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Self-Injurious Cognitions: A Systematic Review and Scale Development for Suicide and Non-suicidal Self-Injury

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Chapter 1 Systematic Review

Self-Punishment and its Association with Non-suicidal Self-Injury and Suicide Attempt: A Systematic Review of the Literature

Prepared in accordance with the author requirements for British Journal of Psychology

[Author Submission Guidance](#)

Abstract

This review synthesised a range of studies to comprehensively understand self-punishment in the context of Non-Suicidal Self-Injury (NSSI) and Suicide Attempts (SA). This was a quantitative systematic review conducted following PRISMA (2020) guidelines. Terms synonymous with self-punishment were used to search six electronic databases (PsychINFO, PubMed, Cochrane Library, Embase, CINHAL, MEDLINE). Only studies that discussed a relationship between self-punishment and NSSI or SA were considered for inclusion. Eighteen studies were included in the final synthesis. Heterogeneity of the studies was high, and the majority were cross-sectional (N=9) in design. Only a few of the studies relating to SA met inclusion criteria (N=5) due to limited studies highlighting self-punishment specifically. All studies reported significant associations between levels of self-punishment relating to SA and NSSI. The results of the review suggest self-punishment cognitions are intricately linked to self-criticism and negative self-evaluations. This review demonstrated the variety of ways that self-punishment is conceptualised, as well as its potential importance in the aetiology of self-injurious cognitions. Clinical and research implications of these findings are also considered.

Introduction

Self-Injurious Behaviour (SIB), consisting of Non-Suicidal Self-Injury (NSSI) or Suicide Attempt (SA), is a significant public health concern (WHO, 2018). SA involves intentionally inflicting physical harm on oneself with the intent or hope of ending one's life, whereas NSSI involves self-injury without any intention of causing death (Silverman, 2016). SA and NSSI frequently co-occur, and individuals may transition from non-suicidal to suicidal intent both within and between episodes of SIB. NSSI is a powerful predictor of SA and can often result in accidental fatalities (Brown, Henriques, Sosdjan & Beck, 2004). Instances of NSSI also increase an individual's risk of future suicidal behaviour (Chan et al., 2016), with around 50% of people who die by suicide having engaged in NSSI previously (Foster, Gillespie, McClelland, & Patterson, 1999).

Many factors underly NSSI and SA behaviour, including hopelessness, depression, impulsivity, defeat/entrapment and perceived burdensomeness (Beck & Steer, 1993; Gilbert & Allan, 1998; Van Orden et al., 2012). A frequently mentioned, but less theoretically conceptualised construct is self-punishment. In the development of the Suicide Attempt Beliefs Scale (SABS) and the Non-suicidal Self Injury Beliefs Scale (NSIBS), Siddaway et al. (2019) found that certain beliefs about NSSI and SA were associated with the likelihood of an individual engaging in both NSSI and SA and referred to these as Self-Punishment Cognitions (SPC).

Self-Punishment Cognitions

It is important to highlight that there is no widely agreed definition of SPC or consensus on specific constructs that underly SPC (Lear et al., 2019). Broadly, SPC refer to thoughts or beliefs that an individual has about themselves that lead to feelings of guilt, shame, self-blame or the perception of self as deserving or needing to be punished. This can then result in

self-punishing behaviours (APA, 2015). The American Psychological Association's (APA) Dictionary of Psychology defines self-punishment as "*the act of inflicting physical or psychological harm on oneself for one's perceived misdeeds. Self-punishment ranges from blaming oneself unjustifiably for negative occurrences to attempted suicide, and it commonly occurs in severe cases of major depressive disorder*" (APA, 2015). SPC may include feelings of worthlessness, inadequacy, or self-hatred and can lead to self-destructive behaviours such as NSSI, substance abuse, or social withdrawal. Emerging empirical work provides consensus that SPC influence on NSSI and SA, although there is variability in how SPC have been defined in the literature (Burke et al., 2021).

Self-punishment is also a key component of Schema Therapy, manifesting through the theory of the 'Punitive Self' in early maladaptive schemas (Young et al., 2003). This concept includes 'self-criticism' as a fundamental aspect of SPC. The theory asserts that individuals with a '*Punitive Self*' respond hypercritically to their own mistakes, suffering, or imperfections (Young et al., 2003). This '*self-directed hypercriticalness*' is described as an '*internalised process that may not necessarily extend to their expectations of others.*' (Yalcin et al., 2021). Young et al., (2003) differentiation the perceptions of punishment towards self and others, paying particular attention to self. This definition suggests that SPC involves intense self-criticism, which is hypothesised to increase instances of self-directed harm or SIB.

Self-criticism has also been highlighted as a direct component of SPC. The Defective Self Model (Hooley, Ho, Slater & Lockshin, 2010) asserts that individuals choose to self-injure to gratify the desire for self-punishment associated with a self-critical cognitive style. "*Self-injury is used to regulate negative self-directed thought and emotions and is made accessible by the belief that the individual deserves punishment*" (Hooley et al., 2010). Upon seeking to validate the Defective Self Model, the results that emerged were mixed. Self-criticism did not directly predict self-injury outcomes, but it did indirectly predict urge

intensity through daily thoughts about punishment. This highlights a degree of separation between self-critical cognitions and NSSI, and that SPC and self-critical cognitions are not the same. However, self-criticism may indirectly influence NSSI outcomes by having a direct impact on SPC (Hooley et al., 2010).

The Integrative Model of NSSI also provides a conceptualisation of self-punishment (Nock, 2014), indeed, self-punishment is one of the specific risk factors for NSSI. The model states that "*The self-punishment hypothesis suggests that self-deprecation may encourage NSSI as a form of self-directed abuse and may be one pathway through which abuse during childhood leads to later engagement in NSSI" (*Glassman et al., 2007). In this definition, self-deprecation is considered a core component of SPC.

From these different theories, there is a consensus that SPC has a relationship with SIB. Indeed, Siddaway et al. (2019) demonstrated this relationship in the development and validation of the SABS and NSIBS. However, throughout the literature, there is ambiguity and inconsistency regarding the conceptualisation of SPC (Burke et al., 2020). Different models present varying theoretical understandings of SPC (Hooley et al., 2010). Often, self-critical cognitions are related to SPC, as well as traits such as self-hatred, guilt, and shame (Lear et al., 2019). Similarly, in a range of studies, participants endorse self-punishment as a reason for engaging in NSSI, however, no specific definition or explanation of self-punishment is provided (Klonsky, 2011; Hamza, Willoughby & Good, 2013; Robillard, Legg, Ames & Turner, 2022). This inconsistency underscores the need for a more unified and precise definition of SPC to enhance the assessment, prevention, and treatment of SIB. A clearer understanding of SPC would also facilitate the development of targeted interventions and improve the predictive validity of measures related to SPC.

Measurement of SPC

The variety of ways SPC have been conceptualised has influenced the measurement of this concept. Over the years, there have been numerous ways in which self-punishment has been measured in empirical research. Ecological Momentary Assessment (EMA) in the form of daily diary entries, self-report scale measures, and qualitative reports have all been used to assess the prevalence of SPC (Burke et al., 2021). Stand-alone items have also been generated to assess the prevalence or frequency of self-punishment behaviours and cognitions within larger research studies (Burke et al., 2021).

In terms of validated scales, the Young Schema Questionnaire-Revised incorporates items related to the Punitive Self (Yalcin et al., 2022) and the Self-Forgiveness: Dual-Process Scale also incorporates measures related to SPC (Griffin et al., 2018). The SABS and NSIBS have subscales relating to self-punishment beliefs (Siddaway et al., 2019). Example items from these scales include "*NSSI is an expression of my self-hatred*" and "I *attempt suicide because I deserve to suffer.*" Scales designed to measure NSSI behaviour also include items specifically related to self-punishment (ISAS, SRS -see below). At present there is no scale developed that is designed to specifically measure SPC.

Due to the lack of specific measures, the extent of SPC influencing NSSI and SA is unclear. Further understanding SPC and their role in SIB is a crucial development for the assessment, prevention, and treatment of NSSI and SA behaviour. For the purposes of this systematic review, a broad interpretation of self-punishment will be adopted. Self-punishment can be defined as self-directed negative thoughts about the self (e.g. self-hatred, self-anger), underpinned by the belief that it is *necessary* to punish in order to achieve atonement or restore internal homeostasis.

Aims

Different theoretical perspectives have varied emphasis when it comes to defining SPC. However, they all agree that self-punishment may have some bearing on the emergence of SA and NSSI. As noted above, SPC have been identified as a potential risk factor for both NSSI and SA (Siddaway et al., 2019). Understanding the nature of this association could help in the development of more effective prevention and intervention strategies for these behaviours. By conducting a systematic review of the existing literature on self-punishment and SIB, this study aims to provide a comprehensive overview of the current state of knowledge on this topic. Specifically, we aim to identify how SPC are associated with NSSI and SA.

Methods

Search Strategy

Six relevant electronic databases were identified as appropriate to use for this study. These were PsycINFO, PubMed, Cochrane Library, Embase, CINHAL and MEDLINE. Databases were searched for relevant empirical studies published from inception up to January 2024. Peer-reviewed, English language studies (Morrison et al., 2012) were eligible for inclusion. A study protocol was registered with PROSPERO on the 20th June 2023, which can be accessed from the enclosed link.

The following search terms were used: "self-persecuting" OR "self persecuting" OR "self-hatred" OR "self hat*" OR "deservingness" OR "deserving" OR "punishment" OR "punitive" yesOR "punitive self" OR "punish*" OR "punishing thoughts" OR "self-blame" OR "punitive attitudes" OR "self-punishing attitudes" OR "cognition & reasoning" AND "Suicid*" OR "self-injur*" OR "self injur*" OR "self-harm" OR "self harm" OR "NSSI" OR

"nonsuicidal self injury" OR "nonsuicidal self-injury" OR "suicid* attempt" OR "suicid* ideation".

Inclusion and exclusion criteria

To be eligible for inclusion, studies had to (a) assess NSSI or SA thoughts or behaviour; (b) assess self-punishment or a related term; and (c) record the relationship between NSSI and/or SA and self-punishment. This review was limited to quantitative analysis which recruited all ages and participant groups. Studies that did not examine relationships between SPC and NSSI/SA thoughts or behaviour were excluded. Reviews, meta-analyses, and case-studies were excluded.

Forward and backward citation searches was employed on included papers identified to ensure comprehensive coverage of relevant literature. Backward citation searching involved examining the reference lists of the included studies to identify earlier works that may not have been captured in the initial database search. Forward citation searching, involved identifying more recent studies that have cited the included studies, which allowed the review to capture the latest research developments and assess the ongoing impact of the included studies.

Data extraction

A data extraction tool was developed to aid synthesis (Table 1). Demographic characteristics, study design, measures used to assess NSSI and/or SA measures and self-punishment, as well as key findings were extracted. Study rigour was assessed using a quality assessment framework based on O'Connor, Ferguson, Green, O'Carroll, and O'Connor (2016). This scale looks at 6 areas, producing an overall score for each study of 0 to 13. The six areas include: study design (cross-sectional, case controlled or prospective studies), power (whether mentioned, insufficient or achieved), suicide/NSSI Assessment (ratings varied per category

e.g. non-validated scale, single questions, self-report, hospital admissions, validated diagnostic mood rating scale, clinical interview, validated scale), self-punishment assessment (whether self-report, validated measure or clinical interview) & confounding variables (attempt to control, presence of comparison groups etc). Within the Data Extraction Table (1), each study is given a reference number for ease of identification throughout the write up.

Data analysis

Findings were aggregated and synthesized findings from a diverse set of studies to provide a comprehensive understanding of the topic. The heterogeneity among the included studies in terms of methodologies, populations, interventions, and outcome measures precluded a meta-analysis. Specifically, the differences in study designs, variations in sample sizes, and the inconsistent reporting of key variables across studies made it challenging to perform a quantitative synthesis without introducing significant bias. Therefore, a narrative approach was utilised, allowing for a more nuanced and interpretative analysis that highlights the complexities and variations across the studies. This method enables the exploration of patterns, identifying gaps, and drawing informed conclusions, while respecting the diversity and richness of the available evidence.

