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Exploring the role of loneliness in relation to self-injurious thoughts and behaviour in the context of the integrated motivational-volitional model

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ABSTRACT

Suicide is a worldwide public health concern claiming approximately 800,000 lives around the world every year. The impact of loneliness on mental and physical wellbeing has received increasing attention in recent years, however its role in the emergence of self-injurious thoughts and behaviours is unclear. The current study explored loneliness in relation to other psychological variables associated with self-injurious thoughts and behaviour. Data were collected from UK residents (n = 400, aged 18–76 years) via an online survey accessible between September 2018 and April 2019. Univariate multinomial logistic regression analyses identified that loneliness independently distinguished between participants with no history of self-injurious thoughts or behaviours, those with a history of self-injurious thoughts only, and those with a history of self-injurious behaviours. When other key variables were controlled for, loneliness distinguished between controls and those with a self-injurious thoughts or behaviours history. However, loneliness did not distinguish between people with self-injurious thoughts only and those with a history of self-injurious behaviours. To understand how loneliness might contribute towards the emergence of self-injury, analysis exploring the extent to which loneliness moderates established risk factors (e.g., defeat, entrapment) was conducted. The results suggest that loneliness moderates both the relationship between defeat and entrapment, and between entrapment and self-injurious thoughts. Future work exploring these associations prospectively would advance understanding of the role of loneliness in suicide risk and inform the development of clinical and community-based suicide prevention interventions.

1. Introduction

One person dies by suicide on average every 40 s worldwide (World Health Organization, 2016). In addition to this, many more people experience self-injurious thoughts or behaviour (O'Connor et al., 2018; Aschan et al., 2013). Despite the scale and impact of self-injury, our ability to predict self-injury with any degree of accuracy has not progressed significantly in recent decades (Franklin et al., 2017). However, there is growing recognition that the factors underpinning self-injurious behaviours are multi-factorial and complex, and that key determinants of self-injurious behaviour have a psychological basis (O'Connor and Nock, 2014). Although many psychological variables have been shown to be associated with suicide risk, the nature of the association has not been fully explored. In this study, we focus on one such factor, loneliness and investigate the extent to which it is associated with other established suicide risk factors.

1.1. Loneliness

Loneliness is an affectively-laden cognition (Van Orden et al., 2010) which arises from a discrepancy between the quantity or quality of the social relationships one has, compared to those they desire (Perlman and Peplau, 1982). The impact of loneliness on wellbeing has received increasing attention in recent years (Lee et al., 2021; HM Government, 2018), particularly since the global COVD-19 pandemic. Research suggests that between 10 and 36% of the general population experience loneliness at some point in their lives (Perlman and Peplau, 1982; Richard et al., 2017; Yang and Victor, 2011). Distinctive from social isolation, loneliness is not outwardly visible to others and therefore it can go undetected by onlookers. This is a cause for concern as research has found that loneliness can have serious implications for an individual's psychological health and wellbeing. For example, it is longitudinally associated with both depression (Mushtaq et al., 2014) and

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self-injurious thoughts and behaviour (McClelland et al., 2020). However, not everyone who experiences loneliness goes on to experience self-injurious thoughts or behaviours. This, therefore, suggests that an inter-play of other factors must be considered when identifying what role loneliness has in the emergence of self-injury.

1.2. Loneliness within theoretical models of self-injurious behaviour

To date, loneliness is only expressly included in one of the dominant models of self-injurious behaviour; the Interpersonal Theory of Suicide (IPT; Joiner, 2005; Van Orden et al., 2010). Within this theory, loneliness is posited to be a contributory factor to the emergence of thwarted belongingness, where, in combination with perceived burdensomeness, it can give rise to the desire to die. Other theoretical models such as the Integrated Motivational Volitional Model of suicidal behaviour (IMV; O'Connor and Kirtley, 2018; O'Connor, 2011), also offer insights into the potential role of loneliness within the suicidal and self-injury process.

1.3. IMV model

The IMV model (see Fig. 1) incorporates the key components of the IPT within the second phase of its tripartite structure. Briefly, the IMV model considers an individual's past experiences (pre-motivational phase) and current situational factors (motivational phase) to predict the development of self-injurious thoughts. The model then considers a third phase (volitional phase) relating to the emergence of self-injurious behaviour, which states that a group of factors called volitional moderators (e.g., knowing someone who has died by suicide) govern the transition from self-injurious thoughts to self-injurious acts.

*Factors associated with self-injurious thoughts and behaviours*Within the IMV model, the pre-motivational phase describes vulnerability factors such as genetic history and early life trauma (O'Connor et al., 2020; Cleare et al., 2018). The latter may contribute to the development of maladaptive personality traits (e.g., socially-prescribed perfectionism; Smith et al., 2018) and a life-long increased sensitivity to stress (Heisel et al., 2003). While the pre-motivational phase pertains in part to traits that are stable over time, the motivational phase encompasses an individual's current psychological state, for example, loneliness. According to the motivational phase of the IMV model, ineffective stress management can lead to defeat, which in turn can give rise to entrapment and self-injurious thoughts. This can potentially lead to self-injury and death as outlined in the Volitional Phase.

1.4. Motivational phase

The IMV model posits that transition across the motivational phase is moderated by several variables. For example, avoidant coping styles and over-generalised memory recall in combination with pre-motivational factors may render the emergence of self-injurious thoughts more likely (Xiong et al., 2020). On balance, protective factors including episodic memory and adaptive coping (e.g., problem solving) have been found to buffer the association between defeat and entrapment (Williams and Broadbent, 1986) while social support, for example, may moderate the association between entrapment to self-injurious thoughts (Lee, 2019). However, it is important to highlight that Lee (2019), like most other research exploring moderating effects of a similar topic, these findings are based on cross-sectional data which cannot discern cause and effect, and the small participant sample may not be nationally representative. Although several factors have been identified that influence the emergence of self-injurious thoughts, how loneliness interacts with these variables to contribute to the emergence of self-injury remains unclear.

