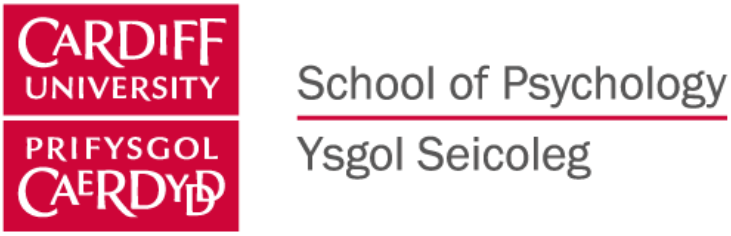

Understanding suicidality: A systematic review of the psychological protective factors for older adults and an empirical study of mental images of suicide and experiential avoidance

Thesis submitted in partial fulfilment of the requirement for the degree of:

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Preface

Suicide is a pressing global health issue, with a significant number of individuals dying by suicide each year. It remains one of the leading causes of death worldwide, with one in every 100 deaths being attributable to suicide. As such, it is crucial to understand the factors that increase and reduce suicide risk to identify those in greatest need of intervention and to inform the development of effective prevention programs. The research described in this thesis seeks to explore the impact of psychological factors on suicidality in younger and older adults. Firstly, a systematic literature review was completed to identify the psychological factors that could protect against suicide in older adults. Secondly, an empirical study explored the relationship between the psychological processes of suicide-related mental imagery and experiential avoidance in a university student sample.

Suicide rates in older adults are amongst the highest of any age group in developed countries. However, an understanding of the psychological factors that could reduce suicidal thoughts and behaviours in this population is limited. The aim of the systematic review was to identify psychological factors that could protect against suicidal thoughts and behaviours in adults aged 65 years and over. Seventeen papers were identified, which explored the influence of a variety of psychological factors in mitigating suicidal thoughts and behaviours. The review found that older adults with greater meaning and purpose in life, higher psychological wellbeing and satisfaction with life, and adaptive coping skills were less likely to experience suicidal thoughts. However, the findings of the review were based on limited data sets, with the quality of the papers varying in strength. Further research is needed to explore the influence of these psychological factors on suicidal thoughts and behaviours over time, as well as making comparisons on the protective influence of these factors across more defined

age groups and populations. The psychological factors identified in the review should be considered in both suicide risk assessment and for informing the development of clinical interventions. During risk assessment, practitioners should seek to explore an older person's sense of meaning in life, psychological wellbeing, satisfaction with life, and coping style, to identify those at greater and lesser risk. In addition, interventions or therapies aimed at reducing suicide in older adults should seek to enhance the psychological factors identified in this review. Robust evaluations should be conducted alongside the implementation of these factors to ensure future interventions are evidence based.

The objective of the empirical research was to investigate the potential relationship between two psychological constructs previously associated with an elevated risk of suicide. The sample consisted of 197 university students in Wales who completed online questionnaires of suicide-related mental imagery, experiential avoidance, and suicidality. Suicidal mental imagery refers to the visual contemplation of suicide, as opposed to verbal contemplation, with prior research indicating that individuals who experience mental images of suicide are at a heightened risk. Experiential avoidance describes attempts to suppress, control, or eliminate internal experiences (i.e., thoughts, emotions, memories, sensations) that are distressing. The empirical research examined the predictive nature of suicidal mental imagery on experiential avoidance, as well as the role that experiential avoidance plays in the relationship between suicide-related mental images and suicidality. The research found that those with greater experiences of suicide-related mental imagery had a greater inclination towards engaging in experiential avoidance. Suicide-related mental imagery also predicted levels of experiential avoidance and suicidality. In contrast to previous research, experiential avoidance was not found to predict suicidality, and concerns regarding the validity of the experiential avoidance measure used in prior research are discussed. This research highlights the need for clinicians

to assess the presence of mental images of suicide, and not verbal thoughts alone, when exploring a client's suicide risk. Moreover, the research identifies the significance of exploring the specific nature of suicidal mental imagery experienced by clients, with exploratory analysis revealing that "suicidal daydreaming" may serve as a more pronounced indicator of suicide risk compared to intrusive suicide-related mental imagery. The research also raises an interesting idea for clinicians to consider, with this being that promoting the notion of 'thoughts are just thoughts' may unintentionally downplay the gravity of experiencing mental images of suicide on suicide risk.

Overall, this thesis provides important insights into the role of psychological factors in suicide risk, highlighting the need for continued research in this area to inform more effective prevention and intervention strategies.

Psychological factors protecting against suicidality in older adults: A systematic review of the literature

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Paper 1

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Abstract

Objective: Suicide rates in older adults are often the highest of any age group, particularly among developed nations. However, there is a limited understanding of the factors that could protect against suicidality in older age. This systematic review aimed to identify and evaluate the psychological factors that protect against suicidality in older age.

Method: EMBASE, MEDLINE, PsychINFO and Scopus were searched. Papers were quality assessed using the Quality Assessment with Diverse Studies tool (QuADS).

Results: 17 papers were included and narratively synthesised. The protective factors identified were: meaning/purpose in life, reasons for living, coping, psychological wellbeing, life satisfaction, personality, cognitive functioning, and sense of belonging. Factors that showed greatest empirical promise for protecting against suicide in old age included: meaning/purpose in life, psychological wellbeing, coping and life satisfaction. There were mixed results for cognitive functioning, with some research identifying greater cognitive functioning correlating with lower suicide ideation, and other research not showing this relationship.

Conclusion: Several psychological factors identified in this review could be tentatively included in interventions aimed at reducing suicide in OA. Further research is required, as methodological limitations constrain the generalisability of the findings.

Key words: Suicide; Suicidality; Protective factors; Older adulthood; Resilience

Introduction

Suicide is a global public health issue, with more than 700,000 people dying by suicide each year, the equivalent of one person every 40 seconds (World Health Organization, n.d.). Suicide rates in older adulthood are often the highest of any age group, particularly among developed nations (Moutier et al., 2021). Data from the Global Burden of Disease Study estimates the annual rate for suicide in those aged 70+ being 27.45 per 100,000 compared to 16.17 in people aged 50-69 and 11.6 in 15-49 age group (Naghavi, 2019). Moreover, suicide in older age is characterised by less impulsive acts, higher levels of intent and more successful methods (Cai et al., 2022; Draper, 2014). Given these high rates, an understanding of the protective factors that reduce suicide risk in older adulthood is of great importance in the prevention of suicide.

Much research has focused on factors that increase the risk of suicide in older adults (OA). Life events such as retirement, widowhood, comorbid physical illness, and functional limitations all might increase the vulnerability of OA to suicide (Conejero et al., 2018). Identified sociodemographic risk factors for suicide in older age include social isolation, being widowed or single and living alone (Bonnewyn et al., 2009; Fässberg et al., 2012; Sinyor et al., 2016). Clinical risk factors include functional disability, specific physical illness (including liver disease, male genital disorders, and arthritis/arthrosis), depression and dementia (Fässberg et al., 2016; Lutz & Fiske, 2018; Sinyor et al., 2016). A recent systematic review found the following risk factors to be most associated with suicide attempts in older age: depressive disorders, methods employed to self-harm (particularly poisoning), and prescription of psychotropic medication (Beghi et al., 2021). Furthermore, male gender, any psychiatric disorder (depression, anxiety and bipolar disorders), stressors/bereavement, and living alone were also identified as significant predictors of completed suicides in later life.

The understanding of protective factors against suicide in older adults is more limited compared to research on risk factors (Centers for Disease Control and Prevention [CDC], 2022). Protective factors can be defined as "societal or psychosocial conditions or individual behaviours that lessen the likelihood that an individual will engage in suicidal behaviour" (McLean et al., 2008, p. 15). They are conceptualised as factors that promote resilience and healthy survival amongst people known to be exposed to suicidal risk conditions, and are not merely the inverse of risk factors, or the absence of them (McLean et al., 2008). An understanding of the protective factors that reduce suicidality is important in formulating potential interventions for suicide (Lapierre et al., 201l). A previous review of the literature, looking at both systematic reviews and primary studies of populations including adolescents, veterans, psychiatric patients, and victims of domestic abuse, identified protective factors such as coping skills, hopefulness, physical activity and health, social support, family connectedness and supportive schools (McLean et al., 2008). However, this review did not focus on protective factors relevant to older adults, which is important as societal and psychosocial conditions are likely to be different across the life stages, indicating protective factors could vary across the life span (Windsor & Anstey, 2010). More understanding is required to identify the protective factors against suicide in OA. This can help design interventions that reduce risk factors and increase protective factors.

The are two known systematic reviews which set out to identify factors protecting against suicide in OA (Holm & Severinsson, 2015; Yoon & Cummings, 2019). Holm & Severinsson (2015) identified psychosocial risk and protective factors in OA aged 59+ using a thematic analysis approach. From 12 quantitative papers, they identified risk factors categorised into four themes: burden to others, poor social integration, strain from physical illness, and

negative religious activity (where researchers found that those who report a higher frequency of religious activity occurrence, such as daily conduct of religious rituals and weekly attendance at religious services, had greater suicidal ideation). Psychosocial protective factors included: sense of belonging, maintaining social dignity, satisfaction with relationships, feeling useful, and positive religious activity. This review did not specifically examine the psychological factors that may protect OA. A review by Yoon & Cummings (2019) identified protective factors at various levels (individual, family, community, and macro), which include spirituality/religiosity, economic status, health status, family solidarity, social activity, and positive attitudes towards elders. Despite being a comprehensive review, the population under study was South Korean older adults aged 50+ and thus does identify the psychological protective factors that might be relevant for OA from other cultures or parts of the world.

There are currently no systematic reviews that focus solely on psychological factors that may protect against suicide in OA. However, it is important to understand the psychological mechanisms involved in suicidality to develop effective clinical interventions aimed at reducing suicide attempts and deaths (British Psychological Society, 2016; O'Connor & Nock, 2014). While risk and protective factors for suicide exist at various levels (individual, relational, community, and societal; Cramer & Kapusta, 2017), psychological variables are believed to play a crucial role in how stressors at various levels impact suicidality. For instance, the integrated motivational-volitional (IMV) model of suicide proposes that suicide ideation is triggered by appraisals of defeat and humiliation in response to life stressors, rather than the stressor itself (O'Connor & Kirtley, 2018). Psychological factors such as self-efficacy and internal locus of control may buffer against negative life events and reduce subsequent suicidality (Goldsmith et al., 2002). A comprehensive understanding of the

psychological factors that reduce suicidality could identify important treatment targets and develop effective psychological therapies and clinical interventions.

Several existing reviews have provided insight into the factors that increase suicidality in OA. However, no existing review has comprehensively investigated the psychological factors that reduce suicide in this population. The present paper conducted a systematic review to identify and evaluate the psychological protective factors for reducing later life suicide ideation, attempt, and death.

Method

An a priori protocol was established and registered on PROSPERO (CRD42022343694). The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines were followed.

Definitions

Suicide can be conceptualised as a continuum of ideations and behaviours, ranging from thinking about suicide to suicidal planning and behaviours (Svetic & De Leo, 2012). Within the present review, suicidality is defined as a phenomenon encompassing suicidal ideation, suicide plans and both lethal and non-lethal suicide attempts (House et al., 2020). The primary outcome was suicide ideation, which includes thoughts about, consideration of, or planning to engage in self-directed injurious behaviour with the intention of dying. Suicide ideation was chosen as the primary outcome because it is the most studied outcome among the studies under consideration for this review. Protective factors are defined as attributes associated with a lower likelihood of negative outcomes or that reduce the impact of known

risk factors (Lopez et al., 2019). Psychological factors are defined in a broad way as internal mental processes and attributes from within the individual and include personality traits and individual differences, cognitive appraisals and affect regulation (O'Connor & Nock, 2014; Resnick, 2014). Finally, whilst defining older adulthood by age can be subjective, this review has chosen to use the age criteria of 65 and over. This is because in the UK, 65 years of age has traditionally been taken as the marker for the start of older age (Office for National Statistics, 2019).

Search strategy

Articles were identified using EMBASE, MEDLINE, PsychINFO, Web of Science, and Scopus databases. The search strategy was designed to target studies capturing three broad domains: suicidality, protective factors and older adults.[1] Keywords (e.g., "suicid*", "protect*", "older adult*") and subject headings (e.g., Suicidality, Protective Factors, Older Adulthood) specific to each database were used to identify the relevant literature. The primary search strategy was designed in MEDLINE (Table 1.1) and adapted to the other electronic sources. The targeted literature was not limited by publication date, but studies not available in the English language were excluded (n = 5). The search was executed on August 19th, 2022. OpenGrey was used to explore grey literature, as well as enquiry emails sent to key authors following full-text evaluation. No further studies were identified from these sources.

Table 1.1

Search strategy used in MEDLINE, PsychINFO, EMBASE and adapted for Web of Science and Scopus

Strategy	Descriptors used
#1	(Suicide/) OR (Suicidal Ideation/) OR (Suicidality/) OR (suicid*)
#2	(Protective Factors/) OR (protect*) OR (decrease*) OR (prevent*) OR (reduce*) OR (resilienc*) OR (recover*)
#3	(Older Adulthood/) OR (older adult*) OR (advanced age) OR (old* age) OR (elder*) OR (late* life) OR (old* person) OR (late* adulthood) OR (old* people)
#4	#1 AND #2 AND #3

Inclusion and exclusion criteria

Two primary inclusion criteria were adopted: 1) participants to be within the 'older age' demographic (65 years and above) and 2) the study must have investigated the relationship between a psychological protective factor and suicidality (e.g., suicide ideation, suicide attempts, death by suicide). Papers which included participants younger than 65 were eligible for inclusion if their sample included an identifiable 65+ age group and comparisons were made between the age groups. There were no criteria on the measurement method of suicidality, although studies of behaviours without a clear suicidal intent were excluded, as well as self-report data which did not clearly measure suicidal ideation. Papers were excluded if they did not conduct statistical analyses, focused only on individual case studies, or did not report original research (e.g., literature reviews). Studies about treatment or prevention were excluded. Full text also needed to be available to be included in the review.

Screening and selection procedures

A two-stage screening process was employed to assess eligibility for inclusion. Initially, the titles and abstracts of all identified papers were screened against the inclusion/exclusion criteria, resulting in the identification of 87 papers for full-text screening. An independent reviewer screened 10% (n = 464) of the title and abstracts, achieving substantial agreement with the primary reviewer (κ = 0.66). The independent reviewer identified three additional papers for potential full-text screening, and a consensus was reached to include one of these papers, bringing the total to 88 papers for full-text screening. The full texts of papers were screened by the primary reviewer and 17 papers were identified for inclusion in the review. The independent reviewer screened 10% (n = 9) of the full-text papers, achieving substantial agreement with the primary reviewer (κ = 0.77). While the independent reviewer suggested one additional paper for inclusion, it was ultimately deemed outside the scope of the review and excluded.

Data extraction

Document templates were used to extract the following information from all included studies: (a) author and paper type; (b) sample population, setting, size, age range, and sex; (c) study methods, including study design and data collection methods; and (d) results relevant to the aim of the review. The document template was informed by the Cochrane data collection form and piloted before commencing data extraction for remaining papers.

Quality assessment

The methodological quality of included studies was appraised using the Quality Assessment with Diverse Studies tool (QuADS; Harrison et al., 2021). This tool was chosen as it has previously demonstrated substantial inter-rater reliability in the appraisal of heterogenous studies (Harrison et al., 2021), and due to its ease of use. The QuADS provides a total quality score based on 13 items (Appendix B). Five of the papers (29% of the sample) were assessed by an independent reviewer and discussions took place to come to a consensus on scores. The consensus scores were then used for the quality assessment.