Figure 1. Procedure for identifying, screening, and determining eligibility of studies for inclusion in the review (adapted from Page et al., 2021)
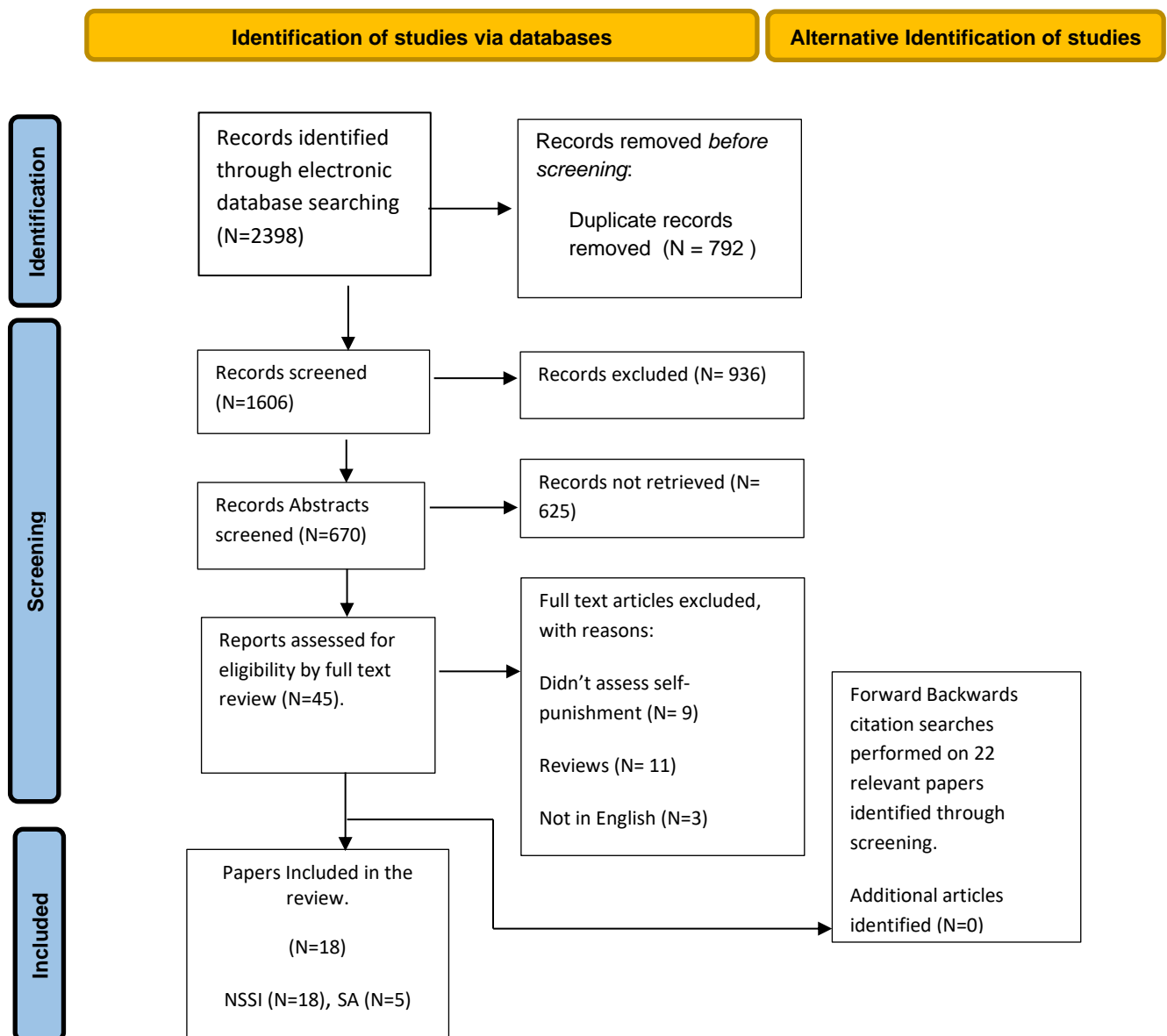
Results

Eighteen studies explored the relationship between NSSI, and self-punishment thoughts and behaviour and five studies explored SA and self-punishment thoughts and behaviour (Table 1). Two studies appear to report on the same research, using the same sample to explore different hypotheses (2, 3). To avoid duplication, the sample characteristics from one of these studies (2) are not included in synthesis, although the findings are both discussed as they report on different elements of self-punishment. Seven studies were conducted using a clinical sample (N=3 adolescents, N=4 adults; 6, 9, 10, 11, 12, 13, 15). Six studies recruited undergraduate students (1, 2, 3, 5, 7, 8). Three studies recruited a non-clinical adolescent population (4, 16, 17) and one study recruited from the general population (18).

Quality Assessment

Quality assessment scores ranged from 4 to 10 (low-high) with a mean of 6. Most studies were cross-sectional (N=15). Three studies reported longitudinal data; two collected ecological momentary assessment data (by means of diary entries). Twelve studies used validated measures and all studies included self-report measures. Two studies controlled for confounding variables during analysis. In general, studies typically were within a one score range of the mean quality assessment score. For studies that scored low on the quality assessment, this was taken into consideration when drawing inference from the study results.

Quality assessment was completed by the first author and another member of the research team cross-checked 20% (5) of the papers for inter-rater reliability, with 100% concordance after discussion.

Table 1 Summary of Quality Assessment Scores (See Appendix 5 O'Connor, Ferguson, Green and O'Connor (2016) Framework)

	Study Design	Sample Size/Power	Suicide Ax	NSSI Ax	Outcome Measure Ax (Self-Punishment)	Confounding Variables	Total Score
Lear, Wilkowski & Pepper (2019)	2	0	-	2	1	1	**6**
Burke et al. (2020)	2	1	-	2	1	0	**6**
Burke et al. (2021)	1	2	-	2	0	2	**7**
Robinson, Garisch & Wilson (2021)	2	1	1	-	1	0	**5**
Hamza, Willoughby & Good, (2013)	0	2	-	2	2	1	**7**
Lindholm, Bjarehed & Lundh, (2011)	0	1	-	2	2	1	**6**
Robillard, Legg, Ames & Turner (2022)	2	2	-	1	1	0	**6**
Bracken-Minor & McDevitt-Murphy (2014)	1	1	-	2	1	0	**5**
Gilbert, McEwan, Irons, Bhundia, Christie, Broomhead & Rockliff (2010)	0	2	-	1	1	2	**6**
Sack, Seddon, Sosa-Hernandez & Thomassin (2022)	1	1	-	1	1	1	**5**
Vergara, Jobes & Brausch (2023)	0	2	2	-	1	1	**6**
Brown, Comtois & Linehan (2002)	0	0	3	-	1	0	**4**
Kostic, Zikic, Stankovic & Nikolic (2019)	0	1	-	2	1	1	**5**
Shen, Hu, Zhou & Fan (2023)	1	2	-	1	1	0	**5**
Alessi, Szanto & Dombrovski, (2019)	1	1	3	-	1	1	**7**
Klonsky (2011)	0	2	-	2	1	1	**6**
Dixon-Gordon, Turner, Haliczer, Gratz, Tull & Chapman (2020)	1	2	-	2	1	0	**6**
Siddaway Wood, O'Carroll & O'Connor (2019)	1	2	2	2	2	1	**10**

Note. Ax=Assessment.

Sample Characteristics

The combined sample size was 10,404 participants with a mean age of 26.53. In total, 61.70% of the participants were female (N=6,420). Studies were conducted in a range of countries (7 =USA, 4=Canada, 1=New Zealand, 1=Sweden, 2=UK, 1=China & 1=Serbia). Of the eighteen studies, five did not report the ethnic characteristics of their sample (1, 6, 9, 13, 14).

Assessment of Self-Punishment

A variety of assessment tools were used to measure self-punishment thoughts and behaviour. All studies found that self-punishment correlates with NSSI/SA behaviour, however there was heterogeneity in terms of the conceptualisation of self-punishment. Self-punishment was conceptualised as a function of SIB (N=14), a trait (N=1; 2), or self-critical cognitions (N=4: 1, 2, 3, 9). One study explored specific cognitions linked to self-punishment and SA/NSSI (N=1: 18).

The Inventory of Statement about Self-Injury (ISAS) (Klonsky & Olino, 2008) and the Self-Rating Scale (SRS) (Hooley et al., 2010) were the most frequently used methods for measuring SPC. The ISAS was developed to measure functions of SIB. It contains one item that measures SPC as a reason or motivator for engaging in SIB. The item is worded "When I harm myself, I am expressing anger towards myself for being worthless or stupid". Across studies, the ISAS demonstrated good psychometric properties, with internal consistency scores for the subscales ranging from $\alpha = 0.53$ to 0.82, making it a robust tool for assessing various functions of NSSI, including self-punishment.

The SRS is a 7-point Likert scale that is a wide measure of self-criticism (8-items). Items for the SRS were taken from other measures, including the NEO-FFI (Costa & McCrae, 1992), Beck Hopelessness Scale (Beck et al., 1974), LCB (Craig et al., 1984), and the DES (Bernstein & Putnam, 1986), and capture facets of self-criticism, such as "Sometimes I feel completely worthless." The SRS items demonstrated adequate internal consistency ($\alpha = .73$; Hooley et al., 2010). The use of this scale to explore self-punishment highlights the ambiguity surrounding the concept of self-punishment and its ties to self-criticism.

The Suicide Attempt Beliefs Scale (SABS) and Non-suicidal Self-Injury Beliefs Scale (NSIBS; Siddaway et al., 2019) were recently developed to measure NSSI and SA cognitions.

Each measure includes a subscale that measures SPC (e.g., "*I engage in NSSI because I deserve to suffer*", "*NSSI is a way to express anger or self-criticism,*" "*I deserve suicide attempt scar and injuries*"). These scales the only measures in the literature that assess cognitions about NSSI and SA, respectively. All other measures assess the reasons given for engaging in SIB, also conceptualised as the functions SIB serves.

Assessment of NSSI & SA

SA thoughts and behaviour were measured differently in the five studies included in this review (4, 11, 12, 15, 18). NSSI was assessed using a variety of self-report measures. The Deliberate Self-Harm Inventory (DSHI) (Gratz, 2001) was the most frequently used measure of NSSI. The DSHI is a 17-item self-report questionnaire developed to assess facets of NSSI such as frequency, severity, duration, and type of behaviour. Across studies, the DSHI demonstrated strong psychometric properties, including good internal consistency ($\alpha = 0.79$). Results indicate that the DSHI had adequate test-retest reliability over a period ranging from 2 to 4 weeks, with a mean of 3.3 weeks ($\varphi = .68$, $p < .001$), suggesting that the DSHI reliably classifies participants as self-harming or not (Gratz, 2001).

Furthermore, the Self-Harm Behaviour Questionnaire (SHBQ) (Gutierrez et al., 2001) was another prominent tool used to assess self-injurious behaviours. The SHBQ, composed of sections on NSSI, suicidal attempts (SA), suicidal thoughts (ST), and suicidal intent (SI), showed high internal reliability for the SA and ST subscales ($\alpha = 0.94$ and $\alpha = 0.87$, respectively). The SHBQ's inclusion of questions on intent and motivation allowed for deeper exploration into the cognitive and emotional factors driving self-punishment in relation to NSSI and SA.

Self-Punishment correlation with SA and NSSI

Self-punishment consistently emerged as a prominent function of NSSI across various studies, underscoring its role in emotional regulation and psychological distress. Klonsky (2011) reported that 32% of individuals who engage in NSSI cited self-punishment as a primary function. Similarly, Robillard et al. (2022) found that self-punishment held a higher salience in NSSI behaviours (r=0.58) compared to other self-damaging behaviours such as binge drinking (r=0.06) and binge eating (r=0.11), suggesting that individuals who engage in NSSI are more likely to use self-injury to punish themselves than other harmful behaviours.

Among adolescents with depression, Shen et al. (2023) found that 75.66% endorsed self-punishment as a core motive for their NSSI, with a higher prevalence among females (77.94%) than males (65.33%, $p < 0.000$, Cohen's $d = 0.35$). This gender difference was further supported by Kostic et al. (2019) where females reported higher self-punishment scores (M = 2.03, SD = 1.25) compared to males (M = 1.60, SD = 1.68), though this difference was not statistically significant. Dixon-Gordon et al. (2020) found that individuals in the "Self-Punishment/Interpersonal Motives" class, a group characterized by high levels of emotional dysregulation, were more likely to experience relational and emotional difficulties.

Self-punishment was also consistently linked to emotional distress, emotional dysregulation, and psychological conditions such as depression and anxiety. Gilbert et al. (2010) found that self-persecution, a form of self-punishment, was strongly correlated with self-harm (r = 0.54, p < .01), depression (β = 0.36, p = .009), and anxiety (β = 0.32, p = .022). These findings highlight the centrality of self-punishment in both emotional suffering and self-injurious behaviours. Similarly, in Dixon-Gordon et al. (2020), participants in the "Self-Punishment/Interpersonal Motives" class, which accounted for 30.3% of the sample, reported higher self-punishment scores (M = 4.26) and exhibited more significant emotional

regulation difficulties than those in other classes ($\eta^2 = 0.22$ for emotion regulation). This group also displayed higher levels of depression, reinforcing the close relationship between self-punishment and emotional dysregulation.

Lear et al. (2019), highlighted that self-punishment was found to mediate the relationship between self-criticism and NSSI urges. The study reported that self-criticism had no direct effect on NSSI urge intensity (b = 0.027, p = .109); however, through daily punishment deservingness (self-punishment cognitions), the indirect effect became significant (ab = 0.023, p = .012), suggesting that self-punishment plays a crucial role in amplifying NSSI urges in individuals prone to self-criticism.