1.5. Loneliness as a risk factor for self-injury

As illustrated in Fig. 1, the IMV model defines factors associated with the transition from entrapment to suicidal ideation as 'Motivational

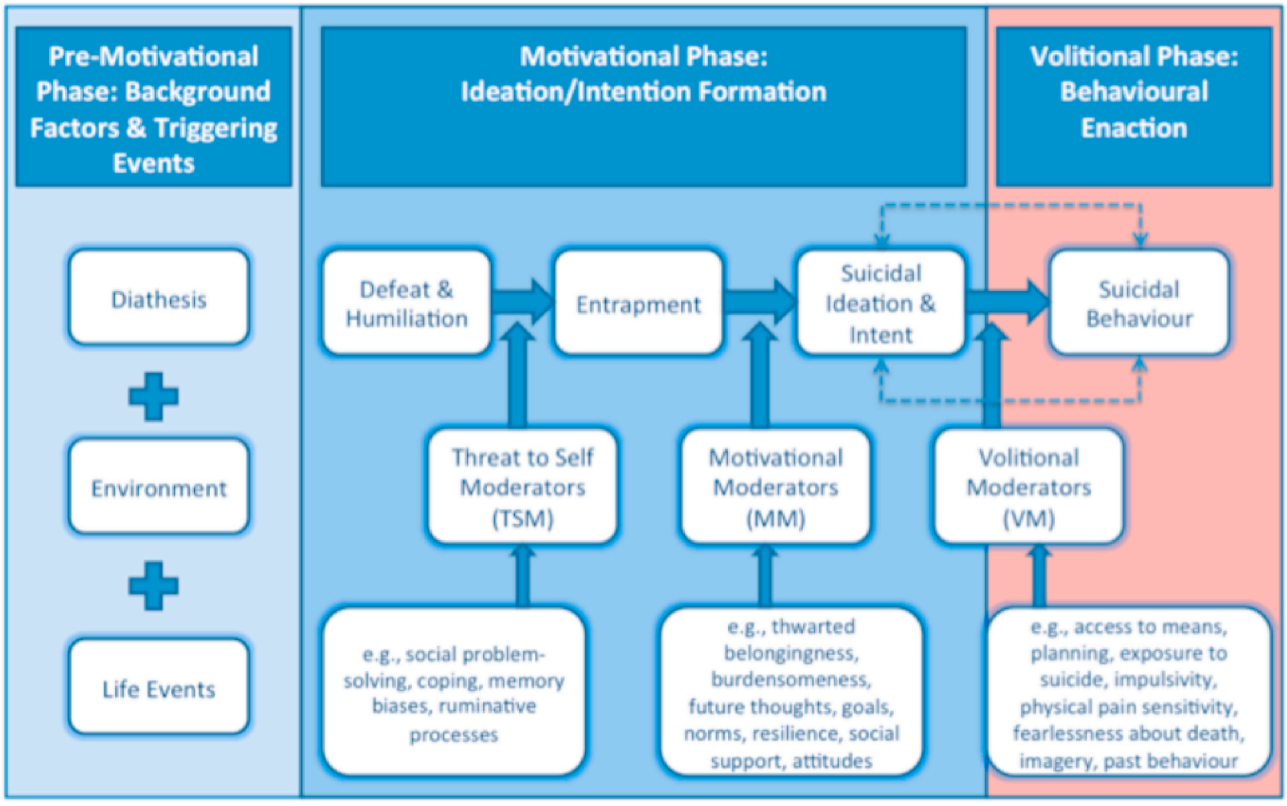

Fig. 1. The integrated motivational-volitional model (O'Connor and Kirtley, 2018).

Moderators'. These include socially oriented factors such as social support and thwarted belongingness. Given that loneliness is conceptually related to thwarted belongingness and social support, it is likely to operate as a MM rather than a volitional moderator (which governs the transition from thoughts to self-injurious acts). If so, loneliness would be expected to differentiate between those with a history of self-injurious thoughts or behaviour and those without. However, as a MM, loneliness would not be expected to play a key role in distinguishing between those with a history of self-injurious thoughts from those with a history of self-injurious behaviour.

1.6. Current study aim

The overarching aim of the study was to advance the understanding of the relationship between loneliness and self-injurious thoughts and behaviours. To fully explore the role of loneliness within the context of self-injury, the current study defined self-injury consistent with the NICE (2013) guidelines of self-harm, to include 'any act of self-poisoning or self-injury carried out by an individual irrespective of motivation'. According to this definition, therefore, this includes suicide attempts and self-injury without intent to die. With this in mind, the current study addressed four research questions:

1. To what extent does loneliness differentiate between those with a history of self-injurious thoughts, self-injurious behaviour, and no self-injury history?
2. To what extent do psychological variables derived from the IMV model, differentiate between populations with histories of self-injurious thoughts, self-injurious behaviour, and no self-injury history?
3. Is loneliness independently associated with self-injurious thoughts or behaviours when other psychological factors are controlled for?
4. Is loneliness a moderator of the defeat - entrapment relationship, and/or of the entrapment - suicidal ideation relationship within the context of the IMV model?

1.7. Key hypotheses

It was hypothesised that:

1. Loneliness scores will be higher for those with a history of self-injurious thoughts or behaviour than those without
2. Suicidal ideation and trauma scores will be higher in those with a history of self-injury than in those without.
3. Maladaptive states and traits (i.e., loneliness, trauma history, negative coping styles, perfectionistic traits, entrapment, defeat and stress) would be positively associated with suicidal ideation, all remaining variables (i.e., social support and adaptive coping styles) will be negatively associated with suicidal ideation.
4. Loneliness would distinguish between participants with no history of self-injurious thoughts or behaviour, a history of self-injurious thoughts, and those with a history of self-injurious behaviours.
5. Loneliness would operate as a Motivational Moderator, strengthening the relationship between entrapment and suicidal ideation.

2. Methods

2.1. Recruitment and procedure

The study employed a cross-sectional design to collect participant data using an online survey via the University of Glasgow's Online Survey System. The study was available between September 2018 and April 2019 to ≥18 years olds based in the.UK. The study-was advertised via a snowballing approach on social media profiles held by the research team (Twitter, Facebook), public trading websites (Gumtree, Craigslist), University of Glasgow participant recruitment pages and the Suicidal Behaviour Research Laboratory (SBRL) website (www.suicideresearch.info). Individuals who observed the study advert were invited to share the advert with their own contacts. Participants were recruited using opportunity sampling, where interested participants who viewed the study advert were invited to access a weblink. The initial survey screen displayed the participant information sheet and consent form. Also included were hyperlinks to contact information of support services and privacy notice. Participants indicated consent and eligibility by clicking an electronic checkbox under the consent form. They were then directed to the next page to commence the anonymous survey. The support services sheet was available throughout the survey should participants wish to discuss personal experiences at any point during the survey. After survey completion, participants were invited to enter a prize draw by following a separate link to enter their contact details. This link was detached from the survey to ensure participants' contact details could not be linked to their survey responses while still enabling the winner to be contacted. The winner of the draw was selected at random and offered a choice prize of either an iPad Mini or High Street vouchers to the value of £200.

Ethical approval was granted by the University of Glasgow Medical, Veterinary and Life Sciences Ethics Committee and the study investigation was conducted in accordance with the Declaration of Helsinki (World Medical Association, 2013).

2.2. Measures

All measures included in the survey are listed below. All reported Cronbach's alphas (α) were calculated for the present sample.

Demographics. Age, gender, nationality, sexuality and average hours of employment per week.

History of self-injurious thoughts and behaviours. Items from the Adult Psychiatric Morbidity Survey (McManus et al., 2007) were modelled to capture suicidal ideation history in the current study pertaining to occurrence, frequency and recency of participant's self-injurious thoughts and behaviours (see supplementary material 1; s1).

