Exploring Vulnerability and Protective Factors in Suicidality

Shaunagh Hendry, BSc (Hons), MSc

Submitted in partial fulfilment of the requirements for the degree of

Doctorate in Clinical Psychology

School of Health and Wellbeing

College of Medical, Veterinary and Life Sciences

University of Glasgow

July 2024

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Acknowledgements

Many thanks to Professor Rory O'Connor for his support and supervision throughout the development and completion of this research project. Thank you to the participants that took part in the original UK COVID-19 Mental Health & Wellbeing study.

Thank you to my family and friends for all their amazing support during the Dclinpsy. Thank you to all those who I met along the way that inspired me and taught me many important lessons over the course of my journey in Clinical Psychology.

Chapter 1

The Role of Resilience in Suicidality

Prepared in accordance with the author requirements for [British Journal of Psychology; https://bpspsychub.onlinelibrary.wiley.com/hub/journal/20448295/homepage/forauthors.html]

Abstract

There is growing interest in identifying factors which protect against suicide risk over time. Resilience is one such protective factor which has received considerable research attention. However, a systematic review has yet to address this topic. This systematic review focuses on prospective research where resilience has been measured or investigated in relation to suicide risk over time. A total of eight major databases were searched (EBSCO (Medline), EMBASE (Ovid), PubMed, Scopus, Web of Science, Cochrane Review and PsychINFO). The final search was conducted on June 2024. The focus of this review was to explore to what extent resilience acted as a protective factor against suicidality (suicidal thoughts or behaviours) over time. Ten studies (10, 462 participants) were included in the narrative synthesis and the NIH Quality Assessment Tool (National Heart, Lung and BI, 2018) was used for assessing risk of bias in the studies. The majority of studies found that high levels of resilience were significantly associated with low suicidality over time. However, the extent to which resilience remains protective after accounting for other established risk factors is unclear. Many gaps in our understanding remain, further research needs to understand for whom and when resilience may protect against suicide.

1. Introduction

Suicide is a leading cause of death according to the Centers for Disease Control and Prevention and is highlighted as a major public health concern (CDC, 2024). Suicide research has often focused on exploring and identifying risk factors (Han et al., 2022). In contrast, protective factors within suicide are an under researched area (O'Connor & Nock, 2014). However, growing research is focusing on this topic, identifying several key protective factors for suicide. Such factors include good mental health, social support, problem solving and coping skills, self-esteem, spirituality access to mental health services and restriction to lethal means (Sher, 2019). Despite these advances, prevention of suicide remains limited. Therefore, establishing more protective factors against suicidality is crucial to address this issue. Suicidality refers to suicidal thoughts, often interchanged with ideation, suicidal intent and plans as well as attempts and deaths by suicide (APA, 2018).

Resilience as a protective factor to suicidality

Resilience has been highlighted as an important protective factor against suicidality and has become the focus of recent suicide research and prevention efforts (Sher, 2019). However, as noted by Herrman et al. (2011) there is a lack of consensus around the definition for resilience. The American Psychological Association (2014) defines resilience as "the process of adapting well in the face of adversity, trauma, tragedy, threats or even significant sources of stress." A recent conceptual analysis by Wang, Lu and Don (2022) highlighted the issue of various meanings being attributed to resilience. They identified the five most common concepts attributed to resilience in suicide: social support, coping strategies, psychological capital, meaning in life and sense of responsibility.

Irrespective of its definition, resilience has been found to have a strong positive association with suicidal ideation when researching a network of risk and protective factors (Holman & Williams, 2022). Roy, Sarchiapone and Carli (2007) noted that resilience is protective against the development of a psychiatric disorder, however the extent to which it is related to suicidal thoughts and behaviour is under-researched. However, in their study, Roy and colleagues found that low resilience was a risk factor in those who attempted suicide compared to those who had not attempted suicide. Resilience is included in contemporary models of suicide risk such as the Integrated Motivational-Volitional (IMV) Model (O'Connor & Kirtley, 2018) where it is hypothesised to moderate the entrapment-suicidal ideation relationship. Sher and Peters (2019) highlighted the importance of building resilience when coping with stress however they noted that this is more challenging for those with limited access to mental health services.

A systematic review examining 77 papers found a number of psychological factors that had the strongest evidence base for moderating suicide risk (Johnson et al., 2011). The buffering hypothesis proposed by Johnson et al. (2011) theorises that high levels of resilience act as a barrier between risk and suicidality, weakening this relationship. Conversely, those who experience low levels of resilience may have no buffer against the impact of risk therefore, increasing the likelihood of suicidality. Johnson et al. (2011) found strong evidence of a buffering hypothesis of resilience to suicidality, and identified a number of psychological moderators which together with resilience act as a buffer. These psychological factors included cognitive abilities and beliefs or attitudes such as attributional style, perfectionism, agency and hopelessness.

More recently, Jeong and Noh (2023) conducted a rapid review of the literature examining resilience as a protective factor for suicide in older adults. They identified six studies and found evidence in all studies for resilience being a protective factor against suicide risk. By comparison, in young adults when exploring the factors that contribute to suicide resilience, Han et al. (2011) identified cognitive flexibility, emotional regulation skills, restricting use of digital technology and less dependence on maladaptive coping strategies to be protective suicide resilience factors. More recently still, Souza et al. (2024), in their review of studies testing the IMV Model, found that the majority of studies reported higher levels of resilience in those who did not report suicidality compared to those who did.

Although there has been growing attention on resilience as a protective factor, most of the focus, including in reviews, has been on cross-sectional relationships rather than studying its influence over time (Souza et al., 2024). Therefore, conclusive understanding of how resilience and suicide risk develop over time and any potential protective properties have not been established. Studying the role of resilience in suicidality through prospective studies, rather than cross-sectional, can provide us with a better understanding of whether resilience (at baseline) predicts suicidality over time, which is a first step on the road to determining a potential causal relationship.

Various longitudinal studies have found a positive effect of resilience in suicidality in veterans and across the lifespan (Youssef et al., 2013; Liu et al., 2014). However, conflicting evidence has been published, for example, Liu et al. (2016) found strong cross-sectional associations but when investigating suicidal ideation and resilience in a longitudinal context, they concluded that resilience does not provide independent protection against suicide risk.

Measuring resilience

In the research literature, resilience has been assessed using various measurement scales (Sher, 2019). One such widely used scale is the Connor-Davidson Resilience scale (CD-RISC) which includes 25 items, rated on a 5-point scale (0-4), with higher scores showing greater resilience (Connor & Davidson, 2003). Further to this, a brief form of this measure was developed by Campbell-Sills and Stein (2007) which included 10 items. Both of these scales have been found to be valid measures of resilience (Windle, Bennett & Noyes, 2011).

With the growing body of research that has focused on resilience in suicide risk and the lack of a systematic review addressing this topic in adults across the lifespan, there is a need to capture what findings have identified in this area so far. The findings of such a review are important to better inform future research and intervention. This systematic review focuses on prospective research where resilience has been mentioned as a concept, factor or outcome that has been measured or investigated in relation to suicide risk over time.

1.2 Current Study

To address the knowledge gaps identified above, this systematic review addresses two research questions:

1. To what extent has resilience been found to act effectively as a protective factor against suicidality over time?
2. If resilience is found to act as a protective factor towards suicide over time is their evidence of a differential effect?

The first question will explore if high levels of resilience at baseline are most commonly reported to be associated with low suicidality at follow-up in the research. The second question will address if resilience is not as effective as a protective factor in some groups of people and not in others or only in certain circumstances, to ascertain if there is evidence of a differential effect.

2. Methods

A total of eight major databases were searched: (EBSCO (Medline), EMBASE (Ovid), PubMed, Scopus, Web of Science, Cochrane Review and PsychINFO. An initial search was conducted on 4th October 2023 and the final search was conducted in June 2024, with search terms developed using Boolean phrases (AND, OR). The original scope of this review was to include both cross-sectional as well as longitudinal studies. However, this resulted in too many articles which met the inclusion criteria. Due to the time constraints for completion of this review for a Doctoral Thesis, cross-sectional studies were excluded. The search spanned 2003 until June 2024.The start date was chosen because this is when the Connor–Davidson Resilience Scale (CD-RISC; Connor and Davidson, 2003), the most widely used resilience scale, was published. This review was registered on PROSPERO (ID number: CRD42023430012).

2.1 Search Strategy

The following search terms were used: "suicid*" this term encompassed "suicidal ideation", "suicidal thoughts", "suicide attempt", "suicidal behaviour", "suicidal acts", "suicidality", "suicide death", "completed suicide." This was combined with the term "resilience" which was also referred to as "resilience (psychological)."

The process of screening through to narrative synthesis is summarised in Figure 1. A total of 9137 papers were identified during initial searches on the referenced databases. Once duplicates were removed this left 4697 records for title and abstract screening. Twenty percent of the abstracts were chosen at random for a second reviewer to blindly screen (n = 939). The second reviewer initially reached an 95.0% concordance rate, which following discussion reached a 100% concordance rate. During full-text screening a total of 317 papers were screened for eligibility. Following completion of screening, 20% of these were once again reviewed by a second reviewer and an 98.7% concordance rate was reached, following discussion 100% was reached.

2.2 Eligibility Criteria

The inclusion criteria for this review were as follows: (i) articles published in the last 20 years, (ii) full text available, (iii) adult sample 18 years old or above, (iv) English language studies only, (v) any setting or country, (vi) where resilience has been measured or reported in context of suicidality, (vii) suicidal ideation, intent or attempt has been reported either historically or active, (viii) clinical and/or general population, (ix) quantitative and observational research (x) and prospective longitudinal design.

The exclusion criteria for this review were the following: (i) population that included children or adolescents, (17 years old and under), (ii) investigated self-harm or non-suicidal self-injury or intent, (iii) case studies, (iv) cross-sectional study (v) and retrospective study design.

2.3 Critical Appraisal

Each included study was appraised for methodological quality and risk of bias. The NIH Quality Assessment Tool for Observational Cohort (National Heart, Lung and BI, 2018) was used for all the studies. This included 14 items (yes=1 and no=0). When applying this quality tool, a score between 0 and 14 could be reached. A total quality assessment score for each study was calculated. This was reviewed by another member of the research team, making up 20% of the final papers (n =3).

