs. attempt Not significant
			No suicidality group: No to both questions above.	Sexual orientation	Not analysed	No suicidality < Attempt OR= 0.25 (95% CI: 0.14 – 0.47)  Ideation < attempt OR= 0.55 (95% CI: 0.35 – 0.84)
				Ethnicity	Not analysed	No suicidality vs. Attempt Not significant  Ideation vs. attempt Not significant
				Depression	No suicidality < Attempt (d =1.24)  Ideation < attempt (d= 0.50)	No suicidality vs. Attempt Not significant  Ideation vs. attempt Not significant
				Anxiety	No suicidality < Attempt (d =0.74, p= NA)  Ideation < Attempt (d= 0.40, p= NA)	No suicidality vs. Attempt Not significant  Ideation vs. attempt Not significant

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Defeat	No suicidality < Attempt (d =1.54)  Ideation < attempt (d= 0.57)	No suicidality vs. Attempt Not significant  Ideation vs. attempt Not significant
				Entrapment	No suicidality < Attempt (d =1.55)  Ideation < attempt (d= 0.58)	No suicidality < Attempt (OR= 1.04, 95% CI: 1.01 – 1.07) Ideation < attempt Not significant
				Brooding rumination	No suicidality < Attempt (d =0.82)  Ideation < attempt (d= 0.39)	No effect size calculated.
				Belongingness	No suicidality > Attempt (d =1.40)  Ideation > attempt (d= 0.43)	No suicidality < Attempt OR= 0. 94, (95% CI: 0.90 – 0.98)  Ideation < attempt Not significant

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Perceived burdensomeness	No suicidality < Attempt (d =1.44) Ideation < attempt (d= 0.55)	No suicidality < Attempt OR= 1.07 (95% CI: 1.03 – 1.10) Ideation < attempt OR= 1.03 (95% CI: 1.01 – 1.05)
				Alcohol	OR = 1.006, 95% CI 1.002–1.010	No effect size calculated.
				Substance abuse	$\chi^2 = 19.355, p = 0.000$	No effect size calculated.
				Goal disengagement	No suicidality < Attempt Not significant Ideation < attempt Not significant	No suicidality vs. Attempt Not significant Ideation vs. attempt Not significant
				Goal reengagement	No suicidality > Attempt (d =0.52) Ideation > attempt: (d= 0.23)	No suicidality vs. Attempt Not significant Ideation vs. attempt Not significant
				Impulsivity	No suicidality < Attempt (d =0.24)	No suicidality < Attempt Not significant Ideation < attempt

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					Ideation < attempt (d= 0.24)	(OR= 1.15, 95% CI: 1.04 – 1.28)
				Fearlessness about death	No suicidality < Attempt (d =0.4)  Ideation < attempt (d= 0.56)	No suicidality < Attempt OR= 1.07 (95% CI: 1.03 – 1.10)  Ideation < attempt OR= 1.05 (95% CI: 1.02 – 1.07)
				Discomfort tolerance	No suicidality < Attempt Not significant Ideation < attempt Not significant	No suicidality vs. Attempt Not significant  Ideation vs. attempt Not significant
Grandison et al. (2020)	Adults referred to NHS Trauma Service for psychological therapy  N= 93 Age: Mean = 38.24, SD = 10.56, Range = 19-62 years	Cross-sectional	Self-reported lifetime history of suicidality (both ideation and enaction)  “Have you tried to hurt or kill yourself or threatened to do so?”	Marital Status	Not significant chi-square OR = 1.63 (95% CI = .54–4.96)	No effect size calculated.
				Employment status	Out of employment:  History of suicidality > no history of suicidality: OR=.34 (95% CI: .13–.92,	Out of employment:  History of suicidality > no history of suicidality: OR = 4.12 (95% CI: 1.23 – 13.73)

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
	Gender: Female (N = 89, 95.7%).			Childhood Trauma:	<p>Lifetime suicidality &gt; No lifetime suicidality</p> <p>Total childhood trauma: <i>d</i> = 0.59, <i>p</i> &lt; .05</p> <p>Emotional abuse <i>d</i> = 0.62, <i>p</i> &lt; .05</p> <p>Physical abuse Not significant</p> <p>Sexual abuse Not significant</p> <p>Emotional neglect <i>d</i> = .60, <i>p</i> &lt; .01</p> <p>Physical neglect Not significant</p>	<p>Total Not reported</p> <p>Emotional abuse OR = 1.13 (95% CI 1.01-1.27)</p> <p>Physical abuse No effect size calculated.</p> <p>Sexual abuse No effect size calculated.</p> <p>Emotional neglect Not significant</p> <p>Physical neglect No effect size calculated.</p>
				Emotional dysregulation	<p>Impulse: Not significant</p> <p>Limited access to emotion regulation strategies: Not significant</p>	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Emotion hyperactivation	Not significant	No effect size calculated.
				Emotion deactivation	$d = 0.51, p = .043^*$	No effect size calculated.
				Living arrangements	OR = 1.12 (95% CI: 0.41 – 3.04)	No effect size calculated.
				Negative self-concept	Not significant	No effect size calculated.
				Disturbed relationships	Not significant	No effect size calculated.
Gilchrist & Sadler, (2019)	Sample was from medicolegal autopsies which were not classed as 'natural'  N = 168 Age: Mean = 45.5 years, Range = 13-94 years	Retrospective	Suicide death  Police mortuary in Dundee records	Depression	Effect size not reported  30.6% of participants with a diagnosis of depression died to suicide, 15.7% of participants without a diagnosis of depression died to suicide	



Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
	Gender: 79.8% male, 20.2% female.					
				Substance abuse	$\chi^2 = 19.355, p = 0.000$	
				Alcohol	OR = 1.006, 95% CI 1.002–1.010	
Hafferty et al. (2019)	General population  N = 15, 798, 339 self-harm cases Age: Over 18 Gender: 59% female	Retrospective	History of hospital treated SH  Record-linkage of Generation Scotland: Scottish Family Health Study to Scottish Morbidity Records and Scottish NSH data.	Age	Under 65 years old > Over 65 years old:  SH > no SH: d = 0.16	Age 18-24 vs Age 55-64 Not significant  Age 25-34 > Age 55-64 OR = 2.0 (95% CI = 1.2-3.3)  Age 35-44 > Age 55-64 OR = 2.2 (95% CI = 1.4-3.5)  Age 45-54 > Age 55-64 OR = 1.6 (95% CI = 2.5)  Age 64-74 < 55-64 OR = 0.4 (95% CI = 0.2-0.8)  Age 75+ < Age 55-64 OR = 0.2 (95% CI = 0.04-0.97)

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Sex	Female>Male $h = 0.17, p = 0.002$	Not significant
				Relationship status	Single > In a relationship $h = 0.31,$	OR = 2.0, 95% CI 1.5–2.8.
				Deprivation	SIMD score (less deprived) SH < no SH $d = 0.58$	SIMD score (less deprived) SH < no SH OR = 0.8 (95% CI: 0.7-0.9)
				Depression	SH > no SH $h = 0.81$	History of depression > No history of depression: OR = 5.6 (95% CI = 3.5-8.9)
				Neuroticism	SH > no SH Cohen's $h = 0.89,$	SH > no SH OR = 1.2 (95% CI 1.1–1.2)
				Academic qualifications	College or university degree: SH < no SH $h = 0.39$  No qualification: SH> no SH: Cohen's $h = 0.32$	College or university degree: Not significant  No qualification, SH > no SH: OR = 2.2 (95% CI: 1.2-4.1)

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Cognitive ability	Verbal declarative SH < no SH $d = 0.19$  Vocabulary SH < no SH $d = 0.40$  Processing speed SH < no SH $d = 0.34$  Executive function SH < no SH $d = 0.26$	Overall cognitive ability SH < no SH OR = 0.8 (95% CI = 0.7-0.9)
Harkness-Murphy et al. (2012)	Looked after and accommodated young people  N = 102 Age: Range = 11-17 years Gender: Female (N = 48; 47.06%), Male (N = 54; 52.94%)	Cross-sectional	Lifetime history of SH  "Have you ever harmed yourself?"	Self-criticism:	No effect sizes calculated.  Self-critical styles: Inadequate SH vs. No history of SH ( $p < 0.001$ )  Self-reassurance SH vs. No history of SH ( $p < 0.001$ )  Hated	Self-critical styles: Inadequate Not significant  Self-reassurance: Not significant  Hated: SH > No history of SH OR = 5.262, 95% CI 2.372-11.669  Self-persecution:

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					SH vs. No history of SH ( $p < 0.001$ )  Self-persecution SH vs. No history of SH ( $p < 0.001$ )  Self-correction SH vs. No history of SH ( $p < 0.01$ )	Not significant  Self-correction: Not significant
				Academic self-esteem	SH vs. No history of SH ( $p < 0.001$ )	
				Common problems	Problems with home/parent: Not significant  Problems with school/schoolwork: Not significant  Problems with friends/girlfriend/ boyfriends: $\chi^2 (2) = 11.658, p < 0.01$	Problems with home/parent: No effect size calculated.  Problems with school/schoolwork: No effect size calculated.  Problems with friends/girlfriends/boyfriends: Not significant
				Reasons for living	No effect size calculated	Reasons for living: Not significant

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					Reasons for living SH<No history of SH (p <0.001)	
Howard, Karatzias, Power, & Mahoney, (2017)	Female prisoners N = 89 Age: 18-65 (mean 34.52) Gender: Female (N = 89; 100%)	Cross-sectional	Self-reported lifetime history of SH  'Have you ever deliberately self-harmed?'. Participants who answered 'yes' were also asked to report any methods of self-harm they identified in their histories.	PTSD symptoms	No effect size calculated  Total PTSD score: SH vs. no SH (p <0.05)  Intrusion SH vs. no SH (p <0.05)  Avoidance SH vs. no SH Not significant  Arousal/ reactivity SH vs. no SH (p<0.01)  Mood/cognition SH vs. no SH (p <0.01)	No effect size calculated.  Total PTSD score: SH > no SH OR = .001  Intrusion SH > no SH OR = 0.006  Avoidance SH > no SH OR = 0.014  Arousal/ reactivity SH > no SH OR = 0.000  Mood/cognition SH > no SH OR = 0.004
				Childhood trauma:	Emotional abuse SH > no SH $\chi^2 (1) = 8.58, p<0.01.$	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					Physical abuse Not significant	
					Sexual abuse SH > no SH $\chi^2 (1) = 4.5, p < 0.05.$	
					Emotional neglect Not significant	
					Physical neglect Not significant	
					Multiple traumas Not significant	
				Emotional dysregulation	B = 0.16; B = 0.19	No effect size calculated.
				Dissociative experiences		No effect size calculated.
Kavalidou, Smith, Der & O'Connor (2019)	Young cohort N = 1,515 Age: 15 years (approx.)	Retrospective over five waves of data collection	Self-reported lifetime history of Suicide attempt	Mental health diagnosis	OR = 17.593, 95% CI 4.805-64.409	OR = 14.187, 95% CI 3.671-54.830
				Multimorbidity	Suicide attempt	Suicide attempt

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
	Middle cohort N= 1,444 Age: approx. 35 years (approx.)  Older cohort N = 1551 Age: 55 years (approx.)		“Have you ever seriously thought about taking an overdose of drugs or injuring yourself deliberately?”  If ‘yes’: “Have you ever actually taken an overdose of drugs or injured yourself deliberately?”		OR = 8.279, 95% CI 2.735-25.060,	OR = 5.776, 95% CI 1.427–23.383
				Physical health	Not significant	Not significant
Lemaigre & Taylor (2019)	Socio-economically deprived men N= 86 Age: Mean = 41.9 years, SD = 12.10, 18-69 years Gender: Male (N=86, 100%).	Cross-sectional	Self-reported lifetime history of suicidality (this term includes both ideation and enactment)  4-item scale – Suicidal Behaviour Questionnaire Revised. Assesses SSHI and attempt.	Mental health diagnosis	No effect size calculated.	No effect size calculated.
				Childhood trauma	B = .049 95% CI .016-.082	Not significant
				Emotional dysregulation	B = .045	No effect size calculated.
				Interpersonal difficulties	B = .185	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
McClelland, Evans, & O'Connor, (2021)	General population (UK Residents)  N=385 Age: Mean = 35.27, SD = 13.9 Gender: Female (N = 308, 78.5%), Male (N = 77, 19.3%)	Cross-sectional	History of self-injurious behaviours. Measured using items from the Adult Psychiatric Morbidity Survey.	Childhood Trauma	<u>Emotional abuse</u> SH> No lifetime history of SH or SSHI OR = 3.36 (95% CI 2.43-4.63)  SH> SSHI OR = 1.58 (95% CI 1.29-1.94)  <u>Emotional neglect</u> SH< No lifetime history of SH or SSHI OR = 0.33 (95% CI 0.23-0.47)  SH>SSH OR = 0.76 (95% CI 0.61-0.95).  <u>Physical abuse</u> SH > No lifetime history of SH or SSHI OR = 1.846 (95% CI 1.25-2.74) SH>SSH B = 0.341, OR = 1.407, 95% CI 1.053-1.880.	<u>Emotional abuse</u> SH> No lifetime history of SH or SSHI: OR = 2.582 (95% CI 1.47 – 4.53)  SH> SSHI OR = 1.69 (95% CI 1.21-2.35)  <u>Emotional neglect</u> SH > No lifetime history of SH or SSHI Not significant  SH> SSHI Not significant  <u>Physical abuse</u> SH> No lifetime history of SH or SSHI Not significant  SH> SSHI Not significant  <u>Physical neglect</u> SH> No lifetime history of SH or SSHI: Not significant SH> SSHI



Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p><u>Physical neglect</u> SH&gt; No lifetime history of SH or SSHI OR =2.30 (95% CI 1.64 - 3.22)</p> <p>SH&gt;SSHI B = 0.23, OR = 1.27, 95% CI 1.01-1.56.</p> <p><u>Sexual abuse</u> SH&gt; No lifetime history of SH or SSHI OR = 1.62, 95% CI 1.23-2.13</p> <p>SH&gt;SSHI OR = 1.33, 95% CI 1.07-1.65.</p>	<p>Not significant</p> <p><u>Sexual abuse</u> SH&gt; No lifetime history of SH or SSHI Not significant</p> <p>SH&gt; SSHI Not significant</p>
				Socially prescribed perfectionism	<p>SH&gt; No lifetime history of SH or SSHI: OR =1.07 (95% CI 1.05-1.09)</p> <p>SH&gt;SSHI: OR = 1.02 (95% CI 1.01-1.04)</p>	<p>SH&gt; No lifetime history of SH or SSHI: Not significant</p> <p>SH&gt; SSHI: Not significant</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Stress	SH> No lifetime history of SH or SSHI OR = 1.45, 95% CI 1.32 – 1.59  SH>SSHI OR = 1.14, 95% CI 1.07 - 1.23.	SH> No lifetime history of SH or SSHI: Not significant  SH> SSHI: Not significant
				Defeat	SH> No lifetime history of SH or SSHI: OR = 1.13 (95% CI 1.10-1.16)  SH>SSHI: OR = 1.04 (95% CI 1.02-1.06)	SH> No lifetime history of SH or SSHI Not significant  SH> SSHI Not significant
				Entrapment	SH> No lifetime history of SH or SSHI: OR = 1.09 (95% CI 1.07 – 1.11)  SH>SSHI OR = 1.02 (95% CI 1.01 – 1.04).	SH> No lifetime history of SH or SSHI: Not significant  SH> SSHI Not significant
				Suicidal ideation	SH>No lifetime history of SH or SSHI:	SH > No lifetime history of SH or SSHI:

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					OR = 2.01 (95% CI 1.70-2.37).  SH> SSHI OR = 1.16, 95% CI 1.10-1.23.	OR = 1.72 (95% CI 1.41-2.10). SH> SSHI: OR = 1.16 (95% CI 1.07 1.26).
				Coping	<u>Avoidant</u> SH> No lifetime history of SH or SSHI: OR = 1.475 (95% CI 1.32-1.65)  SH> SSHI: OR = 1.116 (95% CI 1.05-1.19)  <u>Emotion focused</u> SH> No lifetime history of SH or SSHI Not significant  SH> SSHI Not significant  <u>Problem focused</u> SH> No lifetime history of SH or SSHI: Not significant	<u>Avoidant</u> SH> No lifetime history of SH or SSHI: Not significant  SH> SSHI: Not significant  <u>Emotion focused</u> SH> No lifetime history of SH or SSHI: Not significant  SH> SSHI Not significant  <u>Problem focused</u> SH> No lifetime history of SH or SSHI Not significant SH> SSHI: Not significant