Loneliness. UCLA Loneliness Scale (Russell et al., 1978) is a 20-item (score range: 20–80) self-report assessment of loneliness (e.g. 'I lack companionship') using a 4-point Likert-type scale (from 'never' to 'often'). High scores reflected greater loneliness. The UCLA scale is a leading measure of loneliness with high reliability and validity across a range of populations and cultures (Russell et al., 1980). There was excellent internal consistency in the current study (Cronbach's $\alpha = 0.94$).

Suicidal ideation. Suicide Probability Scale – Suicide Ideation subscale (SPS; Cull and Gill, 1989). The 8-item suicide ideation subscale (score range 8–24) assesses various thoughts of suicide (e.g. 'I feel the world is not worth continuing to live in') and respondents answered on a 4-point Likert-type scale (from 'none of the time', to 'most or all of the time'). Higher scores reflected greater suicidal ideation. In this study, the measure demonstrated excellent internal consistency (Cronbach's $\alpha = 0.92$).

Stress. The Perceived Stress Scale-Short Form (PSS-short; Cohen and Williamson, 1988) is a 4-item (score range 0–16) scale that assesses how often a participant felt or thought a certain way (e.g. 'Felt that things were going your way?') answered on a 5-point Likert-type scale (from 'never' to 'very often'). High scores indicated greater stress. The PSS-short has been found to be a reliable, brief measure of stress (Lee, 2012) with good internal consistency within the current study (Cronbach's $\alpha = 0.86$).

Childhood trauma. The Child Trauma Questionnaire (CTQ-short; Bernstein et al., 1998) is a 28-item questionnaire that retrospectively measures childhood abuse and neglect (e.g. 'I believe I was physically abused') with responses measured using a 5-point Likert-type scale (from 'never true' to 'very often true'; total subscale scores range: 0–4. High scores indicated more trauma. The measure has been found to be an appropriate tool for clinical and non-clinical populations (Bernstein

et al., 2003). In the current study, internal consistency of the CTQ subscales were 'strong' for emotional abuse (Cronbach's α = 0.90), emotional neglect (Cronbach's α = 0.92) and sexual trauma (Cronbach's α = 0.97), 'good' for physical neglect (Cronbach's α = 0.78) and 'fair' for physical neglect (Cronbach's α = 0.78) Due to a technical error one item was omitted from the physical abuse subscale, however internal consistency was still 'good' (Cronbach's α = 0.80).

Socially Prescribed Perfectionism: The Multidimensional Perfectionism Scale (HFMPS; Hewitt et al., 1991) is comprised of 15 items (score range 15–105) relating to Socially Prescribed Perfectionism (e.g. 'The people around me expect me to succeed at everything I do') taken from a larger measure of perfectionism. Answers are reported on a 7-point Likert-type scale (form 'strongly disagree', to 'strongly agree') High scores on this measure indicate more socially prescribed perfectionistic traits. This measure is widely used (Hewitt et al., 1991) and showed strong internal consistency in the current study (Cronbach's α = 0.90).

Autobiographical memory. The Thinking About Life Experiences Scale (TALE; Bluck and Alea., 2011) is a 15-item questionnaire that measures three functions of autobiographical memory using a 5-point Likert-type scale (from 'almost never' to 'very frequently'; score range 0–20). Higher scores echoed greater use of the memory recall style. Based on the current study, good internal consistency was identified for self-continuity (Cronbach's α = 0.80), social bonding (Cronbach's α = 0.83) and directing behaviour (Cronbach's α = 0.80).

Defeat. The Defeat Scale (Gilbert and Allan, 1998) is a 16-item questionnaire that measures an individual's perceived struggle or loss of social rank (e.g., 'I feel that I have not made it in life'), which has been linked to low psychological health. Respondents answered using a 5-point Likert-type scale (from 'never' to 'always'score range 0–64) with higher scores reflecting greater defeat. This measure has high internal consistency in the general population (0.94 student population, Gilbert and Allan, 1998). The measure demonstrated excellent internal consistency in the current study (Cronbach's α = 0.97).

Entrapment. The Entrapment Scale (Gilbert and Allan, 1998) measures internal entrapment (6-items; one's own thoughts and feelings e.g. 'I feel powerless to change myself') and external entrapment (10-items; external situations e.g. 'I have a strong desire to escape from things in my life') with answers recorded on a 5-point Likert-type scale (from 'Not at all like me' to 'Extremely like me'; score range: 0–40). Higher scores in each of these measures reflected greater sense of entrapment. Both scales were found to have high levels of internal consistency for both student and clinical populations (>0.85; Gilbert and Allan, 1998). Within the current study, excellent internal consistency was observed for both internal (Cronbach's α = 0.95) and externalt subscales (Cronbach's α = 0.93).

Coping. The Brief COPE (Carver, 1997) This 28-item measure includes 14 subscales exploring various coping methods (e.g., 'I've been using alcohol or other drugs to make myself feel better' and 'I've been getting emotional support from others'), recorded using a 5-item Likert-type scale (from 'I haven't been doing this at all', to 'I've been doing this a lot'). Coping behaviours are reflected by higher scores in this measure. To identify a higher-order factor structure of these coping styles we used the 4-factor model by Nahlén and Saboonchi (2010) which showed acceptable fit for the data of the current study (see s2). In the current study, good internal consistency was observed for problem focused coping (Cronbach's α = 0.83, score range 2–8) and socially supported coping (Cronbach's α = 0.84, score range 3–12), while avoidant and emotion-focused coping had fair internal consistency (Cronbach's α = 0.77 and 0.71 and score range 3–12 and 4–16 respectively).

Social support. The Enriched Social Support Instrument (ESSI; Mitchell et al., 2003) is a 7-item measure (score range: 7–35) that explores practical, emotional, and informational supports that are available to the participant (e.g., 'Is there someone available to you who shows you love and affection?'), with responses based on a 5-point Likert-type scale (from 'none of the time' to 'all of the time'). Higher scores reflected greater social support. The measure has strong psychometric properties (Gottlieb and Bergen, 2010) and strong internal consistency was evidenced in the current study (Cronbach's α = 0.90).

2.3. Statistical analysis

Statistical analyses were conducted using SPSS (version 26) Participants were classified according to their reported self-injury history, as follows: i) no history of ideation or behaviour group (NH) included participants with no history of self-injurious thoughts or self-injurious behaviour; ii) history of self-injurious thoughts group (SIT) – participants with a; history of self-injurious thoughts only but no history of self-injurious behaviour; and iii) history of self-injurious behaviour group (SIB)– participants with a; history of self-injurious behaviour (including suicide attempt) regardless of self-injurious thoughts history. Demographics were reported by frequency for categorical variables and means and standard deviation for continuous variables. Between-group differences for continuous demographic variables (i.e., age) were analysed using one-way ANOVAs.