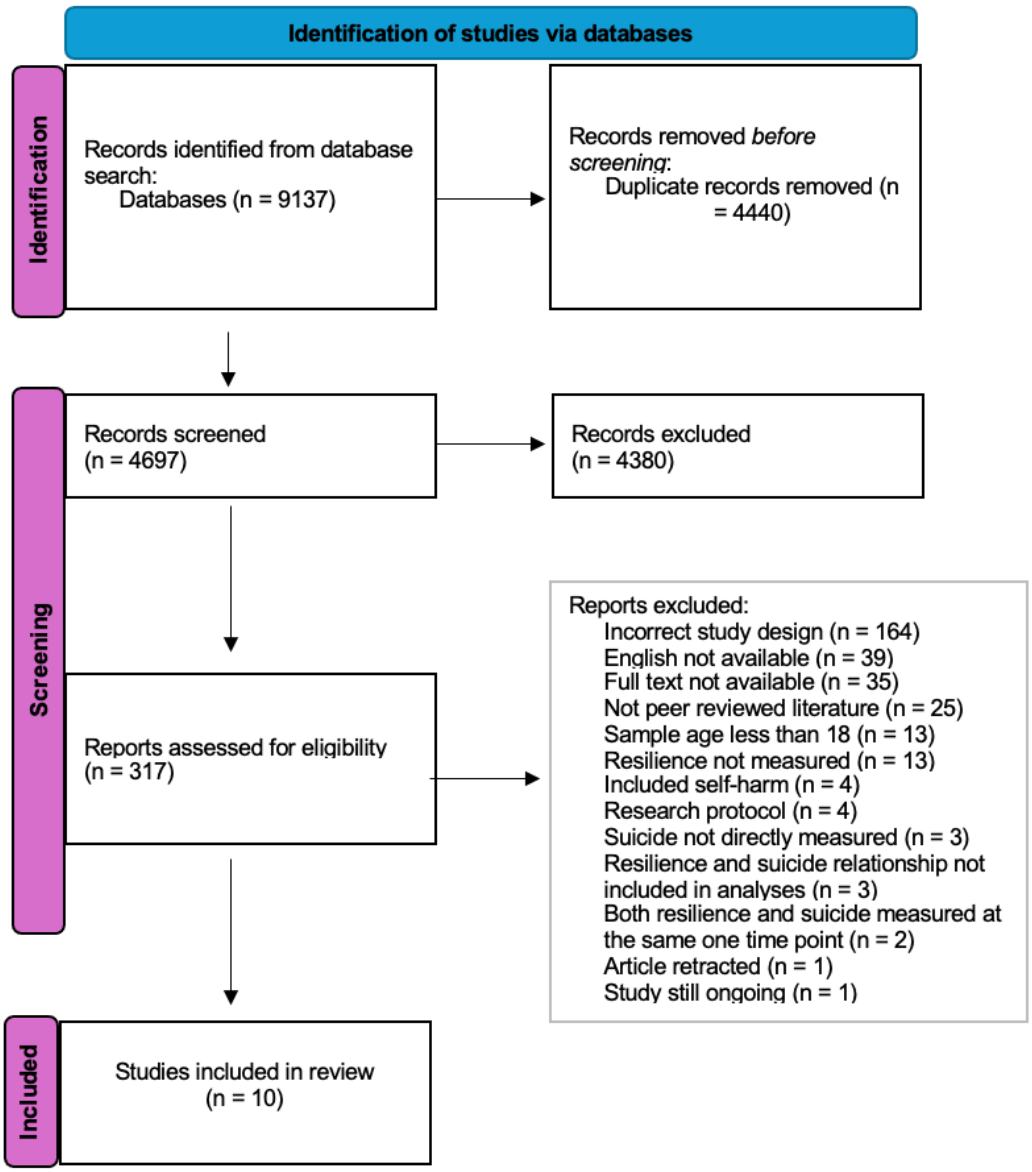

Fig. 1: PRISMA flow diagram (Page et al., 2021)

2.4 Narrative Synthesis

Narrative synthesis was used to highlight the similar and differing characteristics of the included papers. This included appraisal of the following characteristics: type of suicidality measure, the population group and psychometric measures of resilience. Major findings relevant to this review were grouped under the two proposed research questions outlined above. Any patterns or variability that were identified by the papers in the relationship between resilience and suicidality were detailed. Heterogeneity or homogeneity of the studies methodology, design and quality was

considered, where possible in order to provide insight into why the results of this review were found.

This review did not include a meta-analysis approach given the heterogeneous nature of the populations. Such variability would reduce our confidence in the robustness of the findings.

3. Results

Ten studies met the eligibility criteria for this study. A summary of each study and their findings are shown in Table 1.

3.1 Overview

Seven of the studies included in this review explored suicidal ideation specifically while the remaining three studies measured both suicidal thoughts and behaviours. At baseline a total of 10,462 participants were included across all ten studies. All studies followed a cohort prospective study design. The studies varied in terms of types of samples recruited and the sample size ranged from 16 to 2404. Five studies recruited from US veterans or armed servicemen populations (Smith et al., 2016; Elbogen et al., 2020; Yurgil, Barkauskas and Dewleen, 2021; Kumar et al., 2021; Youssef et al., 2013). Two studies recruited from the general population (Llistosella et al., 2022 and Liu et al., 2016) while one study recruited a general population and clinical sample (Stockner et al., 2024). One study recruited participants who had a lifetime experience of suicidality (Harris et al., 2021). One study recruited LQBT+ identifying adults (Kartz, et al., 2023).

The majority of the studies focused on comparing data, which included resilience and suicidality, at two time points: baseline and follow-up. Three studies compared suicidal thoughts and behaviours that participants reported as either, persistent, intermittent (only present at baseline or follow-up), not active or historic and compared this to resilience (Llistosella et al., 2022; Youssef et al., 2013; Harris et al., 2021). One study included control groups comparing them to a sample of adults with a history of mental health difficulties (Stockner et al., 2024).

The most common scale used to measure resilience was the CD-RISC included in six of the studies in this review (Connor & Davidson, 2003). The Resilience Appraisals Scale (RAS; Johnson et al., 2010) was used in one of the studies. In the final three studies, one used the Brief Resilience Scale (Smith et al., 2008), another used the long form of the Resilience Scale developed by Wagnild and Young (1993) and the other used a brief version of this scale (Katz et al., 2023).

Two studies reported to be underpowered due to smaller sample sizes. (Youssef et al., 2013; Harris et al., 2021). Eight studies reported loss of more than 20% of participants to follow-up (Smith et al., 2016; Elbogen et al., 2020; Yurgil, Barkauskas and Dewleen, 2021; Kumar et al., 2021; Llistosella et al., 2022; Stockner et al., 2024; Kartz, et al., 2023; Youssef et al., 2013).

Results of this review are outlined with subheadings, consistent with the research questions stated in the introduction. (1) To what extent has resilience been found to act effectively as a protective factor against suicidality over time? (2) If resilience is found to act as a protective factor towards suicide over time is their evidence of a differential effect?

3.2 To what extent has resilience been found to act effectively as a protective factor against suicidality over time?

The majority of studies (N=9) found an association between either resilience and suicidal ideation (N=6) or resilience and suicidal behaviour (N=3). No studies in this review investigated resilience and suicide death. Studies differed in how they reported the findings of the relationship between resilience and suicidality over time. Specifically, they either reported high resilience at baseline being associated with lower rates of suicidality at follow-up, or low resilience at baseline being associated with higher rates of suicidality at follow-up.

Seven studies found high resilience at baseline to be associated with lower rates of suicidality at follow-up (Smith et al., 2016; Katz et al., 2023; Youssef et al. 2013; Elbogen et al., 2020; Stockner et al., 2024; Yurgil, Barkauskas and Dewleen, 2021). Kartz et al. (2023) found that overall resilience at baseline was negatively associated with suicidal ideation as it decreased at each time point (wave one, two and three across 2 months). Three veteran studies found baseline resilience and suicidal ideation at follow-up to have an inverse relationship over time (Youssef et al., 2013; Elbogen et al., 2020; Yurgil, Barkauskas and Dewleen, 2021). Smith et al. (2016) also found greater protective psychosocial characteristics, which included resilience, at baseline to be negatively associated with suicidal ideation onset at follow-up. Stockner et al. (2024) observed an increase in resilience over time alongside a decrease in active suicidal ideation. However, unlike previous studies, they measured passive suicidal ideation, which increased over time. Stockner et al. (2024) suggested that this increase was due to a shift from active suicidal ideation to passive suicidal ideation accompanied by an increase in resilience.

Three studies found that those who reported low resilience at baseline were more likely to report suicidality at follow-up (Harris et al., 2021; Llistosella et al., 2022). Liu et al. (2016) findings indicated

that not only did lower resilience predicted suicidal thoughts and behaviours when reported at baseline but in addition to this when suicidality was reported at baseline and at four year follow-up.

The only non-significant findings were reported by Kumar et al. (2021) who found that despite resilience having a protective effect when moderating the relationship between posttraumatic stress symptoms and suicidal ideation at wave one, this was not found for baseline resilience and suicidal ideation at three-year follow-up.

It is important to interpret these findings in the context of how the relationship between resilience and suicide risk over time was affected when controlling for other factors. Six studies investigated this relationship while controlling for a combination of different factors: baseline suicidality, demographics, psychological, risk and psychiatric factors (Elbogen et al., 2020; Llistosella et al., 2022; Liu et al., 2016; Yurgil, Barkauskas and Dewleen, 2021; Stockner et al., 2024; Youssef et al. 2013).

Three studies controlled for demographic factors (e.g. gender, ethnicity, education, employment, race and marital status), and found resilience to act as a protective factor over time (Elbogen et al., 2020; Youssef et al. 2013; Llistosella et al., 2022). Liu et al. (2016) controlled for a range of suicide risk factors, which included psychiatric factors. When including low mastery, anxiety, depression, life satisfaction, social network, rumination, reward seeking and avoidant behaviour in the relationship resilience no longer predicted suicide risk. The only model in Liu's study that found significant results when controlling for risk factors was where decline in resilience predicted suicidal ideation at both time points. Yurgil, Barkauskas and Dewleen (2021) also controlled for psychiatric factors, in addition to history of suicidal ideation. This resulted in resilience prior to deployment no longer predicting suicidal ideation at follow-up. Stockner et al. (2024) included all variables that were found to be significant as predictors for suicidal ideation in follow-up, in multivariate models. Such variables included baseline suicidal ideation scores, loneliness, peace, faith, and resilience. In these analyses, resilience was no longer found to be an independent predictor of passive or active suicidal ideation at follow-up 11 weeks later.

3.3 If resilience is found to act as a protective factor towards suicide over time is their evidence of a differential effect?

Two studies explored differential effects where there was evidence of resilience being protective (Kumar et al., 2021; Yurgil, Barkauskas and Dewleen, 2021). A differential effect of resilience as a protective factor was identified within the veteran populations' studies with one study (Kumar et al., 2021) finding that psychological resilience did not act as a protective factor against suicidal ideation

at three-year follow-up when accounting for posttraumatic stress symptoms. This concords with Yurgil, Barkauskas and Dewleen, (2021) who found after controlling for psychiatric symptoms, including posttraumatic stress, that baseline resilience no longer predicted follow-up suicidal ideation. The remainder of veteran studies either did not measure posttraumatic stress (Elbogen et al., 2020), or did not analyse it in the context of resilience and suicidality (Youssef et al., 2013), or included posttraumatic stress and resilience as part of multiple other measures to make up larger variables, such as protective characteristics and psychiatric distress. (Smith et al., 2016). These studies found that resilience did remain protective over time towards suicidality.

3.4 Quality assessment

Quality assessment scores for each of the studies are provided in Appendix 1.3. The NIH Quality Assessment Tool (see appendix 1.3) scores ranged from 8-12. On average the NIH quality assessment percentages across ten studies was 72.1%. The majority of studies scored within the high-quality range, above ten (Etherington et al., 2020). The lowest score was eight out of 14.

In terms of the relationship between the papers that scored on the lower end by comparison with the overall scores, one veteran study found non-significant results for resilience as a protective factor over time (Kumar et al., 2021). However, Smith et al. (2016) and Elbogen et al. (2020) who also scored towards the lower end on the quality assessment tool, and focused on veterans found a negative association with resilience and suicidality over time. Given these mixed findings and due to the limited number of studies, it is not possible to discern if the quality of the studies impacted on the overall findings of this paper.

Table 1: Characteristics of studies included in this review and the key findings

Study	Authors & year of publication	Sample size, characteristics and study design	Psychometric measures	Statistical analyses	Results	Key findings
1.	Elbogen et al. (2020)	US veterans 18 years and older. **N**= 1090 One year, two waves.	Suicidal ideation: Item from PHQ9 † (Löwe et al., 2004) CD-RISC † (Connor & Davidson, 2003)	Chi-square analyses Multinomial logistic regression analysis	A significant correlation was found between resilience and suicidal ideation at one year follow up ($\chi 2$ = 50.80, df=1, $p < .001$; r = −0.32, $p < .0001$). Wave one of resilience significantly predicted suicidal ideation at wave 2 (odds ratio (OR) = 0.45, confidence interval (CI) = 0.26–0.80, p = 0.006).	Higher levels of resilience were found to be associated with lower odds of suicidal ideation, including when covariates were controlled for in each model (age, gender, race and suicidal ideation at wave one).

2.	Harris et al. (2021)	Participants were required to have an experience of or diagnosis of psychosis and lifetime experiences of suicidal thoughts and behaviours. **N=** 100 included at baseline. **N=** 90 completed follow-up **N=** 89 included in main analyses. Three months, two waves.	Suicidal thoughts ideation: BSSI † (Beck & Steer, 1990). RAS † (Johnson et al., 2010)	Paired t-tests Moderated mediation analyses	The strength of the direct effect between baseline defeat, entrapment and follow-up STB † increased when baseline distress relating to delusions and hallucinations was medium (P = .02) and high (P = .04) intensity, while resilience was at its lowest. The relationship between baseline defeat and follow-up STB increased when both baseline distress and resilience were moderate (P = .05).	Individuals who reported lower resilience at baseline were more likely to experience STB as a result of defeat/entrapment, psychosis, and distress.