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					SH> SSHI: Not significant  <u>Socially supported</u> SH> No lifetime history of SH or SSHI: Not significant  SH> SSHI Not significant	<u>Socially supported</u> SH> No lifetime history of SH or SSHI Not significant  SH> SSHI Not significant
				Social support	SH> No lifetime history of SH or SSHI OR = 0.88 (95% CI 0.84-0.92)  SH> SSHI OR = 0.96 (95% CI 0.92-0.99)	SH> No lifetime history of SH or SSHI Not significant  SH> SSHI Not significant
				Loneliness	SH> No lifetime history of SH or SSHI: OR = 1.13 (95% CI 1.20-1.17)  SH> SSHI OR = 1.03 (95% CI: 1.01-1.05).	SH> No lifetime history of SH or SSHI Not significant  SH> SSHI Not significant

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
Melson & O'Connor (2019)	<p>General adult population sample</p> <p>N = 1546</p> <p>Age: 34.39 years (SD = 13.03; range 17–69)</p> <p>Gender: Female (N = 1,079; 69.80%), Male (N = 460; 29.75%); Undisclosed (N = 7, 0.45%).</p>	Cross-sectional	<p>Lifetime history of SH</p> <p>‘Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?’</p> <p>Or;</p> <p>‘Have you ever deliberately harmed yourself in any way (but without wanting to kill yourself)?’</p>	Age	SH > SSHI OR = 0.97 (95% CI = 0.95 – 0.98)	No effect size calculated.
				Sex	<p>More likely to be female SH&gt; No lifetime history of SH or SSHI OR = 1.73 (95% CI: 1.29-2.32)</p> <p>SH&gt;SSHI OR = 1.71 (95% CI: 1.20-2.43)</p>	<p>SH&gt; No lifetime history of SH or SSHI: OR = 1.71 (95% CI:1.21-2.42)</p> <p>SH&gt;SSHI OR = 1.81 (95% CI: 1.24-2.66)</p>
				Depression	<p>OR = 1.03, 95% CI = 1.01 – 1.04, SH &gt; ideation</p> <p>SH vs no suicidality not reported</p>	No effect size calculated.
				Stress	<p>SH&gt;No lifetime history of SH or SSHI: OR = 1.12 (95% 1.06-1.19)</p> <p>SH vs SSHI Not significant</p>	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Negative mood regulation expectancies	SH>No lifetime history of SH or SSHI: OR = 0.97 (95% CI 0.96-0.98)  SH vs SSHI Not significant	No effect size calculated.
				Optimism	SH>No lifetime history of SH or SSHI: OR = 0.75 (95% CI 0.62-0.90)  SH>SSHI Not significant	No effect size calculated.
				Alcohol	<u>Frequent heavy drinking</u> SH> No lifetime history of SH or SSHI OR = 1.31 (95% CI 1.13-1.51)  SH>SSHI OR = 1.46, 95% CI 1.24-1.72	<u>Frequent heavy drinking</u> SH> No lifetime history of SH or SSHI Not significant  SH>SSHI OR = 1.32 (95% CI 1.11-1.58)  <u>Alcohol expectancies</u> SH>No lifetime history of SH or SSHI OR = 2.33 (95% CI 1.49-3.62)

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p><u>Alcohol expectancies</u> SH&gt;No lifetime history of SH or SSHI OR = 3.04 (95% CI 2.22–4.17)</p> <p>SH&gt;SSHI OR = 1.64, 95% CI 1.18–2.30</p> <p><u>Alcohol-related negative urgency</u> SH&gt; No lifetime history of SH or SSHI OR = 1.93, 95% CI 1.60–2.33.</p> <p>SH&gt;SSHI OR = 1.74 (95% CI 1.41–2.16)</p>	<p>SH vs SSHI Not significant</p> <p><u>Alcohol-related negative urgency</u> SH&gt;No lifetime history of SH or SSHI OR = 1.51, 95% CI 1.21-1.87</p> <p>SH&gt;SSHI OR = 1.47 (95% CI 1.15-1.88)</p>
				Social support	<p>SH&gt;No lifetime history of SH or SSHI OR = 0.84 (95% CI 0.77-0.92)</p> <p>SH vs SSHI Not significant</p>	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
O'Connor et al. (2012)	General population adolescents  N= 5604 Age: 90% of the young people were 15-16 years Gender: Female (N = 2776, 49.53%), Male (N = 2821, 50.34%), Undisclosed (N = 7; 0.12%).	Cross-sectional	SH  Measure "Have you ever deliberately taken an overdose (e.g., of pills or other medication) or tried to harm yourself in some other way (such as cut yourself)?"	Sex	SH Females>Males OR = 3.73, 95% CI 2.78–5.00	SH> SSHI OR = 1.51, 95% CI 1.10–2.08
				Depression	Ors are not reported	SH vs SSHI: Not significant
				Socially prescribed perfectionism	SH> No lifetime history of SH or SSHI: OR = 1.06, 95% CI 1.04-1.08  SH vs SSHI Not significant	SH vs No history of SH or SSHI No effect size calculated.  SH vs SH Ideation No effect size calculated.
				Negative life stress	SH > No suicidality: OR = 1.49, 95% CI = 1.43 – 1.57,  SH > SSHI: OR = 1.13, 95% CI = 1.09 – 1.17	SH vs No suicidality No effect size calculated.  SH > SSHI OR = 1.05, 95% CI = 1.01 – 1.08
				Self-esteem	SH<No lifetime suicidality: OR = 0.86, 95% CI 0.84-0.89.  SH vs SSHI Not significant	SH vs No history of SH or SSHI: No effect size calculated.  SH vs SSHI No effect size calculated.



Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Brooding ruminatation	OR = 1.18, 95% CI = 1.15-1.22, SH > No suicidality  Not significant OR = 1.03, 95% CI = 0.99 – 1.06 SH vs SSHI	SH vs No suicidality No effect size calculated.  SH vs SSHI No effect size calculated.
				Optimism	SH<No lifetime history of SH or SSHI OR = 0.92, 95% CI 0.90-0.94. SH vs SSHI Not significant	SH vs No history of SH or SSHI No effect size calculated. SH vs SSHI No effect size calculated.
				Exposure to friend self-harm	OR = 6.43, 95% CI = 5.05 – 8.20, SH > No suicidality  OR = 2.33, 95% CI = 1.75 – 3.12, SH > SSHI	SH vs No suicidality No effect size calculated.  OR = 1.80, 95% CI = 1.28 – 2.52, SH > SSHI
				Exposure to family self-harm	OR = 7.27, 95% CI = 5.84 – 9.05, SH > No suicidality  SH > SSHI: OR = 2.97, 95% CI = 2.14-4.11	SH vs No suicidality No effect size calculated.  SH vs SSHI: OR = 2.60, 95% CI = 1.79 – 3.77

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Descriptive norms	SH > No suicidality: OR = 1.17, 95% CI = 1.13 – 1.22,  SH > SSHI: OR = 1.06, 95% CI = 1.03 – 1.09	SH vs no suicidality: No effect size calculated.  SH vs SSHI: Not significant
				Impulsivity	SH > No suicidality: OR = 1.29 (95% CI = 1.20 – 1.38)  SH > SSHI: OR = 1.10 (95% CI = 1.02 – 1.20)	SH vs No suicidality No effect size calculated.  SH vs SSHI Not significant
O'Connor, O'Carroll et al. (2012)	Participants hospitalised after a Suicide attempt  N = 237 Age: Mean = 36.8 years (SD 13.0, range = 16 – 73)	24-month longitudinal study	Hospital re-presentation with an episode of Suicide attempt between Time 1 and Time 2 (24 months later)	Age	Re-presentation vs. no re-representation: Not significant	Re-presentation vs. no re-representation: Not significant
				Sex	Not significant	No effect size calculated.
				Marital status	Not significant	No effect size calculated.
				Employment Status	Re-presentation vs. no re-representation:	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
	Gender: Female (N=150, 63.29%), Male (N = 87, 36.71%)				Not significant	
		Deprivation	5 quintiles of social deprivation. None are significant	No effect size calculated.		
		Depression	Re-representation vs. no re-representation: Not significant	No effect size calculated.		
		Anxiety	Re-representation vs. no re-representation: Not significant	No effect size calculated.		
		Suicidal ideation	Suicide attempt T1-T2 > No Suicide attempt T1-T2: OR = 1.12, 95% CI = 1.06 – 1.18	Suicide attempt T1-T2 > No Suicide attempt T1-T2 : OR = 1.09, 95% CI = 1.03 – 1.17		
		Goal disengagement	Re-representation vs. no re-representation: Not significant	Re-representation vs. no re-representation: Not significant		
		Goal reengagement	Suicide attempt T1-T2 < No Suicide attempt T1-T2 : OR = 0.47, 95% CI = 0.32 –	Suicide attempt T1-T2 < No Suicide attempt T1-T2 : OR = 0.48, 95% CI = 0.29-0.78,		