Visual inspection showed that the psychometric measures were normally distributed and therefore parametric analyses were used. Initial correlation analyses were conducted to assess the association between all study variables. Univariate multinomial logistic regressions were used to compare scores between participant groups and are reported using chi-squares. Pairwise analyses were employed to identify differences between groups and were reported using odds ratio (OR) and 95% confidence intervals (95% CI). Additionally, multinomial logistic regressions were used to identify which variables remained significant when all other study psychological variables were controlled for and pairwise comparisons were explored. Hayes (2013) PROCESS macro for SPSS was used to test whether loneliness acted as a moderator between i) defeat and entrapment, and ii) entrapment and suicidal ideation. We then conducted simple slopes analyses to probe at which levels of the variables the moderator had its effect.

2.4. Missing data

Missing data analysis was conducted for all variables. Following previous research (e.g., Wetherall et al., 2018), a participant's data was excluded from any scale if less than 75% of the scale items were completed. Applying this rule resulted in 4–6 participants (1–1.5%) being excluded for each measure (of which four participants were excluded from the entire study).

Missing data on individual items ranged from 0 to 4.2% per variable. Little's Missing Completely at Random (MCAR) test was non-significant, indicating that these values were missing completely at random. Estimation-Maximisation imputation techniques were applied to the missing data to generate complete datasets for further analysis. Participants who did not answer all self-injury history questions were not included in the logistic regression analyses as they could not be allocated. However, all participants were included in all correlation and moderation analyses as self-injury history data was not a pre-requisite.

3. Results

3.1. Sample characteristics

Participant demographic details are described in Table 1. Overall, 400 participants took part in the study (79.1% female, 19.2% male) and they had an average age of 35.3 years old (*sd.* 13.9, range 18–76, n = 393). ANOVA revealed no significant difference in age between the participant groups. The study sample was limited to individuals residing in the UK at the time of recruitment, of which 69.4% of participants identified as British. 61% of all participants were employed.

Correlations between loneliness, suicidal ideation and other variables For the most part, variables were inter-correlated in the expected directions

Table 1
Participant demographics by self-reported self-injurious thoughts and behaviour history (n = 400).

	Total sample* (n = 400)	NH group (n = 84)	SIT group (n = 105)	SIB group (n = 204)
Gender n (%)				
Male	77 (19.3)	23 (27.4)	19 (18.1)	34 (16.7)
Female	308 (78.5)	60 (71.4)	84 (80)	164 (80.4)
Other	6 (1.5)	0	1 (1)	5 (2.5)
Missing/Not stated	3 (0.8)	1 (1.2)	1 (1)	1 (0.5)
Age				
Mean (sd), n	35.27 (13.9) 383	33.68 (13.4) 82	34.51 (14) 103	36.32 (14.1) 198
Missing/Not stated n, (%)	17 (4.3)	2 (2.4)	2 (1.9)	6 (3)
Nationality n (%)				
British	267 (69.4)	54 (65.5)	67 (62.6)	146 (71.1)
Other	118 (30.3)	27 (32.1)	37 (35.2)	54 (26.5)
Missing/Not stated	15 (3.75)	3 (3.6)	1 (1.0)	4 (1.9)
Sexuality n (%)				
Straight	284 (71)	71 (84.5)	74 (70.5))	139 (68.1)
Gay	29 (7.3)	5 (6.0)	9 (8.6)	15 (7.4)
Bisexual	54 (13.5)	6 (7.1)	16 (15.2)	32 (15.7)
Other/Not sure	25 (6.25)	2 (2.4)	6 (5.7)	17 (8.3)
Missing/not stated	8 (2.0)	0 (0)	0 (0)	1 (0.5)
Employed n (%)				
Yes	244 (61)	56 (66.7)	63 (60)	120 (58.8)
Missing/not stated	3 (0.8)	1 (1.2)	1 (1)	1 (0.5)

(see s3). Suicidal ideation was significantly associated with all study variables except directing behaviour (memory subscale). Loneliness was significantly associated with all variables in the expected direction except for self-continuity (memory subscale) which was not significantly correlated with loneliness.

3.2. Differentiating between participant groups by self-injury history

Univariate multinomial logistic regression (see s4) indicated that loneliness scores differed significantly between NH, SIT and SIB groups (χ^2 (2) = 94.797, p = 0.0001). Additionally, a further 13 of the 18 psychosocial variables were also found to distinguish between the three participant groups. Follow-up pairwise comparisons (see s5) revealed that self-reported loneliness significantly differed between all participant group pairs (NH group vs SIT group; OR = 1.102, 95% CI 1.06, 1.136, p = 0.0001, NH vs SIB; OR = 1.132, 95% CI 1.098, 1.167, p = 0.0001, SIT vs SIB; OR = 1.028, 95% CI 1.007, 1.048, p = 0.008).

Multivariable multinomial logistic regression (see Table 2) showed that when all other variables were controlled, loneliness significantly differentiated between NH, SIT and SIB groups (χ^2 (2) = 8.572, p = 0.014). Further between-group differences were identified for emotional abuse (χ^2 (2) = 16.644, p = 0.0001) and suicidal ideation (χ^2 (2) = 43.667, p = 0.0001). Pairwise analysis (see Table 3) revealed that loneliness scores differed between NH and SIT participants groups (OR = 1.089, 95% CI 1.026, 1.155, p = 0.005), with no differences identified between NH and SIB, or SIT and SIB. Of all the variables within the multivariable multinomial logistic regression only suicidal ideation differentiated between all pairwise comparisons (NH vs. SIT: OR: 1.48, 95% CI 1.214, 1.804; NH vs SIB: OR: 1.722, 95% CI 1.409, 2.10; SIT vs SIB OR: 1.161, 95% CI 1.068, 1.262).

3.2.1. Defeat and entrapment moderation model

Analysis exploring loneliness as a moderator between defeat and entrapment was conducted. Significant main effects were identified between defeat and entrapment (b: 1.102, SE = 0.147, t = 7.5, p = 0.0001, 95% CI 0.813, 1.391) and loneliness and entrapment (b: 0.465, SE = 0.108, t = 4.295, p = 0.0001, 95% CI 0.252, 0.677). The overall test of interaction between defeat and loneliness in predicting entrapment was also significant (β: 0.008, SE = 0.0027, t = −2.8214, p < 0.01, 95% CI -0.0131, −0.0023).

Table 2
Multivariable multinomial logistic regression between NH, SIT and SIB groups (n = 392, df = 2).