Self-Punishment and NSSI Urges

The relationship between self-punishment and NSSI urges was emphasized across several studies. Burke (2020) found that both trait and state self-punishment were significantly associated with NSSI urges (trait self-punishment: M = 2.33, SD = 1.49; state self-punishment: M = 0.58, SD = 1.16), indicating that enduring self-punishment tendencies, as well as fluctuating daily cognitions, contributed to the likelihood of experiencing urges to self-harm. However, self-punishment did not consistently lead to NSSI behaviour. Despite strong associations with NSSI urges, Burke (2020) found that only 0.9% of Ecological Momentary Assessment (EMA) alerts reported actual NSSI behaviour, despite 8.22% of alerts indicating the presence of NSSI urges.

Similarly, Lear et al. (2019) found that self-punishment played a mediating role in the relationship between self-criticism and NSSI urges (ab = 0.023, p = .012), although this mediating effect did not extend to actual NSSI behaviour (ab = 0.023, p = .111). This suggests that while self-punishment is a significant driver of NSSI urges, other factors may mediate whether these urges result in self-injurious behaviour.

NSSI Frequency and Severity

Several studies demonstrated that self-punishment was associated with greater frequency and severity of NSSI. Sack et al. (2022) identified that participants in the Multiple Functions (MF) class, where 100% of participants endorsed self-punishment as a motivator, reported significantly more frequent NSSI episodes (M = 39, SD = 38.81) compared to the Single/Avoidant Function (SAF) class (M = 15.08, SD = 16.86). The study further found that participants in the MF class exhibited greater emotional instability (Mean = 17.04, SD = 3.22), impulsivity (Mean = 15.59, SD = 4.11), and negative relationships (Mean = 20.18, SD = 5.42), highlighting the broader emotional and relational challenges faced by individuals who engage in NSSI for self-punishment.

Shen et al. (2019) found a positive correlation between self-punishment and NSSI frequency (p < 0.05) and versatility, with individuals who endorsed self-punishment engaging in more diverse and severe forms of self-harm. While self-punishment was linked to greater NSSI severity, the study found no significant relationship between self-punishment and longer NSSI duration after Bonferroni correction, indicating that while self-punishment may drive more intense behaviours, it does not necessarily sustain NSSI over time.

Self-Punishment and Suicidal Behaviour

Self-punishment was found to play a significant role in suicidal behaviours, particularly in individuals with a history of both NSSI and suicide attempts. Vergara et al. (2023) reported that adolescents with a history of both NSSI and SA had significantly higher self-punishment scores (EM = 3.90) compared to those with only NSSI (EM = 2.55, F(1, 61) = 8.16, p < .01). This suggests that self-punishment is a more prominent motivator for adolescents who engage in both NSSI and suicidal behaviour.

Brown et al. (2022) found that 59% of individuals who engaged in non-suicidal parasuicide cited self-punishment as a key motivator, compared to 38% of those who attempted suicide (χ^2 = 4.51, p = .03). Interestingly, in a within-person analysis comparing suicide attempts with non-suicidal parasuicide, self-punishment was equally endorsed in both contexts, suggesting that individuals who engage in both behaviours may use self-punishment as a common motive, regardless of the intent behind their self-injurious actions.

Table 2 *Summary of Quantitative Studies Included in the Review*

Author	Study Design	Sample	Self-punishment conceptualisation	Self-punishment measure	SA/NSSI Behaviour Measure	Key findings	Effect Size
1. Lear, Wilkowski & Pepper (2019)	Longitudinal	Undergraduate students who reported at least 1 SIB incident in last year (n=48)	Through Defective Self Model of Self-Injury Related to self-criticism	SRS (8 items, exploring self-criticism cognitions) PDS (10 items, exploring self-punishment cognitions)	ISAS	Self-criticism did not directly predict self-injury outcomes but did indirectly predict urge intensity through daily thoughts about punishment.	Not Specified
2. Burke et al. (2020)	Longitudinal	Undergraduate students with a history of repetitive NSSI (n=64)	Related to self-criticism	Unvalidated item assessing self-punishment cognitions – "*I am deserving of pain and punishment*". SRS (8 items administered, exploring self-criticism cognitions)	DSHI	Findings suggest that trait and aggregated state self-punishment, but not self-critical cognitions, predict NSSI urges experienced over the EMA period.	β= 2.77
3. Burke et al. (2021)	Case-controlled	University students with and without a history of NSSI (n=123)	Related to self-criticism	Unvalidated item assessing self-punishment cognitions – "*I am deserving of pain and punishment*". SRS (8 items administered, exploring self-criticism cognitions)	DSHI	Results demonstrate that both trait and state levels of self-critical and self-punishment cognitions robustly differentiate between young adults with and without a lifetime history of NSSI.	d= 1.36
4. Robinson, Garisch & Wilson (2021)	Longitudinal	Secondary school students (n=2,057)	Self-punishment as a function of suicide attempt	ISAS (39 items administered, 3 items relating to self-punishment cognitions) e.g.: '*When I harm myself, I am expressing anger at myself for being worthless or stupid*'	DSHI	SP as a predictor of (i) suicidal ideation & behaviour severity (ii) clinically elevated suicidal thoughts & behaviours	$\beta = .07$ $\beta =1.15$
5. Hamza, Willoughby & Good, (2013)	Cross-sectional	Undergraduate students (n=1107)	Self-punishment as a function of NSSI	ISAS (39 items administered, 3 items relating to self-punishment cognitions)		Individuals who engaged in NSSI indicated greater use of coping behaviours self-punishment than the non-NSSI group.	Not Specified

6.	Lindholm, Bjarehed & Lundh, (2011)	Cross-sectional	Women with severe forms of NSSI who were treated within residential care settings (n=22) Therapists working with women (n=21)	Self-punishment as a function of NSSI	ISAS (39 items administered, 3 items relating to self-punishment cognitions)	NSSI behaviour	Patients rated self-punishment as more relevant than interpersonal functions for NSSI. The therapists' ratings differed little from the patients' self-reports, although significant differences were found for other functions.	d =0.15
7.	Robillard, Legg, Ames & Turner (2022)	Longitudinal	University students (n=704)	Self-punishment as a function of NSSI	ISAS (39 items administered, 3 items relating to self-punishment cognitions)	Unvalidated measure of self-damaging behaviours	Punishing oneself was more strongly endorsed for purging, fasting, and NSSI than binge eating and binge drinking.	β = .67
8.	Bracken-Minor & McDevitt-Murphy (2014)	Case Controlled	Undergraduate students (n=480)	Self-punishment as a function of NSSI	ISAS (39 items administered, 3 items relating to self-punishment cognitions)	DTS DERS	BPD-positive self-injurers had higher self-punishment, functions of NSSI than BPD-negative self-injurers.	d= 6.34
9.	Gilbert, McEwan, Irons, Bhundia, Christie, Broomhead & Rockliff (2010)	Cross-sectional	In-patients and day-patients (N = 73)	Related to self-criticism	FSC/AS (21 item measure exploring reasons for self-criticism, measure included 6 items on self-persecuting cognitions as reasons for NSSI) e.g.: *'If I punish myself, I feel better'.* *'To cope with feelings of disgust with myself.'*	SHR	Self-harm was significantly associated with forms and functions of self-criticism, shame, and feelings of inferiority (low social rank). **The self-persecuting** function of self-criticism was especially linked to self-harm, depression, and anxiety.	β =.42
10.	Sack, Seddon, Sosa-Hernandez &	Cross-sectional	Inpatient youth (*n* = 68)	Self-punishment as a function of NSSI	DSHI (1 item on self-punishment when assessing motivations for NSSI) e.g.		The *Multiple Functions* class (*n* = 28) endorsed to "feel something," **"punish self,"** "escape feelings," "relieve anxiety," "stop feeling self-hatred," "stop feeling angry," "show how much they are	d= -.066

	Thomassin (2022)				*"I self-harm to punish myself"*		hurting," and "create a hurt that can be soothed."	
11.	Vergara, Jobes & Brausch (2023)	Cross-sectional	Adolescents from a behavioural health hospital and a children's crisis stabilization unit (n=70)	Self-punishment as a function of NSSI	ISAS (39 items administered, 3 items relating to self-punishment cognitions)	SHBQ	Engaging in NSSI for interpersonal boundaries, in addition to the intrapersonal function of self-punishment, were higher for the NSSI + SA group.	d= 2.98
12.	Brown, Comtois & Linehan (2002)	Cross-sectional	Women accepted into a randomized clinical trial for parasuicide. (n=75)	Self-punishment as a function of suicide attempt	Parasuicide History Interview with inclusions of 1 specific item relating to self-punishment as a reason for parasuicide.	Parasuicide interview	Nonsuicidal parasuicide was more often intended to express anger, punish oneself, regain normal feelings, and distract oneself.	Not specified
13.	Kostic, Zikic, Stankovic & Nikolic (2019)	Cross-sectional	Adolescents who deliberately engaged in self-injury at least once. (n=50)	Self-punishment as a function of NSSI	ISAS (39 items administered, 3 items relating to self-punishment cogntions)	Socio-demographic questionnaire	In terms of the NSSI function, the obtained scores were the highest for affect regulation 3.36 (1.47), self-punishment 1.90 (1.39) and marking distress.	d= .62
14.	Shen, Hu, Zhou & Fan (2023)	Cross-sectional	Adolescents with depression from 16 hospitals across China (n=1101)	Self-punishment as a function of NSSI	FASM (1 item on self-punishment when assessing motivations for NSSI) e.g. *"I self-harm to punish myself"*.	Unvalidated measure of suicidal thoughts and behaviours	Anti-dissociation and self-punishment were high risk factors linked to severe NSSI or suicide behaviours.	d= .35
15.	Alessi, Szanto & Dombrovski, (2019)	Case-controlled	Individuals who had attempted (n=119) Non psychiatric healthy control (n=50)	Self-punishment as a function of suicide attempt	RASQ (1 item on self-punishment when assessing motivations for SA)	Hospital admissions where intent has been established	Escape/Self-punishment motives on the RASQ were associated with multiple attempts.	d= 0.89

16.	Klonsky (2011)	Cross-sectional	General population (n=439)	Self-punishment as a function of NSSI	Structured interview questions around motivations for SIB.		Most injurers reported that NSSI functioned to alleviate negative emotions. Fewer reported that they self-injured to punish themselves, to communicate with others/get attention or to escape a situation or responsibility.	Not specified
17.	Dixon-Gordon, Turner, Haliczer, Gratz, Tull & Chapman (2020)	Case-controlled	adolescents and young adults with recent NSSI (n = 155, Sample 1) In the community (n = 127, Sample 2).	Self-punishment as a function of NSSI	SASSI (1 item on self-punishment when assessing motivations for SA) QNSSI (3 items relating to self-punishment as a motivation for NSSI)	DSHI	Low interpersonal, self-punishment/interpersonal, moderate intra/interpersonal, high intra/ interpersonal, and mainly interpersonal motives classes were not associated with lifetime NSSI characteristics, but highly motivated participants reported more severe depression and BPD symptoms, and greater emotion dysregulation than low-motivated participants. Those in the mainly interpersonal (Sample 1) and self-punishment/interpersonal (Sample 2) motives classes reported greater NSSI frequency during follow-up.	Sample 1, n^2p= 0.37 Sample 2, n^2p=0.40
18.	Siddaway Wood, O'Carroll & O'Connor (2019)	Scale Development & Validation	Individuals with lived experience of SICs or SIB (n= 3,313)	Self-punishment cognitions	SABS (26 items about SA cognitions, 3 item subscale related self-punishment) NSIBS (39 items about NSSI cognitions, 4 item subscale related to self-punishment)	Multiple Measure used for scale validation	The SABS *Belonging Stigma, Self-punishment* and subscales statistically significantly predicted lifetime suicidal behaviour when controlling for a broad range of variables.	β=0.56

Note. SRS=Self-Rating Scale (Hooley et al., 2010); PDS= Punishment Deservingness Scale (Schoenleber, Berenbaum & Motl, 2014); ISAS= Inventory of Statements about Self-Injury (Klonsky & Olino, 2008); DSHI= Deliberate Self-Harm Inventory (Gratz, 2001); SHBQ= Self-Harm Behaviour Questionnaire (Gutierrez et al., 2001); FASM= Functional Assessment of Self-mutilation Questionnaire (Lloyd-Richardson et al., 2007); RASQ= Reasons for Attempting Suicide Questionnaire (Holden & McLeod, 2000); SABS= Suicide Attempt Beliefs Scale (Siddaway et al., 2019); NSIBS= Non-suicidal Self-Injury Belief Scale (Siddaway et al., 2019); QNSSI=Questionnaire for Non-suicidal Self Injury (Kleindienst et al., 2008); SASII=Suicide Attempt Self Injury Interview (Linehan et al., 2006); SHI=Self-Harm inventory (Sansone & Sansone, 2004); DTS= Distress Tolerance Scale (Simons & Gaher, 2005); DERS= Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004); FSC/AS= The Functions of Self-Criticizing/Attacking Scale (Gilbert et al., 2004), BPD= Borderline Personality Disorder, *β*=Standardised Regression Coefficient, *d*=Standardized effect size; Cohen's

Discussion

This systematic review synthesised quantitative studies to gain a comprehensive understanding of the relationship between self-punishment and NSSI and SA. This review offers valuable insights into the multifaceted nature of self-punishment and its role in driving SIB. The results of the review reveal the central role of self-punishment cognitions (SPC) as a key motivator for self-injurious behaviours (SIB) across various populations and clinical contexts. The evidence suggests that SPC is deeply intertwined with emotional regulation difficulties, psychological distress, and maladaptive coping strategies, particularly in those with NSSI and SA histories. However, the current literature reveals conceptual ambiguity surrounding self-punishment, which warrants careful consideration and exploration.