3.	Katz et al. (2023)	Young adults (18-29 years old) who identified as bisexual. 396 participants included in baseline, 319 at one month follow up and 299 included in two-month follow-up. Two months, three waves.	Suicidal ideation: BSSI † (Beck & Steer, 1990). BRS † (Smith et al., 2008).	Bivariate correlations	At all three time points, there were significant negative associations between baseline resilience and suicidal ideation (r = −.27 to −.37).	As suicidal ideation decreased over the course of this study, it continued to remain negatively associated with baseline resilience.
4.	Kumar et al. (2021)	US veterans **N=** 713 Three-year study, two waves.	Suicidal ideation: two questions adapted from the PHQ-9 † (Löwe et al., 2004), CD-RISC 10 (Campbell-Sills & Stein, 2007).	Moderation and regions of significance analyses	Resilience did not interact with initial posttraumatic stress symptoms to predict suicidal ideation three years later (see appendix 1.5).	Psychological resilience at baseline did not serve as a protective factor against suicidal ideation severity three years later at wave two.
5.	Liu et al. (2016)	General population. Study only included wave three and four.	Suicidal ideation: PSFS † (Lindelow, Hardy, &	T-test	Suicidal ideation was found to be associated with low resilience four years later.	Overall, the results of this study suggest that resilience does not fully

		Wave three **N=** 2404 (28–32 years) Wave four **N=** 1191 (32–36 years) Four years, two waves.	Rodgers, 1997). CD-RISC 10 † (Campbell-Sills & Stein, 2007).	Chi-squared test Logistic regression	(see appendix 1.5). Higher resilience was associated with lower likelihood of suicidal ideation (see appendix 1.5).	predict suicidality and vice versa. Low resilience was only predictive if suicidal thoughts were reported at follow-up and/or at baseline. When suicide risk factors were controlled for, suicidality change did not predict occurrence of resilience. This only occurred for decline in resilience remaining predictive for suicidal ideation at both time points.
6.	Llistosella et al. (2022)	General population. Healthy control group, recovery group, incident	Suicidal thoughts and behaviours:	Analysis of variance	Statistically significant differences were found	Individuals with very low and low resilience showed

	(participants with new onset mental health problems during the pandemic) and persistent group (participants with mental health difficulties before and during the pandemic). **N**= 1357 completed follow-up One year, two waves	Relevant items to suicide in CIDI † questionnaire (Kessler & Üstün, 2021). CD-RISC 10 † (Campbell-Sills & Stein, 2007).	Post-hoc analyses Logistic regression. Spearman's correlation.	between groups for resilience STB: (F [3; 1774] = 28.47, η^2 = 0.046, p < 0.001). Statistically significant differences were found between healthy group and persistence (STB, p < 0.001) and recovery (STB, p = 0.035) groups, but not with incidence group in (p = 0.133). Comparing groups for each mental health problem, the healthy group had the highest score of resilience and the persistence group the lowest	a higher risk of STB than those with high resilience during COVID- 19. Higher rates of resilience were found in healthy and recovery groups. While lower resilience was found in incident and persistent groups. Highest risk for STB was found in the persistent group. These association were found when adjusting for age, gender, employment status, and marital status.

					regarding STB (see appendix 1.5) Logistic regression results showed that very low resilience increased the risk STB in all three groups compared with those with very high resilience, (see appendix 1.5).	
7.	Smith et al. (2016)	US veteran aged 18 and older. **N**= 2107 Two years, two waves	Suicidal ideation: PHQ9 † Löwe et al., 2004 CD-RISC † (Connor & Davidson, 2003)	Multinomial logistic regression analysis Post-hoc analyses	When looking at predictors of suicidal ideation onset over time, when compared to the no suicidal ideation group higher resilience (included in protective	Significant findings for higher protective psychosocial characteristic scores at baseline were found to be negatively associated with emergence of

					psychosocial characteristics) was negatively associated with suicidal onset. Protective psychosocial relative risk ratio = 0.57 (.45–.74).	suicidal ideation onset over time.
8.	Stockner et al. (2024)	Control group included general population (N= 234) and the patient group included a clinical population (N= 80) **N**= 314 11-weeks, two waves.	Suicidal ideation: two items BSCL-9 and BSCL-39 † (Beck, Kovacs & Weissman, 1979). RS-13 † (Wagnild and Young 1993).	General Linear Model for Repeated Measure. Hierarchical linear regression.	When evaluating the possible effect between groups on changes from the baseline to follow-up resilience was found to be significant (Wilks λ = 0.976, F1;310 = 7.56, p = 0.006; ηp = 0.02) as well as passive suicidal ideation (Wilks λ = 0.982,	Increase and stability of resilience over time in the clinical sample was observed along with an increase in passive suicidal ideation, which Stockner et al. (2024) suggested was due to a shift from active suicidal ideation.

			F1;312 = 5.73, p = 0.02; ηp = 0.02). Both resilience (t234 = 2.51, p = 0.01) and passive suicidal ideation scores (t234 = 2.28, p = 0.03) increased significantly in the patient group. Resilience was found to be one predictor of both active (R2 change = 0.03, p < 0.001) and passive (R2 change = 0.05, p < 0.001) suicidal ideation at follow-up, where baseline ideation scores were controlled for. However,

					this was no longer the case when including all significant variables in a hierarchical linear regression model.	
9.	Youssef et al. (2013)	US veterans 18 and older. **N**= 176 Three years, two waves.	Suicidal ideation: BSSI † (Beck & Steer, 1990). CD-RISC † (Connor & Davidson, 2003).	Multiple logistic regression	Factors within the CD-RISC such as secure relationships and positive acceptance of change were the most predictive of suicidality over time (r2=0.04; F =8.19, p=0.005). Resilience at baseline was found to be predictive of suicidality at follow-up (r2=0.17, F	Suicidality and resilience were shown to be inversely related over time. Secure relationships and positive acceptance of change were significantly predictive of lower suicidality.

					=3.95, p= 0.0485), when controlling for other variables (education, gender, ethnicity, race and psychiatric factors.)	
10.	Yurgil, Barkauskas and Dewleen (2021).	Active armed service members. Reference groups were used for resilience (high, medium, low). **N**= 1805 Four months, three waves.	Suicidal ideation: one item of the BDI-II † (Beck, Steer & Brown, 1996). CD-RISC 10 † (Campbell-Sills & Stein, 2007).	Univariate logistic regressions Full multivariate analysis Post-hoc analyses	Odds of suicidal ideation post-deployment decreased for those with moderate (Odds Ratio = 0.50, confidence interval = 0.27-0.93, p= 0.028) and high (Odd ratio = 0.25, confidence interval = 0.08-0.79, p = 0.019) resilience compared to the low resilience group.	New onset of suicidal ideation showed a decrease in resilience over time compared with those with resolved suicidal ideation where resilience increased. When controlling for all other predictors (history of suicidal ideation and psychiatric symptoms) pre-deployment resilience no

		Pre-deployment resilience no longer predicted suicidal ideation at follow-up when including other predictors ($\chi 2$ =2.77, df=4, P=0.597).	longer predicted suicidal ideation. This was only the case for post-deployment resilience, recorded at follow-up.

† Abbreviations: STB = Suicidal thoughts and behaviours, PHQ9 = Modified item from Patient Health Questionnaire-9, CD-RISC = Connor-Davidson Resilience scale, RAS = The Resilience Appraisals Scale, CIDI = Relevant items to suicide in the Composite International Diagnostic Interview, CD-RISC 10 = Connor-Davidson Resilience Scale, PSFS = Psychiatric Symptom Frequency Scale, BSSI = Beck Scale for Suicide Ideation, BDI-II = Beck Depression Inventory II, BRS = Brief Resilience Scale, RS-13 = Resilience Scale, BSCL = Brief Symptom Checklist.

4 Discussion

The overarching aim of this review was to explore if resilience acts as a protective factor against suicidality over time and if so to what extent. Ten papers were included in this review, with nine providing evidence of a significant association between resilience and suicidality. Overall, findings from this review support resilience as a protective factor against suicidality over time. A further research question was also addressed, namely, to determine if there is evidence of a differential effect of resilience as a protective factor. Specifically, this was to ascertain if the protective effect of resilience differed in certain groups of people or under certain circumstances. The short answer is that it is unclear as our ability answer this question was limited by the lack of studies investigating any differential effects. The only evidence of a differential effect was found in veteran populations where posttraumatic stress was included in the relationship between resilience and suicidality over time versus where it was not included.

4.1 To what extent has resilience been found to act effectively as a protective factor against suicidality over time?

Overall, the findings of this review are in line with research that highlights resilience as a key protective factor in suicidality (Johnson et al., 2011). The majority of studies reported high levels of resilience to be associated with lower suicidality over time. This central finding of this review is consistent with previous cross-sectional research that cites resilience as a protective factor against suicidality (Jeong and Noh, 2023; Han et al., 2011). However, it is important to note that the majority of the studies focused on suicidal ideation, so more research is needed to confirm the extent to which resilience predicts suicidal attempts or suicide deaths over time.

The buffering hypothesis proposes that high levels of resilience act as a barrier between risk and suicidality (Johnson et al., 2011). This review focused on the concept of resilience as a whole and where this was measured by a scale, rather than constructs that confer resilience such as attribution style or agency as explored by Johnson et al. (2011). Given that this review adds to preliminary evidence of resilience as an important protective factor against suicidality over time, this review indicates the need to further investigating the buffering hypothesis in the context of the longitudinal relationship between resilience and suicidality.

An important theme highlighted by this review is that despite the evidence of resilience acting as a protective factor against suicidality over time, the impact of other factors on this relationship needs further exploration. For example, only three studies controlled for demographic factors and found

resilience remained a protective factor over time (Elbogen et al., 2020; Youssef et al., 2013; Llistosella et al., 2022). In the cross-sectional literature, research in a large population-based sample investigating resilience and sociodemographic factors indicated that higher resilience was associated with female gender, married marital status, higher education and full-time occupation (Weitzel at al., 2022). This would suggest that sociodemographic factors may have an influence on the relationship between resilience and suicidality but that resilience was found to remain a protective factor when accounting for confounding factors such as gender, education, age and income. This is in concordance with the small number of studies in this review which controlled for similar confounders. This would suggest in the context of suicidality, that demographic factors such as these possibly do not account for the relationship between higher resilience and low suicidality over time. However, more research needs to be undertaken to further explore the role of sociodemographic factors in the relationship between resilience and suicidality.

Controlling for psychiatric factors seemed to have more of an impact on the suicide and resilience association. This was highlighted by Yurgil, Barkauskas and Dewleen (2021) who found when controlling for psychiatric factors and history of suicidal ideation, that resilience at baseline no longer predicted suicidality four months later. This is in concordance with results from Liu et al. (2016) who found that only decline in resilience predicted suicidality at follow-up when controlling for anxiety and depression and other psychological risk factors for suicide. This would suggest that psychiatric factors may play some role in lessening the protective effect of resilience in suicidality. This also highlights a shift from higher rates of resilience as a protective factor, to low resilience as a risk factor for increased suicidality over time (Liu et al., 2016). Wu et al. (2020), despite finding resilience to predict mental health status over time, found that this effect declined after two years. It could, therefore, be the case that in the context of mental health difficulties persisting overtime, the protective effect of resilience is less in this context in comparison to those who do not experience such difficulties. As has been established by recent research, mental health disorders are an important risk factor for suicidality (Moitra et al., 2020). Therefore, the protective impact of resilience over time could be weakened by the presence of mental health difficulties, increasing the risk of resilience declining and increasing the likelihood of suicidality risk.

4.2 If resilience is found to act as a protective factor towards suicide is their evidence of a differential effect?

This review is limited in being able to answer this question because most of the studies did not explore a differential effect in relation to, other groups such as gender, ethnicity, or presence of mental health difficulties or socioeconomic status.