Variable	χ^2	*p*
Coping		
Avoidant Focused	2.486	0.289
Emotion Focused	2.202	0.333
Problem Focused	0.443	0.801
Socially Supportive	5.879	0.053
Defeat	2.272	0.321
Entrapment	2.042	0.360
Loneliness	**8.572**	**0.014**
Memory		
Directing behaviour	0.126	0.939
Self-Continuity	1.237	0.539
Social bonding	1.813	0.404
Socially Prescribed Perfectionism	0.267	0.875
Social Support	0.253	0.881
Stress	1.508	0.471
Trauma		
Emotional Abuse	**16.644**	**0.0001**
Emotional Neglect	2.102	0.350
Physical Abuse	1.009	0.604
Physical Neglect	0.318	0.853
Sexual Abuse	0.604	0.739
Suicidal Ideation	**43.667**	**0.0001**

X^2 = chi-square, p = p-value; df = degrees of freedom. NH group is reference group. Values highlighted in bold are statistically significant (p < 0.05). NH= No history of self-injurious thoughts or behaviour; SIT = history of self-injurious thoughts only; SIB = history of self-injurious behaviour.

Simple slopes analysis was used to explore loneliness one standard deviation above ('high') and below ('low') the mean (see Fig. 2). Within the defeat-entrapment moderation model both the high (b: 0.639, SE = 0.063, 95% CI 0.516, 0.762) and low (b: 0.84, SE = 0.07, 95% CI 0.702, 0.978) loneliness slopes were significant. Fig. 2 illustrates that higher levels of defeat and loneliness were associated with higher levels of entrapment overall, however when defeat scores were low, high levels of loneliness were more strongly associated with higher levels of entrapment compared to those reporting low levels of loneliness. This therefore illustrates that loneliness was a statistically significant moderator between defeat and entrapment, even in those who present with low or no loneliness.

3.2.2. Entrapment and suicidal ideation moderation model

Loneliness was also explored as a moderator of the association between entrapment and suicidal ideation. Within the final moderation model, the entrapment to suicidal ideation pathway was not statistically significant (b:0.017, SE = 0.045, t = 0.368, p = 0.713, 95% CI -0.072, 0.105), however the relationship between loneliness and suicidal ideation was significant (b: 0.147, SE = 0.03, t = 4.899, p = 0.0001, 95% CI 0.0003, 0.004). Additionally, a significant moderating effect of loneliness between entrapment and suicidal ideation was evident (β: 0.002, SE = 0.0009, t = −2.367, p < 0.05, 95% CI 0.0003, 0.0037; Fig. 3).

Simple slopes analysis one standard deviation above and below the mean of loneliness revealed that both the low (b: 0.086, SE = 0.019, 95% CI 0.048, 0.124) and high (b: 0.139, SE = 0.017, 95% CI: 0.106, 0.173) loneliness slopes were significantly different from zero. As illustrated in Fig. 3, higher levels of entrapment and higher levels loneliness were associated with higher levels of suicidal ideation. Conversely, those who reported the lowest levels of suicidal ideation reported low levels of entrapment and low levels of loneliness.

Table 3
Pairwise analysis following multivariable multinomial logistic regression by self-injurious thoughts and behaviour history group membership (n = 392).

	NH vs SIT [a]					NH vs SIB [a]					SIT vs SIB [b]				
			95% CI					95% CI					95% CI		
	B	**OR**	Low	High	***p***	**B**	**OR**	Low	High	***p***	**B**	**OR**	Low	High	***p***
Coping															
Avoidant	0.1	1.105	0.938	1.302	0.232	0.129	1.138	0.964	1.342	0.126	0.026	1.027	0.940	1.121	0.555
Emotion Focused	−0.003	0.997	0.893	1.112	0.955	0.048	1.050	0.939	1.174	0.396	0.051	1.053	0.980	1.130	0.158
Problem Focused	−0.036	0.964	0.822	1.132	0.657	−0.055	0.946	0.802	1.116	0.512	−0.024	0.976	0.876	1.087	0.660
Socially Supported	**0.143**	**1.153**	**1.021**	**1.302**	**0.022**	0.083	1.087	0.959	1.231	0.193	−0.060	0.941	0.864	1.026	0.168
Defeat	0.017	1.017	0.959	1.079	0.572	0.039	1.040	0.980	1.104	0.200	0.021	1.021	0.984	1.060	0.267
Entrapment	−0.020	0.980	0.946	1.016	0.268	−0.027	0.974	0.939	1.010	0.153	−0.006	0.994	0.971	1.017	0.616
Loneliness	**0.085**	**1.089**	**1.026**	**1.155**	**0.005**	0.056	1.057	0.995	1.124	0.073	−0.029	0.972	0.932	1.013	0.179
Memory															
Directing behaviour	−0.005	0.995	0.876	1.130	0.933	−0.019	0.982	0.861	1.119	0.781	−0.013	0.987	0.907	1.073	0.756
Self-Continuity	−0.035	0.965	0.865	1.077	0.528	−0.061	0.941	0.841	1.053	0.289	−0.024	0.976	0.909	1.049	0.515
Social bonding	−0.012	0.988	0.881	1.108	0.839	0.040	1.041	0.925	1.171	0.508	0.050	1.052	0.974	1.135	0.196
Socially Prescribed Perfectionism	0.008	1.008	0.977	1.040	0.617	0.005	1.005	0.974	1.038	0.751	−0.002	0.998	0.978	1.019	0.859
Social Support	0.022	1.022	0.937	1.115	0.623	0.014	1.014	0.928	1.109	0.753	−0.009	0.991	0.933	1.052	0.764
Stress	−0.109	0.897	0.738	1.089	0.271	−0.121	0.886	0.726	1.082	0.236	−0.01	0.990	0.869	1.129	0.883
Trauma															
Emotional Abuse	0.447	1.563	0.888	2.753	0.122	**0.949**	**2.582**	**1.472**	**4.528**	**0.001**	**0.524**	**1.688**	**1.213**	**2.350**	**0.002**
Emotional Neglect	−0.377	0.686	0.343	1.372	0.287	−0.121	0.886	0.445	1.765	0.731	0.234	1.264	0.849	1.882	0.248
Physical Abuse	−0.338	0.713	0.369	1.381	0.316	−0.260	0.771	0.403	1.476	0.433	0.069	1.071	0.732	1.568	0.723
Physical Neglect	0.143	1.153	0.695	1.915	0.582	0.095	1.100	0.663	1.825	0.713	−0.046	0.955	0.691	1.319	0.779
Sexual Abuse	−0.168	0.845	0.550	1.299	0.443	−0.154	0.857	0.559	1.315	0.479	0.011	1.011	0.774	1.322	0.936
Suicidal Ideation	**0.392**	**1.480**	**1.214**	**1.804**	**0.0001**	**0.543**	**1.722**	**1.409**	**2.104**	**0.0001**	**0.149**	**1.161**	**1.068**	**1.262**	**0.0001**

B= Unstandardised beta; OR= Odds Ratio; CI= Confidence Interval; p = p-value; [a] NH group is reference; [b] **SIT** is reference. Values highlighted in bold are statistically significant ($p < 0.05$). NH= No history of self-injurious thoughts or behaviour; SIT = history of self-injurious thoughts only; SIB = history of self-injurious behaviour.*3.2. Loneliness as a moderator of established suicide risk factors.*

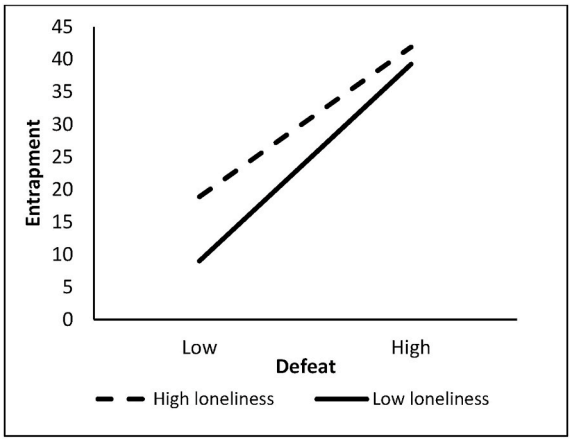

Fig. 2. Loneliness as a moderator between defeat and entrapment.