The eighteen quantitative studies consistently highlighted the relevance of SPC in the context of NSSI and SA across different age groups and clinical populations. There were various measures used to assess SPC such as the ISAS, SHBQ, and SHI (Klonsky & Glenn, 2010; Gutierrez et al., 2001; Sansone & Sansone, 2004). These scales measure a range of SPC and a range of other functions for SIB, and studies varied in their conceptualisation of self-punishment. Three studies conceptualised self-criticism as a facet of self-punishment, with self-criticism being defined as "*constant and harsh self-scrutiny, overly critical evaluations of one's own behaviour, and negative reactions to perceived failures in terms of active self-bashing*" (McIntyre, Smith & Rimes, 2018) (2, 3, 9). One study (18) looked at specific forms of SPC. The rest of the quantitative studies interpreted self-punishment as a 'function' or motivation for NSSI or SA. This is a limitation as it does not explore the nature of the cognitions in depth and does not provide a description of what cognitions are considered to be SPC.

The results of the review suggest that SPC are intricately linked to self-criticism and negative self-evaluations. Individuals who endorse beliefs related to deserving pain and

punishment exhibit higher levels of NSSI urges and engagement in SIB. The longitudinal

studies included in the review provide evidence for the predictive utility of trait and state

levels of self-punishment in differentiating between individuals with and without a history of

NSSI (1, 2, 7, 4). Very few studies explored the relationship between SPC and SA. Indeed,

these studies do not provide enough scope to draw definitive conclusions, other than to

highlight that the studies suggested that SPC may be a relevant factor in the aetiology of SA.

     The included studies highlight the role of self-punishment as a coping mechanism,

particularly in regulating negative affect and expressing internalised distress. Those who

report higher self-punishment scores often struggle with more intense depression, anxiety,

and interpersonal difficulties. These emotional complexities, in turn, exacerbate the severity

and frequency of NSSI, as individuals use self-injury to regulate overwhelming negative

emotions. The evidence suggests that self-punishment is a crucial factor in driving SIB,

particularly in individuals who experience heightened psychological distress and emotional

dysregulation. This finding highlights the potential value of addressing maladaptive cognitive

patterns and emotion regulation strategies in therapeutic interventions targeting NSSI and SA.

     While self-punishment is a strong predictor of NSSI urges, it does not always lead to

actual self-injurious behaviour. Several studies highlighted this discrepancy between the

presence of NSSI urges and the occurrence of NSSI behaviour. For example, self-punishment

was consistently found to intensify urges to self-injure, yet these urges did not always result

in action. This suggests that while SPC fuels the desire to self-harm, other factors, such as

emotional regulation strategies or external influences, may play a moderating role in whether

these urges are acted upon.

     This distinction between urges and behaviours points to a critical area for further

investigation. Understanding the factors that prevent individuals from acting on their NSSI

urges could have significant implications for clinical interventions. Interventions aimed at

addressing the underlying cognitive processes of self-punishment may reduce NSSI urges, but additional focus is needed on identifying the protective factors that help individuals resist engaging in self-harm.

Self-Punishment and Suicidal behaviour

While the relationship between SPC and NSSI is well-established, fewer studies have focused on the connection between self-punishment and suicide attempts. The studies that do explore this relationship suggest that self-punishment plays a critical role in individuals with a history of both NSSI and SA. For example, adolescents with a history of both behaviours often report higher levels of self-punishment compared to those who engage only in NSSI. This highlights the possibility that self-punishment may act as a bridge between non-suicidal and suicidal behaviours.

However, the literature on self-punishment and SA is less developed, and there is a need for more focused research on how SPC might contribute to the escalation from NSSI to suicidal intent. Exploring this connection in greater detail would provide valuable insights into the risk factors that predispose individuals to more severe self-injurious behaviour.

SABS and NSIBS

Given that the SABS and the NSIBS (Siddaway et al., 2019) provide respective self-punishment subscales, reflection on these instruments is of importance. From the synthesis of findings, the SABS and the NSIBS capture the components of self-deprecation; worthlessness and self-hatred that emerge in this review (Siddaway et al., 2019). Self-criticism is also encompassed in the NSIBS with one item '*NSSI is a way to express anger or self-criticism'*. By highlighting 'anger' the measures are also tapping into an emotion regulation component of self-punishment. A limitation could be that anger and self-criticism are condensed together

into one item, which does not appear in the SABS. Overall, these instruments are a promising and helpful as they capture many themes that emerged within the review, making them useful measures for exploring SPC.

Strengths and Limitations

A strength of this review related to the range of terms that were encompassed within the search strategy. Attention was paid to the variety of definitions and conceptualisations of self-punishment and a thorough attempt was made to identify these within the literature. A limitation could be that grey literature was not included in the review; however, it was excluded in an attempt to enhance the quality of studies included in the review.

A significant strength of this review is its inclusion of a range of diverse studies. This comprehensive approach enhances the robustness and reliability of the findings, as it ensures that the conclusions drawn are based on diverse and extensive data, thereby increasing the generalizability and validity of the results.

The studies included in the review employed a wide range of outcome measure which provide a wealth of information to inform this review. Future studies may wish to consider sub-group analyses to explore SPC but differentiate between individuals who have engaged in NSSI once compared with many times. This could highlight whether there is a link between frequency of SPC and increased instances of NSSI or SA

Additionally, future research could benefit from adopting a multidimensional approach to conceptualizing self-punishment, considering its cognitive, affective, and behavioural components.

Clinical and Theoretical Implications

The literature highlights the potential usefulness of self-punishment in understanding why people engage in NSSI. Clinically, further understanding of SPC enhances risk assessment, intervention, and prevention strategies. For instance, it may be useful for psychological interventions to specifically target SPC, and risk assessment protocols can incorporate measures to gauge the intensity and frequency of these SPC. This review also highlights the wide range of individuals who this will be relevant for.

Theoretically, this relationship enriches models of psychopathology by highlighting the cognitive processes involved in SA and NSSI. Furthermore, it raises important questions about the origin of SPC. Future research could investigate this, and explore how early trauma and attachment issues might influence the development of SPC, thereby informing trauma and attachment theories in relation to SIB.

Conclusion

In conclusion, the studies contribute valuable insights into understanding the relationship between self-punishment, NSSI and SA. Addressing the conceptual ambiguity surrounding self-punishment is crucial for advancing research and clinical practice in the field of SIB. Clear definitions and operationalizations of self-punishment are needed to facilitate accurate measurement and assessment in both research and clinical settings. Self-punishment cognitions have been highlighted as an important component in the assessment and management of NSSI behaviour which can guide clinical intervention through risk assessment and treatment.

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Chapter 2 Main Research Project

The Development and Validation of the Brief Suicide Attempt Belief Scale (BSABS) and the Brief Non-suicidal Self-Injury Belief Scale (BNSIBS)

Prepared in accordance with the author requirements for The British Journal of Psychiatry

Author Submission Guidelines

Plain Language Summary

Background: There is a large prevalence of self-harm and suicide within society. This puts a burden on the health system and can lead to emotionally distressing outcomes for families and individuals. Thoughts and cognitions about suicide/self-harm often lead to individuals engaging in self-injurious behaviour. By examining these thoughts and beliefs, it is hoped that we will be able to identify individuals who are more at risk of engaging in the behaviour. Two scales were developed (Suicide Attempt Belief Scale [SABS] & Non-Suicidal Self Injury Belief Scale [NSIBS]) exploring these beliefs, and it was found that people who scored highly in certain beliefs were more likely to have engaged in self-harm/suicidal behaviour. This was a positive outcome, proving this scale invaluable to assessing risk. The scales that were created include many questions to answer and it is hoped that by reducing the size of these scales they will be easier to use.

Aims and Questions: The objective of the project is to create a shorter version of the SABS and the NSIBS. These are measures that have been created to explore beliefs in relation to suicide and non-suicidal self-injury.

Method: Data from the individuals who participated in the scale validation study will be evaluated using statistical software. This will look for consistency within the brief scales, as well as similarities between the original scale and the brief version.

Main Findings and Conclusions: The Brief Suicide Attempt Belief Scale (BSABS: Appendix 5) and the Brief Non-Suicidal Self Injury Belief Scale (BNSIBS: Appendix 6) were successfully shown to measure the same content as the parent scales. The shorter scales do this with less items and significantly shorter completion times. The findings also showed that groups of people who experienced self-harm and suicidal thoughts were more likely to score higher on these scales. This highlights how these measures might be helpful in predicting and reducing risk for individuals who experience suicide and self-harm thoughts and behaviours.

Key References:

Siddaway, A. P., Wood, A. M., O'Carroll, R. E., & O'Connor, R. C. (2019). Characterizing Self-Injurious Cognitions: Development and Validation of the Suicide Attempt Beliefs Scale (SABS) and the Nonsuicidal Self-Injury Beliefs Scale (NSIBS). *Psychological Assessment.*

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Abstract

Background The 26-item Suicide Attempt Belief Scale (SABS) and the 39-item Non-Suicidal Self Injury Belief Scale (NSIBS) were recently developed to assess a broad range of Self-Injurious Cognitions (SIC) (Siddaway et al., 2019). Although the SABS and the NSIBS improve assessment of SIC, their length may be prohibitive in certain clinical and research settings. An efficient instrument is needed for situations that do not require multidimensional assessment of SIC. For practical and clinical research considerations, brief measures of the SABS and NSIBS were desirable to enhance their clinical and research utility.

Aims To develop brief measures of the SABS and NSIBS, which tap the same broad range of content and demonstrate good internal consistency across multiple populations. Similarly, to establish whether the brief scales demonstrate similar psychometric properties to the parent scales.

Method Using items from the original SABS and NSIBS, 7-item and 10-item brief scales, respectively, were created. Items were selected based on their performance across three samples (N=1,528). Psychometric properties were evaluated using two additional samples (N=944) and cross-validated in two new independent samples (N=1,345). Group differences on the brief measures were explored to establish group validity.

Results The Brief Suicide Attempt Belief Scale (BSABS) and the Brief Non-Suicidal Self-Injury Scale (BNSIBS) demonstrated good internal consistency and very strong correlation with parent scales. The scales showed significant positive correlations with measures of perceived burdensomeness, suicidal cognitions, depression, and hopelessness. Statistically significant differences were found across groups depending on frequency and history of SA and NSSI. The scales also demonstrated good test-retest reliability across 2-4 weeks.

Conclusion The BSABS and the BNSIBS demonstrate promising psychometric properties and provide a brief alternative to the parent scales.

Introduction

Self-Injurious Cognitions (SIC) refer to thoughts about deliberately harming oneself, which can manifest as Self-Injurious Behaviour (SIB) (Nock et al. 2008). SIB can involve either a Suicide Attempt (SA) or Non-Suicidal Self-Injury (NSSI), as described by Silverman (2016). SA involves intentionally inflicting physical harm on oneself with at least some intention of ending one's life; NSSI involves self-injury without any intention of causing death. SA and NSSI frequently co-occur, and individuals may transition from non-suicidal to suicidal intent both within and between episodes of SIB. NSSI is a powerful predictor of SA and can often result in accidental fatalities (Brown, Henriques, Sodjan & Beck, 2004).

These behaviours are prevalent across both physical and mental healthcare services. Suicide is currently the 12th leading cause of death worldwide, with 6,588 suicides occurring in the UK in 2022, according to the Office for National Statistics (Curtin, Tejada-Vera & Bastian, 2023). SA and NSSI are among the most frequent reasons for hospital admissions and are responsible for a significant proportion of injuries and fatalities globally (WHO, 2018). SA and NSSI also have substantial economic costs, with suicide alone costing an estimated £1.1 billion in Scotland in 2022 (Samaritans, 2024). In addition, these behaviours can have a profound emotional impact on individuals, their families, and their social support networks, and they pose significant clinical challenges. Identifying those at risk of SIB and developing interventions to prevent and manage these behaviours are key priorities for national research agendas and government strategies aimed at reducing suicide rates (The Scottish Government, 2021; 2023).