The only evidence of a differential effect was when comparing the veteran population studies. Kumar et al. (2021) found that when posttraumatic stress symptom severity was also included in the model to predict suicidal ideation, resilience did not serve as a protective factor against suicidal ideation at follow-up. Similarly, Yurgil, Barkauskas and Dewleen (2021) found resilience at baseline was no longer associated with suicidal ideation at follow-up. The other veteran studies which did not include posttraumatic stress in their analyses or measure them as individual variables, found that resilience remained predictive of suicidal ideation over time (Elbogen et al., 2020; Youssef et al., 2013; Smith et al., 2016). Resilience does seem to contribute some protective effect, but this possibly diminishes in the context of other factors such as posttraumatic stress (Kumar et al., 2021). It could be the case that the presence of posttraumatic stress increases the likelihood of a differential effect of resilience as a protective factor. This could be important to note for veteran populations, as highlighted by Fogle et al., (2020) posttraumatic stress disorder is one of the most prevalent mental health disorders in US veterans. However, at this time there are too few studies investigating this specific potential effect to draw any firm conclusions.

4.3 Strengths and limitations

A key strength of this review is that it explores an under researched areas that is protective factors in suicidality, which is key to furthering our understanding of suicide prevention. Specifically, longitudinal research on resilience's role in suicide risk has been limited. Therefore, the papers in this review reflect a narrower range of countries, settings, study designs and samples by comparison to cross sectional research in this area.

However, it is important to consider this review's findings in the context of its limitations. Despite the small number of eligible studies in this review limiting our ability to infer if study quality impacted on the findings, there are some important methodological limitations that were highlighted. Loss to follow-up was largely an issue in the majority of studies which likely impacted on the reliability of results (see appendix 1.4, item 13). Power calculations were also lacking in the majority of these studies with some noted to be underpowered due to smaller sample sizes at

recruitment or due to participant drop out. There is a lack of research exploring socioeconomic and interpersonal factors in the context of resilience and suicidality over time. Therefore, this is not something we were able to fully explore in this review in terms of how this aspect may strengthen or weaken the protective impact of resilience in suicidality.

Longitudinally any fluctuations in resilience and how this relates to suicidality was not explored as the majority of studies only captured these factors at baseline and follow-up. The limited amount of research on this topic also makes it challenging to discern if resilience has a strong protective effect on suicidality for short versus longer time periods. The studies included in this review were limited to English speaking only. It is likely that there may be some relevant studies that were written in other languages that were not included in this review.

4.4 Clinical implications

The implications of this review are limited due to the still sparce research that has been published in this area. Despite this there is some merit in assessing resilience clinically in the context of suicidality, given that low resilience has often been found in those who report suicidality. Focusing on enhancing resilience as a protective factor over time, through intervention (in conjunction with other forms of intervention addressing suicide risk) could potentially act as a buffer against suicidality (Johnson et al., 2011). However, further research is needed to investigate if an intervention targeting resilience lessens suicidality over time.

4.5 Future Research

Unfortunately, it was not possible to include cross-sectional studies in this research as originally planned. Given that more research has been conducted exploring this area compared to longitudinal research this would be able to provide a fuller sense of the role of resilience in suicide risk. Further longitudinal research is needed to focus on capturing more regular intervals of resilience and suicidality over time, to ascertain if and how these factors relate to each other as they fluctuate over time.

The concept of resilience and an agreed upon definition of this has been the topic of much discourse in the past (Herrman et al., (2011). The multifacetedness of resilience has recently been highlighted, describing it as a dynamic factor and conceptualising it within a biological, psychological, social and systemic context. This is moving away from resilience as a static individual trait. Rather that it is a fluid process which can respond to larger circumstances and social structures out with the individual

(Denckla et al., 2020). This approach to resilience was not something that was noted in any of the studies in this review. However, it can be addressed by (1) including a range of socioeconomic factors and status when investigating resilience, (2) focusing on resilience as a dynamic process, rather than an individual trait, (3) including diverse and minority populations when investigating resilience, (4) understanding resilience on multiple levels (biological, psychological, social and systemic) and (5) undertaking a variety of study designs, across a number of different settings and populations (Denckla et al., 2020). This will allow for a better understanding of what factors allow resilience to be more protective and under which circumstances this is the case, particularly when considering individuals who have less access to the means that enhance resilience. This is particularly important to further the theoretical understanding of how to build resilience and how we can best approach creating this for others.

4.6 Conclusion

This review highlights preliminary evidence of resilience being a protective factor to suicidality over time. In addition, a key finding of this review is that further research needs to be dedicated to this area while addressing the weaknesses in the research methodology, gaps in the literature and exploring this topic in a broad range of populations. Given that resilience has been proposed as a moderator within the IMV model, it is imperative that resilience continues to be the focus of research exploring protective factors in suicidality (Kirtley & O'Connor, 2018). With this, more conclusive theoretical and clinical implications can be generated for resilience and its role in suicide risk.

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Chapter 2

Exploring Vulnerability and Protective Factors in the Relationship Between Entrapment and Suicidal Ideation

Prepared in accordance with the author requirements for [British Journal of Psychology; https://bpspsychub.onlinelibrary.wiley.com/hub/journal/20448295/homepage/forauthors.html]

Plain Language Summary

Title: Exploring Vulnerability and Protective Factors in the Relationship Between Entrapment and Suicidal Ideation

Background: Research continues to be unable to fully predict who is most at risk of dying by suicide. To increase knowledge of suicide prediction and prevention, researchers have been investigating factors which increase the risk of suicide. To this end, a theoretical framework to help understand how an individual may be vulnerable to suicide has been developed by O'Connor (2011). This framework proposes how the transition from suicidal ideation to suicidal behaviour occurs. In addition, this framework proposes that suicidal thoughts are more likely to emerge when feelings of defeat and entrapment are present. Entrapment is seen as key to understanding suicide risk. Feelings of burdensomeness, feeling one does not belong and lack of social support have also been shown to increase the risk of suicidal thoughts occurring. Suicidal ideation, in turn, can transition into suicidal behaviour such as self-harm and suicide attempts. This framework does not just allow focus on potential risk factors but it has identified factors which can protect against suicide.

Aims and Questions: The overall aim of this study was to further investigate the relationship between entrapment and suicidal ideation, due to its important role in the emergence of suicide risk as proposed by O'Connor (2011). Specifically, it aims to identify factors which strengthen or weaken this relationship and which risk and protective factors are relevant in the transition between entrapment and suicidal ideation.

Methods: This study used data which had previously been gathered from an online survey. This study investigate the strength of the relationship between defeat, entrapment, and suicidal ideation and whether additional factors, when present, influence this also. These included the following risk and protective factors: demographics, any pre-existing mental health condition, anxiety, depression, loneliness, resilience, and social support.

Results: Higher levels of entrapment were found in those who reported suicidal thoughts compared to those who did not. Individually, only pre-existing mental health condition, anxiety and depression symptoms were found to increase the likelihood of suicidal ideation being reported when feelings of entrapment were also high. Feelings of defeat were found to be associated with increased feelings of entrapment which in turn were associated with the likelihood of experiencing suicidal ideation.

Conclusion: This study contributes to growing evidence that entrapment plays a key role in the emergence of suicidal thinking. Overall, this study highlights the importance of considering the risk

of suicidal thinking developing when an individual is experiencing mental health difficulties and feelings of entrapment.

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Abstract

More than 700,000 people die by suicide each year across the globe (World Health Organisation, 2019). It remains challenging to predict suicide risk despite the progress that has been made in research. A key theory explaining the emergence of suicidality is O'Connor's (2011) Integrated Motivational-Volitional (IMV) Model of suicidal behaviour. Due to dearth in the literature, protective factors as well as vulnerability factors were investigated within the model. These potential moderators included, pre-existing mental health condition, anxiety and depression symptoms, loneliness, resilience, and social support. This cross-sectional study uses secondary data gathered online from 3077 general population participants from the UK COVID-19 Mental Health & Wellbeing study (O'Connor et al., 2021). The aim of the present study was to investigate potential moderators and mediators in the entrapment–suicidal ideation relationship. SPSS PROCESS was used to conduct analyses. Higher levels of entrapment were found in those who reported suicidal ideation compared to those who did not. Individually, only pre-existing mental health condition, anxiety and depression symptoms were found to moderate the entrapment–suicidal ideation relationship. This study contributes to evidence that entrapment plays a key role in the emergence of suicidal ideation and the continued need for research testing the IMV Model.

1. Introduction

More than 700,000 people die by suicide each year across the globe and there are at least 250,000 admissions to general hospitals following self-harm per annum (World Health Organisation, 2019; Kirtley & O'Connor, 2018). Although there has been much progress in understanding the factors associated with suicide risk, it remains challenging to predict this risk. It is important, therefore, to identify more specific markers of suicide risk and factors which can act in a protective manner. In the past, research has focused on identifying single risk factors such as history of previous suicide attempt or focusing on domains of risk factors such as cognitive factors (Probert-Lindström et al., 2020; Wenzel, Brown & Beck 2009). However, as concluded by many researchers, understanding the interaction between factors associated with suicidal thoughts and those that govern the transition from suicidal thoughts to suicidal acts remains limited. Therefore, research has moved towards ideation-to-action frameworks to capture the complexity and the transition between ideation and behaviour (Klonsky, Saffer & Bryan, 2018).

Suicidal ideation remains a complex topic with a multifaceted relationship with vulnerability and protective factors (Holman & Williams, 2022). The complexity of how suicidal ideation emerges, and how this develops into suicidal behaviour is highlighted by key ideation-to-action models such as the Interpersonal Theory of Suicide (Van Orden et al., 2010) and the Integrated Motivational-Volitional (IMV) Model of suicidal behaviour (O'Connor, 2011; O'Connor & Kirtley, 2018). Importantly when looking at risk factors, which are crucial to predicting suicide and preventing it, research has indicated that these are different for suicidal ideation vs attempts (Klonsky, Saffer & Bryan, 2018). Therefore, a more comprehensive understanding of the factors associated with suicidal ideation specifically is needed as suicidal ideation is the key driver in the increased likelihood of suicidal behaviour emerging.

The Integrated Motivational-Volitional (IMV) Model of suicidal behaviour

As noted above, the IMV model (O'Connor, 2011) is a prominent ideation-to-action framework of suicidal behaviour. Fig. 1 below shows the most recent version of the IMV Model taken directly from O'Connor and Kirtley (2018). This model proposes that defeat and entrapment contribute to the evolution of suicidal ideation and intent and that several factors called volitional moderators can contribute to the transition from ideation into suicidal behaviour. In addition, risk or vulnerability factors have been identified as moderators which act as threats to the individual which may

contribute to the transition between defeat and entrapment. These factors are known as threat to self moderators as stated in the IMV Model and include the following: social problem-solving, coping, memory biases and ruminative processes (O'Connor & Kirtley, 2018). In the transition from entrapment to suicidal ideation, motivational moderators, which include risk and protective factors such as thwarted belongingness, burdensomeness, future thoughts and goals, resilience and social support contribute to the likelihood of a transition occurring from entrapment to suicidal ideation and intent (O'Connor & Kirtley, 2018). The volitional phase of the IMV model (2011) focuses on the transition from suicidal ideation to suicidal behaviour.