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					0.69	
				Hopelessness	Re-presentation vs. no re-representation: Not significant	No effect size calculated.
				History of self-harm (self-harm hospitalisation in past 10 years)	OR = 3.08, 95% CI = 1.69 – 5.63 Suicide attempt T1-T2 > No Suicide attempt T1-T2	OR = 2.73, 95% CI = 1.38 – 5.39 Suicide attempt T2-T2 > No Suicide attempt T1-T2
O'Connor et al. (2013)	Participants hospitalised after a Suicide attempt N = 70 Age: Mean 35.6 (SD = 13.24) Gender: Female (N = 41, 58.57%) and Male (N=29, 41.43%).	48-month longitudinal study	Hospital re-presentation following a Suicide attempt between time 1 and time 2 (48 months later)	Age	Re-presentation vs. no re-representation: Not significant	No effect size calculated.
				Sex	Not significant	No effect size calculated.
				Depression	Suicide attempt T1-T2 > No Suicide attempt T1-2 B = 0.26, p < 0.01,	Re-presentation vs. no re-representation: Not significant,
				Defeat	B = 0.14, p = .003	Not significant
				Entrapment	B = 0.22, p = .004	B = 0.23, B <sub>stdxy</sub> = 0.59, p = <.05

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Suicidal ideation	Suicide re-attempt > No Suicide re-attempt: B = 0.12, p < 0.05,	Suicide re-attempt > No Suicide re-attempt: Not significant
				Hopelessness	Suicide re-attempt > No Suicide re-attempt: B = 0.32, p < 0.01,	Suicide re-attempt > No Suicide re-attempt: Not significant
				Self-harm history (previous Suicide attempt)	Suicide attempt T1-T2 > No Suicide attempt T1-T2 B = 0.97, p < 0.001,	Suicide attempt T1-T2 > No Suicide attempt T1-T2 B = 0.79, p < 0.05,
O'Connor et al. (2015) <sup>1</sup>	Participants hospitalised after a Suicide attempt  N = 388 Age: Mean 35.3 years, SD = 13.91, range = 16–71 years Gender: Female (N=220, 56.70%) Male (N = 168, 43.30%).	15-month longitudinal study	Hospital re-admitted following a Suicide attempt between time 1 and time 2 (15 months later)  Hospital records were linked using national database from The Information Services Division of the National	Age	Suicide re-attempt > No Suicide re-attempt: Not significant	No effect size calculated.
				Sex	Suicide re-attempt > No Suicide re-attempt: Not significant	No effect size calculated.
				Relationship status	Suicide re-attempt > No Suicide re-attempt: Not significant	No effect size calculated.
				Employment status	Suicide re-attempt > No Suicide re-attempt:	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
			Health Service Scotland		Not significant	
				Depression	Suicide re-attempt> No Suicide re-attempt: OR = 1.04, 95% CI = 1.02 – 1.06	Not significant
				Suicidal ideation	Suicide re-attempt> No Suicide re-attempt: OR = 1.05, 95% CI = 1.03 – 1.08	Suicide re-attempt> No Suicide re-attempt: OR = 1.04, 95% CI = 1.00 – 1.07
				Hopelessness	Suicide re-attempt> No Suicide re-attempt: OR = 1.07, 95% CI = 1.02 – 1.12	Not significant
				Positive future thinking	Overall future thinking not assessed  <u>Interpersonal/ Social</u> Not significant, OR =0.93, 95% CI = 0.81 – 1.06  <u>Achievement</u> OR = 0.79, 95% CI = 0.63 –	<u>Interpersonal/ Social</u> No effect size calculated.  <u>Achievement</u> Not significant  <u>Intrapersonal</u> Suicide attempt T1-T2 > No Suicide attempt T1-T2 :

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p>1.00, Suicide attempt T1-T2 &lt; No Suicide attempt T1-T2</p> <p><u>Intrapersonal</u> Suicide attempt T1-T2 &gt; No Suicide attempt T1-T2 : OR = 1.19, 95% CI = 1.04 – 1.36</p> <p><u>Leisure/ pleasure</u> Not significant</p> <p><u>Other’s health</u> Not significant</p> <p><u>Financial</u> Suicide attempt T1-T2 &lt; No Suicide attempt T1-T2: OR = 0.67, 95% CI = 0.47 – 0.97,</p> <p><u>Other</u> Not significant</p>	<p>OR = 1.25, 95% CI = 1.07 – 1.44</p> <p><u>Leisure/ pleasure</u> No effect size calculated.</p> <p><u>Other’s health</u> No effect size calculated.</p> <p><u>Financial</u> Not significant</p> <p><u>Other</u> No effect size calculated.</p>
				Self-harm history (previous Suicide attempt)	Suicide re-attempt> No Suicide re-attempt: OR = 1.42, 95% CI = 1.18-1.72	Suicide re-attempt> No Suicide re-attempt: OR = 1.27, 95% CI = 1.04-1.56,

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Suicidal intent	Suicide re-attempt> No Suicide re-attempt: Not significant OR = 1.03, 95% CI = 0.97 – 1.09	No effect size calculated.
O'Connor et al. (2018) <sup>3</sup>	General population young people  N = 3508 Age: 18-34 years Gender: Female (N = 1733, 49.4%), Male (N = 1775, 50.6%).	Cross-sectional	NSSH 'Have you ever deliberately harmed yourself in any way but not with the intention of killing yourself? (i.e., self-harm)' (yes)  Suicide attempt: 'Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?' (yes)  No suicidality: No to both questions above.	Age	No effect size calculated. Differences in prevalence inferred based on 95% CI.  <u>18-23 years old:</u> No suicidality< NSSH NSSH > Suicide attempt:  <u>24-29 years old:</u> No suicidality vs. NSSH: Not significant. NSSH vs. suicide attempt: Not sig  <u>30-34 years old:</u> No suicidality> NSSH, NSSH < Suicide attempt:	No effect size calculated.
				Sex	Suicide attempts Female > Male OR = 1.67 (95% CI 95% 1.35–2.07)	No effect size calculated.



Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					NSSH Female > Male OR = 2.02 (95% CI = 1.68–2.43)	
				Relationship status	NSSH Not married>Married OR = 1.79, (95% CI 1.35-2.37)  Suicide attempt Not significant	No effect size calculated.
				Ethnicity	NSSH > Suicide attempt: PR= 95.2 (95% CI: 92.0–97.6)	No effect size calculated.
				Employment status	<u>NSSH</u> Unemployed > employed: OR = 1.67, 95% CI = 1.25 – 2.23  <u>Suicide attempt</u> Unemployed > employed: OR = 2.23, 95% CI = 1.88 – 3.40	No effect size calculated.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Living arrangements (Accommodation)	<p><u>NSSH</u> Living in rental accommodation &gt; own their own home OR = 2.06, 95% CI = 1.60–2.65</p> <p><u>Suicide attempt</u> Living in rental accommodation &gt; own their own home OR = 3.17, 95% CI = 2.30–4.37</p>	No effect size calculated.
Riordan, Morris, Hattie & Stark, (2012)	Cohort born between 1 Jan 1975 and 31 Dec 1988 N = 897,685 Age: Born between 1975 and 1988. Gender: Information on gender of full birth cohort at baseline not presented in the paper.	Retrospective. Cohort followed until 2007.	Suicide death Hospital treated lifetime SH Psychiatric hospital records obtained from Scottish Morbidity Record. Discharge records from general hospitals following self-harm admission, admission to	Maternal age at birth	<p><u>Suicide</u> Age group 15-19 &gt; Age group 25-29: HR = 1.85, 95% CI 1.53 – 2.22,</p> <p>Age group 20-24 &gt; Age group 25-29 HR = 1.47, 95% CI 1.26 – 1.70,</p> <p>Age group 30-34 vs Age group 25-29 Not significant</p>	<p><u>Suicide</u> HR = 2.33, 95% CI = 1.87 – 2.89, Age Group 15-19 &gt; Age Group 25-29</p> <p>Age Group 20-24 &gt; Age Group 25-29: HR = 1.57, 95% CI = 1.33 -1.84,</p> <p>Age group 30-34 vs Age Group 25-29: Not significant</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
			psychiatric hospital records and deaths registered in Scotland obtained from General Register Office for Scotland.		<p>Age group 35 – 45 vs Age Group 25-29 Not significant,</p> <p><u>SH</u></p> <p>Age group 15-19 &gt; Age group 25-29: OR = 2.04, 95% CI = 1.97-2.11,</p> <p>Age group 20-24 &gt; Age group 25-29: HR = 1.50, 95% CI = 1.46 – 1.55,</p> <p>HR = 0.89, 95% CI = 0.85 – 0.92: Age group 30-34 &lt; Age group 25-29:</p> <p>Not significant, Age group 35-45 vs Age group 25-29</p>	<p>Age group 35-45 vs Age group 25-29: Not significant</p> <p><u>SH</u></p> <p>Age group 15-19 &gt; Age group 25-29 OR = 2.41, 95% CI = 2.31 – 2.52,</p> <p>Age group 2-24 &gt; Age group 25-29: HR = 1.58, 95% CI = 1.53 – 1.63</p> <p>Age group 30-34 &lt; Age group 25-29: HR = 0.81, 95% CI = 0.77 – 0.84:</p> <p>Age group 35-45 &lt; Age group 25-29: HR = 0.76, 9% CI = 0.72 – 0.82</p>
				Sex	<p><u>SH</u></p> <p>Male &lt; Female HR = 0.70, 95% CI 0.68–0.72</p>	<p><u>SH</u></p> <p>Male &lt; Female HR = 0.71, 95% CI 0.69-0.73</p> <p>Suicide</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					Suicide Male>Female HR = 3.15, 95% CI 2.74–2.63	Male>Female HR = 3.11, 95% CI 2.68–3.62
				Deprivation	<u>Suicide</u> Not significant, Quintile 2 > Quintile 1  HR = 1.38, 95% CI = 1.08 – 1.75, Quintile 3 > Quintile 1  HR = 1.88, 95% CI = 1.49 – 2.35, Quintile 4 > Quintile 1  HR = 1.99, 95% CI = 1.61 – 2.48, Quintile 5 > Quintile 1  <u>SH</u> HR = 1.18, 95% CI = 1.23 – 1.25, Quintile 2 > Quintile 1  HR = 1.50, 95% CI = 1.43 – 1.58, Quintile 3 > Quintile 1  HR = 1.88, 95% CI = 1.79 – 1.96, Quintile 4 > Quintile 1	<u>Suicide</u> Not significant, Quintile 2 > Quintile 1  Not significant Quintile 3> Quintile 1  HR = 1.61, 95% CI = 1.28 – 2.04, Quintile 4 > Quintile 1  HR = 1.57, 95% CI = 1.25 – 1.97, Quintile 5> Quintile 1  <u>SH</u> HR = 1.09, 95% CI = 1.03 – 1.15, Quintile 2 > Quintile 1  HR = 1.31, 95% CI = 1.25 – 1.38, Quintile 3 > Quintile 1  HR = 1.56, 95% CI = - 1.49 – 1.64, Quintile 4 > Quintile 1

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					HR = 2.07, 95% CI = 1.98 – 2.16, Quintile 5 > Quintile 1	HR = 1.56, 95% CI = 1.49 – 1.64, Quintile 5 > Quintile 1
				Gestation	<u>Suicide</u> Not significant  <u>SH</u> Not significant	<u>Suicide</u> No effect size calculated.  <u>SH</u> HR = 1.02, 95% CI = 1.00 – 1.02
				Birth weight	<u>&lt;2500g</u> SH HR = 1.17, 95% CI 1.11–1.23 Suicide Not significant  2500-3249g SH HR = 1.17, 95% CI 1.14–1.21 Suicide Not significant  <u>3250-3749g</u> SH Not significant Suicide Not significant	<u>&lt;2500g</u> SH HR = 1.11, 95% CI 1.04–1.18 Suicide Not significant  2500-3249g SH HR = 1.11, 95% CI 1.07–1.14 Suicide Not significant  <u>3250-3749g</u> SH Not significant Suicide Not significant  <u>3750-4499g</u> SH

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<u>3750-4499g</u> SH HR = 0.89, 95% CI 0.86–0.92 Suicide Not significant  <u>&gt;4500g</u> SH HR = 0.85, 95% CI 0.75–0.96 Suicide Not significant	HR = 0.93, 95% CI 0.90–0.97 Suicide Not significant  <u>&gt;4500g</u> SH HR = 0.96, 95% CI 0.84–1.09 Suicide Not significant
				Maternal parity	<u>Suicide</u> Maternal sibling > No maternal siblings HR = 1.23, 95% CI = 1.07 – 1.42, One  Two maternal siblings > No maternal siblings: Not significant  Three or more maternal sibling > No maternal siblings: HR = 1.74, 95% CI = 1.42 – 2.12,	One maternal sibling > No maternal siblings: Suicide HR = 1.53, 95% CI = 1.31 – 1.78,  Maternal sibling > No maternal siblings: HR = 1.60, 95% CI = 1.29 – 1.98,  Two maternal siblings > No maternal siblings: HR = 2.69, 95% CI = 2.10 – 3.44, Three +  <u>SH</u> One maternal siblings > no

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p><u>SH</u> Maternal sibling &gt; No maternal siblings: HR = 1.05, 95% CI = 1.02 – 1.08, One</p> <p>Maternal siblings &gt; no maternal siblings: HR = 1.23, 95% CI = 1.18 - 1.27, Two</p> <p>Maternal siblings &gt; no maternal siblings: HR = 1.49, 95% CI = 1.42 – 1.55</p>	<p>maternal siblings: HR = 1.35, 95% CI = 1.31- 1.41,</p> <p>Two maternal siblings &gt; no maternal siblings: HR = 1.75, 95% CI = 1.65 – 1.84,</p> <p>Maternal siblings &gt; no maternal siblings: HR = 2.11, 95% CI = 1.97 – 2.27</p>
				Family size	<p><u>No siblings</u> SH: Not significant Suicide: Not significant</p> <p><u>One sibling</u> SH: HR = 0.93, 95% CI 0.89–0.96 Suicide: Not significant</p> <p><u>Two siblings</u> SH: HR = 1.11, 95% CI 1.07–1.15 Suicide: Not significant</p>	<p><u>No siblings</u> SH: Not significant Suicide: Not significant</p> <p><u>One sibling</u> SH: HR = 0.90, 95% CI 0.86–0.94 Suicide: Not significant</p> <p><u>Two siblings</u> SH: HR = 0.92, 95% CI 0.87–0.96 Suicide: Not significant</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p>Three or more siblings SH: HR = 1.46, 95% CI 1.40–1.52 Suicide: HR = 1.69, 95% CI 1.37–2.09</p>	<p>Three or more siblings SH: Not significant Suicide: Not significant</p>
Russell, Rasmussen & Hunter (2020)	<p>General population adolescents</p> <p>N = 1045 Age: Mean = 15.35 years, SD = 0.68. Gender: Female (N = 550, 52.8%).</p>	6-month longitudinal study	<p>Self-reported lifetime history of SH</p> <p>“Have you ever deliberately taken an overdose (e.g., of pills or other medication) or tried to harm themselves in some other way (e.g., cutting themselves)</p> <p>Then asked to provide a description of most recent act of self-harm to establish whether they met the</p>	Mental wellbeing	SH>No SH or SSHI: OR = 0.913, 95% CI 0.838-.995	Not significant
				Defeat	Not significant	Not significant
				Internal entrapment		B = 0.19, p< 0.01
				External entrapment		Not significant



Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
			CASE definition of self-harm			
Värnik et al. (2011)	General population comparison against 16 European countries from 2000-2005.  Participants information on Scotland specifically not available	Retrospective	Suicide death  Death records obtained from General Register Office for Scotland and coded using International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10, WHO 1992).	Sex	Not significant	
Wetherall et al. (2018) <sup>3</sup>	General population young people  N= 3508 Age: 18-34 years Gender: Female (N = 1733, 49.4%),	Cross-sectional	Self-reported lifetime history of Suicide attempt  "Have you ever made an attempt to take your life, by taking an overdose of	Age	Suicide attempt> No suicidality: OR = 1.04,  Suicide attempt > Suicidal Ideation: OR = 1.05	OR = 1.07, 95% CI: 1.04 1.10, Suicide attempt> No suicidality  OR = 1.07, 95% CI : 1.03 – 1.10
				Sex More likely to be female	Suicide attempt> No lifetime reported suicidality OR = 0.62 p < 0.05.	Suicide attempt> No lifetime reported suicidality: OR = 0.52, 95% CI 0.39 – 0.70.