Assessment of SIC

Given their prevalence and clinical importance, it is extremely concerning that several recent comprehensive reviews indicate that the field's ability to predict and prevent SA and NSSI remains poor (Franklin et al., 2016). For example, recent meta-analyses have found that existing risk factors are only slightly better than chance in predicting suicide (Franklin et al., 2017). Moreover, although numerous risk assessment scales and tools are in widespread use in clinical settings, the available evidence indicates that these have very limited predictive ability. Overall, research highlights that the field is currently some distance away from explaining or predicting with sensitivity and specificity who will develop SA or NSSI cognitions, or who will act on such cognitions, or when (Wenzel & Spokas, 2014).

Recent research highlights the limitations of traditional suicide risk prediction models, which have shown poor predictive power for self-injurious behaviours (SIB). Hawton et al. (2022) argues that the current reliance on risk prediction tools, including scales and stratification systems, is ineffective and potentially harmful. These tools fail to capture the fluctuating and dynamic nature of suicide risk, often classifying those who later die by suicide as low risk. Similarly, Ernst et al. (2024) emphasize the importance of recognizing the distinct but interrelated constructs of wish to live (WTL) and wish to die (WTD) in assessing suicidal ambivalence, which also fluctuates within individuals. Both studies call for a shift from prediction to therapeutic, person-centred risk assessment that engages patients in meaningful dialogue and safety planning. Such approaches allow for a deeper understanding of modifiable risk factors and protective factors, offering a more nuanced and responsive framework for managing suicide risk. This integrative perspective reinforces the need for assessments that focus on both dynamic risk factors and enduring beliefs related to SA and NSSI. This approach highlights the necessity of an instrument that differentiates *what* individuals believe about NSSI or SA. In Developing the Suicide Attempt Belief Scale

(SABS) and the Nonsuicidal Self Injury Belief Scale (NSIBS), Siddaway et al. (2019) highlighted that there is a lack of specificity surrounding why certain people engage in SA/NSSI specifically, and why others do not. To address these shortcomings, Siddaway et al. (2019) explored what individuals believe about SA/NSSI and how this may relate to why certain individuals engage in this behaviour.

To this end, Siddaway et al. (2019) identified the importance to of exploring the role of beliefs about SIB. Beliefs are relatively stable personal meanings about suicide or NSSI (e.g., '*Attempting suicide is the only option I have for solving my problems*'), which may explain and drive SIC, making them important treatment targets. Evidence indicates that beliefs can underpin and drive other types of cognition (e.g., thoughts, assumptions, intentions) (Beck & Haigh, 2014). Siddaway et al. (2019) argued that examining beliefs may provide valuable information over and above SA or NSSI thoughts and other existing risk factors. Although individuals may currently deny or not be experiencing suicidal thoughts, endorsement of suicidal beliefs is likely to indicate enduring risk for SIB.

Siddaway et al. (2019) developed the SABS and the NSIBS to measure the beliefs people hold regarding SA and NSSI, and to test whether the same cognitions characterise SA and NSSI (Siddaway et al., 2019). The SABS and NSIBS both encompass items that describe how SIB relate to oneself and others. They exhibit strong test-retest reliability over 2–4 weeks and robust internal consistency. Unsurprisingly, the two scales correlated strongly, with 95% of the correlations between the subscales of the two scales being $\geq r = .5$.

A series of multivariate hierarchical regressions demonstrated that these scales have strong predictive ability, exceeding what is commonly observed in rigorous tests of incremental validity, highlighting the novelty and value of each new instrument.

The development of the SABS and NSIBS also contributed to the unresolved conceptual debate surrounding whether it was useful to consider SA and NSSI as one

construct or two independent constructs (Siddaway et al., 2019). Clarifying how SIC relate

and differ across SA and NSSI has fundamental implications for understanding these

phenomena and the development of interventions. Siddaway et al. (2019) demonstrated that

SA and NSSI cognitions are similar but distinct phenomena, which are best conceptualised as

separate constructs.

Rationale for Brief Scales

Although the SABS and NSIBS offer improved assessment of SA and NSSI cognitions over

existing measures, their length might be prohibitive in certain clinical and research contexts,

thereby limiting their use. Developing brief measures of these scales will be invaluable for

situations where brief assessment is preferable because of logistical or practical constraints

(e.g., primary care settings, epidemiological, longitudinal or experience sampling research).

Should the brief scales demonstrate strong psychometric properties and predictive accuracy,

they could be used for screening purposes to identify individuals who may require more

detailed clinical and risk assessment. Similarly, having a brief scale allows relevant concepts

to be measured in a swift manner and eliminates any redundancy of items, reducing potential

fatigue and boredom associated with answering similar questions repeatedly, which may act

as a disincentive for participants engaging in research (Robins, Hendin & Trzesniewski,

2001).

Should the brief scales demonstrate comparably strong psychometric properties, they

could be used to identify potentially vulnerable individuals requiring more detailed

assessment who may currently be missed. The development of brief measures of self-

injurious beliefs would introduce new tools for clinicians to draw upon from a repertoire of

potential options to effectively identify, understand, and support at-risk individuals. In

addition, brief scales would be less burdensome and faster to complete in circumstances

participants are completing multiple measures, and when in circumstances are severely ill, medically less fit, or have limited literacy or writing skills. The development of brief scales for assessing self-injurious cognitions is crucial given the limitations of traditional, lengthy risk tools, which often fail to capture the dynamic nature of suicide risk (Hawton et al., 2022).

Group Differences

To explore whether the brief scales can discriminate between theoretically meaningful groups, group analysis of variance was deemed relevant to establish whether more recent SA and NSSI thoughts would be associated with stronger endorsement of the Brief Suicide Attempt Belief Scale (BSABS) and Brief Non-Suicidal Self Injury Belief Scale (BNSIBS). Evidence of group differences would suggest that clinicians could use the BSABS and BNSIBS for assessment and monitoring (e.g., highlighting that an individual who has stopped engaging in SA or NSSI nevertheless remains at elevated risk of these behaviours because of ongoing strong endorsement of SA or NSSI cognitions). This is in-line with existing SA theories that predict the strength and recency of SA cognitions are associated with greater risk of SA (e.g., Rudd, 2000). Previous research also suggests that those with a multiple suicide attempt history should be treated as distinct from those with only a single attempt and individuals with ideation but no previous attempts (e.g., Rudd, Joiner, & Rajab, 1996). Group differences between males and females would also be explored, as evidence repeatedly highlights SA as a gendered phenomenon, with male deaths outnumbering female deaths everywhere in the world (Bennett et al., 2023).

Aims

The aim is to develop two brief measures of SA and NSSI cognitions and to establish whether they (a) tap into the same variety of content as the parent scales, the SABS and the NSIBS and (b) demonstrate good internal consistency across multiple populations. As well as this, the psychometric properties of the brief measure will be compared to the parent scales, with the hope that both establish similar psychometric properties to their respective long form measures. The aim is also to determine whether there are statistically significant group mean differences on the BSABS and BNSIB when exploring self-injurious thoughts and behaviour.

Method

For ease of analysis and synthesis, this research was divided into three distinct phases (Gámes et al., 2014), adhering to best practices for scale development (Wood & Boyce, 2018) Each phase is outlined below, followed by the corresponding results.

Ethical Approval

Ethical approval was granted from the University of Glasgow's College of Medical Veterinary and Life Sciences (MVLS) ethics committee on August 18th, 2023, project number: 200220443 (Appendix 2). Secondary data were used in this research, having previously received ethical approval from the University of Stirling.

Phase 1 Method

Participants

All samples used in this study were recruited through online forums. The decision to use online recruitment from various sources was made due to the desire to obtain large samples that are heterogeneous with regards SIB characteristics and the vulnerable and stigmatised nature of the behaviour under study, with evidence suggesting that anonymous online research participation may result in up to three times more reporting of self-injurious behaviours (e.g., Nock et al., 2008).

Two of the samples (Sample 5 & 6) used in the development of the parent scales were used here. The sample was recruited online from a broad range of SIB and mental health forums; support websites, and mental health charities worldwide. Adverts were placed on social media websites with links to the study website. Each data collection period lasted between two and four weeks. The SABS and NSIBS were completed a second time after 2–4 weeks to compute test–retest reliabilities. Sample 5 and 6 consisted of 77% females, 84% white, 27% mixed multiple ethic groups, 16% Asian. Ages ranged from 18 to 66 years (M= 28.09, SD = 10.04).

Measures

The SABS is a 26-item measure of cognitions about SA that comprises seven subscales: Self-Punishment, Escape, Dependence, Belonging, Stigma, Eliciting Help and Revenge. Items are rated on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). The subscales show evidence of strong internal consistency, and an alpha of .92 was found for both samples (Siddaway et al, 2019).

The NSIBS is a 39-item measure of cognitions about NSSI that comprises 10 subscales: Problematic, Anti-suicide, Anti-dissociation, Self-Punishment, Eliciting Help,

Escape, Dependence, Belonging, Stigma, and Revenge. Items are rates on a 7-point Likert-type scales ranging from 1 (strongly disagree) to 7 (strongly agree). The subscales show evidence of strong internal consistency, and the alphas for Phase 1 samples ranged between .91 - .92 (Siddaway et al, 2019).

Item Selection

The items of the brief scales were selected by two of the project supervisors, one of whom was the lead author of the SABS and NSIBS. A single item was selected from each subscale of the parent scales, resulting in the 7-item BSABS and 10-item BNSIBS.

Items were considered for potential inclusion in the brief scales based on several considerations, including high factor loadings (indicating a strong marker of a factor) across three samples (N=1,528; Sample 3, 4 & 5) theoretical reasons (best represent the theme of a factor), and practical reasons (brevity). This approach aimed to ensure that the short scales would be robust across various populations and measure a broad content from every subscale from the parent measures.

Typically, the highest loading items were selected for inclusion in the brief scales (to ensure accurate measurement of the underlying latent construct). In situations where two items consistently loaded well on a factor, examination of the content of items was undertaken by the research team to compare which item loaded most consistently across the three samples. There was only one instance where an item that was not the highest loading amongst any sample was included following discussion. For the 'interpersonal influence' item on the NSSI subscale, '*my NSSI makes people care about me*' was not the highest loading item, but as there was no consensus across samples on the highest loading item, these items were examined from a theoretical perspective. '*My NSSI makes people care about me*' was thought to clearly represent interpersonal influence, whereas other possible items, such

as '*my NSSI persuades other people to change their mind*' were thought to be more easily
misunderstood.

In two instances, the second highest loading from the subscale was chosen, where
similar loadings existed, but the item was too similar to another item. For example, "*I engage
in NSSI because I deserve to suffer*" was not selected to measure the self-punishment
BNSIBS subscale because "*I attempt suicide to suffer*" had been selected to measure the
BSABS subscale, as inclusion of the two very similar items may have caused confusion. In
one case, "*NSSI makes people care about me*" was chosen to ensure full representation of the
construct, as three different items loaded highest across the three samples, whereas this item
loaded consistently across the samples and showed greater theoretical distinctiveness from
other items.

Missingness

There were relatively small amounts of missing data on some variables in several samples,
which were not Missing Completely At Random (MCAR). MI operates by generating
plausible missing values based on the observed data's distribution. To reflect uncertainty,
random components are integrated into these estimates, producing a series of "complete" data
sets devoid of missing values. Analyses is then conducted separately on each data set, and the
outcomes are amalgamated across data sets using combining rules for multiple imputation
(Schafer & Graham, 1999). Multiple imputation (MI) is increasingly advocated as a preferred
approach for responding to missing data. Evidence indicates that MI performs well across
different circumstances, such as small samples, very large multiple regressions, and when
there are large amounts of missing data (Schafer & Graham, 1999). Missing data were
multiply imputed on all variables at the item level (Gottschall, West, & Enders, 2012) using

SPSS Version 29.0 (IBM Corp, 2024). The number of imputations was matched to the

fraction of missing data (Graham, Olchowski, & Gilreath, 2007).

Significance

Although adjustments like the Bonferroni correction were considered to control for the

increased risk of Type I errors, they were ultimately deemed unnecessary for this analysis.

This decision was based on several factors: the study's primary focus was on pre-specified

hypotheses, minimizing the risk of spurious findings; the number of comparisons was

relatively low with the variety of samples and participants reducing the likelihood of inflated

error rates. As well as this, the tests were closely related, with outcomes expected to be

correlated rather than independent. Therefore, the results presented are based on the original

significance levels, reflecting a careful balance between controlling for errors and

maintaining statistical power. The large sample size also provided robust statistical power,

further mitigating the need for such adjustments

Phase 1 Results

Descriptive Statistics

Table 1 displays means and, standard deviations for samples 5 and 6 .

Internal Consistency

The BSABS internal consistency statistics for the Phase 1 samples are reported in Table 1.

These results (mean a= .75, mean average interitem correlation [AIC] = .30) suggest adequate

internal consistency (Clark & Watson, 1995). AIC of around .15 measure relatively broad

constructs and AIBs of .50 measure relatively narrow constructs (Siddaway et al., 2019). The BNSIBS exhibited similar consistency (mean α = .68, AIC =.18) indicating average strength in relationship between items on the scale.