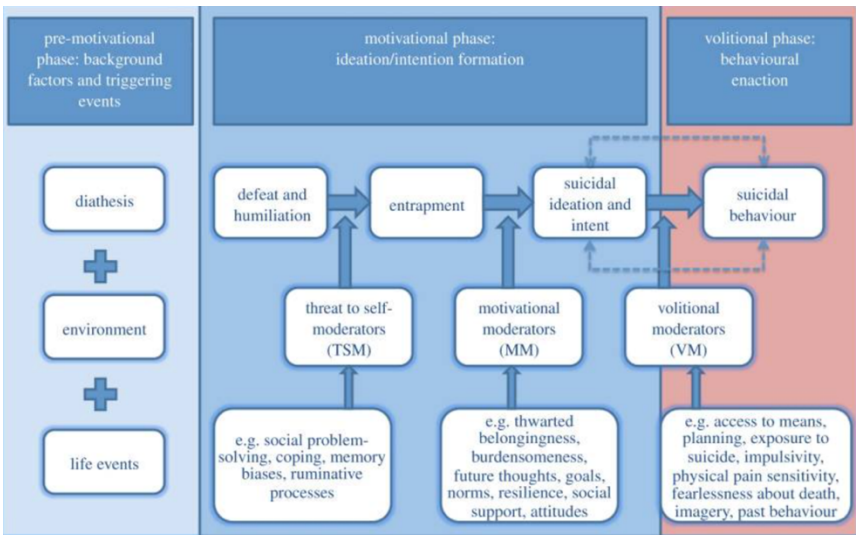

Figure 1: The Integrated Motivational-Volitional (IMV) Model of suicidal behaviour (O'Connor & Kirtley, 2018).

The role of entrapment in suicidality

Entrapment is defined by Gilbert and Allan (1998) as the wish to escape circumstances which are perceived as inescapable and unbearable. Internal entrapment emerges due to internal thoughts and feelings of perceived entrapment. External entrapment refers to external circumstances that are perceived as inescapable, resulting in the individual feeling trapped. Some have argued that entrapment is best conceptualised as a unidimensional concept as both internal and external entrapment play a similar role in suicidal ideation (Teismann & Brailovskaia, 2019). However,

O'Connor and Portzky (2018) noted that better understanding of internal and external entrapment equally as a unified and separate concepts and the impact on suicidal ideation emergence needs to be studied further.

Research exploring internal and external entrapment separately as mediators between defeat and suicidal ideation has found differences in terms of the strength of the effect. For example, Lucht et al. (2020) found in a sample of German patients admitted to a psychiatric ward due to suicidality, that the indirect effect of internal entrapment as a mediator was greater than external entrapment on the defeat to suicidal ideation relationship. Holler et al. (2021) found that when including internal entrapment in the relationship between defeat and suicidal ideation this predicted a change in suicidality over time. However, this was not found when external entrapment was included in the model. This differential relationship between defeat and internal versus external entrapment on the outcome of suicidal ideation emphasises the need for further investigation of the entrapment components separately rather than solely total entrapment.

Vulnerability factors for entrapment and suicidality

As noted above, it remains challenging to predict suicidality. Therefore, it is imperative that research continues to explore suicide vulnerability factors, while addressing the gaps in the literature by investigating protective factors. Given that suicide theory is focused on testing an ideation-to-action framework, research is needed to aid continue development of these frameworks particularly to encourage clinical and theoretical progress around suicide.

O'Connor and Portzky (2018) reported on numerous studies that found entrapment to be associated with increased suicidality. In addition, these authors identified key gaps within the research, such as the extent to which negative mood and life stress may activate or affect entrapment. Indeed, Taylor et al. (2011), in a systematic review, highlighted strong cross-sectional evidence for an association between entrapment and depressive symptoms. Other studies in Taylor et al.'s review related feelings of anxiety or anxiety disorders to entrapment, in the case where the association between anxiety and entrapment diminished this occurred when depression was controlled for. They noted that this weakened association could be attributed to the overlap of depression symptomology with anxiety that results in anxiety being associated with entrapment. In addition, Taylor et al. (2011) noted that research exploring the relationship between entrapment and anxiety was sparce, making it challenging to draw any firm conclusions about the extent to which anxiety relates to entrapment.

More recent findings indicate a potential association between anxiety and entrapment however this continues to be an area that requires more in-depth research particularly for exploring this in the context of suicide risk (Siddaway et al., 2015). What is more, mental health conditions, in general, are largely absent from the research literature on the IMV model, therefore establishing if and how these factors contribute is important in furthering our understanding of emerging suicidality.

Another key vulnerability factors that has been found to act as a moderator in the IMV model is loneliness. For example, McClelland, Evans and O'Connor (2021) found that loneliness moderated the relationship between defeat and entrapment and entrapment and self-injurious thoughts. Indeed, they noted that it is important to be mindful that loneliness plays a role both in encouraging reengagement in social connectiveness or, if unaddressed, increasing distress.

Protective factors for entrapment and suicidality

Protective factors in comparison to vulnerability factors to suicide are not as frequently investigated (de Beurs et al., 2019). In one of the exceptions, Teismann and Brailovskaia (2019) explored protective factors in their research and highlighted that individuals with high or medium scores in psychological well-being and mental health were less likely to experience suicidal ideation when their levels of entrapment were high compared to those with low scores. In addition, O'Connor and Portzky (2018) highlighted a lack of research exploring whether entrapment differs as a function of socio-demographic factors such as gender, age and employment. Therefore, it is crucial to investigate the presence of such factors to ascertain if they play a protective effect when experiencing entrapment and deter the emergence of suicidal ideation.

There are also existing protective factors that may reduce the likelihood of suicide and increase the likelihood of an individual's ability to cope (Chehil & Kutcher, 2012). Within the IMV model such factors which relate to coping are resilience and social support. It is important to investigate their role as previous research has identified the importance of increased coping ability (Chehil & Kutcher, 2012), well-being and mental health (Teismann and Brailovskaia, 2019) and arguably resilience and social support are likely included in these factors. Resilience and social support are established motivational moderators within the IMV model, although O'Connor and Portzky (2018) noted further research is required to investigate the extent of their protective impact on entrapment and suicidal ideation.

1.3 Current Study Aims

Overall, the aim of this study was to investigate factors that act as potential moderators and mediators in the entrapment with suicidal ideation relationship. To address key research gaps, potential vulnerability and protective factors were explored to investigate if they moderated the relationship between entrapment and suicidal ideation. In the case of vulnerability factors, pre-existing mental health condition, anxiety, depression and loneliness were investigated. Protective factors such as resilience and social support were also investigated. Further to this, the role of internal and external entrapment as mediators of the relationship between defeat and suicidal ideation was examined. In summary, the following research questions were addressed:

1. How does entrapment differentiate between those who reported suicidal ideation compared to those who did not report suicidal ideation?

2. Do established vulnerability factors strengthen the relationship between entrapment and suicidal ideation?

3. What protective factors are associated with suicidal ideation, and do they weaken the relationship between entrapment and suicidal ideation?

4. To what extent does internal and external entrapment mediate the relationship between defeat and suicidal ideation?

1.4 Key Hypotheses

It was hypothesised that:

1. Those who experience higher levels of entrapment are more likely to report higher rates of suicidal ideation than those who do not.

2. Vulnerability factors (pre-existing mental health condition, anxiety symptoms, depression symptoms and loneliness) would be positively associated with suicidal ideation and would moderate the entrapment–suicidal ideation relationship.

3. Protective factors (resilience, social support and employment) would be negatively associated with suicidal ideation and would moderate the entrapment–suicidal ideation relationship.

4. Both external and internal entrapment would strengthen the relationship between defeat and suicidal ideation through mediation, but internal entrapment would show a stronger effect.

2. Methods

2.1 Recruitment and procedure

This study used secondary data gathered for the UK COVID-19 Mental Health & Wellbeing study (UK COVID-MH; O'Connor et al., 2021). Multiple waves of data were gathered from participants during COVID, however this study only investigated the initial wave of data (Wave 1) gathered therefore the study design is cross-sectional. The study sample size is 3077 participants.

The UK COVID-MH study (O'Connor et al., 2021) commissioned recruitment of a sample of adults via quota sampling in the UK. This was done by Taylor McKenzie, a social research company. Within this sample, participants' ages ranged from 18–65+ years. Other demographic information such as gender (women: 51%; men: 49%), income, education, location, and occupation were gathered (O'Connor et al., 2021).

Participants were recruited online due to the constraints of lockdown between 31st March and 9th April 2020. An invitation was sent to approximately 7471 individuals who were part of an online UK panel open to the general public. 3077 were included in the final sample following screening, with the target for recruitment being at least 3000 participants.

Following consent, participants completed a battery of questionnaires which included questions on psychological and social measures and also included questions about participants' experience of the COVID-19 pandemic and lockdown (O'Connor et al., 2021). However, for the present purposes, the

focus here is on findings related to suicidal ideation, defeat, and entrapment as well as investigating potential vulnerability and protective factors.

The original study gained ethical approval from the University of Glasgow's Medical, Veterinary & Life Sciences Ethics Committee (O'Connor et al., 2021). This study is within the scope of the original ethical approval, and this was confirmed by the ethics committee. All information that was included in the data was non-identifiable with an assigned participant number in order to provide anonymity.

2.2 Measures

A number of different measures were included in the original online survey. However, only those that are relevant to this study's aims are described below.

Demographic information includes gender, age, employment status, level of education and region of the UK.

Pre-existing mental health condition was assessed by asking the following question: 'Do you have any long-standing physical or mental impairment, illness or disability?' Long standing was defined as over a period of at least 12 months. Mental health relevant answers that could be selected include depression, anxiety, attention deficit disorder and attention deficit hyperactivity disorder (ADHD), autism spectrum condition (ASC), obsessive compulsive disorder (OCD), post-traumatic stress disorder (PTSD) and alcohol or drug problems. The participants were also able to indicate any other relevant mental health problem that wasn't indicated in the options.

Suicidal ideation was assessed via one item adapted from the Adult Psychiatric Morbidity Survey (McManus et. al., 2016). Suicidal ideation was assessed by the question 'Have you ever seriously THOUGHT of taking your life?' A response was indicated by the following 'yes,' 'no,' and 'I would rather not answer'.

Depressive symptoms were assessed via the nine-item Patient Health Questionnaire (PHQ-9) (Löwe et al., 2004) on a four-point scale ranging from zero ('Not at all') to three ('Nearly Every Day'). Scores range from 0-27. Higher scores indicate high levels of depressive symptoms. Nine different statements are included ('e.g. Feeling tired or having little energy') asking how often participants' are bothered by these problems over the past two weeks. Only eight of the PHQ-9 items were included in analysis, as the item assessing suicidality was excluded so as not to confound the

analysis. This measure has demonstrated excellent internal consistency (Cronbach's α = 0.88, Löwe et al., 2004).

Anxiety symptoms were assessed using the seven-item Generalized Anxiety Disorder (GAD-7) Spitzer et al., (2006) tool using a four-point scale which ranges from zero ('Not at all') to three ('Nearly Every Day'). Higher scores indicating higher levels of anxiety ranging from 0-21. Seven different statements are included (e.g. 'worrying too much about different things') asking how often participants' are bothered by these problems over the past two weeks. This study found that this measure demonstrated excellent internal consistency (Cronbach's α = 0.92).

Defeat was assessed using four items from the Short Defeat and Entrapment Scale (SDES; Griffiths et al., 2015) on a five-point scale ranging from one ('Never') to five ('Always'). Higher scores show high levels of defeat and ranging from 4-20. This measure included 4 different statements about feelings of defeat (e.g. 'I feel defeated by life') to rate how much these feelings have been experienced over last seven days. This scale has demonstrated excellent internal consistency in the study (Cronbach's α = 0.88 to 0.94).

Entrapment was measured by the Entrapment Scale Short-Form (E-SF; de Beurs et al., 2020). This scale included four different statements about feelings of entrapment (e.g. 'I feel trapped within myself') to rate how much these feelings have been experienced over seven days on a five-point scale ranging from one ('not at all like me') to five ('extremely like me'). Scores range from 4-20, with higher scores indicating high levels of entrapment. Within this scale two items pertain to external entrapment and the other two items to internal entrapment. Scores for internal and external entrapment range from 2-10, with high scores indicating high levels of either internal and external entrapment. This measure demonstrated excellent internal consistency for all items (Cronbach's α = 0.87). Cronbach's α for internal and external items was found to be 0.78 and 0.82, respectively.

Loneliness was assessed using the UCLA three-item Loneliness scale (Hughes et al., 2004) on a three-point scale ranging from one ('hardly ever') to three ('often'). Scores range from 3-9, with higher scores indicating high levels of loneliness. The questionnaire included three different statements about loneliness (e.g. 'how often do you feel left out?') to indicate to what extent these statements describe the participants' experience. The internal consistency of this measure is good (Cronbach's α = 0.72).