Fig. 3. Loneliness as a moderator between Entrapment and Suicidal Ideation.

4. Discussion

4.1. Summary of aim and research questions

This study explored the extent to which loneliness was associated with self-injurious histories using primary, cross-sectional data. This is the first known paper to explore where precisely loneliness may fit within a contemporary model predicting suicidal behaviour.

The findings indicated that loneliness was associated with all variables of the current study except for self-continuity (memory subscale). It is posited that this result is due to self-continuity (the retrospective awareness of oneself over-time) being independent of social relationships (Bluck and Alea, 2008). Conversely all other variables distinguish in this study have a social element, including the other memory subscales (i.e., social bonding, directing behaviour). The comparisons across groups revealed that loneliness independently distinguished those with a history of self-injurious thoughts from those with no history in the multivariable model, no further significant pairwise comparisons were identified.

In the context of the IMV model, this suggests that loneliness acts as a motivational moderator and as such, one would not expect it to differentiate between those with self-injurious thoughts versus self-injurious behaviours. However, it was surprising that it didn't differentiate between those no history and those with self-injurious behaviours. However, this may be because the effects of loneliness are statistically accounted for by history of trauma or current ideation.

Pairwise analyses of other included variables revealed that similar to loneliness, socially supportive coping only distinguished between those with no history of self-injury and those with a history of self-injurious thoughts and is upheld by previous research (Marusic and Goodwin, 2006). Furthermore, childhood emotional abuse distinguished between

those with a history of self-injury and history of self-injurious thought, as well as those with history of self-injury compared to no history of self-injury which is also validated by existing literature (De Araújo and Diogo, 2016). In fact, consistent with similar studies, suicidal ideation was the only measure to distinguish between all pairwise comparisons when all other variables were controlled for (Khanipour, 2016; Somer et al., 2015).

Further exploration of loneliness within the current study revealed that loneliness could operate as both a Threat to Self Moderator (TSM) and as a Motivational Moderator. This is most likely accounted for by the similarities between loneliness and other known Threat to Self Moderators or Motivational Moderators. For example, Threat to Self Moderators encapsulate self-oriented factors, including ruminative processes, social problem solving, and coping which although distinctive, have been found to be associated with loneliness (Dibb and Foster, 2021; Chang et al., 2020; Deckx et al., 2018; Liu et al., 2019; Zawadzki et al., 2013). In contrast, Motivational Moderators include socially oriented factors such as thwarted belongingness and social support (as discussed earlier), as well as resilience. Each of these factors has also been shown have strong associations with loneliness (Joiner, 2005; Van Orden et al., 2010; Lee et al., 2021). Based on this literature, and the results of the current study, further research is warranted to clarify where loneliness may 'fit' within the IMV model.

We posit, however, that loneliness is most likely to function as a Motivational Moderator. This is because the simple slopes analyses of the entrapment-suicidal ideation model indicated loneliness was associated with increased suicidal ideation scores regardless whether entrapment was high or low. Yet, the same interactive effect was not observed within the defeat-entrapment model. Here, loneliness was only associated with increased entrapment when defeat was absent. These findings therefore prove beneficial when considering loneliness as a contributing factor when one is experiencing entrapment or suicidal ideation.

For individuals presenting with suicidal ideation, both loneliness and entrapment should be explored when developing treatment plans. Additionally, the current study found loneliness to be associated with increased self-reported entrapment in those who reported low defeat. This could be helpful when exploring factors which contribute to patients' feelings of entrapment; if an individual does not report feeling defeated, clinicians may benefit from investigating patients' sense of loneliness instead. Exploring these crucial differences in the underpinnings of an individual's sense of entrapment, may facilitate more effective treatments and reduce the likelihood of relapse.

4.1.1. Future research

Although it was beyond the scope of the present study, research has shown that loneliness is also associated with suicidal ideation prospectively (McClelland et al., 2020). However, loneliness leading to later suicidal ideation may be influenced by the duration or intensity of loneliness experienced. Consideration of such an approach has already been developed by Palmer (2019) and suggests that loneliness can be protective as well as deleterious. Specifically, Palmer (2019) argues that loneliness may be helpful in the short-term by prompting an individual to seek-out further relationships or reinforce existing ones and thereby ensure the security of their social surroundings. In doing so, short-term loneliness may be quickly resolved and can ultimately be helpful in maintaining an individual's wellbeing through improved quality or quantity of social bonds. Furthermore, Palmer (2019) goes on to argue that longer-term loneliness, or 'chronic loneliness', can lead to increased social safety concerns. Indeed, Cacioppo et al. (2006) posits that loneliness has an evolutionary role where loneliness prompts hunter-gathers to return to their social groups to protect and nurture their lineage. Without loneliness, it is argued that offspring would have been less likely to survive to maturity. As such loneliness may be innate and, if left unresolved, it may lead to other safety concerns including perceived burdensomeness (Van Orden et al., 2010) and stress; both contributory factors of the distress that precedes self-injurious behaviour. Loneliness may therefore have both adaptive and maladaptive properties. Therefore, future work should investigate what characteristics of loneliness (duration, intensity, co-occurrence with other risk factors) are associated with defeat, entrapment and suicidal ideation.

4.2. Recommendations

In summary, we recommend that loneliness and self-injurious thoughts and behaviour be explored longitudinally in tandem with other psychological factors (e.g., depression). This will allow us to better understand the nature and extent of the impact of loneliness on psychological wellbeing including on risk of self-destructive behaviours.

4.3. Limitations

The main limitation of the current study is the cross-sectional design which makes inferences around cause and effect impossible. Additionally, participants were recruited using opportunity sampling and this resulted in over-representation of females. Participants were grouped based on their life-time history of self-injurious thoughts and behaviours, with no consideration given to the recency of their experiences (if any) or severity of self-injury. During the analysis, we did not correct for multiple tests, which increases the risk of type I errors but reduces the risk of type II errors in the context of having planned hypothesis-driven analyses. Furthermore, analyses of the interactions between loneliness and other established correlates with self-injurious thoughts and behaviours were only tested within the confines of the IMV model. In the current study loneliness was tested solely as a moderator and therefore other ways in which loneliness could function as a mechanism of self-injurious thoughts and behaviours were not explored. . Finally, no distinction was made between those who had a history of engaging in self-injurious behaviour with suicidal intent, compared to those who engaged in self-injurious behaviour where the motives are not suicidal.