Data analysis strategy

A narrative synthesis of the findings was produced. Conclusions regarding the relative importance of identified protective factors was based upon effect size, amount of supporting literature and paper quality.

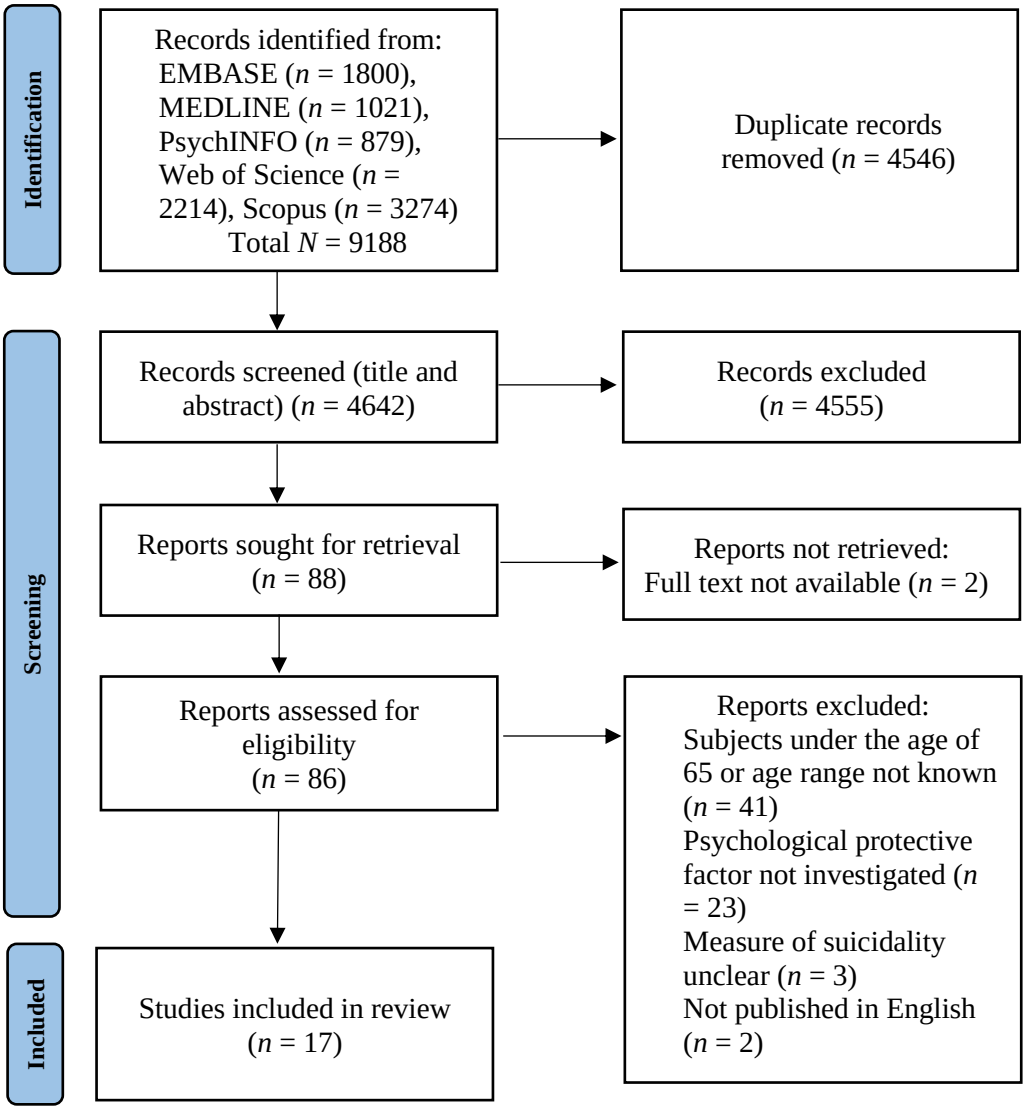
Results

Literature search results

Results from screening process appear in the PRISMA Flow Diagram (Figure 1.1). Database searches retrieved 9188 papers which were imported into EndNote; 4546 duplicates were removed. Following title/abstract and full text-screening, 17 papers were identified for inclusion (Table 1.2). The full texts of two papers were unobtainable and excluded.

Figure 1.1

PRISMA Diagram of Searching and Screening



37 papers were excluded as they included participants below the age of 65, whilst four papers were excluded due to unknown participant age. Seven papers were excluded for investigating risk factors. 16 papers were excluded for investigating protective factors that were not psychological in nature. Three papers were excluded as due to unclear measure of suicidality. Two papers were excluded as the main body of the text was not published in the English language.

Table 1.2

Summary of included studies in the review

Author	Sample	Sample size in analysis	Measurement of suicidality	Protective factor(s) investigated	Measurement of protective factor(s)	Summary of results
Ahn & Kim (2015)	Older Korean immigrants	220	K-SSI	Coping	Brief Cope Scale (BCS)	Higher coping scores associated with lower SI (r = -.29, p<.01). Coping reduced SI (β = -.31, p<.000).
Cha & Lee (2018)	Older adults	201	K-SSI	Ego-resilience	Ego-Resilience Scale (ERS)	Higher ego-resilience scores associated with lower SI (r = -.49, p<.001). Ego-resilience reduced SI (β = -.26, p<.01).
Fiske et al. (2013)	Older adults with health-related limitations	50	GSIS	Primary control (PC) strategies Secondary control (SC) strategies	Optimization of Primary and Secondary Control Scale (OPS)	Greater use of compensatory PC strategies (r = -.45, p <.05) and selective PC strategies (r = -.40, p <.05) associated with lower SI. The use of SC strategies was not significantly related to SI.
Heisel et al. (2002)	Older adults	90	GSIS & SSI	Cognitive functioning	Mini-Mental State Examination (MMSE)	Greater cognitive functioning associated with lower SI, whether SI measured by the measured by GSIS (r = -.29, p<.001) or SSI (r = -. 21, p<.05).
Heisel & Flett (2008)	Older adults	102	GSIS	Psychological wellbeing (PWB) Meaning in life (MIL) Purpose in life (PIL)	Psychological Well-Being Scale (PWS) Perceived MIL subscale of GSIS PIL subscale of PWS	Higher PWB (r = -.60, p<.001), MIL (r = -.62, p<.001) and PIL (r = -.57, p<.001) scores associated with lower SI. PWB reduced SI (β = -.34, p = .000). MIL reduced SI (β = -.29, p = .001). After controlling for covariates and risk factors, PWB was no longer significantly associated with decreased SI, whereas MIL was (β = -.25, p = .002).

Heisel & Flett (2014)[2]	Older adults	173	GSIS	Meaning in life (MIL) Purpose in life (PIL) Life Satisfaction	Experienced Meaning in Life Scale (EMIL) PIL subscale of PWS Satisfaction with Life Scale (SWLS)	Higher MIL (r = -.39, p<.001), PIL (r = -.37, p<.001) and life satisfaction scores (r = -.45, p<.001) associated with lower SI. PIL did not explain unique variance in SI when controlling for MIL. MIL moderated the relationship between depression and SI. PIL did not moderate the relationship.
Heisel & Flett (2016)[2]	Older adults	122	GSIS	Meaning in life (MIL)	EMIL Purpose in Life Test (PIL-Test)	Higher MIL scores at baseline associated with lower SI at follow-up, as measured by both EMIL (r = -.34, p < 0.001) and PIL-Test (r = -.65, p<.001). MIL at baseline, as measured by the PIL-Test, significantly predicted the onset or exacerbation of SI over a 6- to 22-month period (β = -.39, p = .000), but not when measured by the EMIL.
Heisel et al. (2016)[2]	Older adults	109	GSIS	Reasons for living (RFL) Meaning in life (MIL)	Reasons for Living-Older Adults (RFL-OA) EMIL	Higher RFL (r = -.41, p < .001) and MIL (r = -.57, p<.001) scores associated with lower SI. RFL reduced SI (β = -.22, p = .013). MIL reduced SI (β = -.39, p<. 0001). RFLs no longer explained significant variance once MIL was included in the model. MIL mediated the relationship between RFL and SI.
Hirsch et al. (2007)	Older adults	462	SCID & HRSD	Positive affect (PA) Sociability Activity Cognitive functioning	Subclusters of NEO Five-Factor Inventory (NEO-FFI) MMSE	Higher PA scores associated with lower SI (r = -.19, p<.01). High levels of PA reduced SI (aOR = 0.78, 95% CI = 0.66–0.94), but trait sociability and trait activity did not. Cognitive functioning was not significantly related to SI.

Hobbs & McLaren (2009)	Older adults	159	Suicide subscale of GHQ	Agency	Agency subscale of the Personal Attributes Questionnaire (PAQ)	Higher agency scores associated with lower SI (r = -.35, p<.01). Agency moderated the relationship between depression and SI, but only in men.
Kim et al. (2014)	Older adults	684	K-SSI	Psychological wellbeing (PWB)	PWS	Higher PWB scores associated with lower SI (r = -.21, p <.01). PWB had both direct (β = -.074, p<.05) and indirect effects (via depression, β = -.102, p<.05) on SI.
Kim (2015)	Older adults	315	SIS	Grit	Grit Scale	Grit moderated the relationship between depression and SI. For those low in depression, high amounts of grit made no difference to their SI.
Lee (2021)	Older adults	4378	Study-specific	Life satisfaction	Study-specific	Life satisfaction reduced SI (*OR* = 0.902, 95% CI = 0.898-0.906).
Lutzman & Sommerfeld (2021)	Older male adults	170	SSI	Meaning in Life (MIL)	Meaning in Life Questionnaire (MLQ)	Higher MIL scores associated with lower SI (r = -.16, p<.05). MIL reduced SI (*OR* = 0.76, 95% CI = 0.60-0.96).Among the young-old (ages 65–74), MIL reduced SI (*OR* = 0.61, 95% CI = 0.39–0.94). This effect was not found in the older group (75+).
Tsoh et al. (2005)	Three older adult comparison groups: Suicide attempters, Suicide completers, Community comparisons	224	BSIS	Neuroticism Extraversion Agreeableness Conscientiousness Openness	NEO-FFI	Conscientiousness was the only personality trait that independently showed protective effects against suicide attempts (aOR 0.7, 95% CI 0.5-0.9), although this effect not seen in suicide deaths. When comparing those had survived following a suicide attempt and those who had died, conscientiousness increased the likelihood of dying by suicide (aOR 1.3, 95% CI = 1.1-1.5).

Vanderhorst & McLaren (2005)	Older adults	110	Suicide subscale of GHQ	Sense of belonging	Sense of Belonging Instrument (SOBI) subscales: SOBI-P (psychological state) & SOBI-A (antecedents)	Higher sense of belonging scores associated with lower SI, as measured by SOBI-P subscale (r = -.30, p<.01) and SOBI-A subscale (r = -.35, p<.01). Sense of belonging did not predict SI over and above that which was attributable to social support.
Won et al. (2021)	Older adults	1375	SBQ-R	Life satisfaction	SWLS	Life satisfaction reduced suicidality (B = -.072, p<.0001).

Note. SI = suicide ideation; K-SSI = Korean version of Beck Scale for Suicidal Ideation; GSIS = Geriatric Suicide Ideation Scale; SCID = Structured Clinical Interview for DSM-IV; HRSD = Hamilton Rating Scale for Depression; GHQ = General Health Questionnaire; SIS = Suicidal Ideation Scale; SSI = Beck Scale for Suicidal Ideation; BSIS = Beck Suicidal Intent Scale; SBQ-R = Suicide Behaviours Questionnaire Revised; aOR = adjusted odds ratio; OR = odds ratio; 95% CI = 95% confidence interval

Overview of study characteristics

The included studies were published between 2002 and 2021. Data was collected from 18 countries across four continents, including North America (8 studies), Asia (6 studies), Australia (2 studies), and Europe (1 study). Most studies were conducted in South Korea (*n* = 4) and the United States of America (*n* = 3). All studies collected data from OA living in the community. Most studies used a cross-sectional design (*n* = 15). One study used a longitudinal design (Heisel & Flett, 2016), and one study used a case-control design (Tsoh et al., 2005) where participants who had died by suicide (data collected from proxy-respondents) were matched to participants who had attempted suicide and community controls. Tsoh et al. (2005) was the only study where the outcome was not solely suicide ideation (SI) and included suicide attempts and deaths by suicide.

Quality assessment results

Table 1.3 displays the quality assessment results for the included studies, with scores presented as a percentage of the maximum score (39). Quality ratings ranged from 38% to 79%. Studies with lower quality ratings lacked clear descriptions of theoretical underpinnings and the rationale for data collection tools. Higher quality studies had appropriate study designs and data collection tools, and clear descriptions of the research setting and target population. Few studies adequately addressed recruitment data or evidence of appropriate sampling. Future studies could benefit from involving stakeholders in research design, providing detailed recruitment data and justification for specific measures used, and clearly describing the theoretical and conceptual framework.

Table 1.3

Quality assessment results using QuADS

	Item on QuADS													
Paper	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**% of maximum score**
Ahn & Kim (2015)	2	1	3	0	2	2	0	2	2	3	3	0	2	56
Cha & Lee (2018)	2	3	3	2	3	2	2	2	3	0	3	0	1	67
Fiske et al. (2013)	3	3	3	3	2	3	3	3	1	0	3	0	3	77
Heisel et al. (2002)	2	1	2	0	1	2	0	2	1	3	3	0	3	51
Heisel & Flett (2008)	2	3	2	3	2	3	3	2	1	0	3	0	1	64
Heisel & Flett (2014)	3	3	2	0	2	3	3	3	1	0	3	0	2	64
Heisel & Flett (2016)	3	3	3	3	2	3	3	2	2	2	3	0	1	77
Heisel et al. (2016)	3	2	3	3	2	3	3	2	2	2	3	0	3	79
Hirsch et al. (2007)	2	1	3	0	2	3	0	3	3	2	3	0	2	62
Hobbs et al. (2009)	3	3	2	3	1	2	2	2	3	2	3	0	3	74
Kim et al. (2014)	0	2	3	1	2	1	2	2	1	1	2	0	2	49
Kim (2015)	1	3	1	3	1	0	0	1	1	1	3	0	0	38
Lee (2021)	2	3	1	3	1	2	1	1	1	1	3	0	3	56
Lutzman & Sommerfeld (2021)	3	3	3	3	2	2	3	3	1	2	3	0	2	77
Tsoh et al. (2005)	1	1	3	0	2	2	3	3	3	0	3	0	3	62
Vanderhorst & McLaren (2005)	3	3	3	3	2	3	3	3	2	1	3	0	2	79
Won et al. (2021)	2	3	3	3	1	0	3	1	1	1	3	0	2	59

Key:

Item No.	***Criteria***
1	Theoretical or conceptual underpinning to the research
2	Statement of research aim(s)
3	Clear description of research setting and target population
4	Study design appropriate to address the stated research aim(s)
5	Appropriate sampling to address the research aim(s)
6	Rationale for choice of data collection tool(s)
7	Format and content of data collection tool appropriate to address the stated research aim(s)
8	Description of data collection procedure
9	Recruitment data provided
10	Justification for analytic method selected
11	Method of analysis appropriate to answer the research aim(s)
12	Evidence that the research stakeholders have been considered in research design or conduct
13	Strengths and limitations critically discussed

Narrative synthesis of findings

Meaning/purpose in life

The factor with greatest empirical support was meaning in life (MIL). MIL is defined as the extent to which an individual perceives themselves as worthwhile and as having a valued life purpose (Steger et al., 2009). MIL was investigated in five papers (Heisel & Flett, 2008; Heisel & Flett, 2014, Heisel & Flett, 2016, Heisel et al., 2016, Lutzman & Sommerfeld, 2021), with all papers identifying a protective influence against SI. The papers were noted to be higher quality studies within the review. Heisel & Flett (2008) found MIL was associated with reduced SI even when controlling for covariates and risk factors, whilst another protective factor, psychological wellbeing, no longer showed protective effects. One study found MIL moderated the relationship between depression and SI, indicating MIL is most protective against SI at higher levels of depression (Heisel & Flett, 2014).