Test-Retest

Intraclass Correlation Coefficient (ICC) values range from 0 to 1, where values closer to 1 indicate high agreement or reliability. The BSABS ICC value for Sample 5 was 0.68 (95% CI: 0.57 - 0.79), indicating strong stability over time. The ICC value for Sample 6 was also 0.68 (95% CI: 0.57 - 0.79) indicating strong agreement between the test and retest measurements.

The ICC value for the BNSIBS Sample 5 was 0.69 (95% CI: 0.56 - 0.78), indicating substantial agreement between the test and retest measurements. The ICC value for Sample 6 was also 0.66 demonstrating similar agreement between the test and retest measurements.

Associations with Parent Scales

Table 2 displays the correlations between the BSABS total score and the SABS total score across the two Phase 1 samples. The BSABS correlates strongly with the SABS, suggesting the brief scale measures a sizable portion of the wide-ranging content from the longer measure.

Table 3 displays correlations between BNSIBS and NSIBS across the two Phase 1 samples. The BNSIBS correlates strongly with the NSIBS, suggesting the brief scale measures a sizable portion of the wide-ranging content from the longer measure.

Because correlations between the brief and parent scales will be artifactually inflated because of the presence of overlapping items (see Smith, McCarthy, & Anderson, 2000), a sensitivity analysis was run excluding from the parent scales the items included in the

BSABS and BNSIBS. The resultant correlations were similarly strong, indicating on the

BSABS ranged from .90 – .91 and the BNSIBS .75-.91 on Samples 5 and 6

Table 1. *Means, Internal Consistency Reliabilities (Coefficient Alphas), Average Interitem Correlations (AICs), and Test–Retest Reliabilities for the Brief Suicide Attempt Beliefs Scale (BSABS) and Brief Non-suicidal Self-Injury Beliefs Scale (BNSIBS)*

| | Phase 1 | | | | | | | | | | Phase 2 | | | | Phase 3 | | | | | | | | | |
| | Sample 5 (N=664; 130) | | | | | Sample 6 (N=650;135) | | | | | Sample 7 (N=358) | | | | Sample 8 (N=689; 184) | | | | | Sample 9 (N=655;166) | | | | |
Subscales (number of items)	M	SD	α	AIC	ICC	M	SD	α	AIC	ICC	M	SD	α	AIC	M	SD	α	AIC	ICC	M	SD	α	AIC	ICC
BSABS (7 items)	22.54	8.7	.77	.32	.68	23.83	8.46	.76	.31	.68	13.29	8.85	.88	.54	22.32	8.34	.74	.29	.69	22.28	7.40	.63	.19	.58
BNSIBS (10 items)	42.91	8.8	.66	.16	.69	42	10.05	.73	.21	.66	19.54	13.71	.94	.62	43.10	8.34	.63	.14	.70	42.61	8.97	.65	.15	.77

Note. Phase 1 scale development samples; Phase 2 scale evaluation samples; Phase 3 brief cross-validation samples; AIC average interitem correlation.

Phase 2 Method

Participants

Phase 2 utilised the same samples from Phase 1 (Samples 5 & 6) and an additional sample (Sample 7) that was specifically recruited by the lead author of Siddaway et al (2019) in order to validate the brief scales. This sample was unique in that participants who did not have a history of SA or NSSI thoughts were recruited as a control sample. Some participants did not carefully read the study advert; data from participants who endorsed having previously experienced suicidal or NSSI thoughts were removed (N=64). The sample consisted of N=294 participants, 59% females, 83% white, 3.1% mixed multiple ethic groups, 5.1% Asian, 3.7% Black. Ages ranged from 18 to 83 years (M= 22.87, SD = 13.36).

Measures

The BSABS and BNSIBS were used as well as the following instruments for convergent and discriminant analysis. For additional detail regarding the psychometric properties of the following measures, please refer to Siddaway et al. (2019).

Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012). The INQ is a 15-item measure of the belief that other people would be better off without the respondent (Perceived burdensomeness) and a perception of a lack of interpersonal connections (Thwarted belongingness). Items are rated on a 7-point Likert scale ranging from *Not at all true for me* to *Very true for me*.

Suicide Cognitions Scale (SCS; Rudd & Bryan, 2021). The SCS is an 18-item measure of suicidal beliefs. Items are rated on a 5-point Likert scale ranging from *strongly disagree* to *strongly agree*. Although the scale is unpublished, two studies have demonstrated good psychometric properties.

McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini et al., 2003). The MSI-BPD is a 10-item self-report measure which identifies individuals who are likely to meet the diagnostic criteria for Borderline Personality Disorder. Each DSM-IV BPD criterion is assessed with one item on the MSI-BPD, except for the paranoid ideation/dissociative symptoms criterion that is measured with two items on the MSI-BPD. Item 2 assesses intentional physical injury with and without suicidal intent; this item was omitted to avoid confounding results.

Short Form Perceived Stress Scale (PSS; Wartigg, Forshaw, South & White, 2013). The PSS-4 is a 4-item self-report measure of the subjective experience of stress, rated for the past month. Respondents use a 5-point Likert scale ranging from *Never* to *Very often*.

Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet & Farley, 1988). The MSPSS is a 12-item self-report instrument designed to assess perceived social support from family, friends, and significant others. Items are rated on a 7-point Likert scale ranging from *Very strongly disagree* to *Very strongly agree* and a total score is computed.

Brief Experiential Avoidance Questionnaire (BEAQ; Gámez et al., 2014). The BEAQ is a 15-item measure of experiential avoidance, which can be defined as an unwillingness to remain in contact with distressing emotions, thoughts, memories, and physical sensations, even when doing so creates harm in the long run. Items are rated on a 6-point Likert scale ranging from *Strongly disagree* to *Strongly agree*. The scale has reasonable psychometric properties (Gámez et al., 2014).

Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991). The BSS is a 21-item measure of suicide desire, perceived capability to make a SA, and SA plans and preparations. The two optional items (20 and 21) were not administered.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The

DERS is a 36-item self-report measure of difficulties regulating various dimensions of negative emotion. Items are rated on a 5-point Likert scale ranging from *Almost never* to *Almost always*.

Depressive Symptom Inventory-Suicidality Subscale (DSI-SS; Metalsky & Joiner, 1997). The DSI-SS is a 4-item self-report questionnaire designed to identify the frequency and intensity of suicidal ideation and impulses in the past two weeks, rated on a 4-point scale.

Difficulties in Emotion Regulation Scale-Positive (DERS-Positive; Weiss, Gratz & Lavender, 2015). The DERS-Positive is a 13-item self-report measure of difficulties regulating various dimensions of positive emotion. Items are rated on a 5-point Likert scale ranging from *Almost never* to *Almost always*.

Brief Reasons for Living Scale (BRFLS; Ivanoff, Jang, Smyth & Linehan, 1994). The RFL measures reasons for not making a SA across six subscales. Items are rated on a 6-point Likert scale ranging from *Not at all important* to *Extremely important*.

Emotion Reactivity Scale (ERS; Nock, Wedig, Holmberg & Hooley, 2008). The ERS is a 21-item self-report measure of the sensitivity, intensity, and duration of emotions, rated on a 5-point Likert scale ranging from *Not at all like me* to *Completely like me*. The scale has some demonstrated psychometric properties that were based on a single, small sample (Nock et al., 2008).

Subjective Vitality Scale (SVS; Ryan & Frederick, 1997). The SVS consists of 6 items and taps perceptions of being full of energy and alive rated on a 1 (*Not at all true*) to 7 (*Very true*) scale.

Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen & Griffin, 1985). The SWLS is a 5-item measure of participants' global assessments of how satisfied they are

with their lives. Items are rated on a 7-point Likert scale ranging from *Strongly disagree* to *Strongly agree*.

Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999). The SHS contains 4 items that are assessed on a 7-point Likert scale. Two items ask respondents to characterise their happiness using absolute ratings and ratings relative to peers; Two items offer brief descriptions of happy and unhappy individuals and ask respondents the extent to which each characterisation describes them. Responses to the 4 items are combined.

New General Self-Efficacy Scale (Chen et al., 2001). The NGSE is an 8- item instrument designed to assess individuals' beliefs in their own ability to handle a variety of challenging situations and achieve desired goals. The NGSE scale was scored on a 5-point Likert-type scale from strongly disagree (1) to strongly agree (5).

Patient Health Questionnaire (Kroenke, Spitzer & Williams, 2001). The PHQ is an instrument for common mental disorders. The PHQ-9 is the depression module, which scores each of the 9 DSM-IV criteria as "0" (not at all) to "3".

Phase 2 Results

Descriptive Statistics

Table 1 displays the scale means and standard deviations for samples used across the analysis.

Internal Consistency

BSABS Internal consistency statistics for the Phase 2 samples are reported in Table 1. Sample 7's results (mean α = .88, mean average interitem correlation [AIC] = .54) suggest adequate internal consistency (Clark & Watson, 1995). The BNSIBS exhibited excellent consistency (mean α = .94, AIC =.62).

Association with Parent Scale

Results were very similar to those found in Phase 1, with the BSABS and BNSIBS exhibiting strong correlations with their respective parent scales. With the brief items omitted for a sensitively analysis, the BSABS resulted in scores of $r = .94$ and the BNSIBS $r = .97$, near perfect correlations.

Convergent and Divergent Validity

Table 2 and 3 displays the association of the BSABS and the BNSIBS with various clinical and wellbeing measures across the three samples. The BSABS and the NSIBS demonstrated small to moderate positive correlations with measures of suicidal thinking, burdensomeness, thwarted belongingness, experiential avoidance, difficulties in regulating emotion and emotion reactivity. The BSABS and NSIBS showed a small negative correlation with BPD symptoms, perceived stress, satisfaction with life, reasons for living, and vitality.

To further interrogate relationships to compare the psychometric properties of the brief and parent scales, follow-up significance analyses were run using the Williams modification of Hotelling's Test for two correlations with one common variable (Kenny, 1987). No statistically significant differences were observed in the correlations between the brief and parent scales and other measures.

Table 2. Associations Between the Brief Suicide Attempt Belief Scale (BSABS) Total Score, Suicide Attempt Belief Scale (SABS) Total Score and a range of Clinical & Wellbeing Measures Total Scores

	Phase 2						Phase 3	
	SABS	BSABS	SABS	BSABS	SABS	BSABS	BSABS	
Measure	**S5**		**S6**		**S7**		**S8**	**S9**
Suicide Cognitions								
SABS		.96		.95		.97		
SCS	.41	.44					.50	
INQ	.28	.29					.35	
BSS	.47	.47					.50	
Avoidance related								
BEAQ	.29	.31					.22	
Quality of Life								
PSS	.08	.05					.13	
MPSS	-.26	-.27					-.18	
SVS			-.17	-.17	-.22	-.21		-.21
SWLS			-.19	-.19	-.15	-.13		-.17
SHS			-.20	-.20				
BRFLS			-.09	-.07				
Negative Emotionality								
DERS			.24	.25				.29
DERSP			.30	.30				.01
ERS			.26	.28				.33
Psychopathology								
DSISS			.31	.30				
MSI-BPD	-.37	-.39					.25	
NGSES					-.01	-.01		-.19
PHQ					.18	.14		

Note. INQ= Interpersonal Needs Questionnaire (Van Orden et al., 2012); SCS= Suicide Cognitions Scale (Bryan et al., 2014); MSI-BPD= McLean Screening Instrument for Borderline Personality Disorder (Zanarini et al., 2003); PSS= Short Form Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983); Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet & Farley, 1988); BEAQ= Brief Experiential Avoidance Questionnaire (Games et al., 2014); BSS=Beck Scale for Suicide Ideation (Beck & Steer, 1991); DERS=Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004); DSISS=Depressive Symptom Inventory-Suicidality Subscale (Metalsky & Joiner, 1997); DERS-P= Difficulties in Emotion Regulation Scale-Positive (Weiss, Gratz & Lavender, 2015); BRFLS= Brief Reasons for Living Scale (Ivanoff, Jang, Smyth & Linehan, 1994); ERS=Emotion Reactivity Scale (Nock et al., 2008); SVS=Subjective Vitality Scale (Ryan & Frederick, 1997); SWLS= Satisfaction with Life Scale (Diener, Emmons, Larsen & Griffin, 1985); SHS=Subjective Happiness Scale (Lyubomirsky & Lepper, 1999); NGSE= New General Self Efficacy Scale (Chen et al., 2001); PHQ= Patient Health Questionnaire (Kroenke, Spitzer & Williams, 2001)

Table 3. Associations Between the Brief Non-suicidal Self Injury Belief Scale (BNSIBS) Total Score, Non-suicidal Self Injury Belief Scale (NSIBS) Total Score and a range of Clinical & Wellbeing Measures Total Scores

Measure	Phase 2						Phase 3	
	NSIBS	BNSIBS	NSIBS	BNSIBS	NSIBS	BNSIBS	BNSIBS	
	S5		**S6**		**S7**		**S8**	**S9**
NSSI Cognitions								
NSIBS		.95		.95		.98		
Suicide Cognitions								
SCS	.26	.25					.35	
INQ	.30	.30					.26	
BSS	.13	.10					.26	
Avoidance related								
BEAQ	.31	.33					.28	
Quality of Life								
PSS	.06	.07					.13	
MPSS	-.08	-.09					-.06	
SVS			-.20	-.26	-.20	-.20		-.28
SWLS			-.18	-.19	-.13	-.14		-.13
SHS			-.20	-.20				
BRFLS			-.01	-.01				.00
Negative Emotionality								
DERS			.39	.35				.30
DERSP			.32	.30				
ERS			.37	.33				.34
Psychopathology								
DSISS			.27	.28				
MSI-BPD	-.35	-.34					.25	
NGSES					.04	.02		-.14
PHQ					.16	.15		

Note. Measures as Table 2

Phase 3 Method

Participants

Phase 1 and Phase 2 results were established using datasets where the full 26-item SABS and 39-item NSIBS were administered (i.e., incorporated among 47 other items and in a different order of presentation). To explore whether the brief instruments would generate similar results when administered alone, the 7-item BSABS and the 10-item NSIBS were administered to two new samples (N=1,345). Other measures were also administered to assess discriminant and convergent associations. It was anticipated that the BSABS and BNSIBS would demonstrate similar psychometric properties and yield results comparable to those found in the Phase 1 and Phase 2 analyses. The BSABS and BNSIBS were completed a second time after 2–4 weeks to compute test–retest reliability. Sample 8 consists of 66.9% females, 68.1% white, 3.6% mixed multiple ethic groups, .6% Asian with 24% missing demographic data. Ages ranged from 18 to 72 years (M= 26.55, SD = 10.01). Sample 9 consists of 64.2% females, 65% white, 2.4% mixed multiple ethic groups, .6% Asian with 28% missing demographic data. Ages ranged from 18 to 66 years (M= 26.52, SD = 9.88)

Measures

Samples 8 and 9 utilised the same measures in Phase 2, which are outlined above.