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
	Male (N = 1775, 50.6%).		tablets or in some other way?".		Suicide attempt>SSHI OR = 0.53, p < 0.05	Suicide attempt>SSHI : OR = 0.49, 95% CI 0.36 – 0.67
				Relationship status (More likely to be unmarried)	Suicide attempt> SSHI OR = 1.30, p < 0.05 Suicide attempt vs No lifetime reported suicidality Not significant	Suicide attempt vs No lifetime reported suicidality Not significant Attempt vs SSHI Not significant
				Ethnicity	Not significant, exact ORs not reported	Suicide attempt vs Suicidal Ideation Not significant  Suicide attempt vs No suicidality Not significant
				Employment status (employed)	OR = 0.35, Suicide attempt < No SSHI or attempt  OR = 0.63, Suicide attempt < SSHI	Suicide attempt vs no suicidality Not significant  Suicide attempt vs SSHI Not significant
				Depression	OR = 1.14. Suicide attempt> No suicidality	Suicide attempt<No suicidality Not significant

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					OR= 1.02, Suicide attempt > Suicidal Ideation	Suicide attempt< Suicidal Ideation Not significant
				Defeat	Suicide attempt>No lifetime reported suicidality OR = 1.12, p < 0.05  Suicide attempt>SSHI OR = 1.02, p < 0.05	Suicide attempt>No lifetime reported suicidality B = 0.03, OR = 1.03, 95% CI 1.01-1.06.
				Entrapment	Suicide attempt>No lifetime reported suicidality OR = 1.10, p < 0.05  Suicide attempt>SSHI OR = 1.01, p < 0.05	Suicide attempt vs No lifetime reported suicidality Not significant  Attempt vs SSHI Not significant
				Perceived burdensomeness	Suicide attempt>No lifetime reported suicidality OR = 1.19, p < 0.05	Suicide attempt>No lifetime reported suicidality B = 0.07, OR = 1.07, 95% CI 1.04-1.10  Attempt vs SSHI Not significant
				Thwarted belongingness	Suicide attempt>No lifetime reported suicidality	Suicide attempt vs No lifetime reported suicidality

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					OR = 1.15, p < 0.05 Suicide attempt>SSH OR = 1.02, p < 0.05	Not significant  Attempt vs SSH Not significant
				Resilience	Suicide attempt<No suicidality OR = 0.90, p < 0.05  Suicide attempt< SSH OR = 0.97, p < 0.05	Suicide Attempt vs No suicidality Not significant  Suicide attempt vs SSH Not significant
				Goal reengagement	OR = 1.10 Suicide attempt< No suicidality OR = 1.04  Suicide attempt< Suicidal Ideation	Suicide attempt vs Suicidal Ideation: Not significant  Suicide attempt vs Suicidal Ideation : Not significant
				Goal disengagement	Not significant, exact Ors not reported	Suicide attempt vs Suicidal Ideation: Not significant  Suicide attempt vs no suicidality: Not significant

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Social support	<p>Suicide attempt &lt; No suicidality: OR = 0.87, p &lt; 0.05</p> <p>Suicide attempt &lt; SSHI: OR = 0.98, p &lt; 0.05</p>	<p>Suicide attempt vs No suicidality: Not significant</p> <p>Attempt vs SSHI: Not significant</p>
				Acquired capability	<p>OR = 1.14, Suicide attempt &gt; No suicidality</p> <p>OR = 1.09, Suicide attempt &gt; Suicidal Ideation</p>	<p>OR = 1.13, 95% CI = 1.10 – 1.18, Suicide attempt &gt; no suicidality</p> <p>OR = 1.10, 95% CI = 1.06-1.14 Suicide attempt &gt; Suicidal Ideation</p>
				Mental images	<p>OR = 1.07, Suicide attempt &gt; SSHI</p> <p>OR = 1.41, Suicide attempt &gt; No suicidality</p>	<p>OR = 1.07, 95% CI: 1.03- 1.10, Suicide attempt &gt; SSHI</p> <p>OR = 1.26, Suicide attempt &gt; No suicidality</p>
				Impulsivity	<p>OR = 1.03, Suicide attempt &gt; SSHI</p> <p>Suicide attempt &gt; No suicidality : OR = 1.08,</p>	<p>OR = 1.02, 95% CI = 1.01 -1.04, Suicide attempt &gt; SSHI</p> <p>Suicide attempt &gt; No suicidality : OR = 1.03, 95% CI = 1.02 – 1.05</p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Exposure to Suicide attempt in friend	Suicide attempt > SSHI: OR = 1.74  Suicide attempt > No suicidality: OR = 4.48	Suicide attempt > SSHI OR = 1.49, 95% CI = 1.09 -2.06,  Suicide attempt > No suicidality: OR = 2.04, 95% CI = 1.49 – 2.80
				Exposure to Suicide attempt in family	Suicide attempt > SSHI: OR = 1.50  Suicide attempt > No suicidality: OR = 3.68	Suicide attempt > No suicidality : OR = 1.93, 95% CI = 1.40 – 2.66  Suicide attempt vs Suicidal Ideation: Not significant
				Exposure to friend/family suicide death	Suicide attempt > SSHI: OR = 1.35,  Suicide attempt > No suicidality: OR = 2.77	Suicide attempt vs Suicidal Ideation : Not significant  Suicide attempt > No suicidality: Not significant
Young, Sweeting & Ellaway (2011)	General population adolescents	Longitudinal study over 8 years	Self-reported lifetime history of Suicide attempt	Age: Older than peers	<u>Suicide attempt at age 15:</u> OR = 1.05 (95% CI 0.99-1.11)	<u>Suicide attempts at age 15:</u> OR = 1.05 (95% CI 0.99-1.12)

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
	N = 1698 Age: 11-19 Gender: Female (N = 856, 50.4%), Male (N = 842, 49.6%)		<p>'Have you ever, in your whole life, tried to kill yourself or make a Suicide attempt?'</p> <p>Self-reported lifetime history of SH</p> <p>"Have you ever tried to hurt yourself deliberately". Participants were also asked the age of their first self-harm act.</p>		<p><u>SH at age 19</u> OR = 1.04, 95% CI 0.97-1.11</p>	<p><u>SH at age 19</u> OR = 1.04, 95% CI 0.96-1.12</p>
Sex				<p><u>Suicide attempts at age 15</u> Female&gt;Male Un OR = 3.05, 95% CI 1.94-4.78</p> <p><u>SH at age 19</u> Not significant Female vs Male</p>	<p><u>Suicide attempts at age 15</u> Female&gt;Male OR = 3.76, 95% CI 2.27-6.23</p> <p><u>SH at age 19</u> Not significant Female vs Male</p>	
Deprivation				<p><u>Suicide attempt at age 15</u> Deprivation vs no deprivation: Not significant</p> <p><u>SH at age 19</u> Deprivation vs no deprivation: Not significant</p>	<p><u>Suicide attempt at age 15</u> Deprivation vs no deprivation: Not significant</p> <p><u>SH at age 19</u> Deprivation vs no deprivation: Not significant</p>	
Social class	Not significant	<p>Quintile 2 Suicide attempt at Age 15 Not significant, Quintile 1 vs Quintile 2</p> <p>SH at age 19, not significant, Quintile 1 vs Quintile 2</p>				

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
						<p>Quintile 3 Suicide attempt at age 15 Not significant, Quintile 1 vs Quintile 3</p> <p>SH at age 19, not significant, quintile 1 vs quintile 3</p> <p>Quintile 4 Suicide attempt at age 15 Not significant, Quintile 1 vs Quintile 4</p> <p>SH at age 19, OR = 0.21, 95% CI = 0.06 – 0.64, quintile 1 &lt; quintile 4</p> <p>Quintile 5 Suicide attempt at age 15 Not significant, Quintile 1 vs Quintile 5</p> <p>SH at age 19, not significant, quintile 1 vs quintile 5</p> <p>Quintile 6 Suicide attempt at age 15 Not significant, Quintile 1 vs Quintile 6</p>



Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
						SH at age 19, not significant, quintile 1 vs missing information
				Religion (Protestant)	<u>Catholic vs Protestant</u> Suicide attempt at Age 15: Not significant SH at age 19, not significant: Not significant  <u>Other religion vs. protestant</u> Suicide attempt at Age 15: Not significant  SH at age 19, not significant Protestant vs Other  <u>No religion vs Protestant</u> Suicide attempt at Age 15: Not significant,  SH at age 19: Not significant  <u>Mismatch between religion and school denomination</u> Suicide attempt at Age 15:	<u>Catholic &lt; Protestant</u> Suicide attempt at Age 15: OR = 0.39, 95% CI = 0.16 – 0.96. SH at age 19, OR = 0.07, 95% CI = 0.01 – 0.31, Catholic < Protestant  <u>Other religion vs. protestant</u> Suicide attempt at Age 15: Not significant,  SH at age 19, not significant, <u>No religion vs Protestant</u>  Suicide attempt at Age 15, Not significant, Protestant vs None  SH at age 19, Not significant, Protestant vs None  <u>Mismatch between religion and school denomination</u> No effect sizes calculated

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					<p>OR = 2.81, 95% CI = 1.30 – 6.10, Mismatch &gt; No mismatch</p> <p>SH at age 19, OR = 4.12, 95% CI = 1.32 – 12.89, mismatch &gt; no mismatch</p>	
				Depression	<p><u>Suicide attempt by age 15</u> Depression at age 11 &gt; no depression at age 11: OR = 1.14, 95% CI = 1.09 – 1.21</p> <p><u>SH by age 19</u> Depression at age 11 vs no depression at age 11: Not significant</p>	<p><u>Suicide attempt by age 15</u> Depression at age 11 &gt; no depression at age 11: OR = 1.10, 95% CI = 1.04-1.17</p> <p><u>SH by age 19</u> Depression at age 11 vs no depression at age 11: Not significant</p>
				Attendance at psychiatric service	<p><u>Suicide attempts by age 15</u> Attendance at psychiatric service at age 11 vs no attendance at psychiatric service age 11: Not significant,</p> <p><u>SH at age 19</u></p>	<p><u>Suicide attempt by age 15</u> Attendance at psychiatric service at age 11 vs no attendance at psychiatric service age 11: Not significant,</p> <p><u>SH at age 19</u></p>

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
					Attendance at psychiatric service at age 11 vs no attendance at psychiatric service age 11: Not significant	Attendance at psychiatric service at age 11 vs no attendance at psychiatric service age 11: Not significant
				Parent with no suicidality	<u>Suicide attempt by age 15</u> OR = 1.23 (95% CI 1.09-1.38)  <u>SH by age 19</u> OR= 1.22 (95% CI 1.05-1.42)	<u>Suicide attempt by age 15</u> OR = 0.89 (95% CI 0.77-1.03, p = 0.116)  <u>SH by age 19</u> OR = 1.12 (95% CI 0.93-1.35)
				Parental care	<u>Suicide attempts by age 15</u> OR = 0.76 (95% CI 0.68-0.85)  <u>SH by age 19</u> OR = 0.78 (95% CI 0.67-0.90)	<u>Suicide attempt by age 15</u> OR = 0.89 (95% CI 0.77-1.03)  <u>SH by age 19</u> OR = 0.92 (95% CI 0.76-1.12)
				Weekly victimisation in childhood	<u>Suicide attempt by age 15</u> OR = 2.37 (95% CI 1.40-4.01)  <u>SH by age 19</u> OR = 1.80, 95% CI 0.88-3.68	<u>Suicide attempt by age 15</u> OR = 1.59 (95% CI 0.87-2.91)  <u>SH by age 19</u> OR = 1.34, 95% CI 0.58-3.06

Study	Sample Summary	Study Design	Outcome Measure	Factors explored	Univariate effect sizes	Multivariate effect sizes
				Infrequent victimization in childhood	<u>Suicide attempt by age 15</u> OR = 1.54, 95% CI 0.98-2.43.  <u>SH by age 19</u> OR = 1.92, 95% CI 1.11-3.33	<u>Suicide attempt by age 15</u> OR = 1.16, 95% CI 0.71-1.90  <u>SH by age 19</u> OR = 1.61, 95% CI (0.88-2.95).

DSH = Deliberate self-harm; NSSH = Non-suicidal self-harm; OR = Odds ratio; HR = Hazard ratio;  $\chi^2$ = chi-square; PR= prevalence ratio

*Note.* Bergman et al. (2017) and Bergman et al. (2019) use the same dataset; O'Connor et al. (2018) and Wetherall et al. (2018) use the same dataset; De Beurs et al. (2016), De Beurs et al. (2017) and O'Connor et al. (2015) use the same dataset.

## Appendix 3. Variables which yielded non-significant results

### Ethnicity

Four studies explored ethnicity in relation to SH (Cleare et al., 2018), NSSH (O'Connor et al., 2018), and suicide attempt (Dhingra et al., 2015; O'Connor et al., 2018; Wetherall et al., 2018). No significant differences were identified. Cleare et al. (2018) found that ethnicity did not significantly differ between patients admitted for SH with a lifetime history of one SH episode compared to inpatients with a lifetime history of multiple SH episodes. O'Connor et al. (2018) examined NSSH and suicide attempts in adults (aged 18-34 years) and found that ethnicity was not significantly associated with prevalence of NSSH or suicide attempts. Similarly, Wetherall et al. (2018), O'Connor et al. (2018) and Dhingra et al. (2015) examined ethnicity in relation to suicide attempt. Based on a university student sample, no difference in ethnicity was identified between participants with lifetime history SSHI or no lifetime history of suicidality (Wetherall et al., 2018). Similarly, O'Connor et al. (2018) found no significant difference in ethnicity (White vs. non-White) in 18–34-year-olds with a lifetime history of NSSH only compared to lifetime history of suicide attempt.

### *Older than peers*

Young et al. (2011) found that, compared to peers aged 15 years, being older than 15 was not significantly associated with suicide attempts at 15 years, or lifetime SH later at 19 years.

### Strategies

Grandison et al. (2020) found no significant differences in using strategies for emotional regulation between those who report a lifetime history of suicidality and those who do not.

### Negative self-concept

Grandison et al. (2020) found no significant differences in feelings of negative self-concept between those who self-report a lifetime history of suicidality and those who have no lifetime history of suicidality.

### Disturbed relationship

Grandison et al. (2020) found no significant differences in disturbed relationships between those with a self-reported lifetime history of suicidality and those with no history of suicidality.

### Cigarette smoking

Conlin et al. (2016) found that there was no difference in cigarette smoking between participants who were admitted to hospital for SH by burning and individuals admitted to hospital for accidental burn injury (control group).

### Attendance at psychiatric service

Young et al. (2011) prospectively explored attendance to psychiatric services in relation suicide attempt and NSSH. Psychiatric service use at or before age 11 was not significantly associated with later lifetime history of suicide attempts at 15 years old, or lifetime history of SH at 19 years old.

### Physical health condition

Kavalidou et al. (2019) found that physical health conditions had no significant association with self-reported history of suicide attempt.

### Goal disengagement

Four studies looked at goal disengagement and lifetime history of suicidal attempt. Both Wetherall et al. (2018) and Dhingra et al (2015) found goal disengagement did not significantly differ between

individuals with a lifetime history of suicide attempt, compared to individuals with a history of NSSI only and no lifetime history of suicidality. Cleare et al. (2021) found no significant differences in goal disengagement between individuals with a lifetime history of suicide attempt and individuals with a lifetime history of NSSH. Furthermore, O'Connor, O'Carroll et al. (2012) found that goal disengagement did not significantly differ between individuals who re-presented at hospital after a suicide attempt within 24 months of a baseline suicide attempt, compared to those who did not.

#### Bereavement

Based on both cross-sectional and longitudinal research designs, del Carpio et al. (2020) found that experience of a non-suicidal bereavement was not associated with self-reported history of suicidality.

#### Self-esteem

del Carpio et al. (2020) found that adolescents aged 11-17 years who engaged in lifetime SH did not significantly differ in optimism than the control group at baseline or six-month follow-up.

#### Discomfort tolerance

Dhingra et al. (2015) found no significant differences in discomfort tolerance between participants with a lifetime history of suicide attempt, compared to those with a history of SSHI only, or no history of suicidality.

#### Cry for help/ Cry of pain

There was no significant difference in cry for help between individuals admitted to hospital following a suicide attempt who re-presented to hospital with SH within 15 months of discharge, compared to those who did not re-present with SH to hospitals (De Beurs et al., 2017).