Whilst MIL was found to have the strongest effect size of papers reporting coefficients, the strength of the relationship between MIL and suicidality varied from weak (r = -.16; Lutzman & Sommerfeld) to strong (r = -.65, Heisel & Flett, 2016) and thus caution is warranted when interpreting the relative importance of this factor. Lutzman & Sommerfeld (2021) found MIL was only protective for those in the young-old age group (65-74) and not for those aged 75+. Although the influence of MIL varied depending on age, it is important to note that Lutzman & Sommerfeld's (2021) sample only consisted of males. Therefore, it is unclear if MIL might also vary depending on gender. The variation in effect sizes could also be attributed to methodological differences, as the five studies employed four different MIL measures.

Indeed, Heisel & Flett (2014) found MIL only predicted the onset of SI over a 6–22-month period when MIL was measured by the PIL-Test, and not the EMIL scale.

There is a lack of clarity regarding the difference between MIL and purpose in life (PIL). Heisel & Flett (2014) propose MIL and PIL are distinctive concepts, with MIL being about a "deeper existential significance" (pp. 316) and PIL being about intention and "referring to a role or aim" (pp. 316). They have found MIL and PIL scores to be individually associated with SI (Heisel & Flett, 2008; Heisel & Flett, 2014) but when controlling for MIL, PIL did not explain unique variance in SI (Heisel & Flett, 2014). However, in a later paper the researchers appear to view these concepts as equivalent by using a measure of PIL (PIL-Test) as a way of quantifying MIL (Heisel & Flett, 2016). Due to a lack of research, it is challenging to determine whether MIL/PIL have independent or combined protective effects in individuals aged 65 and over.

Reasons for living

A related concept to MIL, reasons for living (RFL), was investigated in one paper, and was found to be associated with reduced SI (Heisel et al., 2016). RFL are defined as positive beliefs and expectancies and can be conceptualised as reflecting one's satisfaction or enjoyment of life and/or specific sources of meaning or purpose in life (Linehan et al., 1983). One of the highest quality papers in the review, Heisel et al. (2016), looked at the individual influences of RFL and MIL, finding both were associated with reduced SI, although RFL to a lesser extent. Furthermore, MIL was predictive of SI even when controlling for RFL, suggesting that the protective effects of MIL may be more potent than RFL. It was also found that MIL significantly mediated the association between RFL and suicide ideation. It is

difficult to draw firm conclusions regarding the protective influence of RFL in OA, and how this may relate to other protective factors, due to limited papers exploring this concept.

Psychological wellbeing

Following MIL, psychological wellbeing (PWB) was found to have the next greatest protective influence. However, this factor was only investigated in two studies (Heisel & Flett, 2008; Kim et al., 2014). Both studies found PWB was associated with lower levels of SI, although correlation coefficients varied from weak (r = -.21; Kim et al., 2014) to strong (r = -.60; Heisel & Flett, 2008). These studies used the same measure of PWB, but differing measures of SI, which could account for the difference. Alternatively, there were differences where the studies were conducted (North America in Heisel & Flett [2008]; Asia in Kim et al. [2014]) and thus could reflect cultural differences in the experience of PWB. Interesting questions are raised regarding what PWB represents. The Psychological Wellbeing Scale used in both studies measures six aspects of wellbeing: autonomy, environmental mastery, personal growth, positive relations with others, PIL, and self-acceptance (Ryff et al., 2007). It could be considered that many factors investigated by papers in this review could fit within these domains. PWB might consist of a range of protective factors and thus it would make sense that it protects against suicidality. What would be more interesting is understanding the relative contribution of different aspects of PWB in protecting against suicide in OA.

Life satisfaction

Life satisfaction was investigated in three papers, with all papers finding life satisfaction had some protective effects against suicidality (Heisel & Flett, 2014; Lee, 2021; Won et al.,

2021). These studies were conducted in North America, Europe, and Asia, although due to differences in approach to statistical analyses it is not possible to compare the effects of life satisfaction on reducing suicidality. In Heisel et al's (2014) cross-sectional design, life satisfaction showed a stronger negative relationship with SI (r = -.45) than both MIL (r = -.39) and PIL (r = -.37), although the coefficients are relatively similar. In a large sample of 4378 OA, Lee (2021) found life satisfaction reduced the odds of reporting SI by 10%, with sociodemographic factors (such as marital status and number of children) appearing to have a greater protective influence. Given the limited number of papers, and differences in the measurement of life satisfaction and suicidality, it is difficult to draw firm conclusions regarding the protective influence of life satisfaction. Life satisfaction may also encompass other protective factors, such as MIL and RFL, instead of being a distinct and independent factor.

Coping

The literature shows that coping mechanisms in response to negative experiences can also protect against suicidality in OA. Coping is broadly defined as efforts to minimise distress associated with negative life experiences (Carver, 1997). One paper explicitly measured the influence of coping on SI (Ahn & Kim, 2015), finding that coping was associated with reduced SI in a sample of older Korean immigrants living in America. However, coping is a broad term, and the paper does not identify whether specific types of coping are protective, despite using the Brief Cope Scale which provides a measure of avoidant coping, emotion-focused coping, and problem-focused coping. The ability to cope with adversity and life stressors using grit (defined as willingness to persevere toward a long-term goal despite frustration and distress; Kim, 2015) and ego-resilience (defined as the ability to cope with

negative emotional experiences; Cha & Lee, 2018) have also been found to be protective of SI. Kim (2015) found grit moderated the relationship between depression and SI, with grit being most protective at higher levels of depression. However, this paper was the lowest quality within the review, with limited theoretical basis, poor rationale for use of data collection tools and poor description of recruitment data and study procedure. Fiske et al. (2013) is the only paper to investigate the influence of specific coping strategies, finding that primary control coping strategies, which aim to change the environment, were protective against SI, while secondary control strategies focused on changing the self, did not show any protective effects. The sample of this paper was limited to OA with health-related limitations, although it is reasonable to expect high rates of physical health difficulties in this population. Whilst the research indicates that the ability to adaptively respond to life stressors is important in protecting against suicidality, further research is needed to identify what coping styles are most influential to develop clinical interventions and suicide prevention programmes for OA.

Personality

Personality traits have been investigated in three papers (Hirsch et al., 2007; Hobbs & McLaren, 2009; Tsoh et al., 2005). All found evidence of protective influences associated with specific traits. Hirsch et al. (2007) were interested in the influence of trait positive affect (PA), trait sociability and trait activity on SI, finding that high levels of PA reduced SI, whilst sociability and activity showed no significant influence. Trait PA is defined as the tendency to experience positive emotions and moods, whilst trait sociability refers to the extent which individuals seek out social relationships and trait activity refers to the tendency to seek energetic movement and keep busy (Chapman, 2007). Hobbs & McLaren (2009) were

interested in agency, described as characteristics of independence, competitiveness, self-assertion, and self-control. Higher agency was associated with reduced SI and agency was most protective at higher levels of depression in men. However, agency was measured by the extended Personal Attributes Questionnaire (Spence et al., 1979), a measure of 'masculinity' and 'femininity', with the masculine traits purported to represent agency. Given the poor definition of agency, it has little clinical utility due to difficulties in incorporating it within an intervention. Tsoh et al. (2005) investigated the influence of personality traits on the likelihood of someone making a suicide attempt and/or dying by suicide. In their case-control design, they compared personality traits in individuals who had died by suicide (using informant-reports), those who had survived a suicide attempt (SA) and community comparisons. Greater conscientiousness was protective against SA, however when comparing those who had survived following a SA and those who died, conscientiousness increased the likelihood of death. The paper also investigated neuroticism, extraversion, agreeableness, and openness, with evidence of these factors having an influence, however only conscientiousness was put forward into the final multivariate model. Non-psychological factors, such as living with children and greater functioning in activities of daily living, showed greater protective influence against SA and death. Overall, the role of personality traits in protecting against suicide in OA is uncertain given unclear definitions and limited evidence exploring the same aspects of personality.

Cognitive functioning

Two papers investigated the influence of cognitive functioning, with mixed results (Heisel et al., 2002; Hirsch et al., 2007). Heisel et al. (2002) found greater cognitive functioning was associated with lower levels of SI, whilst Hirsch et al. (2007) found no significant

relationship, despite using the same measure of cognitive functioning. Heisel et al. (2002) was noted be of lower quality, with a poor statement of research aims, making it difficult to ascertain whether the study design, data collection tools and sampling was appropriate. The relationship which was found by Heisel et al. (2002) was relatively weak (r = -.21 to -.29, dependent on measure of SI) and overall, it is not possible to conclude that cognitive functioning is protective against SI in OA.

Sense of belonging

Sense of belonging (SOB) was investigated in one study (Vanderhorst & McLaren, 2005), with its protective influence being unclear. SOB is defined as an individual's experience of feeling valued, needed, or significant within their social environment. Whilst greater SOB scores were associated with lower scores of SI, when SOB was entered into a regression model, it did not explain any additional variance in SI over and above that accounted for by social support. Within this study it appears that social support, a coping resource obtained from interpersonal relationships, has a greater protective influence than the psychological factor of SOB.

Discussion

The aim of this review was to identify and evaluate the psychological protective factors for reducing later life suicide ideation, attempt, and death. A total of 17 papers met the inclusion criteria, with several factors investigated: meaning/purpose in life (MIL/PIL), reasons for living (RFL), coping, psychological wellbeing (PWB), life satisfaction, personality traits, cognitive functioning, and sense of belonging (SOB). This review found promising results for MIL/PIL, PWB, and life satisfaction, with these factors being associated with reduced SI in

multiple papers. Certain coping responses and styles (i.e., grit, ego-resilience, and primary control strategies) and personality traits (i.e., trait positive affect, agency) were also found to be protective of SI, however these findings are based on limited data sets. There was a paucity of research looking at the factors protecting against suicide attempt and death in older adults, with only one paper exploring outcomes beyond SI (Tsoh et al., 2005).

The psychological factor with greatest empirical support was MIL/PIL. Greater MIL was associated with reduced SI in all papers where it was investigated. Furthermore, MIL showed greater protective effects than both PWB (Heisel & Flett, 2008) and RFL (Heisel et al., 2016). It was found that MIL protects against SI through both mediating and moderating influences. MIL moderated the relationship between depression and SI, with MIL showing the greatest protective effects at higher levels of depression (Heisel & Flett, 2014). Research suggests that OA with higher levels of depression are at greater risk of suicidal thoughts and behaviours (Beghi et al., 2021). Therefore, increasing MIL may provide greater protection against suicide among OA. Furthermore, MIL was found to mediate the relationship between RFL and SI, suggesting a significant role of MIL in promoting recognition of reasons to live and decreasing suicidality in later life (Heisel et al., 2016). However, despite several papers providing empirical support for MIL, it is important to consider circumstances where its protective influence may vary, with Lutzman & Sommerfeld (2021) finding no protective effect for those aged 75+. As people are living longer and healthier lives, the age range of OA is expanding, and the circumstances of someone aged 65 is likely to differ to someone aged 85. Examining how protective factors differ with age is important for developing age-specific interventions aimed at reducing suicidality. In addition, it is noted that all the papers investigating MIL came from North America and thus it is unclear whether MIL is a relevant

protective factor in other cultures. Although MIL was identified as a protective factor for Korean adults aged 50+ in a previous systematic review (Yoon & Cummings, 2019).

The factor with the greatest empirical support after MIL/PIL is PWB. Although, it is noted that the strength of the protective effect varied between papers (Heisel & Flett, 2008; Kim et al., 2014). It makes intuitive sense that individuals with greater PWB would have lower SI. However, PWB's broad definition limits its clinical utility for developing targeted interventions to increase PWB. Similar can be said for life satisfaction, which was associated with reduced SI in three papers and across several continents (Heisel & Flett, 2014; Lee, 2021; Won et al., 2021). It may be that PWB, and life satisfaction are composite concepts that encompass several of the protective factors in this review, such as MIL, RFL, coping and SOB. It would be beneficial for future research to focus on understanding what contributes to PWB and life satisfaction in OA to provide specified targets for clinical interventions focused on reducing suicide.

Responses to life stressors have been investigated in several papers, finding concepts such as coping (Ahn & Kim, 2015), grit (Kim, 2015) and ego-resilience (Cha & Lee, 2018) to have some protective influences. The ability to cope with negative experiences was found to reduce SI, as was concepts of grit and ego-resilience, which can be conceptualised as the extent to which individuals recover from difficult situations and persevere toward life values. These findings provide support to acceptance-based therapies that suggest wellbeing can be maintained and distress reduced when individuals work towards their values despite difficult life experiences (Hays & Lillis, 2014). Indeed, there is some evidence for Acceptance and Commitment Therapy in reducing depression symptoms for older veterans (Karlin et al., 2013) and OA in long-term care (Davison et al., 2017). Unfortunately, an understanding of

the specific types of coping strategies which reduce SI and could be incorporated into a skills-based psychosocial intervention was more limited. However, one paper found that OA with health limitations who endorsed greater use of primary control strategies had less SI (Fiske et al., 2013). It is interesting to once again consider whether coping relates to other factors identified in this review, with evidence suggesting greater MIL predicts improved coping (Halama, 2014; Ward et al., 2023). In a sample of older adults, Van Ranst & Marcoen (2000) found those with greater MIL used a variety of adaptive coping strategies, with the authors proposing that a belief of MIL results in a utilisation of all available coping mechanisms. Further research could explore how the protective influence of coping against suicidality in older age is influenced by concepts of MIL to help understand whether it can be considered an independent protective factor.

Due to findings being based on single data sets, it is difficult to conclude SOB and RFL as significant protective factors, despite the data indicating some protective influences (Vanderhorst & McLaren, 2005; Heisel et al., 2016). There are also mixed findings regarding personality and individual differences. A variety of different aspects of personality have been investigated, with trait positive affect and agency showing some evidence of protective influences (Hirsch et al., 2007; Hobbs & McLaren, 2009). However, these findings are also based on singular data sets which reduces confidence in concluding their protective nature. Cognitive functioning was associated with lower SI in one paper (Heisel et al., 2002) but demonstrated no relationship in another (Hirsch et al., 2007). Therefore, it is not possible to conclude cognitive functioning to be a protective factor against suicide in OA, although it is acknowledged that dementia, an illness associated with loss of cognitive functioning, has been associated with suicide risk in OA (Sinyor et al., 2016). Overall, while personality and cognitive functioning are important psychological factors, understanding their protective

influence may be less useful since they are less amenable to change through psychological intervention. Therefore, other factors discussed in this review may be more beneficial to consider when developing interventions aimed at increasing protective factors.