Resilience was assessed using four-items of the six-item Brief Resilience Scale (BRS) (Smith et al., 2008) on a five-point scale ranging from one ('not true at all') to five ('true nearly all the time'). Higher scores indicating high levels of resilience ranging from 4-20. The measure included four different statements regarding resilience (e.g. 'coping with stress can strengthen me') to indicate to what extent these statements describe resilience. The full brief measure demonstrated good internal consistency (Cronbach's $\alpha = 0.80–0.91$).

Social Support was assessed using four-items of the seven-item ENRICHD Social Support Instrument (ESSI; Mitchell et al., 2003). The participants indicated this, describing their current social situation on a five-point scale rating from one ('not at all') to five ('all the time'). Scores range from 4-20, with a higher score indicating positive social support. This measure included four different statements evaluating social support (e.g. 'Is there someone available to help you with daily chores?'). The full measure has demonstrated a good internal consistency (Cronbach's $\alpha = 0.86$).

2.3 Statistical Analysis

Statistical analysis was conducted using SPSS Statistics 29 (IMB, 2023) and the PROCESS macro version 4.2 developed by Hayes (2018). Descriptive statistics were calculated and reported for demographic variables such as: age, gender, mental health condition and other socio-economic and mental health variables, where relevant. Primary analysis covered the already outlined research questions. As entrapment is a continuous predictor variable and suicidal ideation is a binary outcome variable logistic regression analysis was used. Simple logistic regression was used to investigate the relationship between entrapment and suicidal ideation. Moderation analysis in logistic regression was performed through the PROCESS macro to investigate if the relationship between entrapment and suicidal ideation is strengthened or weakened by vulnerability factors (pre-existing mental health condition, anxiety, depression and loneliness). Moderation analysis in logistic regression was performed through the PROCESS macro to investigate if the relationship between entrapment and suicidal ideation is weakened when including protective factors (employment status, resilience and social support). Mediation analysis in binary logistic regression was performed through the PROCESS macro to investigate if internal and external entrapment mediate the relationship between defeat and suicidal ideation.

3. Results

3.1. Sample Demographic Characteristics

Overall, 3077 participants took part in the original study with 54.7% female and 45% males. In terms of age, 27.5% were 18-29, 53.2% were 30-59 and 19.3% were 60+ years. Participant demographics for this study are detailed in Table 1 for the total sample, alongside those who reported suicidal ideation and those who did not. When comparing descriptives for the suicidal ideation group (n=689), a higher percentage are female (60.7%) and a high percentage are within the 30-59 age range (57%). In terms of ethnicity most respondents identified as white (93.7%), identified as heterosexual (81.4%), and the majority of those reported having a higher-level education qualification or higher (50.1%). Most people were in employment (52.7%) with about 20% reporting that they were unemployed (22.1%). The majority of those in the suicidal ideation group did not report a mental health condition (54.9%). Percentages for socioeconomic status were found to be similar for the low status group (49.1%) compared to the high status group (50.9%).

Following exclusions for missing data, 2944 participants were included in the multivariable analyses.

Table 1

Participant demographics of total sample and those who did and did not report suicidal ideation (n= 3077)

	Total Sample (n= 3077)	Reported SI group † (n= 689)	Non-SI group (n= 2246)
Gender n (%)			
Male	1385 (45)	268 (38.4)	1067 (47.5)
Female	1684 (54.7)	424 (60.7)	1177 (52.4)
Other	6 (0.2)	5 (0.7)	1(0.0)
Missing / prefer not to answer	2 (0.1)	1 (0.1)	1 (0.0)
Age n (%)			
18-29	847 (27.5)	224 (32.1)	569 (25.3)
30-59	1636 (53.2)	398 (57)	1173 (52.2)
60+	594 (19.3)	76 (10.9)	504 (22.4)
Ethnicity n (%)			
White	2777 (90.3)	654 (93.7)	2008 (89.4)
BAME†	292 (9.5)	44 (6.3)	232 (10.3)
Missing	8 (0.3)	0 (0.0)	6 (0.3)
Sexuality n (%)			
Heterosexual	2830 (92)	568 (81.4)	2143 (95.4)
Gay or Bisexual	220 (7.1)	117 (16.8)	91 (4.1)
Other / prefer not to say	27 (0.9)	13 (1.9)	12 (0.5)
Education n (%)			
No qualifications	136 (4.4)	33 (4.8)	94 (4.2)
School education qualification	1279 (41.6)	317 (46.0)	906 (40.3)
Qualification higher education and higher	1648 (53.6)	345 (50.1)	1236 (55.0)

Other	14 (0.5)	3 (0.4)	10 (0.4)
Employment n (%)			
Employed	1838 (59.7)	368 (52.7)	1403 (62.5)
Unemployed	358 (11.6)	154 (22.1)	174 (7.7)
Other (retired, education, homemaker)	881 (28.6)	176 (25.2)	669 (29.8)
Socioeconomic grouping n (%)			
High group	1758 (57.1)	355 (50.9)	1344 (59.8)
Low group	1319 (42.9)	343 (49.1)	902 (40.2)
Mental Health Condition n (%)			
Reported MH condition†	2241 (72.8)	315 (45.1)	1843 (82.1)
Did not report MH condition	836 (27.2)	383 (54.9)	403 (17.9)

† Abbreviations: SI = suicidal ideation, BAME = Black, Asian and Minority Ethnic, and MH = mental health condition.

3.2 Differentiating entrapment between participants who reported suicidal ideation and those who did not

Logistic regression was used to investigate whether those who did versus those who did not report suicidal ideation differed on levels of entrapment. A logistic regression investigated the effect of overall entrapment on the likelihood of being in the suicidal ideation vs no suicidal ideation group. The overall model was statistically significant when compared to the null model, ($\chi 2(2, N = 2944) = 511.153$, $p < 0.001$). Those in the suicidal ideation group reported significantly higher entrapment scores than those in the no suicidal ideation group (*Exp (B)* = 1.250, 95% CI 1.224, 1.277 $p < 0.001$).

A logistic regression testing the effect of external entrapment on the likelihood of being in the suicidal ideation group versus not was conducted. The overall model was statistically significant when compared to the null model, ($\chi 2(1, N = 2944) = 437.476$, $p < 0.001$). Every unit increase in external feelings of entrapment was associated with a 48% increased likelihood of being in the suicidal ideation group (*Exp (B)* = 1.478, 95% CI 1.422, 1.537 $p < 0.001$).

A logistic regression on the effect of internal entrapment on the likelihood of being in the suicidal ideation group was conducted. The overall model was statistically significant when compared to the null model, ($\chi 2(1, N = 2944) = 479.644$, $p <0.001$). Every unit increase in internal feelings of entrapment was associated with a 50% increased likelihood of being in the suicidal ideation group. Those who reported internal feelings of entrapment, likelihood of reporting suicidal ideation increased by 50% [*Exp (B)* = 1.498 95% CI [1.441, 1.557] $p < 0.001$).

3.3 Exploring entrapment as a moderator between vulnerability and protective factors and suicidal ideation

As described in the paragraphs below, a series of simple moderation analyses was performed using the PROCESS macro (Hayes, 2013). These analyses explored entrapment as a moderator of the relationship between vulnerability factors (anxiety symptoms, depression symptoms, mental health condition and loneliness), illustrated in table 2, and protective factors (employment, resilience and social support), shown in table 3, and suicidal ideation. All vulnerability and two out of three of the protective factors (resilience and social support) were found to have a significant relationship with suicidal ideation. When total entrapment was investigated as a moderator between potential protective and vulnerability factors with suicidal ideation only three out of four of the vulnerability factors were found to have significant interactions.

Total entrapment was explored as a moderator of the association between anxiety symptoms and suicidal ideation. The interaction between entrapment and anxiety symptoms was found to be statistically significant (*B* = -.007, 95% CI [-0.011, -0.003], *p* < .001). Simple slopes analysis at one standard deviation above and below the mean of anxiety symptoms showed that both the low (b: 0.265, SE = 0.022, 95% CI 0.222, 0.307, p < 0.001) and high (b: 0.190, SE = 0.015, 95% CI: 0.160, 0.220, p < 0.001) anxiety symptoms slopes were significantly different from zero. As illustrated in Fig. 2, higher levels of anxiety symptoms and higher levels total entrapment were associated with higher levels of suicidal ideation. Conversely, where lower levels of suicidal ideation and low levels of anxiety symptoms were reported, there were low levels of overall entrapment. The interaction between entrapment and depressive symptoms was also found to be statistically significant (*B* = -.003, 95% CI [-0.007, 0.000], p < .001). Conditional effects showed that when symptoms of depression were both low (b: 0.198, SE = 0.022, 95% CI 0.156, 0.214, p < 0.001) and high (b: 0.157, SE = 0.015, 95% CI 0.128, 0.186, p < 0.001) the slopes were significantly different from zero. This is captured in Fig. 3, where higher levels of depressive symptoms and higher levels of total entrapment were associated with higher levels of suicidal ideation. Where low levels of depressive symptoms and low levels of total entrapment were reported there were low levels of suicidal ideation. Finally, the interaction between total entrapment and mental health condition was found to be statistically significant (*B* = -.050, 95% CI [-0.017, 0.006], p = .027). Conditional effects demonstrated that, slopes which represented no mental health condition (b: 0.205, SE = 0.015, 95% CI 0.175, 0.235, p < 0.001) and mental health condition (b: 0.155, SE = 0.017, 95% CI 0.122, 0.188, p < 0.001) were significantly different from zero. As illustrated in Fig. 4, the presence of a mental health condition and higher levels of overall entrapment were associated with higher levels of suicidal ideation. Conversely, where mental health condition was not reported, together with low levels of overall entrapment, lower levels of reported suicidal ideation were found.

Table 2

Potential moderators of the relationship between **total entrapment** on vulnerability factors of suicidal ideation (n = 2944)

Effect	B.	SE	95% CI		P
			LL	UL	
Anxiety Symptoms					
Constant	-1.281	.055	-1.389	-1.173	< 0.001
Entrapment	. 227	.016	.196	.259	< 0.001
Anxiety Symptoms	.038	.013	.012	.063	.004
Entrapment * Anxiety Symptoms	-.007	.002	-.011	-.003	< 0.001
Depressive Symptoms					
Constant	-1.335	.055	-1.443	-1.227	< 0.001
Entrapment	.178	.016	.147	.209	< 0.001
Depression Symptoms	.067	.011	.046	.089	< 0.001
Entrapment * Depression Symptoms	-.003	.002	-.007	.000	.039
Mental Health Condition					
Constant	-1.716	.065	-1.843	-1.589	< 0.001
Entrapment	.205	.015	.175	.235	< 0.001
Mental Health Condition	1.190	.112	.971	1.409	< 0.001
Entrapment * Mental Health Condition	-.050	.023	-.095	-.006	.027
Loneliness					
Constant	-1.377	.054	-1.483	-1.271	< 0.001
Entrapment	.191	.013	.165	.217	< 0.001
Loneliness	.182	.030	.124	.240	< 0.001

Entrapment * Loneliness	-.005	.006	-.017	.006	.334

Table 3

Potential moderators of the relationship between **total entrapment** on protective factors of suicidal ideation (n = 2944)

Effect	B.	SE	95% CI		P
			LL	UL	
Employment					
Constant	-1.360	.050	-1.459	-1.261	< 0.001
Entrapment	.223	.011	.202	.244	< 0.001
Employment	.072	.056	-.038	.182	.199
Entrapment * Employment	.008	.013	-.017	.032	.533
Resilience					
Constant	-1.381	.053	-1.484	-1.277	< 0.001
Entrapment	.197	.012	.172	.221	< 0.001
Resilience	-.072	.014	-.100	-.045	< 0.001
Entrapment * Resilience	.000	.003	-.005	.006	.858
Social Support					
Constant	-1.361	.051	-1.462	-1.261	< 0.001
Entrapment	.216	.011	.193	.238	< 0.001
Social Support	-.037	.012	-.059	-.014	.002
Entrapment * Social Support	.002	.002	-.003	.006	.463