#### Suicide note

De Beurs et al. (2017) found no significant difference in writing a suicide note between patients who re-attended hospital with SH within 15 months of a suicide attempt than those who did not.

## Appendix 4. Risk and protective factors uniquely investigated within military and veteran populations

### Age

Using single dataset comparing veterans and general populations, Bergman et al. (2019) investigated suicide and Bergman et al. (2017) investigated SH by birth cohort in veteran and general population samples. Bergman et al. (2019) demonstrated that the highest rate of suicide in veterans compared to non-veterans was in both the youngest (1980-1985) and the oldest (1945-1949) birth cohorts. Veterans born between 1965 and 1979 showed no significant difference in suicide incidence compared to non-veterans. Veterans born between 1945-1959 and 1960-1985 were significantly more likely to report lifetime SH when compared to the general population.

Age at suicide was investigated by Bergman et al. (2019) and Bergman et al. (2017) retrospectively between general and veteran populations based on the same data. Bergman et al. (2019) found that veterans who had a lifetime history of hospital treated SH died by suicide at an older age (age  $45.5 \pm 7.9$ ) than veterans with no history of SH ( $43.6 \pm 8.1$  years old). Bergman et al. (2017) did not investigate between group differences of suicide independent of SH history. However, on average, non-veterans were more likely than veterans to die by suicide under the age of 30, while veterans were more likely to die by suicide in all age group comparisons over 30 years old.

### Sex

Across a 30-year period, Bergman et al. (2019) found male veterans were more likely to engage in lifetime SH than female veterans.

### Self-harm history

Bergman et al (2019) found no difference between veteran and non-veteran suicide populations with regard to lifetime SH history.

### Time between index self-harm and fatal self-harm

Bergman et al. (2019) investigated time between first record of hospital-treated SH and suicide within a veteran sample. Results showed that there was a shorter time between index SH and suicide among veteran participants (2.0 years for veterans (IQR 0.4–4.3)) than in the general population (median 2.4 years (IQR 0.5–5.8)).

### Length of military service

Length of service was explored in relation to veterans with a history of hospital-treated SH (Bergman et al., 2019) and suicide (Bergman et al., 2017) compared to the general population. The highest risk of SH was associated with those who did not complete military training. This association steadily weakened as length of service progressed and was no longer significant beyond 10 years of service.

### Veteran status

Bergman et al. (2017) found no significant difference in the incidence of male suicide between veteran and general populations, while female suicide was significantly more likely in the veteran population than in the general population.

Appendix 5. Calculated effect sizes where suicide attempt and suicide were the collective outcome variable (regardless of suicidality history)

Factor	Included papers	Total sample size	Outcome	OR	95% confidence interval		p-value
					Lower	Upper	
Age* (‘younger’ including below average sample age, or younger comparative cohort)	Cleare et al. (2021); Dhingra et al. (2015)* <sup>1</sup> ; Wetherall et al. (2018)	10,092	Suicide attempt	1.03	1.01	1.04	< 0.001
Sex (female)	Cleare et al., (2021)*; Dhingra et al. (2015)* <sup>1</sup> ; Riordan et al. (2012); Wetherall et al. (2018) <sup>1</sup> ; Young et al. (2011)	90,4679	Suicide attempt	1.99	1.77	2.5	< 0.001
Depression	De Beurs et al. (2016); O’Connor et al. (2013); O’Connor et al., (2012); O’Connor et al., (2015) Young et al., (2011)		Suicide attempt	1.05	1.02	1.08	0.003
Marital status	Dhingra et al. (2015); O’Connor et al. (2013); O’Connor, O’Carroll et al. (2012)		Suicide attempt	1.36	0.92	2.01	0.119



Self-harm history	Cleare et al. (2021); O'Connor et al. (2012) O'Connor et al. (2015)	Suicide attempt	1.6 2	0.95	2.78	0.079
Socioeconomic factors; Social class & socioeconomic deprivation	O'Connor, O'Carroll et al. (2012); Riordan et al. (2012); Young et al. (2011)	Suicide attempt	1.1 3	0.61	2.1	0.688

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\* denotes multivariate analyses were included as univariate was not provided

<sup>1</sup> average effect size calculated based on no suicidality and SSHI only groups in relation to suicide attempt.

Brackets indicate the dominant factor identified from the meta-analysis.

## Appendix 6. Calculated effect sizes based on suicidality, self-harm and non-suicidal self-harm

Factor	Included papers	Total sample size	Outcome	OR	95% confidence interval		p-value
					Lower	Upper	
Age ('younger' including below average sample age, or younger comparative cohort)	Cleare et al. (2018); De Beurs (2016); O'Connor, O'Carroll et al. (2012)	4, 111	Repeated SH	1.014	1.01	1.02	< 0.05
Sex (female)	De Beurs et al., (2016); O'Connor, O'Carroll et al. (2012); O'Connor et al., (2013)	664	Repeated SH	0.875	0.62	1.23	NS
Relationship status/ marital status (single)	Cleare, et al. (2018); de Beurs et al. (2016) ; Grandison et al. (2020); O'Connor et al. (2013); O'Connor, O'Carroll et al. (2012)	4, 285	Repeated SH	1.46	1.02	2.09	<0.05
Depression (yes)	Cleare et al. (2018); Hafferty et al. (2019); O'Connor, O'Carroll et al. (2012)	19, 543	Repeated SH	1.09	1.05	1.13	<0.001
Employment status (unemployment)	Cleare et al. (2018); De Beurs et al. (2016); O'Connor, O'Carroll et al. (2012)	4, 111	Repeated SH	1.24	0.88	1.73	NS

Data summarised here are based exclusively on univariate analyses by the included studies.  
Brackets indicate the dominant factor identified from the meta-analysis.

## Appendix 7. Qualitative study summaries

Study	Sample Summary	Outcome Measure	Data Analysis Method	Major Themes	Sub-themes
Marzetti et al. (2022)	<p>LGBT+ sample</p> <p>N = 24</p> <p><u>Age:</u> 16-24 (Mean =19.6)</p> <p><u>Gender:</u></p> <p>1 cis male 6 trans male 11 female, 2 non-binary, 1 trans non-binary, 1 female tomboy, 1 transgender demiboi, 1 non-binary trans woman</p> <p><u>Sexual Orientation:</u></p> <p>7 pansexual, 6 bisexual, 3 queer, 2 bisexual, 1 biromantic, 3 lesbian, 3 gay, 1 homosexual, 1 ace,</p>	Suicidality	Reflexive thematic analysis.	<ul style="list-style-type: none"> <li>• Queerphobia as inescapably everyday</li> <li>• Understanding suicide as a response</li> </ul>	<ul style="list-style-type: none"> <li>○ Cis-heteronormative community climates</li> <li>○ Queerphobic bullying</li> <li>○ Coming out and family response</li> <li>○ Queer entrapment and suicide as an escape</li> <li>○ Suicide as questioning existence</li> </ul>

Study	Sample Summary	Outcome Measure	Data Analysis Method	Major Themes	Sub-themes
	1 asexual, 1 aromantic				
Richardson et al. (2021)	Male-only sample N= 12  <u>Age:</u> 19-49 (Mean = 33.8, SD = 9.8) <u>Gender:</u> all male	Suicide Attempt	Interpretative Phenomenological Analysis (IPA)	<ul style="list-style-type: none"> <li>• Characteristics of Attempt/Volitional Factors</li> <li>• Dealing with Suicidal Thoughts/Negative Emotions</li> <li>• Aftermath</li> <li>• Protective Factors</li> </ul>	<ul style="list-style-type: none"> <li>○ Change in thinking, Unplanned Lived Experience</li> <li>○ Avoidance, seeking help, reached his limit</li> <li>○ Changed but still vulnerable, Altered Sense of Self</li> <li>○ Importance of talking, Importance of relationships</li> </ul>
Zortea et al. (2019)	General population N = 9 Age: 20-30 (Mean = 24.5, SD = 3.4) Gender: 4 male, 5 female	Suicide Attempt	Interpretative Phenomenological Analysis (IPA)	<ul style="list-style-type: none"> <li>• Challenging relationships as a catalyst for STB</li> <li>• Positive relationships as buffers against STB</li> </ul>	<ul style="list-style-type: none"> <li>○ Psychological vulnerability</li> <li>○ Resilience</li> </ul>

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