Missingness

There was a small amount of missing data. The same approach was taken to addressing Missingness as had been used for the Phase 1 and 2 samples.

Phase 3 Results

Descriptive statistics

Table 1 displays the scale means and standard deviations for samples used across the

analysis. The Phase 3 means for the BSABS and BNSIBS was nearly identical to Phase 1

samples (Table 1). Phase 3 samples were representative of participants with a similar history

of SA and NSSI as Phase 1 samples.

Internal consistency

BSABS Internal consistency statistics for the Phase 3 samples are reported in Table 1. These

results (mean α = .7, mean average interitem correlation [AIC] = .24) suggest adequate

internal consistency (Clark & Watson, 1995). The BNSIBS exhibited similar consistency

(mean α = .63, AIC =.15) indicating moderate strength in relationship between items on the

scale.

Test -Retest

The BSABS ICC values ranged from .69 - .51 indicating moderate agreement between the

test and retest measurements. The BNSIBS ICC values ranged from .70 - .77 demonstrating

excellent agreement between the test and retest measurements.

Association with related measures

Table 2 and 3 displays the association of the BSABS and the BNSIBS with a range of clinical

and wellbeing measures. Associations are very similar to those found in the Phase 2 samples.

The mean of absolute differences in correlations between the Phase 2 samples is less than .05,

with no consistent pattern toward stronger or weaker.

Incremental validity

The incremental validity of the BSABS and BNSIBS was explored in a series of multivariate hierarchical regressions.

Current suicidal thoughts The BSABS demonstrated a statistically significant R^2 of .03 in predicting current suicidal thinking as measured by the BSS total when controlling for a broad range of variables. Perceived Burdensomeness (INQ) ($\beta = 0.278$, $p < .001$), Stress ($\beta = 0.03$. $p=0.01$), Social Support ($\beta =-0.38$ $p<0.001$ and Experiential Avoidance (BEAQ) ($\beta =0.06$, $p<0.001$). The model was statistically significant, accounting for a significant proportion of the variance in current suicidal thinking ($R^2 = .47$). BSABS and INQ had the strongest positive relationships with current suicidal thinking followed by Experiential Avoidance. When controlling for these variables, the predictive ability of the model improved slightly (Cox and Snell R^2 increased by 0.02), indicating a more accurate representation of current suicidal thoughts variance explained by the predictors.

Lifetime suicide attempts The BSABS ($\beta = 0.320$, $p < .001$), BNSIBS ($\beta =-0.016$, $p < .001$), INQ ($\beta = 0.033$, $p < .001$), BEAQ ($\beta = -0.002$, $p = 0.297$) and social support ($\beta = -0.206$, $p < .001$) significantly predicted lifetime suicide attempts when accounting for a broad range of variables ($R^2=.25$). The correlations between the predictors and the number of suicide attempts ranged from moderate to strong (0.138 to 0.434), indicating meaningful relationships. Scores on the BSABS, INQ and presence of social support emerged as important factors influencing the frequency SA.

NSSI thoughts The BSNIBS ($\beta=0.598,p<.001$) statistically significantly predicted lifetime suicide thoughts when controlling for a broad range of variables including the BSABS, Satisfaction with life, Negative Emotion (DERS) and Emotion Reactivity (ERS). The regression model yielded an R^2 value of 0.30. The adjusted R^2 was 0.299, suggesting that the

model's explanatory power remains robust when accounting for the number of predictors. The BSABS predictor showed a negative and significant relationship ($\beta=-0.247, p<.001$) with NSSI thoughts, indicating that the more favourable cognitions about suicide resulted in lower prevalence of NSSI thoughts.

Lifetime NSSI The BSNIBS ($\beta=0.574, p<.001$) statistically significantly predicted lifetime suicide thoughts when controlling for a broad range of variables including the BSABS, satisfaction with life, DERS and ERS The regression model demonstrated a statistically significant relationship with an R^2 value of 0.298, indicating that approximately 29.8% can be explained by the predictors included in the model. The results highlight the complex nature of factors influencing non-suicidal self-injury behaviours.

BSABS Group Differences

A series of analysis of variance (ANOVA) were completed to explore group differences on the BSABS, comparing individuals who reported (current suicidal thoughts and lifetime behaviour) in SA thoughts and behaviour across the scores.

A one-way between groups ANOVA was conducted to explore the impact of a history of SA thoughts on BSABS scores (Table 4). Participants were divided into three groups according to lifetime frequency of thoughts of suicide (Group 1: Never, Group 2: Once, Group 3: 2+ Times). There was a statistically significant difference at $p<.05$ level in BSABS scores for the 3 groups: F=129.03 (Sample 9). The effect size, as calculated by eta squared was $\eta^2=.06$, indicating significance. Post hoc comparison using the Games-Howell test indicated that individuals who reported thinking about suicide 2+ times (Group 3) had significantly higher mean scores compared to those who reported thinking about suicide Once or Never. (See Table 4).

An additional one-way between groups ANOVA was conducted to explore the impact of a history of SA behaviour on scores in the BSABS. Participants were divided into identical groups as above. There was a statistically significant difference at $p<.05$ level in BSABS scores for the 3 groups: F= 507.17 (Sample 8).The effect size, as calculated by eta squared was $\eta^2=.07$. Post hoc comparison using the Games-Howell test indicated that individuals who reported attempting SA 2+ times have a significantly higher mean compared to those who reported attempting SA Once or Never. There is a trend of increasing mean scores on BSABS with increasing frequency of SA (Table 6). Similar significance is demonstrated in Sample 9 (See Table 4).

Additional analysis explored SA Recency with significant outcomes. These are highlighted in Table 5.

BNSIBS Group Differences

A one-way between groups ANOVA was conducted comparing individuals who reported (current NSSI thoughts and lifetime behaviour) in NSSI thoughts and behaviour across the scores (Table 6). Participants were divided into three groups according to their frequency of thoughts of NSSI (Group 1: Never, Group 2: Once, Group 3: 2+ Times). There was a statistically significant difference at $p<.05$ level in BNSIBS scores for the 3 groups: F=455.65 (Sample 9). The effect size, as calculated by eta squared was .21. Post hoc comparison using Games-Howell test indicated that individuals who reported 2+ had significantly higher mean scores compared to all other groups.

An additional one-way between groups ANOVA was conducted to explore the impact of a history of NSSI behaviour on scores in the BNSIBS (Table 6). Participants were divided into identical groups as above. There was a statistically significant difference at $p<.05$ level in BSABS scores for the 3 groups: F= 29.17 (Sample 8).The effect size, as calculated by eta

squared was η^2=.01 Post hoc comparison using the Games-Howell test indicated a trend of increasing mean scores on the BNSIBS with increasing frequency of NSSI behaviour. Notably, individuals who engaged in NSSI 2+ times had the highest mean scores among all other groups. Similar significance is demonstrated in Sample 9 (See Table 6).

Additional analysis explored NSSI Recency with significant outcomes. These are highlighted in Table 7.

Gender

A one-way between groups ANOVA was conducted to explore the impact of Gender on scores on the BSABS and BNSIBS (Table 8). Post-Hoc Game-Howell Analysis highlighted that among gender groups there were significant differences in mean scores on the BSABS (Group 1: Males, Group 2: Females) (Table 8). The mean difference BSABS between males and females is statistically significant (mean difference = 5.07, $p < 0.001$), indicating that males reported higher mean scores compared to females. Post Hoc Games-Howell Analysis highlighted that among the gender groups there were slight variations in mean scores on the BNSIBS.

Table 4. *Suicide Attempt Thoughts and Behaviour History Group Differences for the Brief Suicide Attempt Beliefs Scale (BSABS)*

| | | History of SA thoughts | | | | | | History of SA behaviour | | | | | | |
| | | Sample 8 *(N=689)* | | | Sample 9 *(N= 656)* | | | Sample 8 *(N=689)* | | | Sample 9 *(N=656)* | | |
Scale	Group	*M*	SD	*F*-statistic	*M*	SD	F-statistic	Group	*M*	SD	*F*-statistic	*M*	SD	*F*-statistic
BSABS	0	12.22	8.00	315.20***	14.75	7.16	129.02*	0	17.94	8.97	507.17***	19.89	8.65	127.00*
	Once	0	0		14.00	7.08		Once	23.43	6.57		21.60	6.88	
	2+	22.32	8.34		22.77	7.15		2+	25.19	5.95		24.11	5.88	

Note. * = $p < .05$ (1-tailed); *** = $p < .001$ (1-tailed); all post-hoc analyses applied the Games-Howell post-hoc test, which does not assume equal group sizes or homogeneous variances

Table 5. *Suicide Attempt Thoughts and Behaviour Recency Group Differences for the Brief Suicide Attempt Beliefs Scale (BSABS)*

| | | Recency of SA | | | | | | Recency of SA thoughts | | | | | | |
| | | Sample 8 *(N=689)* | | | Sample 9 *(N= 656)* | | | Sample 8 *(N=689)* | | | Sample 9 *(N=656)* | | |
Scale	Group	*M*	SD	*F*-statistic	*M*	SD	F-statistic	Group	*M*	SD	*F*-statistic	*M*	SD	*F*-statistic
BSABS	0	17.94	8.97	252.72***	19.98	8.65	55.70*	0	12.22	8.00	91.68*	14.75	7.16	98.48*
								Today	26	7.16		26.42	4.49	
	Past 2 Weeks	30.80	3.20		27.17	3.69		Past 2 Weeks	23.93	7.19		23.19	7.18	
	Past Month	27.53	5.21		25.40	2.88		Past Month	22.55	9.30		21.62	7.48	

Note. As of Table 4

Table 6. *NSSI Thoughts and Behaviour History Group Differences for the Brief Non-suicidal Self Injury Scale (BNSIBS)*

| | | History of NSSI thoughts | | | | | | History of NSSI behaviour | | | | | |
| | | Sample 8 (N=689) | | | Sample 9 (N= 656) | | | Sample 8 (N=689) | | | Sample 9 (N=656) | | |
Scale	Group	*M*	SD	*F*-statistic	*M*	SD	F-statistic	Group	*M*	SD	*F*-statistic	*M*	SD	*F*-statistic
BNSIBS	0	42	14.53	1.89*	27.57	9.72	455.65***	0	38.67	15.22	29.10*	29.67	11.31	675.56***
	Once	0	0		10.00	.00		Once	35.00	00		0.00	0.00	
	2+ times	43.13	8.10		43.48	7.82		2+ times	43.10	7.77		42.61	7.91	

Note. As of Table 4

Table 7. *NSSI Thoughts and Behaviour Recency Group Differences for the Brief Non-suicidal Self-Injury Beliefs Scale (BNSIBS)*

| | | Recency of NSSI | | | | | | Recency of NSSI thoughts | | | | | |
| | | Sample 8 (N=689) | | | Sample 9 (N= 656) | | | Sample 8 (N=689) | | | Sample 9 (N=656) | | |
Scale	Group	*M*	SD	*F*-statistic	*M*	SD	F-statistic	Group	*M*	SD	*F*-statistic	*M*	SD	*F*-statistic
BNSIBS	0	38.67	15.23	86.09*	29.67	11.30	217.67***	0	42	14.53	123.22***	27.57	9.72	275.39***
	Today	48.40	7.46		49.10	4.71		Today	46.55	6.50		47.46	5.17	
	Past 2 Weeks	46.00	6.79		46.19	6.00		Past 2 Weeks	44.20	7.53		43.40	6.58	
	Past Month	43.88	6.56		43.95	7.52		Past Month	40.00	8.34		41.40	6.84	

Note. As of Table 4

Table 8. *Gender Group Differences for the Brief Suicide Attempt Beliefs Scale (BSABS) and Brief Non-suicidal Self-Injury Beliefs Scale (BNSIBS)*

Scale	Gender						
		Sample 8 (N=689)			Sample 9 (N= 656)		
	Group	*M*	SD	*F*-statistic	*M*	SD	F-statistic
BSABS	Male	27.25	7.13	16.556*	23	.00	6.78*
	Female	22.17	8.56		22.14	6.96	
BNSIBS	Male	42	6.40	6.33*	52	0	16.01*
	Female	43.29	8.20		42.56	8.82	

Note. As of Table 4

Summary

Taken together, these results indicate that isolating and reordering the SABS and NSIBS items into reduced 7-item scale and 10-item scale does not alter the conclusions drawn from the original scale development and evaluation samples. More generally, the basic psychometric properties of the BSABS and BNSIBS replicate well across the samples.