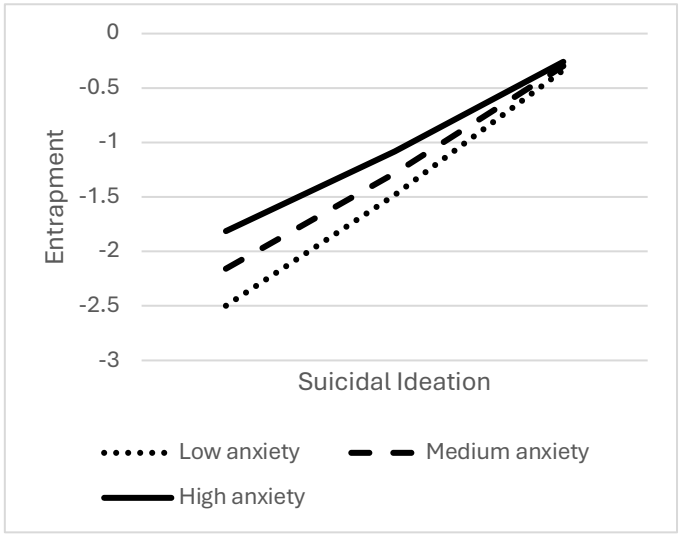

Fig. 2. Entrapment as a moderator between anxiety symptoms and suicidal ideation

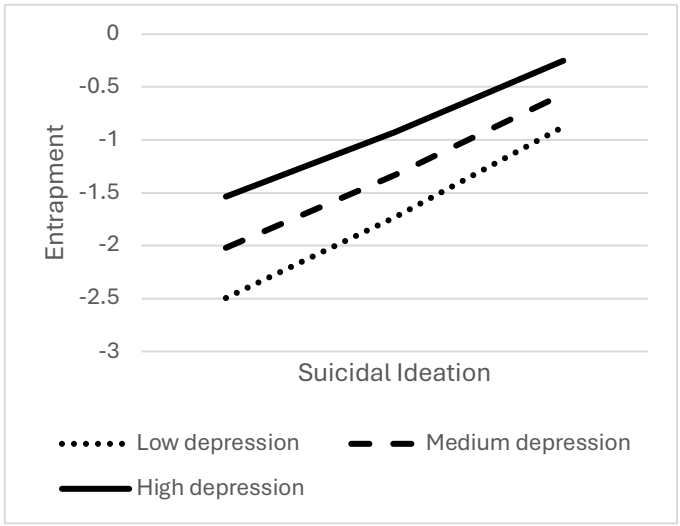

Fig. 3. Entrapment as a moderator between depression symptoms and suicidal ideation

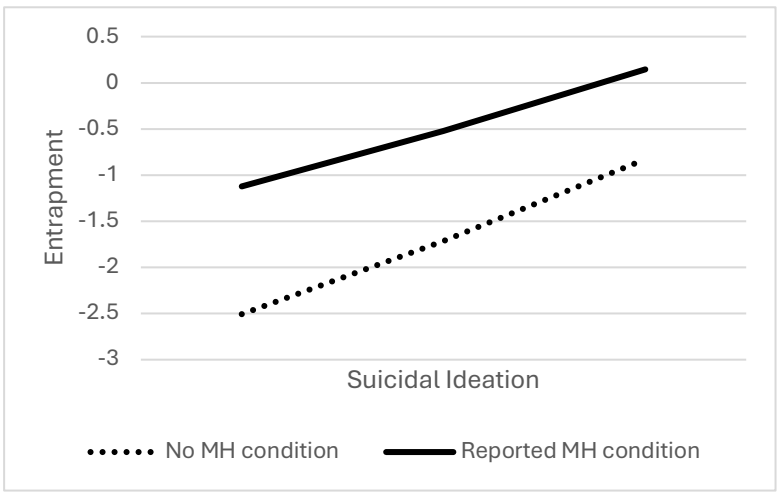

Fig. 4. Entrapment as a moderator between mental health (MH) condition and suicidal ideation

3.4 Exploring external entrapment as a moderator between vulnerability/protective factors and suicidal ideation

These analyses explored external entrapment as a moderator of the relationship between vulnerability factors and protective factors and suicidal ideation (see Appendix 2.1 & 2.2). When external entrapment was investigated as a moderator between potential protective and vulnerability factors with suicidal ideation only two out of four of the vulnerability factors were found to have significant interactions.

External entrapment was explored as a moderator of the association between anxiety symptoms and suicidal ideation. The interaction between external entrapment and anxiety symptoms was found to be statistically significant (*B* = -.011, 95% CI [-.018, -.004], *p* = .002). Simple slopes analysis conducted at one standard deviation above and below the mean of anxiety symptoms showed that both the low (b: 0.394, SE = 0.038, 95% CI 0.321, 0.468, p < 0.001) and high (b: 0.279, SE = 0.027, 95% CI: 0.226, 0.333, p < 0.001) anxiety symptoms slopes were significantly different from zero. As illustrated in appendix 2.3, higher levels of anxiety symptoms and higher levels external entrapment were associated with higher levels of suicidal ideation. Conversely, where lower levels of suicidal ideation and low levels of anxiety symptoms were reported there were low levels of external entrapment. The interaction between external entrapment and mental health condition was found to be statistically significant (*B* = -.094, 95% CI [-0.176, -0.011], p = .026). Conditional effects demonstrated that, slopes that represented no mental health condition (b: 0.356, SE = 0.028, 95% CI 0.301, 0.410, p < 0.001) and mental health condition (b: 0.262, SE = 0.032, 95% CI 0.200, 0.324, p < 0.001) were significantly different from zero. As illustrated in see appendix 2.3, presence of a mental health condition and higher levels of external entrapment were associated with higher levels of suicidal ideation. Conversely, where mental health condition was not reported together with low levels of external entrapment, lower levels of reported suicidal ideation were found.

3.5 Exploring internal entrapment as a moderator between vulnerability/protective factors and suicidal ideation

Analyses explored internal entrapment as a moderator of the relationship between vulnerability factors and protective factors and suicidal ideation, (see Appendix 2.4 & 2.5). When internal entrapment was investigated as a moderator between potential protective and vulnerability factors

with suicidal ideation, only three out of four of the vulnerability factors were found to have significant interactions.

Internal entrapment was explored as a moderator of the association between anxiety symptoms and suicidal ideation. The interaction between internal entrapment and anxiety symptoms was found to be statically significant (*B* = -.015, 95% CI [-0.021, -0.008], *p* < .001). Simple slopes analysis one standard deviation above and below the mean of anxiety symptoms showed that both the low (b: 0.476, SE = 0.041, 95% CI 0.395, 0.557, p < 0.001) and high (b: 0.323, SE = 0.027, 95% CI: 0.270, 0.376, p < 0.001) anxiety symptoms slopes were significantly different from zero. As illustrated in appendix 2.6, higher levels of anxiety symptoms and higher levels of internal entrapment were associated with higher levels of suicidal ideation. Conversely, where lower levels of suicidal ideation and low levels of anxiety symptoms were reported there were low levels of internal entrapment. The interaction between internal entrapment and depression symptoms was also found to be statically significant (*B* = -.006, 95% CI [-0.013, 0.000], p = .040). Conditional effects showed that for depression symptoms, both the low (b: 0.345, SE = 0.041, 95% CI 0.265, 0.426, p < 0.001) and high (b: 0.268, SE = 0.027, 95% CI 0.216, 0.320, p < 0.001) slopes were significantly different from zero. This is captured in appendix 2.6, where higher levels of depression symptoms and higher levels of internal entrapment were associated with higher levels of suicidal ideation. Where lower levels of suicidal ideation were reported, as were lower levels of depression symptoms and low levels of internal entrapment. The interaction between internal entrapment and mental health condition was found to be statistically significant (*B* = -.089, 95% CI [-0.171, -0.007], p = .034). Conditional effects demonstrated that, slopes that represented no mental health condition (b: 0.368, SE = 0.029, 95% CI 0.311, 0.424, p < 0.001) and mental health condition (b: 0.279, SE = 0.030, 95% CI 0.220, 0.338, p < 0.001) were significantly different from zero. As illustrated in appendix 2.6, presences of a mental health condition and higher levels of internal entrapment were associated with higher levels of suicidal ideation. Conversely, where mental health condition was not reported, together with low levels of internal entrapment, lower levels of reported suicidal ideation were found.

3.6 Internal and external entrapment as mediators of the relationship between defeat and suicidal ideation

Two separate mediation analyses were conducted to investigate internal and external entrapment as mediators of the relationship between defeat and suicidal ideation. Fig. 5 presents the path coefficients of the two mediation models. The regression coefficients reported in table 4 are the

indirect effects of defeat on suicidal ideation via external and internal entrapment. Results showed a significant indirect effect of defeat on suicidal ideation via internal entrapment, a*b = 0.087, SE = 0.014, 95% CI [0.060, 0.116] p < 0.001. As the confidence intervals did not include zero, this indicates a significant mediation effect of internal entrapment on the defeat-suicidal ideation relationship. In addition, the mediation analysis of defeat on suicidal ideation via external entrapment also showed a significant indirect effect, a*b = 0.071, SE = 0.014, 95% CI [0.044, 0.099] p < 0.001.

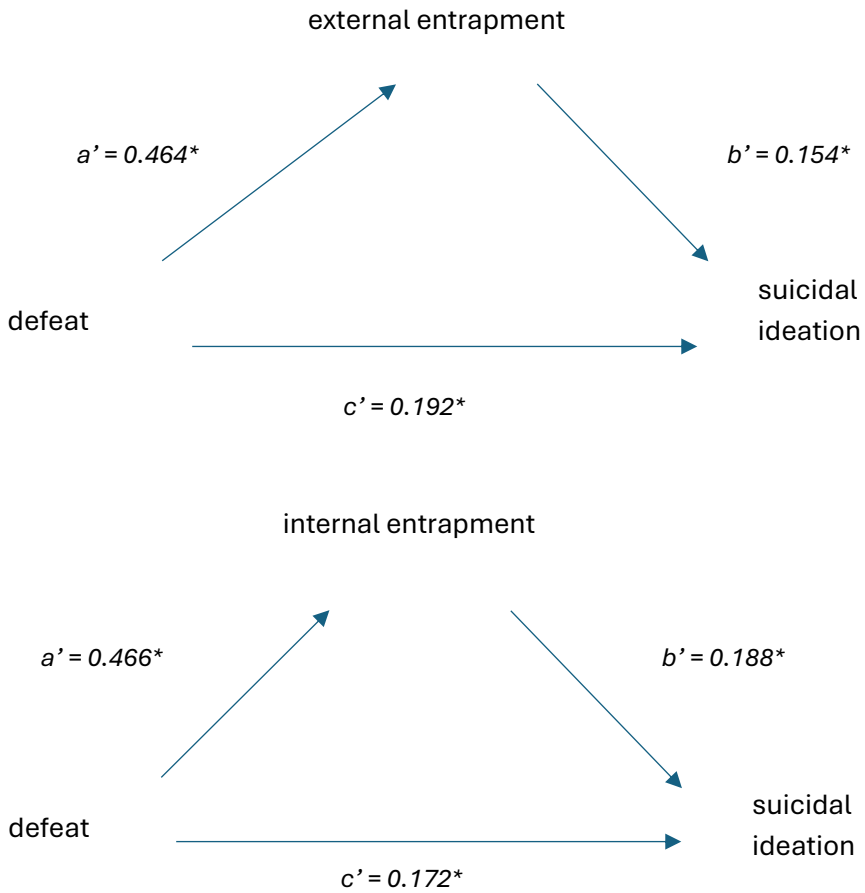

Fig. 5. Simple mediation model of defeat predicting suicidal ideation mediated by external and internal entrapment. * p ≤ .001, *N* = 2944

Table 4

Direct and indirect effects for simple mediation analyses

Mediation Effect	Direct Effect	SE	95% CI		Indirect Effect	SE	95% CI	
			LL	UL			LL	UL
Defeat⇒External Entrapment⇒Suicidal Ideation	.192	.019	.155	.228	.071	.014	.044	.099
Defeat⇒Internal Entrapment⇒Suicidal Ideation	.172	.019	.134	.210	.087	.014	.060	.116

N= 2944

4. Discussion

4.1 Study aims

All research questions were addressed over the course of this project. The overarching aim of this study was to investigate which moderators act as either vulnerability or protective factors in the relationship between entrapment and suicidal ideation. Such factors and relationships had not yet been investigated within the sample population recruited for the UK COVID-MH study (O'Connor et. al., 2021). The first hypothesis was supported, as we found that those with higher levels of entrapment were more likely to report higher rates of suicidal ideation than those who did not. The second hypothesis was partially supported as certain vulnerability factors were found to moderate the entrapment–suicidal ideation relationship. Specifically, those individuals with high levels of anxiety and depression symptoms were more likely to experience suicidal ideation when their levels of total entrapment were high compared to those who were low. Individuals who reported a mental health condition were more likely to report higher rates of suicidal ideation when their levels of total entrapment were high. Conversely, external entrapment did not moderate the relationship between depression symptoms and suicidal ideation. The third hypothesis was not supported, no protective factors were found to moderate the entrapment–suicidal ideation relationship. The final hypothesis was fully supported finding that both external and internal entrapment mediated the relationship of defeat and suicidal ideation. Furthermore, internal entrapment was found to demonstrate a stronger relationship, as hypothesised.