There are limitations of the review papers which need to be considered when drawing conclusions. Firstly, most papers in the review were cross-sectional, except for one longitudinal study (Heisel & Flett, 2016) and one case-control study (Tsoh et al., 2015). The predominance of cross-sectional studies means it is difficult to establish the nature of the relationship between a protective factor and suicidality. Future research could benefit from using longitudinal designs to ascertain what psychological factors are protective for individuals over time. Secondly, this paper was interested in the continuum of suicidality and protective factors against suicidal thoughts, attempts and death. However, only one paper used suicide attempts and death as their outcome of interest (Tsoh et al., 2005). Reducing SI is important as it is a predictor of suicide attempts and death (O'Connor & Kirtley, 2018), however the factors that protect against suicidal behaviours may differ from those against SI since not all cases of ideation lead to action (O' Connor & Kirtley, 2018). Lastly, it would be beneficial to identify protective factors specific to OA when designing suicide prevention programmes, however none of the papers in the review allowed for such comparisons to be made due to their sample. Future research exploring the factors that protect against suicidality in OA should focus on the continuum of the suicidal experience, as well as comparing the importance of these factors to other age groups.

The focus of this review has been on understanding the psychological factors that protect against suicide in OA. However, that is not to negate the influence of other factors found at various levels (e.g., sociodemographic factors, community, and macro-level; Cramer &

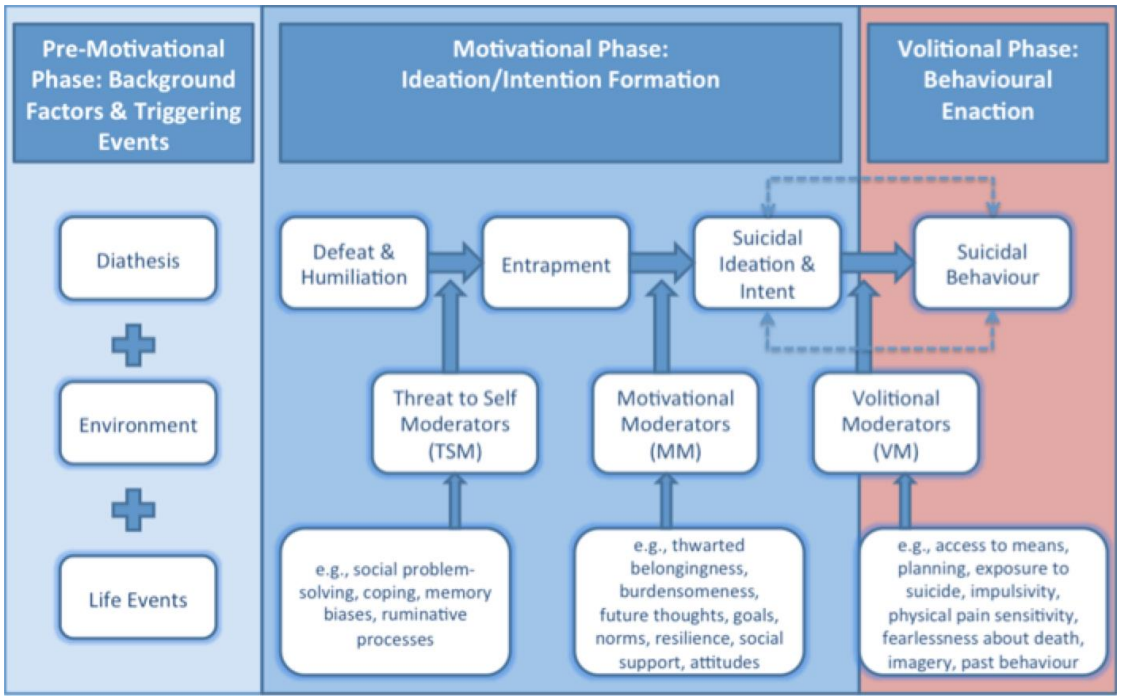
Kapusta, 2017). Within the papers in this review, there is evidence of other factors having a greater protective role than the psychological factors under investigation. For example, marital status, and number of children reduced the likelihood of SI more so than life satisfaction (Lee, 2021) and living with children and greater functioning in activities of daily living was more protective against suicide attempt and death than certain personality traits (Tsoh et al., 2005). Future reviews should compare the relative importance of psychological factors to other factors, however it is crucial to recognise the role of psychological factors, as sociodemographic factors alone cannot explain the complexity and variability of suicide (O' Connor & Nock, 2014). Understanding the psychological mechanisms of suicide is essential for developing interventions to reduce suicidality.

Theoretical relevance

The protective factors in this review can be considered in the context of the IMV model, a biopsychosocial framework that explains the common pathway to suicidal ideation and behaviour (O'Connor & Kirtley, 2018; Figure 1.2).

Figure 1.2

The integrated motivational-volitional (IMV) model of suicidal behaviour



From "The integrated motivational–volitional model of suicidal behaviour" by R. O'Connor and O. Kirtley, 2018, https://doi.org/10.1098/rstb.2017.0268

The IMV model proposes that SI develops in the motivational phase due to appraisals of defeat and humiliation following a life stressor, from which there is no perceived escape. Threat to self-moderators (TSMs) are proposed to make it more or less likely that defeat leads to entrapment. Coping is considered a TSM, with adaptive coping responses proposed to reduce the perception of being unable to escape from one's situation (Gooding et al., 2015). It is unclear where MIL/PIL, PWB, and life satisfaction fit within this framework as they are not currently identified as moderators. PWB and life satisfaction might be relevant in the pre-motivational phase of the model, where biological, genetic, or cognitive vulnerability factors interact with life stressors to increase the risk of SI. Greater levels of PWB and life satisfaction may protect against suicidality by reducing the likelihood of defeat appraisals in response to negative life events. There is some empirical support for this idea, with studies suggesting that individuals with greater PWB are less likely to develop SI in response to

stressors (Brailovskaia et al., 2020). Regarding MIL/PIL, future thoughts are identified as a motivational moderator, with positive thoughts about the future reducing the likelihood that perceptions of entrapment will lead to SI. Having a sense of purpose or meaning in life might generate reasons for living when someone is in a position of feeling trapped with no perception of escape, thus reducing the likelihood of suicidal thoughts (Heisel et al., 2016). More research is needed to determine the theoretical relevance of the factors identified in this review, which could aid in prioritising treatment targets in clinical interventions.

Lifespan relevance

To develop effective suicide prevention programmes, it is important to consider the factors that increase and reduce risk in that population. Suicide in OA has been described as different to other populations, being characterised by less impulsive attempts, greater levels of intent and more successful methods (Cai et al., 2022; Draper, 2014). This raises the question of whether the factors that reduce suicide in OA are different to younger adults. None of the papers in the review compared the protective influence of psychological factors between younger and older adults. However, it is known that the protective influence of sociodemographic variables can vary according to age (Lee et al., 2013), which suggests psychological factors may also differ. There are no known systematic reviews broadly looking at the psychological protective factors against suicidality in adults aged between 18-64, precluding any possibility to compare the findings of this review to younger adults. However, reviews have focused on understanding the protective influence of specific psychological factors across the lifespan. Systematic reviews of clinical and non-clinical populations have found both RFL and MIL to be protective factors against SI and SA in adolescents, adults, and older adults (Bakhiyi et al., 2016; Costanza et al., 2019). This

suggests that age may be less relevant when considering which psychological factors protect against suicide in OA. However, the nature of these factors may differ for OA, as OA report moral objections and child-related concerns as stronger reasons for not engaging in suicidal behaviours than younger adults (Miller et al., 2001). It can also be speculated that some protective factors may be harder for OA to achieve, such as MIL, due to repeated losses (e.g., retirement, bereavement, physical frailty). Indeed, the only known meta-analysis on the topic found PIL declined with age, with this decline being stronger in older age groups (Pinquart, 2002). Overall, more studies and reviews are needed to compare how psychological factors protect against suicide across different age groups. This will help to determine if age is important in the protective nature of these factors.

Limitations

Limitations of this review should be acknowledged. Defining an age cut-off for older adulthood is a potentially subjective process. The age range of 65+ was chosen for this review due to historical and service-related reasons (National Health Service, 2019; Office for National Statistics, 2019). However, it is recognised that this chronological definition is less relevant today as people are retiring later and living longer. Secondly, due to a limited number of papers addressing the research question, the results came from a diverse range of countries and continents, which raises cultural considerations. For instance, evidence suggests that attitudes toward suicide in East Asian cultures may bias the reporting of suicidal behaviour (Han et al., 2013). Underreporting of suicidal experiences is likely to impact results found in a study of protective factors. Furthermore, it is possible that protective factors might vary across cultures, with potentially a greater focus on relational and community-level factors in collectivist cultures. Thirdly, the broad range of content, exposure and outcome

measures and populations among the papers necessitated a narrative synthesis. If there was greater homogeneity in papers, a meta-analysis could identify which psychological factors have the greatest protective effect. Finally, due to the exclusion of non-English papers and use of English-language dominant databases it is possible that papers relevant to the research question may have been missed.

Conclusion

Suicide among OA is major a public health concern, and effective prevention programs require understanding of the psychological processes involved in suicidal thinking and behaviours (BPS, 2016). High quality research exploring the psychological factors that protect against suicidality is limited, with this review making several recommendations for future research. Recommendations include greater use of longitudinal and case control designs, measuring outcomes across the continuum of suicidality and using samples that allows comparison between younger and older adults and within the spectrum of old age. Although more research is needed, the review was able to identify several psychological factors that show promise for reducing suicidality in older age. The protective factors identified in the review are important to consider during suicide risk assessment, particularly an older person's sense of meaning in life, psychological wellbeing, satisfaction with life, and coping style. The review findings can also inform the development of interventions or therapies that aim to reduce suicidality in OA by enhancing protective factors e.g., helping individuals to identify life purpose, gain skills to enhance mental wellbeing and develop adaptive ways of responding to life stressors. To conclude, this review highlights promising psychological factors that may reduce suicidality in OA and can be targeted in clinical interventions.

Footnotes

[1] The initial objective of the review was to identify all factors relevant to protecting against suicide in older adults. However, a large number of potentially relevant papers were identified during the screening process. Therefore, the focus of the review was narrowed to identify psychological factors that may serve to protect against suicide in older adults. PROSPERO registration was amended accordingly.

[2] Whilst these studies are linked, the data extracted was considered to make unique contributions to the review topic and thus were all deemed appropriate for inclusion.

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**Studies included in the review*

The role of suicidal mental imagery and experiential avoidance in suicidality: An exploratory study

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Paper 2

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Abstract

Objective: The purpose of this study was to explore the influence of suicide-related mental imagery (SuiMI) and experiential avoidance (EA) on suicidality. It was hypothesised that greater frequency of SuiMI would be associated with greater EA. It was also hypothesised that greater SuiMI would be associated with greater suicidality, and that EA may mediate or moderate this relationship.

Method: Hypotheses were tested by surveying 197 university students who completed self-report measures that assessed suicide-related mental imagery, experiential avoidance, and suicidality.

Results: Frequency of SuiMI was positively correlated with tendency to engage in EA. SuiMI was a significant predictor of both suicidality and EA. Exploratory analysis found that spontaneous SuiMI explained greater variance in suicidality than intrusive SuiMI, and that SuiMI only predicted EA in low-risk participants and not for those at high risk of suicide. EA did not predict suicidality and did not show a mediating or moderating influence on the relationship between SuiMI and suicidality.

Conclusion: There is evidence to suggest that suicide-related mental imagery may play an important role in suicide risk. Future research should explore the processes involved in this relationship and how these may differ according to type of SuiMI.

Keywords: Suicide, Suicidal mental imagery; Mental imagery; Experiential avoidance; Suicide risk

Introduction

Suicide is a significant world health problem, with more than 700,000 people dying by suicide each year, equating to one person every 40 seconds (World Health Organisation, 2021). Furthermore, the World Health Organisation (n.d.) reports that for every suicide death there are more than 20 suicide attempts. It is essential to understand the psychological processes involved in suicide to develop effective risk assessments and psychosocial interventions.

Suicidal mental imagery and suicidality

Suicide is frequently conceptualised as developing along a continuum, progressing from suicidal ideation to suicidal planning to suicidal behaviour (Sveticic & De Leo, 2012). Suicidal ideation is a broad term used to describe a range of ideas, wishes and preoccupations with death and killing oneself (Harmer et al., 2022). Suicide risk assessment commonly focuses on the experience of suicide ideation in the form of verbal thought (Andreotti et al., 2020). However, there is emerging evidence for the influence of a different type of cognition on suicide risk, that is the experience of mental images of suicide – thinking about suicide visually rather than thinking about suicide verbally. In a sample of formerly suicidal patients, Holmes et al. (2007) found that all reported experiencing detailed suicide-related mental imagery (SuiMI) when at their most despairing. Participants described images of future suicide attempts and of being dead, with these experiences being termed “flash-forwards”, echoing flashbacks seen in post-traumatic stress disorder (PTSD) due to their intrusive and repetitive nature. The experience of SuiMI and its association with increased suicidality has been replicated in a range of populations (Crane et al., 2012), including in adults with a diagnosis of bipolar disorder (Hales et al., 2011), college students (Holaday & Brausch,

2015) and adolescents (Lawrence et al., 2021a). Lawrence et al. (2021b) attempted to further understand the relationship between SuiMI and suicidal behaviours in a sample of undergraduate students. They found that SuiMI predicted a higher likelihood of having made a suicide plan and a higher likelihood of having made a suicide attempt over and above suicidal verbal thoughts. Research has also been interested in the emotional, cognitive and behavioural responses to SuiMI. Qualitative research found individuals wanted to engage in cognitive distraction and suppression in response to the experience of SuiMI (Hales et al., 2011). However, the experience of SuiMI has been found to be both distressing and comforting (Crane et al., 2012, Hales et al., 2011, Holmes et al., 2007), with Hales et al. (2011) describing images which were associated with both fear and relief.

In response to recent research, the Integrated Motivational Volitional (IMV) model of suicide (O'Connor & Kirtley, 2018) has included SuiMI as a volitional moderator in the relationship between suicidal ideation and suicidal behaviours, indicating that someone experiencing SuiMI is more likely to engage in suicidal actions. An understanding of how SuiMI might increase suicide risk is largely informed by evidence exploring the influence of mental imagery in determining future behaviour. Previous research has found that when individuals are asked to imagine themselves engaging in a future event, the likelihood of them doing this action increases (Libby et al., 2007). Furthermore, imagining an event has also been found to increase the perceived probability that the event will happen (Pham & Taylor, 1999). It is suggested that SuiMI forms part of a rehearsal process that precedes a suicidal act, whereby the process of an individual imagining a suicidal act increases both the perception that the event will occur and the likelihood of them engaging in this act (Holmes et al., 2007). Other ideas of how SuiMI increases suicidality can be considered in the context of the IMV model, where SuiMI represents the desired goal of escape from entrapment and thus suicidal intent is

amplified (Crane et al., 2012). Given the growing body of literature suggesting that SuiMI confers significant risk beyond verbal thoughts of suicide, there is a need for further research on SuiMI to better understand its influence on suicidality.