4.4. Conclusions

This study suggests that loneliness distinguishes between those with and without a history of self-injurious thoughts. Within the context of the IMV model, loneliness was found to moderate both the defeat to entrapment, and the entrapment to self-injurious thoughts relationships. Evidence suggests that loneliness is associated with increased self-reported self-injurious thoughts in those experiencing entrapment, and it is associated with entrapment and defeat. Future research would benefit from using a longitudinal design to investigate the role of loneliness in the development of self-injurious thoughts and behaviours including whether intensity and duration affect these relationships. Overall, this study highlights the importance of social connection factors in the emergence of self-injurious thoughts.

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Author contributions

All authors have participated in conception and design, of the study article, revising drafts of the manuscript critically for important intellectual content and all authors approve of the final version.

Declaration of competing interest

This manuscript has not been submitted to, nor is under review at,

another journal or other publishing venue.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jpsychires.2021.07.020.

References

Aschan, L., Goodwin, L., Cross, S., Moran, P., Hotopf, M., Hatch, S.L., 2013. Suicidal behaviours in South East London: prevalence, risk factors and the role of socio-economic status. J. Affect. Disord. 150 (2), 441–449.

Bernstein, D.P., Fink, L., Handelsman, L., Foote, J., 1998. Childhood trauma questionnaire. Assessment of family violence: A handbook for researchers and practitioners.

Bernstein, D.P., Stein, J.A., Newcomb, M.D., Walker, E., Pogge, D., Ahluvalia, T., Stokes, J., Handelsman, L., Medrano, M., Desmond, D., Zule, W., 2003. Development and validation of a brief screening version of the Childhood Trauma Questionnaire. Child Abuse Negl. 27 (2), 169–190.

Bluck, S., Alea, N., 2008. Remembering Being Me: the Self-Continuity Function of Autobiographical Memory in Younger and Older Adults. Self Continuity: Individual and Collective Perspectives, pp. 55–70.

Bluck, S., Alea, N., 2011. Crafting the TALE: construction of a measure to assess the functions of autobiographical remembering. Memory 19 (5), 470–486.

Cacioppo, J.T., Hawkley, L.C., Ernst, J.M., Burleson, M., Berntson, G.G., Nouriani, B., Spiegel, D., 2006. Loneliness within a nomological net: an evolutionary perspective. J. Res. Pers. 40 (6), 1054–1085.

Carver, C.S., 1997. You want to measure coping but your protocol' too long: consider the brief cope. Int. J. Behav. Med. 4 (1), 92.

Chang, E.C., Liu, J., Yi, S., Jiang, X., Li, Q., Wang, R., Tian, W., Gao, X., Li, M., Lucas, A. G., Chang, O.D., 2020. Loneliness, social problem solving, and negative affective symptoms: negative problem orientation as a key mechanism. Pers. Indiv. Differ. 167, 110235.

Cleare, S., Wetherall, K., Clark, A., Ryan, C., Kirtley, O.J., Smith, M., O'Connor, R.C., 2018. Adverse childhood experiences and hospital-treated self-harm. Int. J. Environ. Res. Publ. Health 15 (6), 1235.

Cohen, S., Williamson, G., 1988. Perceived stress in a probability sample of the United States. In: Spacapan, S., Oskamp, S. (Eds.), The Social Psychology of Health. Sage, Newbury Park, CA.

Cull, J.G., Gill, W.S., 1989. Suicide Probability Scale (SPS). Western Psychological Services, Los Angeles.

De Araújo, R.M.F., Diogo, L.R., 2016. More than words: the association of childhood emotional abuse and suicidal behavior. Eur. Psychiatr. 37, 14–21.

Deckx, L., van den Akker, M., Buntinx, F., van Driel, M., 2018. A systematic literature review on the association between loneliness and coping strategies. Psychol. Health Med. 23 (8), 899–916.

Dibb, B., Foster, M., 2021. Loneliness and Facebook use: the role of social comparison and rumination. Heliyon 7 (1), e05999.

Franklin, J.C., Ribeiro, J.D., Fox, K.R., Bentley, K.H., Kleiman, E.M., Huang, X., Musacchio, K.M., Jaroszewski, A.C., Chang, B.P., Nock, M.K., 2017. Risk factors for suicidal thoughts and behaviors: a meta-analysis of 50 years of research. Psychol. Bull. 143 (2), 187–232. https://doi.org/10.1037/bul0000084.

Gilbert, P., Allan, S., 1998. The role of defeat and entrapment (arrested flight) in depression: an exploration of an evolutionary view. Psychol. Med. 28 (3), 585–598. https://doi.org/10.1017/s0033291798006710, 1998.

Gottlieb, B.H., Bergen, A.E., 2010. Social support concepts and measures. J. Psychosom. Res. 69 (5), 511–520.

Hayes, A.F., 2013. Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach. Guilford Press, New York, NY.

Heisel, M.J., Flett, G.L., Hewitt, P.L., 2003. Social hopelessness and college student suicide ideation. Arch. Suicide Res. 7 (3), 221–235.

Hewitt, P.L., Flett, G.L., Turnbull-Donovan, W., Mikail, S.F., 1991. The Multidimensional Perfectionism Scale: reliability, validity, and psychometric properties in psychiatric samples. Psychol. Assess.: J. Consult. Clin. Psychol. 3 (3), 464.

HM Government, 2018. A Connected Society: A Strategy for Tackling Loneliness – Laying the Foundations for Change. Department for Digital, Culture, Media and Sport, London. https://www.gov.uk/government/publications/a-connected-society-astrategy- for-tackling-loneliness. (Accessed 9 May 2021).

Joiner, T., 2005. Why people die by suicide. Harvard University Press.

Khanipour, H., 2016. Suicide probability in adolescents with a history of childhood maltreatment: the role of non-suicidal self-injury, emotion regulation difficulties, and forms of self-criticism. Int. J. High Risk Behav. Addiction 5 (2).

Lee, E.H., 2012. Review of the psychometric evidence of the perceived stress scale. Asian Nurs. Res. 6 (4), 121–127.

Lee, J.S., 2019. Perceived social support functions as a resilience in buffering the impact of trauma exposure on PTSD symptoms via intrusive rumination and entrapment in firefighters. PloS One 14 (8), e0220454.

Lee, S.L., Pearce, E., Ajnakina, O., Johnson, S., Lewis, G., Mann, F., Pitman, A., Solmi, F., Sommerlad, A., Steptoe, A., Tymoszuk, U., 2021. The association between loneliness and depressive symptoms among adults aged 50 years and older: a 12- year population-based cohort study. The Lancet Psychiatry 8 (1), 48–57.