Discussion

The psychometric properties of the BSABS and the BNSIBS were evaluated across five samples. The newly developed brief scales demonstrated strong internal consistency among participants who report a history of SIB as well as those without a history of this behaviour. As anticipated, the scales showed significant positive correlations with measures of perceived burdensomeness, suicidal cognitions, depression, and hopelessness. Mean scores on the BSABS and the BNSIBS were statistically significant across groups measuring the frequency and history of SA and NSSI. Analysis highlighted that higher mean scores on the BSABS and the BNSIBS showed higher propensity towards SIC and SIB. The scales also demonstrated good test-retest reliability across 2-4 weeks suggesting that responses to the measures are relatively stable across time demonstrated through the Interclass Correlation Coefficient, consisting with the notion that the scales measure relatively enduring personal meanings about SIB. No statistically significant differences between the brief scales and their parent scales emerged when comparing with other measures identified through Pearson correlation analysis in Tables 3 and 4, indicating that they could be used interchangeably with little statistical impact.

Advantages of the BSABS & BNSIBS

Previous conceptual debate surrounding SIB measures resulted in a range of instruments developed to measure the content of SIC. However, the SABS and NSIBS were explicitly designed to measures beliefs around NSSI and SA (Siddaway et al., 2019). This novel approach was unique to the parent scales, giving them high clinical utility. Identifying a link between what individuals believe about SIB and their

propensity to engage in this behaviour is a significant turning point that directs the focus of future research, clinical intervention, and treatment of this behaviour.

Although the SABS and NSIBS were outlined to measure SICs as above, their length (26-items, 39-items) may be impractical for certain uses. The BSABS is 73% shorter and the BNSIBS 74% shorter, reducing administration time significantly. The BSABS and the BNSIBS tap into much of the same content and exhibit identical convergent and discriminant associations as the full instrument (see Tables 4 & 5).

Strengths and Limitations

The development of the scales was informed by factor analytic techniques, across multiple samples, increasing the generalisability of the scales and demonstrating their relevance for a wide range of individuals. Furthermore, the development of the scales included test-retest reliability, allowing for the relative consistency to be demonstrated over a specific time.

The findings need to be considered in light of the study limitations. Firstly, the lack of diversity in some samples could impact generalisability of some of the conclusions. The data were limited to self-report methodology and therefore vulnerable to the limits of that single method. Self-report measures are vulnerable to memory bias and lack can lack temporal precision. Finally, all of the data were collected online and therefore represent only those who are able to access the internet easily.

Clinical Implications

When working clinically with someone with a history or propensity towards SIB, thorough assessment is needed on the specific detail of what the person is currently thinking about SIB. Understanding the specific content of an individual's SIC and

beliefs is a vital prerequisite to accurate and effective risk management, formulation, prediction, and intervention. The BSABS and the BNSIBS will make it easier and quicker for clinicians to facilitate understanding and assessment, while screening for risk. This will contribute earlier towards identification and will inform earlier intervention and prevention The BSABS and the BNSIBS also provide a useful variable for SIC in research where the research study may not have sufficient space for the SABS and BSABS. However, in-keeping with the evidence-base and the NICE guidelines for this area, it's advised against using the brief scales as a screening tool or to determine treatment allocation (NICE, 2022). It is advised that the BNSIBS and BSABS be used as a supplementary tool alongside rigorous clinical assessment. However, it is also contingent on further assessment of the performance of these tools in clinical practice. This is an avenue that future research that may seek to consolidate these findings.

The shift toward therapeutic, person-centred risk assessment and management highlighted by Hawton et al. (2022) and Ernst et al. (2024) is especially relevant in light of the development of the BSABS and BNSIBS. Traditional risk prediction models have repeatedly fallen short in capturing the complex and fluctuating nature of suicide risk, as these models often rely on static assessments that fail to reflect real-time changes in an individual's thoughts and feelings. The introduction of the brief scales complements this emerging understanding by offering a practical, efficient tool that can quickly assess self-injurious beliefs, while maintaining the necessary depth for accurate risk evaluation. This aligns with the broader call for assessments that go beyond static risk scores and engage patients in a therapeutic dialogue about their beliefs and intentions, enabling more responsive and individualized care. Incorporating the BSABS and BNSIBS into clinical practice could help bridge the gap between lengthy

assessments and the need for dynamic, flexible tools that enhance early identification and intervention.

Finally, the BSABS and BNSIBS add to the growing body of research that investigates the impact of SIC on SIB. They contribute to emerging evidence that suggest NSSI and SA are better conceptualised as separate, but similar phenomena. Ongoing research will continue to elucidate this relationship in the hopes that prediction and preventing of SA and NSSI becomes more sensitive and accurate.

Conclusion

The initial validation of the BSABS and the BNSIBS demonstrate that the instruments are suitable for the measurement of SIB and NSSI amongst community population and result in similar scores as the parent measures. These scales are quick for researchers and clinicians to administer and score, and places less burden on participants in comparison with the parent scales. It is hoped that the development of these scales will lead to their regular measurement in therapeutic settings, where response burden is known to be problematic.

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Appendices

Appendix 1: PRISMA Checklist

Section and Topic	Item #	Checklist item	Page where item is reported
TITLE			**11**
Title	1	Identify the report as a systematic review.	11
ABSTRACT			**12**
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	12
INTRODUCTION			**13**
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	14
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	17
METHODS			**17**
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	17
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	17
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	17
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	18
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	18
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	18
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	18
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	21
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	21

Section and Topic	Item #	Checklist item	Page where item is reported
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	19
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	24
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	24
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	24
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	19
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	20
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	19
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	20
RESULTS			20
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	20
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	20
Study characteristics	17	Cite each included study and present its characteristics.	24
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	20
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	24
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	24
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	24
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	25
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	25
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	24

Section and Topic	Item #	Checklist item	Page where item is reported
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	25
DISCUSSION			31
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	31
	23b	Discuss any limitations of the evidence included in the review.	33
	23c	Discuss any limitations of the review processes used.	33
	23d	Discuss implications of the results for practice, policy, and future research.	34
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	17
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	17
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	17
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	n/a
Competing interests	26	Declare any competing interests of review authors.	
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	17

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Appendix 2: Ethical Approval

University of Glasgow

Professor Rory O Connor

MVLS College Ethics Committee   200220433

Development and Validation of the Brief Suicide Attempt Beliefs Scale (BSABS) and the Brief Nonsuicidal Self-Injury Beliefs Scale (BNSIBS)

The College Ethics Committee has reviewed your application and has agreed that there is no objection on ethical grounds to the proposed study. We are happy therefore to approve the project, subject to the following conditions

- Use of data is in keeping with original approvals given by participants.

- The data should be held securely for a period of ten years after the completion of the research project, or for longer if specified by the research funder or sponsor, in accordance with the University's Code of Good Practice in Research: (http://www.gla.ac.uk/media/media_227599_en.pdf)

- The research should be carried out only on the sites, and/or groups defined in the application.

- Any proposed changes in the protocol should be submitted for reassessment, except when it is necessary to change the protocol to eliminate hazard to the subjects or where the change involves only the administrative aspects of the project. The Ethics Committee should be informed of any such changes.

- You should submit a short end of study report within 3 months of completion.

Yours sincerely

Terry Quinn

FWSO, FESO, MD, FRCP, BSc (hons), MBChB (hons)

Reader / Honorary Consultant

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The University of Glasgow, charity number SC004401

Appendix 3. Final Approved Major Research Proposal

Accessible from this link: https://osf.io/746rz

Appendix 4: STROBE Checklist

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page No.
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	41
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	44
Introduction			**45**
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	45
Objectives	3	State specific objectives, including any prespecified hypotheses	49
Methods			**50**
Study design	4	Present key elements of study design early in the paper	45
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	51
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	51
		Case-control study—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls	
		Cross-sectional study—Give the eligibility criteria, and the sources and methods of selection of participants	
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed	N/A
		Case-control study—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	51
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement).	50

		Describe comparability of assessment methods if there is more than one group	
Bias	9	Describe any efforts to address potential sources of bias	51
Study size	10	Explain how the study size was arrived at	
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	53
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	53
		(*b*) Describe any methods used to examine subgroups and interactions	54
		(*c*) Explain how missing data were addressed	53
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed	53
		Case-control study—If applicable, explain how matching of cases and controls was addressed	
		Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	

Results

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	51, 56, 63
		(b) Give reasons for non-participation at each stage	51
		(c) Consider use of a flow diagram	n/q
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	51, 56, 63
		(b) Indicate number of participants with missing data for each variable of interest	53
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	53
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	*53*
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	*53*
		Cross-sectional study—Report numbers of outcome events or summary measures	*54*
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	59, 64, 65
		(*b*) Report category boundaries when continuous variables were categorized	64-67
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	64-67

Discussion 72

Key results	18	Summarise key results with reference to study objectives	72
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	73
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	72

| Generalisability | 21 | Discuss the generalisability (external validity) of the study results | 73 |

Other information

| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | N/A |

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Appendix 5: O'Connor, Ferguson, Green and O'Connor (2016) Quality Assessment Framework

Criteria	0	1	2	3
Design	Cross-sectional	Case Controlled	Longitudinal	
Sample Size/ Power	Total sample <56	Total sample >56 but unequal group sizes (if applicable)	Total sample >56 participants, approximately equal group sizes (if applicable)	
Suicide Assessment	No mention of how SA history was assessed	Hospital admissions where intent has not been established; suicide items from a validated diagnostic/ mood rated scale	Hospital admissions where intent has not been established; suicide items from a validated diagnostic/ mood rated scale e.g., HDRS, BDI, SADS	Clinical interview: validated suicide scale (e.g. SIS, SAS) hospital admission where intent has been established; death certificate/ cause of death register.
NSSI Assessment	Not reported/ not assessed	Non-validated scale or other means of self- reporting (e.g. single scale)	Clinical interview or validated scale e.g. (ISAS, SITBI, DSHI)	
Self-Punishment Assessment	No mention of how self-punishment was assessed	Non-validated scale or other means of self- reporting (e.g., single scale)	Clinical interview or validated scale e.g. SABS, NSABS,	
Confounding Variables	No attempt to control for confounding factors in recruitment or analysis	Accounts for basic confounding variables either during recruitment or analysis e.g. age, gender	Accounts for basic confounding variables either during recruitment or analysis e.g medication use/ substance abuse, comorbid psychiatric conditions	

Appendix 6: Brief Suicide Attempt Belief Scale (BSABS)

1.	Attempting suicide helps me fit in with other people	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
2.	People think that my suicide attempt(s) are selfish	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
3.	I attempt suicide because I deserve to suffer	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
4.	Attempting suicide makes other people help me	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
5.	Attempting suicide stops upsetting thoughts going round and round in my mind	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
6.	Attempting suicide is the only method of coping that works for me	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
7.	Attempting suicide is a way to get back at people who have hurt me	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree

Appendix 7: Brief Non-Suicidal Self Injury Belief Scale (BNSIBS)

	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
1. NSSI helps me escape negative emotions	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
2. NSSI is an expression of my self-hatred	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
3. NSSI stops me feeling numb	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
4. NSSI makes people care about me	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
5. People judge and criticise my NSSI	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
6. I cannot cope without NSSI	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
7. NSSI makes my problems worse	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
8. I deliberately use NSSI to avoid acting on suicidal thoughts	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
9. NSSI is enjoyable	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree
10. NSSI helps me get accepted by some people	Strongly Disagree	Moderately Disagree	Mildly Disagree	Neither Disagree nor Agree	Mildly Agree	Moderately Agree	Strongly Agree