Experiential avoidance and suicidality

Recent research has been interested in the role of experiential avoidance (EA) in suicidality. EA pertains to behaviours which attempt to suppress, control, or eliminate internal experiences (i.e., thoughts, emotions, memories, sensations) that are distressing or are expected to be distressing (Hayes et al., 2012). The attempt to suppress, control or eliminate unwanted internal experiences paradoxically leads to an increase in the frequency and intensity of these experiences and maintains emotional distress (Wenzlaff & Wegner, 2000). EA is proposed to take many forms, such as thought suppression, avoidance of reminders of stressful events, emotional avoidance, and avoidant coping strategies (Gamez et al., 2011). EA has been linked to a variety of emotional and behavioural disorders (Hayes et al., 1996; Spinhoven et al., 2014), with EA considered to be most detrimental when someone spends so much time and effort avoiding discomfort that they have little time to pursue the things that they truly value in life (Hayes et al., 2012). The rebound effect, where the frequency of the unwanted thought increases following deliberate suppression, has been found to occur in a variety of clinical populations characterised by the experience of intrusive thoughts, such as depression (Wenzlaff et al., 1988), obsessive-compulsive disorder (Tolin et al., 2002) and PTSD (Beck et al., 2006).

Suicide can be considered an extreme form of EA, with suicidal behaviours providing a way to escape from overwhelming negative internal experiences (Hayes et al., 2008). When

individuals believe they have exhausted all other options to escape from unbearable pain, suicide can provide the ultimate escape. Greater EA has been found to be associated with higher suicidal ideation in psychiatric inpatient samples (Ellis & Rufino, 2016; Roush et al., 2019). Furthermore, it has been found that patients whose EA decreased more over treatment had a greater change in suicidality, independent of changes in depression severity and hopelessness (Ellis & Rufino, 2016). A relationship between EA and suicidality has also been found in non-clinical populations, with Chou et al. (2018) showing EA to be a robust predictor of suicidal ideation in a sample of college students. A recent systematic review of 19 independent studies found moderate to strong associations between EA and suicide ideation and behaviours (Angelakis & Gooding, 2021). The process of how EA relates to suicidality continues to be explored, with recent research suggesting that EA is important in the formation of suicide ideation as it moderates the relationship between defeat and entrapment, identified as essential in the development of suicidal ideation according to the IMV model of suicide (Ordóñez-Carrasco et al., 2020).

Relationship between suicidal mental imagery and experiential avoidance

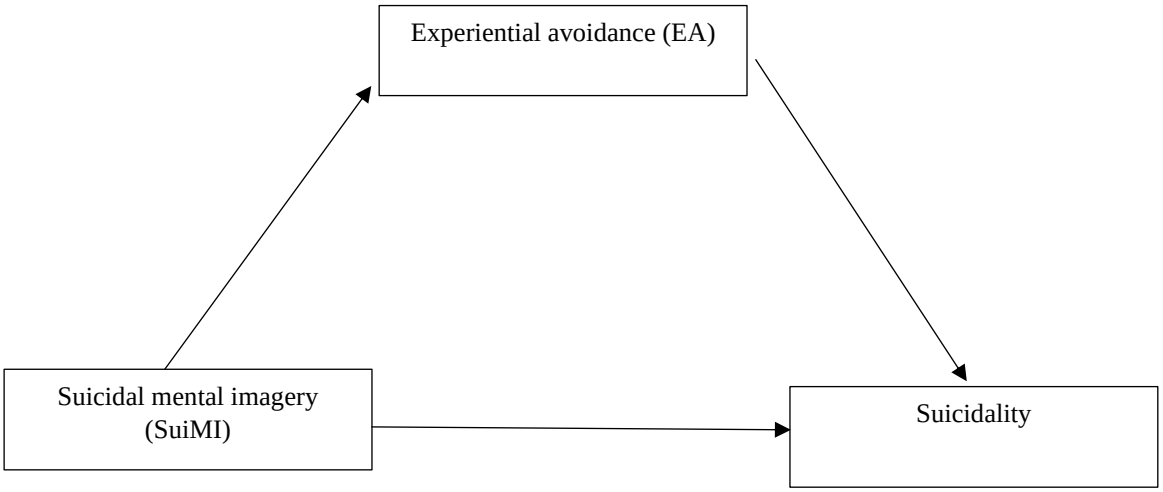
As mental imagery is considered an internal experience, it is interesting to consider the existence of a relationship between EA and SuiMI. Given the potential for EA to exacerbate intrusions (Wenzlaff & Wegner, 2000) this may have implications for SuiMI and suicidality. Pettitt et al. (2009) found that participants who engaged in suppression of suicidal thoughts displayed an increase in the severity of suicidal ideation over a 4-week period. Whilst there is little empirical research looking specifically at the effect of avoiding mental images of suicide (rather than verbal thoughts), comparisons can be drawn from other intrusive experiences. For example, Steil & Ehlers (2000) found positive correlations between thought

suppression and the frequency of, and distress caused by PTSD symptoms (which include intrusive recollections and flashbacks). Similarly, Williams & Moulds (2008) found that greater distress from intrusive memories was associated with greater cognitive avoidance in depression. It is possible that EA may exert a similar influence when considering SuiMI. However, prior to this study, the relationship between SuiMI and EA had not previously been investigated.

Potential mechanisms of how SuiMI and EA might interact with one another to increase suicide risk were contemplated. A mediating role of EA was considered (Figure 2.1). SuiMI might lead to EA as individuals attempt to deal with the aversive nature of the experience, and/or to deal with the emotional conflict it produces. However, EA ultimately amplifies suicidality as emotional distress is maintained and thus suicide is valued as the best option for escaping from unbearable pain. A moderating influence of EA on the relationship between SuiMI and suicidality was also considered (Figure 2.2). It is possible that the relationship between SuiMI and suicidality might be stronger at greater levels of EA due to the rebound effect seen in other intrusive experiences. The paradoxical consequence of EA may lead to greater experiences of SuiMI and thus the observed relationship between SuiMI and suicidality becomes stronger. Alternatively, the relationship between SuiMI and suicidality might be stronger for those with a greater tendency to engage in EA as they endorse avoidant approaches to dealing with distress, with SuiMI providing a visual representation of the ultimate form of avoidance.

Figure 2.1

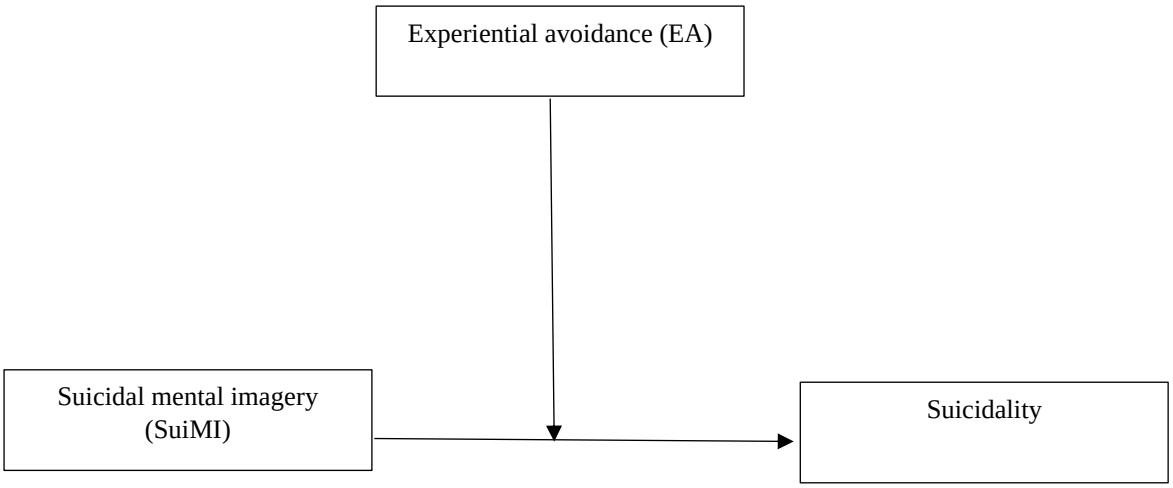
Proposed mediation model



Note. The American Psychological Association (APA, n.d.) defines suicidality as: "the risk of suicide, usually indicated by suicidal ideation or intent, especially as evident in the presence of a well-elaborated suicidal plan".

Figure 2.2

Proposed moderation model



Research aims and hypotheses

This is the first known study to explore the potential relationship between the experience of SuiMI and EA, and how these phenomena might interact to increase suicidality. The aims of this study were as follows:

- To explore the relationship between SuiMI and EA - it was hypothesised that SuiMI and EA would be positively correlated and that levels of SuiMI would predict EA (Hypothesis 1)
- To confirm previous findings that levels of SuiMI and EA predict suicidality – based on previous literature, we expected to find that suicide risk would increase with greater levels of SuiMI and EA (Hypothesis 2)
- To identify whether EA influences the relationship between SuiMI and suicidality – it was hypothesised that EA would have a partially mediating or moderating influence on the relationship between SuiMI and suicidality (Hypothesis 3). A mediating influence of EA may be expected as SuiMI is anticipated to be an unwanted internal experience, leading to EA as a way of coping, with a subsequent increase in suicidality as suicide represents a route of escape from distress. A moderating influence where greater levels of EA increase the relationship between SuiMI and suicidality might be expected due to a greater frequency of SuiMI because of the rebound effect, or potentially due to an endorsement of avoidant coping responses in individuals who engage in EA.

Method

Participants

Participants needed to be aged 18 and above to participate in the study and a student at Cardiff University. Participants were recruited via posters distributed in university buildings and through the university's participant recruitment system. In total, 207 individuals took part in the study. 10 participants were excluded due to incompletion of key measures related to the study variables, resulting in a sample of 197. GPower 3.1.9.4 (Faul et al., 2007) was used to conduct a priori power calculations based on a linear multiple regression model testing if suicidal mental imagery and experiential avoidance predicted suicidality. A sample size of 68 was deemed sufficient for detecting a medium effect size ($\alpha = .05$, power = .80).

Procedure

Data collection took place online using Qualtrics©. Following the provision of informed consent, participants provided demographic information and completed the study questionnaires. The order of these was randomised to reduce order effects. Following completion, all participants were debriefed and provided with information of local and national helplines and how to seek mental health support. Participants were compensated for their time either through the award of participation credits or with the opportunity to enter a raffle to win a shopping voucher. All procedures were approved by the ethics committee at Cardiff University's School of Psychology (Appendix D). Consent form, participant information sheet and debrief form can be found in appendices E - G.

Measures

Demographic information

Participants reported on their demographic characteristics (i.e., age, gender identity, and student status) and completed the following measures:

Suicidal Imagery Questionnaire (SIQ; Ko & You, 2020)

The Suicidal Imagery Questionnaire (Appendix H) is a measure of the experience of suicide-related mental images. The SIQ is a 10-item measure that explores experiences of suicidal mental imagery over the past 6 months. Items are scored from 0 to 4 points, with total scores ranging from 0 to 10. Higher total scores indicate greater experience of suicidal mental imagery. It also consists of two subscales: Spontaneous Suicidal Imagery and Intrusive Suicidal Imagery. Spontaneous suicidal imagery is defined as the experience of intentionally thinking about death whilst intrusive imagery is defined as as sudden and repetitive imagery related to suicide. The SIQ has previously demonstrated good internal consistency and test-retest reliability after a two-week interval ($\alpha = .94$; $r = .88$). The scale showed excellent internal consistency in the present study ($\alpha = .97$).

Multidimensional Experiential Avoidance Questionnaire (MEAQ; Gamez et al., 2011)

The Multidimensional Experiential Avoidance Questionnaire (Appendix I) is a 62-item measure with six subscales assessing dimensions of experiential avoidance. Items are rated on a 1 (strongly disagree) to 6 (strongly agree) Likert-type scale. The six subscales are Behavioural Avoidance, Distress Aversion, Distraction/Suppression, Repression/Denial, Procrastination, and Distress Endurance. The questionnaire provides scores for each subscale, as well as a total score. Higher total scores indicate greater experiential avoidance, with

possible scores ranging from 62-372. The MEAQ has previously shown excellent internal consistency for total MEAQ score (α = .91-.92) and good internal consistency for subscales (ranging from α = .79 to .90). The scale showed excellent internal consistency in the present study (α = .92).

Suicide Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001)

Suicidality was measured by the Suicide Behaviors Questionnaire-Revised (Appendix J). The SBQ-R is a 4-item measure that explores both current and lifetime suicide ideation and suicidal behaviour. Items explore lifetime suicide ideation and attempts, frequency of ideation over the last 12 months, threat of suicide attempt, and self-reported likelihood of future suicidal behaviour. Questions are scored from 0 to 6 points, depending on the item, with total scores ranging from 3 to 18. Higher total scores indicate greater suicidality. The questionnaire has previously shown acceptable to good internal consistency (α = .76 to .87), in addition to excellent test-retest reliability (*r* = .95) over a two-week period (Osman et al., 2001). The SBQ-R has previously been recommended as a validated suicidality assessment tool for use in general population research (Batterham et al., 2015) and has been described as a valid and reliable tool in screening for suicide risk (Osman et al., 2001). The scale showed good internal consistency in the present study (α = .81).

Data analysis strategy

SPSS version 27 was used for the data entry and analysis. First, descriptive analysis procedures were performed to describe the demographic information. Next the data were examined for normality. MEAQ score was found to be normally distributed, as supported by the Kolmogorov-Smirnov test (*p* = .200) and visual inspection of a histogram. Visual

inspection of histograms of SIQ and SBQ-R scores found both sets of data to be highly skewed. Suicidality scores are often not normally distributed due to frequent scores of zero within a non-clinical population. Transformations were applied to normalise the distributions but were found to be unsuccessful. Given the large sample size it was concluded that the assumption of normality can be relaxed because of the Central Limit Theorem (Pek et al., 2018). Visual inspection of scatterplots ensured that the data satisfied the assumptions of homoscedascity and linearity required for the statistical analyses. Next, parametric corelation tests were conducted to explore the relationship of SuiMI with the other variables. A non-parametric correlation test was conducted to confirm the results. These correlations also verified independence of the predictors as required for regression analyses.. A multiple linear regression was conducted to explore whether SuiMI and EA predicted suicidality, with a simple linear regression conducted to test whether SuiMI predicted EA. The regression analyses were judged to be reliable as visual inspection of normal P-P plots indicated the residuals of the model(s) were normally distributed. A mediation analysis (model 4) and moderation analysis (model 1) were carried out using SPSS Process Macro version 4.2 to test the influence of EA on the relationship between SuiMI and suicidality. Exploratory analysis included a series of simple and multiple linear regressions to explore the predictive relationships between study variables in low and high-risk samples. Lastly, a t-test was conducted during exploratory analysis to identify whether there was a significant difference in the type of SuiMI experienced by participants, whilst a multiple linear regression was conducted to identify whether different types of SuiMI explained greater variance in suicidality.

Results

Sample characteristics

The 197 participants included in the final sample identified predominantly as female (85.8%) and were within the 18-24 years age range (90.9%). The majority of the sample were undergraduate students (91.9%). Further sociodemographic and clinical characteristics are shown in Table 2.1. Mean SBQ-R scores were higher in this sample than the nonsuicidal undergraduate sample found in Osman et al. (2001; $M = 5.01$, $SD = 2.97$). 42% of the sample ($n = 83$) exceeded the clinical cutoff of ≥ 7 for suicide risk in a general adult, non-inpatient population on the SBQ-R.