Liu, Q.Q., Yang, X.J., Zhu, X.W., Zhang, D.J., 2019. Attachment anxiety, loneliness, rumination, and mobile phone dependence: a cross-sectional analysis of a moderated mediation model. Curr. Psychol. 1–11.

Marusic, A., Goodwin, R.D., 2006. Suicidal and deliberate self-harm ideation among patients with physical illness: the role of coping styles. Suicide Life-Threatening Behav. 36 (3), 323–328.

McClelland, H., Evans, J.J., Nowland, R., Ferguson, E., O'Connor, R.C., 2020. Loneliness as a predictor of suicidal ideation and behaviour: a systematic review and meta-analysis of prospective studies. J. Affect. Disord. 274, 880–896. https://doi.org/10.1016/j.jad.2020.05.004.

McManus, S., Meltzer, H., Brugha, T., Bebbington, P., Jenkins, R., 2007. Adult Psychiatric Morbidity in England, 2007: Results of a Household Survey. NHS Information Centre for Health and Social Care, Leeds.

Mitchell, P.H., Powell, L., Blumenthal, J., Norten, J., Ironson, G., Pitula, C.R., Froelicher, E.S., Czajkowski, S., Youngblood, M., Huber, M., Berkman, L.F., 2003. A short social support measure for patients recovering from myocardial infarction: the ENRICHD Social Support Inventory. J. Cardpulm. Rehabil. Prev. 23 (6), 398–403.

Mushtaq, R., Shoib, S., Shah, T., Mushtaq, S., 2014. Relationship between loneliness, psychiatric disorders and physical health: a review on the psychological aspects of loneliness. J. Clin. Diagn. Res. 8, WE01–WE04.

Nahlén, C., Saboonchi, F., 2010. Coping, sense of coherence and the dimensions of affect in patients with chronic heart failure. Eur. J. Cardiovasc. Nurs. 9 (2), 118–125. https://doi.org/10.1016/j.ejcnurse.2009.11.006.

National Institute for Health and Care Excellence. Self-harm. Published 28 June 2013. Accessed 16 July 2021. www.nice.org.uk/guidance/qs34.

O'Connor, R.C., Kirtley, O.J., 2018. The integrated motivational-volitional model of suicidal behaviour. Philosophical Transactions of the Royal Society B 373, 20170268.

O'Connor, R.C., Nock, M.K., 2014. The psychology of suicidal behaviour. Lancet Psychiatry 1, 73–85.

O'Connor, R.C., Wetherall, K., Cleare, S., Eschle, S., Drummond, J., Ferguson, E., O'Connor, D.B., O'Carroll, R., 2018. Suicide attempts and non-suicidal self-harm: a national prevalence study of young adults. British Journal of Psychiatry Open 4, 142–148.

O'Connor, D.B., Branley-Bell, D., Green, J.A., Ferguson, E., O'Carroll, R.E., O'Connor, R. C., 2020. Effects of childhood trauma, daily stress, and emotions on daily cortisol levels in individuals vulnerable to suicide. J. Abnorm. Psychol. 129 (1), 92–107. https://psycnet.apa.org/doi/10.1037/abn0000482.

O'Connor, R.C., 2011. Towards an integrated motivational-volitional of suicidal behaviour. In: O'Connor, R., Platt, S., Gordon, J. (Eds.), International Handbook of Suicide Prevention: Research, Policy and Practice. Wiley Blackwell.

Palmer, B.W., 2019. The effects of loneliness and social isolation on cognitive functioning in older adults: a need for nuanced assessments. Int. Psychogeriatr. 31 (4), 447–449. https://doi.org/10.1017/S1041610218001849.

Perlman, D., Peplau, L.A., 1982. Theoretical Approaches to Loneliness. Loneliness: A Sourcebook of Current Theory, Research and Therapy, pp. 123–134.

Richard, A., Rohrmann, S., Vandeleur, C.L., Schmid, M., Barth, J., Eichholzer, M., 2017. Loneliness is adversely associated with physical and mental health and lifestyle factors: results from a Swiss national survey. PloS One 12 (7), e0181442.

Russell, D., Peplau, L.A., Ferguson, M.L., 1978. Developing a measure of loneliness. J. Pers. Assess. 42 (3), 290–294.

Russell, D., Peplau, L.A., Cutrona, C.E., 1980. The revised UCLA Loneliness Scale: concurrent and discriminant validity evidence. J. Pers. Soc. Psychol. 39 (3), 472.

Smith, M.M., Sherry, S.B., Chen, S., Saklofske, D.H., Mushquash, C., Flett, G.L., Hewitt, P. L., 2018. The perniciousness of perfectionism: a meta-analytic review of the perfectionism–suicide relationship. J. Pers. 86 (3), 522–542.

Somer, O., Bildik, T., Kabukçu-Başay, B., Güngör, D., Basay, O., Farmer, R.F., 2015. Prevalence of non-suicidal self-injury and distinct groups of self-injurers in a community sample of adolescents. Soc. Psychiatr. Psychiatr. Epidemiol. 50 (7), 1163–1171.

Van Orden, K.A., Witte, T.K., Cukrowicz, K.C., Braithwaite, S.R., Selby, E.A., Joiner Jr., T.E., 2010. The interpersonal theory of suicide. Psychol. Rev. 117 (2), 575–600.

Wetherall, K., Cleare, S., Eschle, S., Ferguson, E., O'Connor, D.B., O'Carroll, R., O'Connor, R.C., 2018. From ideation to action: differentiating between those who think about suicide and those who attempt suicide in a national study of young adults. J. Affect. Disord. 241, 475–483.

Williams, J.M., Broadbent, K., 1986. Autobiographical memory in suicide attempters. J. Abnorm. Psychol. 95 (2), 144–149. https://doi.org/10.1037/0021-843X.95.2.144.

World Health Organization, 2016. Global Health Estimates 2016: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2016. World Health Organization, Geneva, 2018. https://www.who.int/healthinfo/global_burden_disease/estimates/en/. (Accessed 9 May 2021).

World Medical Association, 2013. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. Jama 310 (20), 2191–2194. https://doi.org/10.1001/jama.2013.281053.

Xiong, T.Y., Madihie, A., Saili, J., Bakar, M.A.A., Bakar, R.A., Mahmud, M.I., 2020. Relationship between suicidal ideation and cognitive distortion among

undergraduates. Malaysian Journal of Social Sciences and Humanities (MJSSH) 5 (9), 30–38.
Yang, K., Victor, C., 2011. Age and loneliness in 25 European nations. Ageing Soc. 31 (8), 1368–1388.
Zawadzki, M.J., Graham, J.E., Gerin, W., 2013. Rumination and anxiety mediate the effect of loneliness on depressed mood and sleep quality in college students. Health Psychol. 32 (2), 212.