Table 2.1

Sociodemographic and clinical characteristics of participants

Characteristics	***N* (%)**
Gender	
Female	169 (85.8)
Male	22 (11.2)
Non-binary	6 (3.0)
Age	
18-24	179 (90.9)
25-34	15 (7.6)
35-44	1 (.5)
45-54	1 (.5)
55-64	1 (.5)
65+	0
Student status	
Undergraduate	181 (91.9)
Post-graduate	16 (8.1)

Suicidal Behaviours Questionnaire-Revised (SBQ-R)	*M* = 6.66
	SD = 3.49
Suicidal Imagery Questionnaire (SIQ)	*M* = 7.96
	SD = 10.41
Multidimensional Experiential Avoidance Questionnaire (MEAQ)	
	M = 208.21
	SD = 33.26

Hypothesis 1: Verifying the relationship between SuiMI and EA

A Pearson correlation coefficient was computed to assess the relationships between the study variables and to test whether individuals who reported greater experiences of SuiMI would report higher levels of EA (Table 2.2). As hypothesized, SIQ scores were positively correlated with MEAQ scores, although the effect size was small. Positive correlations were also found between MEAQ and SBQ-R scores. It was also found that SIQ scores were positively correlated with SBQ-R scores, with this noted to be a large effect. These results were confirmed by a Spearman's rank order correlation (Appendix K).

Table 2.2

Bivariate correlations among primary study variables, as measured by Pearson's r

Primary study variables	1	2	3
1. Suicidality[a]	–	.814**	.214**
2. Suicidal mental imagery[b]	.814**	–	.240**
3. Experiential avoidance[c]	.214**	.240**	–

[a]SBQ-R scores, [b]SIQ scores, [c]MEAQ scores
**p<.01

A simple linear regression was conducted to test whether SuiMI predicted levels of EA. The model was statistically significant (R^2 = .057, F(1, 195) = 11.871, p<.001). SIQ scores were found to significantly predict MEAQ scores (β = .240, p< .001), although the effect size was small.

Hypothesis 2: Verifying SuiMI and EA as predictors of suicidality

A multiple linear regression was used to test whether SuiMI and EA would significantly predict suicidality. The overall regression was statistically significant (R^2 = .663, F(2, 194) = 190.471, p<.001), explaining 66.2% of the variance in suicidality. However, only SIQ scores were found to significantly predict suicidality (β = .809, p< .001). EA, as measured by MEAQ scores, did not significantly predict suicidality as hypothesised (β = .020, p = .639).

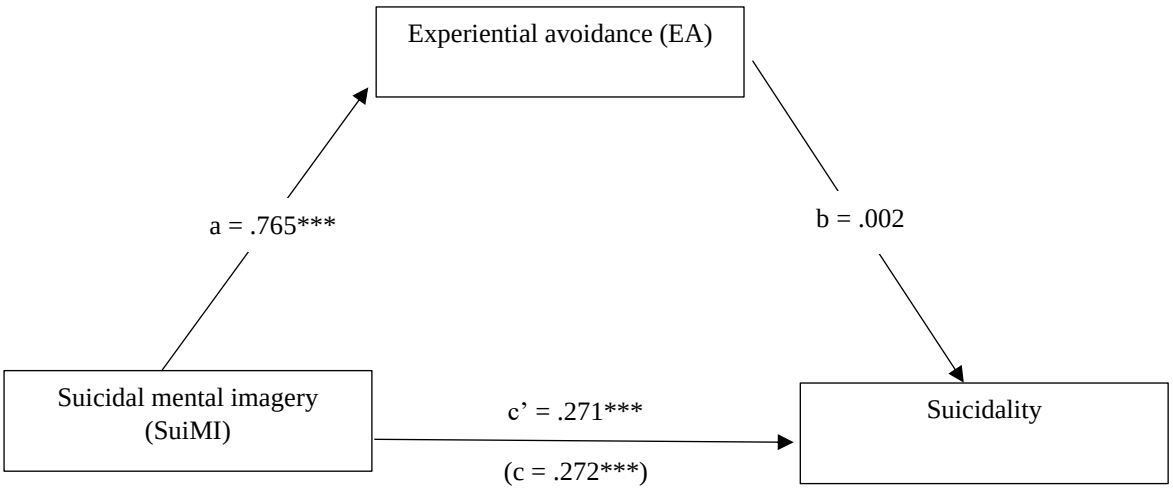
Hypothesis 3: Verifying the mediating/moderating role EA

A mediation analysis using PROCESS Macro No. 4 tested whether the relationship between SuiMI and suicidality was mediated by EA. Mediation analysis found a positive total effect

of SuiMI on suicidality (c = .272, p<.001). There was a significant effect of SuiMI on EA (a = .765, p<.001). The effect of EA on suicidality was not significant (b = .002, p = .639). The indirect effect of SuiMI on suicidality through EA was insignificant, using a 95% confidence interval based on 5000 bootstrap samples (b = .002; 95% CI [-.004, .01]). SuiMI was found to influence suicidality independent of EA (c' = .271, p<.001). The findings indicate that EA is not a mediator of the relationship between SuiMI and suicidality. Results of the proposed model can be seen in Figure 2.3.

Figure 2.3

Results of proposed mediation model



Note. Figure shows direct effects of SuiMI on EA (a), EA on suicidality (b) and SuiMI on suicidality (c'), as well as total effect of SuiMI on suicidality (c).
***p<.001

A moderation analysis using PROCESS Macro No. 1 tested whether the size of the relationship between SuiMI and suicidality changed depending on the moderator of EA. As shown in Table 2.3, SuiMI was significantly related to suicidality, but EA did not moderate the relationship. The hypothesis of EA having a mediating or moderating role on the relationship between SuiMI and suicidality was not supported.

Table 2.3

Suicidality predicted from SuiMI and EA

Predictor					95% CI	
	b	***SE***	***t***	***p***	**LLCI**	**ULCI**
Suicidal mental imagery[b]	.3632	.0837	4.3394	.0000	.1981	.5282
Experiential avoidance[c]	.0064	.0059	1.0866	.2786	-.0052	.0181
Suicidal mental imagery[b] x Experiential avoidance[c]	-.0004	.0004	-1.1208	.2638	-.0012	.0003

[b]SIQ scores, [c]MEAQ scores

Note. *b* = estimate of the regression coefficient; *SE* = standard error of estimate; *t* = t-test value; *p* = significance probability; 95% CI = 95% confidence interval; LLCI = low-limit confidence interval; ULCI = upper-limit confidence interval.

Exploring predictive relationships between study variables in low and high-risk subsamples

To understand whether the finding that EA did not predict suicidality may have been attributable to the sample including participants at low risk of suicide, an exploratory analysis was performed on the high suicide risk participants only (clinical cut-off ≥7 for being at high risk of suicide as measured by the SBQ-R [n = 83]). Multiple linear regression was used to test if SuiMI and EA significantly predicted suicidality in this high-risk sample. This overall regression was statistically significant (R^2 = .608, F(2, 80) = 62.042, p<.001) and replicated the previous result, finding that only SuiMI significantly predicted suicidality (β = .780, p< .001) and EA did not (β = -.003, p = .966). However, when exploring the predictive relationship of SuiMI on EA, a simple linear regression found that SuiMI no longer predicted EA in the high-risk sample (R^2 = .030, F(1, 81) = 2.470, p =.120; β = .172, p = .120). This analysis was re-run in a low-risk subsample (i.e. scored below the clinical cut-off on the

SBQ-R; *n* = 114). These results replicated the initial analysis, where SuiMI predicted both EA and suicidality, and EA did not predict suicidality (Table 2.4).

Table 2.4

Suicidality predicted by SuiMI and EA in low-risk subsample and SuiMI as a predictor of EA

Predictor(s)	**Dependent variable**	***b***	***SE***	***t***	***p***	***β***	***F***	***R^2***
Suicidal mental imagery[b]	Suicidality[a]	.082	.025	3.332	.001	.306	6.843	.110
Experiential avoidance[c]		.003	.003	.814	.417	.075	6.843	.110
Suicidal mental imagery[b]	Experiential avoidance[c]	1.729	.705	2.452	.016	.226	6.014	.051

[a]SBQ-R scores, [b]SIQ scores, [c]MEAQ scores
Note. *b* = estimate of the regression coefficient; *SE* = standard error of estimate; *t* = t-test value; *p* = significance probability; R^2 = explanatory power; *F* = F-test value

Exploring spontaneous suicidal mental imagery (SuiMI) and intrusive SuiMI as individual predictors of suicidality

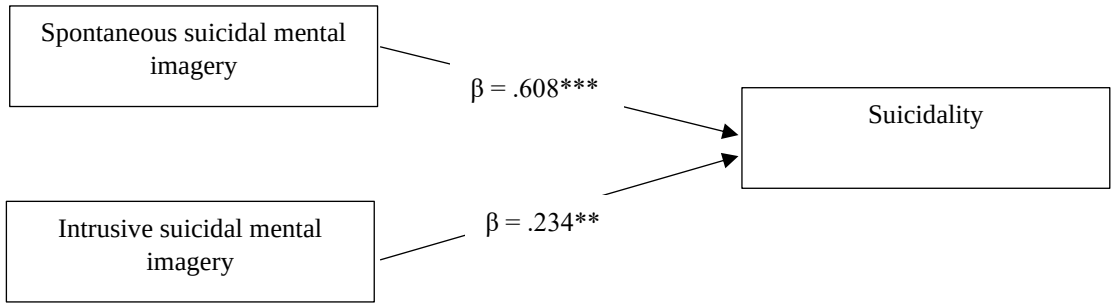
Lastly, exploratory analysis of whether the type of SuiMI predicted levels of suicidality was conducted. Bivariate correlations indicated large correlations between the subscales of the SIQ according to both non-parametric (r = .675, p<.001) and parametric (r = .806, p<.001) tests, indicating potential concern for multicollinearity between predictors. Variance inflation factors (VIF) were examined. VIF values were 3.5 and therefore regression analyses were deemed appropriate as the values did not exceed 10.

A multiple linear regression model was used to test the predictive ability of the SIQ subscales on SBQ-R scores, using the whole dataset. The overall regression was statistically significant

(R^2 = .665, F(2, 194) = 192.733, p< .001; Figure 2.4). Of the 66.5% variance in suicidality explained by SuiMI, spontaneous SuiMI made the largest unique contribution, explaining 10.6% of the variance in suicidality (β = .608, p<.001). Intrusive SuiMI made a small statistically significant contribution (β = .234, p = .003), explaining 1.6% of the variance in suicidality, over and above that explained by spontaneous SuiMI. A paired-samples t-test was conducted to examine for differences in the frequency of spontaneous SuiMI and intrusive SuiMI. Participants experienced significantly greater spontaneous SuiMI (M = 4.87, SD = 6.537) than intrusive SuiMI (M = 3.10, SD = 4.283), t(196) = -6.706, p<.001 (two-tailed).

Figure 2.4

Suicidality as predicted by types of suicidal mental imagery



**p<.01; ***p<.001

Discussion

The aim of this study was to gain a greater understanding of potential processes involved in the relationship between suicide-related mental imagery (SuiMI) and suicidality. It aimed to identify whether there is a relationship between SuiMI and experiential avoidance (EA), and whether EA has an influence on the relationship between SuiMI and suicidality. As hypothesised, SuiMI predicted levels of suicidality, with exploratory analysis indicating that the experience of spontaneous SuiMI explained greater variance in suicidality than intrusive

SuiMI. Furthermore, a positive relationship between SuiMI and EA was found, supporting the hypothesis that those with greater levels of SuiMI will also have a greater tendency to engage in EA. However, EA was not found to have any significant influence on suicidality and the hypothesis of EA as a potential mediator or moderator between SuiMI and suicidality was not supported. EA was not found to predict levels of suicidality in either low or high suicide risk samples. Of particular interest, SuiMI only predicted levels of EA in the low-risk sample and no predictive effect of SuiMI on EA was found in the high-risk sample.

This study replicates previous findings of SuiMI being associated with increased suicide risk in both clinical and non-clinical populations (Crane et al., 2012; Hales et al., 2011; Holaday & Brausch, 2015; Lawrence et al., 2021b), finding that a greater frequency of SuiMI predicted greater suicidality. Mental imagery can be important in guiding behaviour relevant to achieving goals (Conway et al., 2004). Yet when the goal is to kill oneself, the experience of SuiMI may serve to increase the probability of transitioning from just thinking about suicide to engaging in suicidal behaviours (O'Connor & Kirtley, 2018). This is supported by prior research finding that imagining an event increases the likelihood of the person enacting said event (Libby et al., 2007; Pham & Taylor, 1999). In the IMV model of suicide, suicidal behaviour is seen as the salient solution to unbearable life circumstances when no other solutions can be generated, with SuiMI potentially providing a visual representation of this goal. This study is also important in identifying the relationship between SuiMI and suicide risk using an alternative measure, rather than the more commonly used Suicidal Cognitions Interview (Holmes et al., 2007). This is important as the SIQ represents an accessible measure for use in clinical and research scenarios, rather than the time-consuming nature of a structured interview. Given the significant influence of SuiMI on suicide risk, as verified in

this paper, it is important that clinicians and researchers have access to accessible tools to assess this phenomenon.

The finding of EA not having any influence on suicidality is at odds with previous research finding EA to be a predictor of suicidality in both clinical and non-clinical populations (Chou et al., 2018; Ellis & Ruffino, 2016; Roush et al., 2019). This difference could be accounted for by methodological differences in the measurement of EA. Prior studies exploring EA and suicidality have primarily used the Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011). However, the AAQ-II has come under critique due to suboptimal discriminant validity with measures of neuroticism and negative affect, and recommendations have been made to instead use the MEAQ as a measure of EA (Lewis & Naugle, 2017; Rochefort et al., 2018). If the AAQ-II functions as a measure of negative affect, it is unsurprising that previous research has identified strong relationships between EA and suicidality. However, when studies have used a measure of EA with greater construct validity, such as the measure used in this study, the effects of EA as a predictor of suicidality are not found (Rogers & Joiner, 2018; Zvolensky et al., 2016). Further replication is required, with future research investigating the relationship between EA and suicidality to compare alternative measures of EA.

In contrast, a positive association between SuiMI and EA was found. This relationship was expected given prior literature on the rebound effect, where the avoidance of intrusive experiences is associated with greater frequency of these experiences. Furthermore, levels of SuiMI were found to predict levels of EA, with greater experiences of SuiMI leading to greater EA. This fits with ideas of SuiMI being a distressing, aversive internal experience (Crane et al., 2012; Hales et al., 2011; Holmes et al., 2007) and consequentially something

that individuals wish to avoid. Although the predictive effect of SuiMI on levels of EA was relatively small. It was hypothesised that individuals might engage in EA as a response to SuiMI as individuals would find the experience distressing. This is supported by descriptors of individuals feeling frightened, overwhelmed, and drained in response to SuiMI (Holmes et al., 2007). It was also considered that individuals might be trying to avoid the emotions that SuiMI produces. However, it is not possible to draw conclusions on this as the measure of EA used in this study is a general avoidance measure and is not able to identify the specific internal experiences that the individual is avoiding. If a specific measure of imagery avoidance and/or emotional avoidance was used, a larger effect might have been found. Future qualitative research could provide a greater understanding of what causes the greatest distress in SuiMI (i.e., the image, the emotional response or something else) and how avoidant strategies fits with this.

It is interesting to consider further why only those at low risk for suicide were found to have a predictive relationship between SuiMI and EA. It could be possible that SuiMI serves a function for individuals at greater risk of suicide. Conway et al. (2004) has suggested that mental imagery reflect the existence of specific goals and that when an image comes to mind, important goal information becomes available. For those who are already suicidal, SuiMI might represent a goal and thus it is engaged with, rather than avoided. This is supported by work found in addiction literature. The Elaborated Intrusion (EI) theory of craving suggests that the creation of mental images of substance use by cravers is pleasurable, conveying some of the reward or relief of the real thing (May et al., 2004). However, ultimately it draws awareness to a separation between the current state and desired state (Andrade et al., 2012). For suicidal individuals, SuiMI might be a pleasurable and reinforcing experience, with previous research finding similar levels of distress and comfort reported by suicidal

participants in response to SuiMI (Crane et al., 2012; Hales et al., 2011; Holmes et al., 2007). Individuals who are suicidal might achieve reward or relief from SuiMI and therefore not want to avoid the experience, whilst for those who are not suicidal, SuiMI might be viewed as a distressing and aversive experience and something to be avoided. Exploratory analysis indicating that participants had greater experiences of spontaneous SuiMI than intrusive SuiMI adds weight to the idea that individuals might be choosing to engage in SuiMI. Spontaneous SuiMI is representative of suicidal daydreaming where individuals voluntarily conjure images of action leading to their death by suicide (Selby et al., 2007), whilst intrusive SuiMI are conceptualised as involuntary 'snapshots' of suicidal acts (Holmes et al., 207). Spontaneous SuiMI was a more important predictor of suicidality than intrusive SuiMI, and participants reported experiencing significantly greater spontaneous SuiMI than intrusive SuiMI. These results support the idea that SuiMI might not always be experienced as something intrusive that wants to be avoided but could also be an active process the individual is engaged with. The idea of suicidal individuals engaging in certain behaviours despite the risk of increasing suicidality is supported by research looking at self-disgust and suicide, which found suicidal males would seek out mirrors to look at themselves, with the consequence of increased suicide risk (Mason et al., 2022). Whilst this study did not find EA to have a mediating or moderating influence on the relationship between SuiMI and suicidality, it highlights the need for further research to explore alternative cognitive processes that might be significant, particularly given the risk of increased suicide in those who experience SuiMI. Exploring how the process of SuiMI differs in actively suicidal individuals and non-suicidal individuals might support with this.

Given the strong predictive relationship found between SuiMI and suicide risk, this study supports the need for clinicians to assess for the presence of mental images of suicide, and

not verbal thoughts alone, when exploring suicide risk. It would also be prudent for clinicians to explore the type of SuiMI their clients are experiencing and their engagement with the content, with spontaneous SuiMI appearing to have a greater influence on suicide risk. Exploring emotional responses to experiences of SuiMI might also be important, with those who are experiencing pleasurable emotions potentially being at greater risk. There are also potential implications in terms of treatment. Treatment strategies in response to SuiMI have been proposed, such as Eye Movement Dual Task (EMDT) to reduce the emotional charge of unwanted SuiMI (van Bentum et al., 2017). However, where SuiMI is less intrusive in nature and more spontaneously generated by the individual, different approaches to treatment may need to be considered. This could potentially include imagery techniques to reduce the potentially positively reinforcing nature of suicidal daydreaming.

Several study limitations should be noted. A university sample was used as an analogue sample for those experiencing suicidality in the general population, addressing ethical concerns raised by the university ethics committee. Previous research has established associations between SuiMI and suicidality (Holaday & Brausch, 2015), as well as EA and suicidality (Chou et al., 2018; Zvolensky et al., 2016) in university students. However, the study's findings may not be directly generalisable to clinical populations, such as a depressed sample or mental health inpatients. For example, the mean suicidality score was lower than that observed in suicidal adult inpatient samples (M = 11.18, SD = 3.99; Osman et al., 2001). For EA, the mean score was lower than that found in psychiatric patient samples (M = 224.61, SD = 39.94; Gamez et al., 2011), however it was comparable with community adult (M = 185.29, SD = 39.95; Gamez et al., 2011) and college student samples (M = 195.08, SD = 34.46; Gamez et al., 2011) suggesting the findings are reliable within a general population context. Nevertheless, making definitive inferences regarding the comparability of the study's

findings with clinical populations is challenging due to the lack of current research validating the SIQ measure in such samples. Consequently, replicating the study in clinical populations is warranted to establish its broader applicability.

There were also implications relating to generalisability from using a university sample. Many participants were recruited from the School of Psychology, resulting in a sample predominantly composed of females in the 18-24 age bracket. It is important to note that suicide death rates are higher for males in England and Wales (Office for National Statistics, 2022), and a more balanced representation of males in the sample might have revealed potentially stronger predictive relationships between the study variables. However, recent research indicates that gender was not a moderator of prevalence estimates of SuiMI (Lawrence et al., 2023). Regarding age, little is known about its influence on the experience of SuiMI, but Lawrence et al. (2023) found that age group moderated the prevalence estimate of SuiMI, with higher rates in adults than adolescents. Suicide rates are also highest in older adults (Moutier et al., 2021). Therefore, a more diverse age representation in the sample might have strengthened the predictive relationship between SuiMI and suicidality. Future research could assess the generalisability of the findings with samples involving a larger percentage of males and greater age diversity. If using a university sample, targeting postgraduates and schools with more male students could achieve this. For a general population sample, recruitment through charities supporting older adults and males might be beneficial. Ethnicity data were not collected, but it is vital for future research to consider this aspect to draw conclusions on generalisability, as suicide rates vary between ethnic groups (Office for National Statistics, 2021).

Regarding research design, due to the cross-sectional nature of these data, it is not possible to make causal statements concerning the relations under study. Longitudinal studies are required to confirm the predictive ability of SuiMI on suicidality. Such longitudinal studies would benefit from exploring the similarities and differences in the experience of SuiMI in both actively suicidal and non-suicidal participants, as well as including measures to explore potential mediators in the transition from SuiMI to suicidal behaviours. Utilising ecological momentary assessment of SuiMI and EA, rather than retrospective self-reported measures, may provide insight into the circumstances of when different types of SuiMI are experienced and how individuals respond to these.

Conclusion

In conclusion, this study has found that the experience of suicidal mental imagery (SuiMI) is an important predictor of suicidality in a university sample, with suicidal daydreaming appearing to have a greater explanatory role than intrusive suicidal "flash-forwards". SuiMI has been found have a small effect on the tendency to engage in experiential avoidance (EA), although exploratory analysis indicates this relationship only exists in individuals at low risk of suicide. Using a robust measure of EA, EA has not been found to predict levels of suicidality as research has previously indicated. Implications for clinicians include the importance of assessing the presence and type of SuiMI when exploring suicide risk. Future longitudinal studies with a balanced proportion of male and female participants are needed to further our understanding of the relationship between mental images of suicide and suicidality, and the cognitive and emotional processes involved in this relationship. Potential key research questions include further study of the different types of SuiMI and differences in how these are engaged with and responded to. With an improved understanding of suicidal

mental imagery, alternative treatments for suicidal ideation may be identified and support the reduction of suicide risk.

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Appendix A: Submission guidelines for Aging & Mental Health

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Contents

About the Journal

Aging & Mental Health is an international, peer-reviewed journal publishing high-quality, original research. Please see the journal's Aims & Scope for information about its focus and peer-review policy.

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tables
references
tables
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Updated 7th of February 2023

Appendix B: Scoring guideline for Quality Assessment with Diverse Studies

QuADS Criteria	0	1	2	3
1. Theoretical or conceptual underpinning to the research	No mention at all.	General reference to broad theories or concepts that frame the study. e.g. key concepts were identified in the introduction section.	Identification of specific theories or concepts that frame the study and how these informed the work undertaken. e.g. key concepts were identified in the introduction section and applied to the study.	Explicit discussion of the theories or concepts that inform the study, with application of the theory or concept evident through the design, materials and outcomes explored. e.g. key concepts were identified in the introduction section and the application apparent in each element of the study design.
2. Statement of research aim(s).	No mention at all.	Reference to what the sought to achieve embedded within the report but no explicit aims statement	Aims statement made but may only appear in the abstract or be lacking detail.	Explicit and detailed statement of aim/s in the main body of report.
3. Clear description of research setting and target population	No mention at all.	General description of research area but not of the specific research environment e.g. 'in primary care.'	Description of research setting is made but is lacking detail e.g. 'in primary care practices in region [x]'.	Specific description of the research setting and target population of study e.g. 'nurses and doctors from GP practices in [x] part of [x] city in [x] country.'
4. The study design is appropriate to address the stated research aim(s)	No research aim(s) stated or the design is entirely unsuitable e.g. a Y/N item survey for a study seeking to undertake exploratory work of lived experiences.	The study design can only address some aspects of the stated research aim(s) e.g. use of focus groups to capture data regarding the frequency and experience of a disease.	The study design can address the stated research aim(s) but there is a more suitable alternative that could have been used or used in addition e.g. addition of a qualitative or quantitative component could strengthen the design.	The study design selected appears to be the most suitable approach to attempt to answer the stated research aim(s).
5. Appropriate sampling to address the research aim(s)	No mention of the sampling approach.	Evidence of consideration of the sample required e.g. the sample characteristics are	Evidence of consideration of sample required to address the aim. e.g. the sample	Detailed evidence of consideration of the sample required to address the research

		described and appear appropriate to address the research aim(s).	characteristics are described with reference to the aim(s).	aim(s). e.g. sample size calculation or discussion of an iterative sampling process with reference to the research aims or the case selected for study.
6. Rationale for choice of data collection tool(s)	No mention of rationale for data collection tool used.	Very limited explanation for choice of data collection tool(s). e.g. based on availability of tool.	Basic explanation of rationale for choice of data collection tool(s). e.g. based on use in a prior similar study.	Detailed explanation of rationale for choice of data collection tool(s). e.g. relevance to the study aim(s), codesigned with the target population or assessments of tool quality
7. The format and content of data collection tool is appropriate to address the stated research aim(s)	No research aim(s) stated and/or data collection tool not detailed.	Structure and/or content of tool(s) suitable to address some aspects of the research aim(s) or to address the aim(s) superficially e.g. single item response that is very general or an open-response item to capture content which requires probing.	Structure and/or content of tool(s) allow for data to be gathered broadly addressing the stated aim(s) but could benefit from refinement. e.g. the framing of survey or interview questions are too broad or focused to one element of the research aim(s).	Structure and content of tool(s) allow for detailed data to be gathered around all relevant issues required to address the stated research aim(s).
8. Description of data collection procedure.	No mention of the data collection procedure	Basic and brief outline of data collection procedure e.g. ‘using a questionnaire distributed to staff’.	States each stage of data collection procedure but with limited detail or states some stages in detail but omits others e.g. the recruitment process is mentioned but lacks important details.	Detailed description of each stage of the data collection procedure, including when, where and how data was gathered such that the procedure could be replicated.
9. Recruitment data provided	No mention of recruitment data.	Minimal and basic recruitment data e.g. number of people invited who agreed to take part.	Some recruitment data but not a complete account e.g. number of people who were invited and agreed.	Complete data allowing for full picture of recruitment outcomes e.g. number of people approached, recruited, and who completed with attrition data explained where relevant
10. Justification for analytic method selected	No mention of the rationale for the analytic method chosen.	Very limited justification for choice of analytic method selected. e.g. previous use by the research team.	Basic justification for choice of analytic method selected e.g. method used in prior similar research.	Detailed justification for choice of analytic method selected e.g. relevance to the study aim(s) or comment around of the

				strengths of the method selected.
11. The method of analysis was appropriate to answer the research aim(s)	No mention at all.	Method of analysis can only address the research aim(s) basically or broadly.	Method of analysis can address the research aim(s) but there is a more suitable alternative that could have been used or used in addition to offer a stronger analysis.	Method of analysis selected is the most suitable approach to attempt answer the research aim(s) in detail e.g. for qualitative interpretative phenomenological analysis might be considered preferable for experiences vs. content analysis to elicit frequency of occurrence of events.
12. Evidence that the research stakeholders have been considered in research design or conduct	No mention at all.	Consideration of some the research stakeholders e.g. use of pilot study with target sample but no stakeholder involvement in planning stages of study design.	Evidence of stakeholder input informing the research. e.g. use of pilot study with feedback influencing the study design/conduct or reference to a project reference group established to guide the research.	Substantial consultation with stakeholders identifiable in planning of study design and in preliminary work e.g. conceptualisation of the research, a project advisory group or evidence of stakeholder input informing the work.
13. Strengths and limitations critically discussed	No mention at all.	Very limited mention of strengths and limitations with omissions of many key issues. e.g. one or two strengths/limitations mentioned with limited detail.	Discussion of some of the key strengths and weaknesses of the study but not complete. e.g. several strengths/limitations explored but with notable omissions or lack of depth of explanation.	Thorough discussion of strengths and limitations of all aspects of study including design, methods, data collection tools, sample & analytic approach.

Appendix C: Submission guidelines for Journal of Clinical Psychology

1. Submission and Peer Review Process

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All listed authors should have contributed to the manuscript substantially and have agreed to the final submitted version. Please see here and scroll down for a description of authorship criteria.

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Up to six keywords;
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Appendix D: Evidence of ethical approval

Ethics Feedback - EC.22.04.26.6553R

psychethics <[redacted]>
Tue 31/05/2022 15:42

To: [redacted]

Cc: Hannah Maynard

Dear [redacted]

The Ethics Committee has considered your revised PG project proposal: Exploring the relationship between suicidal mental imagery and experiential avoidance in suicidality (EC.22.04.26.6553R).

Your project proposal has received a **Favourable Opinion** based on the information described in the proforma and supporting documentation.

Conditions of the favourable opinion
The favourable opinion is subject to the following conditions being met:

- You must retain a copy of this decision letter with your Research records.
- Please note that if any changes are made to the above project then you must notify the Ethics Committee.
- Please use the EC reference number on all future correspondence.
- The Committee must be informed of any unexpected ethical issues or unexpected adverse events that arise during the research project.
- The Committee must be informed when your research project has ended. This notification should be made to [redacted] within three months of research project completion.

The Committee reminds you that it is your responsibility to conduct your research project to the highest ethical standards and to keep all ethical issues arising from your research project under regular review.

You are expected to comply with Cardiff University's policies, procedures and guidance at all times, including, but not limited to, its Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data and our Research Integrity and Governance Code of Practice.

Kind regards,

School of Psychology Research Ethics Committee
[redacted]

Cardiff University
Tower Building
70 Park Place
Cardiff
CF10 3AT

Tel: [redacted]
Email: [redacted]

Prifysgol Caerdydd
Adeilad y Tŵr
70 Plas y Parc
Caerdydd
CF10 3AT

Ffôn: [redacted]
E-bost: [redacted]

Appendix E: Consent form

School of Psychology, Cardiff University

Exploring the relationship between suicidal mental imagery and experiential avoidance in suicidality

Consent Form - Anonymous data

I understand that my participation in this project will involve completing three questionnaires. The questionnaires will ask about personal experiences of suicidal thoughts and behaviours. They will also ask about how I cope with difficulties. It will require approximately 20 minutes of my time.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason and without loss of course credit.

I understand that I am free to discuss my concerns with the researcher, Hannah Maynard, or the supervisor, Prof. John Fox.

I understand that once I have completed the study it will not be possible to withdraw my data as the information is collected anonymously.

I understand that at the end of the study I will be provided with additional information and feedback about the purpose of the study.

I understand that the research information provided by me will be held totally anonymously, so that it is impossible to trace this information back to me individually. I understand that this information may be retained indefinitely or published.

I understand that I will be asked questions about my experience of suicidal thoughts, feelings and behaviours.

I understand that individual feedback will not be provided as the data is being collected anonymously.

I understand that a clinical follow-up after completing the study is not available.

ELECTRONIC CONSENT: Please select your choice below. You may print a copy of this consent form for your records. Clicking on the “Agree” button indicates that

- You have read the above information
- You are 18 years of age or older
- You are consenting to participate

Agree

Disagree

Appendix F: Participant information sheet

School of Psychology, Cardiff University

Title of Study: Exploring the relationship between suicidal mental imagery and experiential avoidance in suicidality

Participant Information Sheet v2

Principal investigator: Hannah Maynard, Trainee Clinical Psychologist.

Supervisors: Professor John Fox, Consultant Clinical Psychologist.
Dr James Gregory, Consultant Clinical Psychologist.
Dr Andrea Davies, Consultant Clinical Psychologist.

Contact details:
Clinical Psychology Training, School of Psychology, Tower Building, 70 Park Place, Cardiff, CF10 3AT.
e-mail: [redacted]
telephone: [redacted]

We would like to invite you to take part in this research study to find out about some of the psychological factors involved in suicidal thinking and behaviours. The study will take place online and will take about 20 minutes. So that you can decide if you want to take part there is more information below about why the research is being done and what it will involve. Please take some time to read through. If you have any questions, please contact us through the details above. Thank you for reading the information and your interest in the study.

What is the study about?

Many people think about suicide. We want to find out if the way we deal with difficult internal experiences (e.g., emotions, thoughts, memories) affects how suicidal someone feels. In addition, we are interested in the mental images that people can experience when in despair and/or suicidal. We hope that this information will help us to gain a better understanding of the psychological factors involved in suicide. Understanding the psychological factors involved in suicide is necessary to improve how suicide risk is assessed.

Who can take part?

We are inviting any Cardiff University students aged 18 and over to take part. You do not need to have experienced suicidal thoughts or feelings to take part in the study.

What will happen if I choose to take part?

All data collection will take place via the Qualtrics website. After reading this information sheet and indicating you are happy to continue, you will be provided with the consent form and asked whether you agree to participate. If you provide consent, you will be asked to provide some demographic information (e.g. age, gender, whether you are an undergraduate

or postgraduate student). You will then complete a series of questionnaires. These questionnaires will ask about your past and current experiences of suicidal thoughts and behaviours. They will also ask about how you deal with internal experiences, such as emotions and thoughts. One of these questionnaires will ask specifically about suicidal mental imagery you may have experienced. It will take approximately 20 minutes to complete.

Will my data be kept anonymously?

All information you provide will be kept securely and anonymously. No personal information will be collected as part of the study. You can withdraw at any point during the study, however once you have completed the study it will not be possible to withdraw your information as the data will be stored anonymously.

What are the potential benefits and disadvantages of taking part?

The study will be asking about potentially difficult topics, including your past and current experiences of suicidal thoughts and behaviours. It will include questions which ask whether you have ever had thoughts or images of killing yourself and whether you have ever made plans or attempts to kill yourself. The information you provide will be anonymous and it will not be possible to identify you from the information you provide. This means that we are unable to provide any clinical support or follow-up following completion of the study.

If you do choose to take part you will be awarded participation credits (relevant only to School of Psychology students) or you will have the opportunity to enter a raffle to win one of the following gift cards: 1 x £10 Love2Shop, 1 x £25 Love2Shop, 1 x £50 Love2Shop. To enter the raffle, you will be invited to complete a second, unrelated survey where you would enter your email address so that you can be contacted if you win. Your email address will be stored separately to your study data, and it will not be possible to link your email address to the information you provided. The raffle will be drawn once data collection is complete and the winners will be notified by email.

What will happen to the results of the study?

The information that you and others provide will be analysed to try and understand how different psychological factors affect experiences of suicidal thoughts and behaviours. The results will be submitted as part of Hannah Maynard's training in Clinical Psychology. They may also be written up and published in an article and presented to people who work and research in similar areas. If you wish to have information about the results of the study, please let Hannah Maynard know and we will send you a summary of the results as soon as they are available.

Do I have to take part?

No. You do not need to take part if you do not want to. Even if you begin the study you can stop at any time without giving a reason. If you choose to withdraw for any reason and at any point but would still like access to the debrief form, please contact the researcher on [redacted]

What support is available if I become upset whilst completing the study?

We are unable to provide any clinical support or follow-up. If you are struggling to cope or are having thoughts to hurt or kill yourself, we strongly encourage you to seek support from your GP. They can provide you with the support you need and signpost you to other services who may also be able to help.

Cardiff University can also provide you with support for mental health difficulties: https://www.cardiffstudents.com/advice/health-and-wellbeing/mental-health/

You might also want to contact these other organisations who are there to listen, day or night:

- The Samaritans – call for free on 116 123, or email jo@samaritans.org, available 24/7 365 days a year. You can also call the Samaritans Welsh Language Line on 0808 164 0123 (7pm–11pm every day)

- National Suicide Prevention Helpline UK – a supportive listening service to anyone with thoughts of suicide. Call 0800 689 5652, open 24/7

- Papyrus (Prevention of Young Suicide) – for confidential advice contact Papyrus' HOPELINEUK on 0800 068 4141 and pat@papyrus-uk.org (9am – 12am every day)

- C.A.L.L. - if you live in Wales, you can call the Community Advice and Listening Line on 0800 132 737 (open 24/7) or you can text 'help' followed by a question to 81066

- If you're outside the UK, the Befrienders Worldwide website (https://www.befrienders.org/) has a tool to search by country for emotional support helplines around the world

Who is sponsoring the research?

Cardiff and Vale University Health Board is funding the research and Cardiff University is sponsoring the research.

Who has said that the study is OK to go ahead?

The research study has been reviewed and approved by the School of Psychology Research Ethics Committee at Cardiff University.

If you have any concerns or complaints about the
research you can contact the School of Psychology Research Ethics Committee in writing at:
Secretary to the Research Ethics Committee
School of Psychology
Tower Building
70 Park Place
17
Cardiff
CF10 3AT
[redacted]

If you would like more information about the project, please feel free to contact us on the details provided above.

Appendix G: Debrief form

School of Psychology, Cardiff University

Title of Study: Exploring the relationship between suicidal mental imagery and experiential avoidance in suicidality

Debrief form

Thank you for taking part in this study. The information that you and others have provided will be analysed and interpreted. This study was interested in whether there is a relationship between experiential avoidance and the experience of suicidal mental imagery. Experiential avoidance can be defined as attempts to avoid thoughts, feelings, memories, physical sensations, and other internal experiences. Previous research has found that experiential avoidance is associated with suicidal thoughts and behaviours. Research has also found that individuals can have suicidal thoughts that present in the form of mental images. We hope that the findings of this study will identify whether a relationship between experiential avoidance and suicide-related mental images exists. This information could be useful for developing existing models of suicide and understanding who is at an increased risk of suicide.

We are unable to offer any clinical support or follow-up following completion of this study. If you are struggling to cope or are having thoughts to hurt or kill yourself, we strongly encourage you to seek support from your GP. They can provide you with the support you need and signpost you to other services who may also be able to help.

Cardiff University can also provide you with support for mental health difficulties: https://www.cardiffstudents.com/advice/health-and-wellbeing/mental-health/

If you have indicated that you are having thoughts to end your life, we recommend you contact any of the organisations below who will be able to support you:

- The Samaritans – call for free on 116 123, or email jo@samaritans.org, available 24/7 365 days a year. You can also call the Samaritans Welsh Language Line on 0808 164 0123 (7pm–11pm every day)

- National Suicide Prevention Helpline UK – a supportive listening service to anyone with thoughts of suicide. Call 0800 689 5652, open 24/7

- Papyrus (Prevention of Young Suicide) – for confidential advice contact Papyrus' HOPELINEUK on 0800 068 4141 and pat@papyrus-uk.org (9am – 12am every day)

- C.A.L.L. - if you live in Wales, you can call the Community Advice and Listening Line on 0800 132 737 (open 24/7) or you can text 'help' followed by a question to 81066

- If you're outside the UK, the Befrienders Worldwide website (https://www.befrienders.org/) has a tool to search by country for emotional support helplines around the world

If you are experiencing **frequent thoughts to end your life and are not sure you are able to keep yourself safe**, please contact your local Mental Health Crisis Team, or attend your local A&E:

- Cardiff Crisis Team - 02921 824930
- Rhondda Taff Ely Crisis Team - 01443 443712 (ext: 4903 9am – 5pm or 6388 out of hours)
- Merthyr Cynon Crisis Team - 01685 721721 ext 26952 / 26953
- Bridgend Crisis Team - 01656 752666
- Newport – 111 and select option 2
- Carmarthenshire, Ceredigion and Pembrokeshire - 111 and select option 2
- Swansea - 111 and select option 2

The information you have provided will be stored securely and anonymously. This means it is not possible to withdraw your information at this time.

If you wish to have information about the results of the study, please contact Hannah Maynard ([redacted]) who can send you a summary of the results as soon as they are available.

If you have any further questions about the study please contact us on [redacted]. Please note that we are unable to provide emotional support.

Researchers:

Hannah Maynard
Trainee Clinical Psychologist
[redacted]
South Wales Doctoral Programme in Clinical Psychology,
11th Floor, School of Psychology, Tower Building,
70 Park Place, Cardiff, CF10 3AT

Supervisors:
Prof John Fox, Cardiff University and Cardiff & Vale University Health Board
Dr James Gregory, Cardiff University and Cardiff & Vale University Health Board
Dr Andrea Davies, Cwm Taf Morgannwg University Health Board

If you have any concerns or complaints about the research you can contact the School of Psychology Research Ethics Committee in writing at:
Secretary to the Research Ethics Committee
School of Psychology, Tower Building
70 Park Place, Cardiff, CF10 3AT
[redacted]

Appendix H: Suicidal Imagery Questionnaire (Ko & You, 2020)

Instructions: How many times have you experienced the following for the past 6 months? For each item, please rate your experience on the scale from 0 to 4.

0 = None
1 = 1-2 times
2 = 3-4 times
3 = 5-9 times
4 = More than 10 times

1. I have imagined what it would be like to commit suicide.
2. I have imagined what the easiest way would be for me to commit suicide.
3. A scene related to suicide abruptly came to mind.
4. I have pictured myself committing suicide.
5. An image related to suicide unexpectedly came to mind when I did not want to think about suicide.
6. I have imagined being free from the current pain I feel after suicide.
7. An image related to suicide came to mind suddenly, even when I did not want to.
8. I have practiced committing suicide in my head.
9. All of sudden, a scene related to suicide came to mind.
10. I have specifically envisioned when, where, and how to commit suicide.

Appendix I: Multidimensional Experiential Avoidance Questionnaire (Gamez et al., 2011)

Instructions: Please indicate the extent to which you agree or disagree with each of the following statements using the scale below.

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Slightly agree
5 = Moderately agree
6 = Strongly agree

1. I won't do something if I think it will make me uncomfortable
2. If I could magically remove all of my painful memories, I would
3. When something upsetting comes up, I try very hard to stop thinking about it
4. I sometimes have difficulty identifying how I feel
5. I tend to put off unpleasant things that need to get done
6. People should face their fears
7. Happiness means never feeling any pain or disappointment
8. I avoid activities if there is even a small possibility of getting hurt
9. When negative thoughts come up, I try to fill my head with something else
10. At times, people have told me I'm in denial
11. I sometimes procrastinate to avoid facing challenges
12. Even when I feel uncomfortable, I don't give up working toward things I value
13. When I am hurting, I would do anything to feel better
14. I rarely do something if there is a chance that it will upset me
15. I usually try to distract myself when I feel something painful
16. I am able to "turn off" my emotions when I don't want to feel
17. When I have something important to do I find myself doing a lot of other things instead

18. I am willing to put up with pain and discomfort to get what I want
19. Happiness involves getting rid of negative thoughts
20. I work hard to avoid situations that might bring up unpleasant thoughts and feelings in me
21. I don't realize I'm anxious until other people tell me
22. When upsetting memories come up, I try to focus on other things
23. I am in touch with my emotions
24. I am willing to suffer for the things that matter to me
25. One of my big goals is to be free from painful emotions
26. I prefer to stick to what I am comfortable with, rather than try new activities
27. I work hard to keep out upsetting feelings
28. People have said that I don't own up to my problems
29. Fear or anxiety won't stop me from doing something important
30. I try to deal with problems right away
31. I'd do anything to feel less stressed
32. If I have any doubts about doing something, I just won't do it
33. When unpleasant memories come to me, I try to put them out of my mind
34. In this day and age people should not have to suffer
35. Others have told me that I suppress my feelings
36. I try to put off unpleasant tasks for as long as possible
37. When I am hurting, I still do what needs to be done
38. My life would be great if I never felt anxious
39. If I am starting to feel trapped, I leave the situation immediately
40. When a negative thought comes up, I immediately try to think of something else
41. It's hard for me to know what I'm feeling

42. I won’t do something until I absolutely have to

43. I don’t let pain and discomfort stop me from getting what I want

44. I would give up a lot not to feel bad

45. I go out of my way to avoid uncomfortable situations

46. I can numb my feelings when they are too intense

47. Why do today what you can put off until tomorrow

48. I am willing to put up with sadness to get what I want

49. Some people have told me that I “hide my head in the sand”

50. Pain always leads to suffering

51. If I am in a slightly uncomfortable situation, I try to leave right away

52. It takes me awhile to realize when I’m feeling bad

53. I continue working toward my goals even if I have doubts

54. I wish I could get rid of all of my negative emotions

55. I avoid situations if there is a chance that I’ll feel nervous

56. I feel disconnected from my emotions

57. I don’t let gloomy thoughts stop me from doing what I want

58. The key to a good life is never feeling any pain

59. I’m quick to leave any situation that makes me feel uneasy

60. People have told me that I’m not aware of my problems

61. I hope to live without any sadness and disappointment

62. When working on something important, I won’t quit even if things get difficult

Appendix J: Suicide Behaviors Questionnaire-Revised (Osman et al., 2001)

Instructions: Please check the number beside the statement or phrase that best applies to you.

1. Have you ever thought about or attempted to kill yourself? (check one only)
    1. Never
    2. It was just a brief passing thought
    3a. I have had a plan at least once to kill myself but did not try to do it
    3b. I have had a plan at least once to kill myself and really wanted to die
    4a. I have attempted to kill myself, but did not want to die
    4b. I have attempted to kill myself, and really hoped to die

2. How often have you thought about killing yourself in the past year? (check one only)
    1. Never
    2. Rarely (1 time)
    3. Sometimes (2 times)
    4. Often (3-4 times)
    5. Very Often (5 or more times)

3. Have you ever told someone that you were going to commit suicide, or that you might do it? (check one only)
    1. No
    2a. Yes, at one time, but did not really want to die
    2b. Yes, at one time, and really wanted to die
    3a. Yes, more than once, but did not want to do it
    3b. Yes, more than once, and really wanted to do it

4. How likely is it that you will attempt suicide someday? (check one only)
    0. Never
    1. No chance at all
    2. Rather unlikely
    3. Unlikely
    4. Likely
    5. Rather likely
    6. Very likely

Appendix K: Bivariate correlations among primary study variables

Bivariate correlations among primary study variables, as measured by Spearman's rho

Primary study variables	1	2	3
1. Suicidality[a]	–	.783**	.175*
2. Suicidal mental imagery[b]	.783**	–	.235**
3. Experiential avoidance[c]	.175*	.235**	–

[a]SBQ-R scores, [b]SIQ scores, [c]MEAQ scores
*p<.05. **p<.01