4.2 Differentiating entrapment between participants who reported suicidal ideation and those who did not

As expected, the findings in this study supported a key premise of the IMV model that theorises that entrapment is central to the emergence of suicidal ideation (Kirtley & O'Connor, 2018). This was demonstrated by the significantly higher levels of entrapment in individuals who reported to experience suicidal ideation compared to those who did not. The findings clearly show that internal entrapment is significantly associated with suicidal ideation and supports previous research that internal entrapment statistically predicts suicidal ideation (Höller et al., 2021). By comparison research findings add to the mixed literature on the relationship between external entrapment and suicidal ideation (Höller et al., 2022; Souza et al., 2024). The findings from this study also contribute to the growing trend that supports the association between all forms of entrapment and suicidal ideation. It is likely, given that the present data were gathered during the start of the first Lockdown of the COVID-19 pandemic, that this may have inflated reports of external entrapment. Therefore, it is important to be mindful of this when interpreting these results. Future research should be dedicated to investigating this relationship in future waves of these data, both cross sectionally and over time in order to ascertain if this trend continues.

4.3 Moderators of the entrapment –suicidal ideation relationship

Findings showed that total entrapment acted as a moderator between anxiety symptoms, depression symptoms and mental health condition individually and suicidal ideation. Feelings of anxiety and depression have not previously been explored as potential moderating factors within the IMV model (O'Connor & Portzky, 2018). This study's findings highlight the potential for exploring further mental health relevant factors such as presence of a psychiatric condition, symptoms of anxiety and depression as motivational moderators within the IMV model (Teismann and Brailovskaia, 2019). This study supports Taylor et al. (2011) who found that depression is associated with entrapment. Taylor et al. (2011) highlighted that the anxiety and entrapment relationship diminished when depression was controlled for. This would suggest that there is more evidence that supports a stronger relationship between depression and entrapment which differs from the findings in this study. This study found more evidence for anxiety and entrapment being associated with suicidal ideation which is in concordance with Siddaway et al. (2015). Further to this, our findings suggest that entrapment plays an important role when experiencing anxiety symptoms which contributed to an increased likelihood of suicidal ideation emerging. This could be due to

similar reasoning that was noted by Taylor et al. (2011), when encountering cognitive and behavioural mechanisms of anxiety such as threat-related appraisals and hypervigilance in the context of increased levels of entrapment (i.e. I am trapped in this situation). Increased feelings of entrapment could contribute to maintaining the negative bias of these appraisals and avoidance due to continued hypervigilance with the individual believing they are unable to escape this anxiety. This in turn contributes to an increased likelihood of an individual experiencing suicidal ideation.

Little difference was found in the results for moderators of internal and external entrapment by comparison. However, the effect size was diminished by comparison in external entrapment and depression symptoms in comparison to internal entrapment. Given that this was only a slight difference and represents only an initial investigation of these factors we should be mindful when making any interpretations. However, it seems that internal feelings of entrapment (e.g. I feel trapped inside myself,) may have a stronger impact when interacting with depression. This could be due to its ruminative and maladaptive thinking nature and that these internal aspects are harder to escape than external factors as suggested by Taylor et al. (2011). Moreover, this contributes to an increased likelihood of experiencing suicidal ideation.

Total entrapment was found to not act as a moderator of the loneliness and suicidal ideation relationship. This was surprising given that McClelland, Evans and O'Connor (2021) found loneliness to moderate the association between entrapment and suicidal ideation. However, this difference could be due to this study's dichotomous measurement of suicidal ideation as opposed to using a continuous measure.

Interestingly, significant associations were found between most of the protective factors and entrapment. Significant associations were found between resilience, social support and suicidal ideation but not for the relationship between employment and suicidal ideation. These associations diminish when including these protective factors as moderators in the entrapment–suicidal ideation relationship. This conflicts with Wetherall et al. (2019) who found resilience to have a buffering effect in the relationship between entrapment and suicidal ideation. Particularly in the presence of low resilience, higher entrapment was associated with higher rates of suicidal ideation.

This study highlighted the challenge of identifying protective factors, which can protect against suicidal ideation when entrapment is present. Evidence has been found for social support acting as a protective factor in suicidality (Kleiman & Liu, 2013; Chang, Chan & Yip, 2017). However, this has not been adequately explored in other research within the context of entrapment. Our study's findings

suggest that social support alone does not protect against suicidal ideation when entrapment is present, nor does employment. Therefore, it is possible that a combination of protective factors being present when entrapment is high is more likely to result in an increased protective effect against experience suicidal ideation. This is demonstrated by Teismann & Brailovskaia (2019) who found a unidimensional measure of positive mental health and psychological well-being to be a protective factor. Findings showed that when this protective factor was high or medium, suicidal ideation was less likely when their levels of entrapment were high compared to those with lower scores.

4.6 Internal and external entrapment as mediators

This study found a significant mediating relationship between defeat and suicidal ideation in the presence of both internal and external entrapment, but the internal relationship was stronger. This corresponds with evidence that a differential effect continues to be found in external and internal entrapment (Lucht et al., 2020; Taylor et al., 2011). Lucht et al. (2020) highlighted that this could be due to feelings of defeat having a greater effect when interacting with feelings of being trapped because of one's thoughts and feelings, resulting in the emergence of thoughts of suicide. This differential effect supports Forkmann et al.'s (2018) conclusion of the continued need to study entrapment as two constructs as well as a unified concept.

4.7 Strengths and limitations

With regards to better understanding of the research that informs the IMV model, this study is one of the few that investigates the presence of mental health condition as a potential vulnerability factor and how this can affect the relationship between entrapment and suicidal ideation. Despite not finding evidence of distinctive protective factors against suicidal ideation emergence when entrapment is present, this study has highlighted the challenge of focusing on single protective factors. Rather future research should explore the combination of protective factors that mitigate against suicidal ideation when entrapment is present.

The findings of this study should be interpreted in the context of its limitations. The main limitation of this study is the dichotomous measurement of suicidal ideation, which potentially limits the robustness of these findings. Measuring suicidal ideation on a continuum would have better captured the complexity of this outcome and strengthened the generalisability of this study's

findings. Presence of mental health condition was also a binary outcome, and it was also self-reported thereby affecting its validity. However, given that this has not been studied in the context of the IMV model before, this study has established that this should be researched further with the potential of exploring categorical conditions. This study is limited due to its cross-sectional nature therefore there is a lack of understanding of how entrapment and the moderating factors change over time and to what extent this impacts on suicidal ideation. In addition, it is important to be particularly mindful when interpreting these findings as some of the reported data around psychological factors may be inflated due to these data being gathered during Lockdown. Replicative effort should be dedicated to future waves of this data.

4.8 Clinical implications

Increased risk of suicidal ideation should be considered in clinical assessment for those reporting high levels of entrapment in the context of mental health conditions, particularly for those reporting symptoms of anxiety and depression. It may be appropriate for psychotherapeutic interventions to address feelings of entrapment in those struggling with depression and anxiety. This could address cognitive and behavioural mechanisms (cognitive biases, avoidance behaviours and rumination) characteristic of anxiety or depression which interact with feelings of entrapment. As highlighted by Lucht et al. (2020), defeat and entrapment fluctuate over time therefore continued measurement of these factors in clinical practice is required.

4.9 Theoretical implications

A continued study of potential vulnerability and protective factors is required in the context of the IMV model. In particular, understanding how aspects of mental health may contribute to this model and if they can be considered motivational moderators. Symptoms of anxiety, depression and psychiatric condition should be further studied in a longitudinal context in relation to entrapment and suicidal ideation. This would allow us to better understand the extent to which these aspects develop over time. As how suicidal ideation and suicidal behaviour emerge is clearly complex, according to the IMV model, this study highlights the need to focus on a combination of protective factors so as to address this complexity and protect against suicide risk.

4.10 Conclusions

This study contributes to growing evidence that entrapment plays a key role in the emergence of suicidal ideation. Within the IMV model, symptoms of anxiety, depression and presence of mental health condition are associated with an increased likelihood of suicidal ideation when entrapment is

high. None of the protective factors included in this study appeared to buffer the entrapment–suicidal ideation relationship. This study provided preliminary evidence of the mediating effect of external and internal entrapment on the relationship between defeat and suicidal ideation. Due to the cross-sectional design of this study, further research is required to explore the mediating effect of entrapment through a prospective design. Further research should investigate these factors in the context of the IMV model and explore the value of including these as motivational moderators. Overall, this study highlights the importance of considering the risk of suicidal ideation emerging in the presence of entrapment.

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Appendices:

Appendix 1.1: PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	5
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	75
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	7
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	8
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	9
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	10
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	9
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	9
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	9
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	8
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	8
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	9
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	9
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	15
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	n/a

Appendices:

Appendix 1.1: PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	15
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	n/a
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	n/a
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	n/a
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	n/a
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	n/a
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	10
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	11
Study characteristics	17	Cite each included study and present its characteristics.	11
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	14
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	15
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	14
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	11
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	11
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	11
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	n/a
Certainty of	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	n/a

Appendices:

Appendix 1.1: PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
evidence			
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	26
	23b	Discuss any limitations of the evidence included in the review.	28
	23c	Discuss any limitations of the review processes used.	28
	23d	Discuss implications of the results for practice, policy, and future research.	29
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	9
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	9
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	8
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	n/a
Competing interests	26	Declare any competing interests of review authors.	n/a
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	n/a

Appendix 1.2: PRISMA 2020 Abstract Checklist

Section and Topic	Item #	Checklist item	Reported (Yes/No)
TITLE			
Title	1	Identify the report as a systematic review.	yes
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	yes
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	no
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	yes
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	yes
Synthesis of results	6	Specify the methods used to present and synthesise results.	yes
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	yes
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	yes
DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	yes
Interpretation	10	Provide a general interpretation of the results and important implications.	yes
OTHER			
Funding	11	Specify the primary source of funding for the review.	no
Registration	12	Provide the register name and registration number.	no

Appendix 1.3: Quality Assessment Scores

Study	Study Design	NIH Quality Assessment Score	Quality Assessment Score (as percentage %)
Smith et al, (2016)	Cohort	9/14	64%
Elbogen et al, (2020)	Cohort	8/14	57%
Llistosella et al. (2022)	Cohort	11/14	79%
Liu et al. (2016)	Cohort	11/14	79%
Harris et al, (2021)	Cohort	12/14	86%
Yurgil, Barkauskas and Dewleen (2021).	Cohort	10/14	71%
Kumar et al, (2021)	Cohort	9/14	64%
Katz et al. (2023)	Cohort	10/14	71%
Youssef et al. (2013)	Cohort	11/14	79%
Stockner et al, (2024)	Cohort	10/14	71%

Appendix 1.4: Quality Assessment Table using NIH Quality Assessment Tool for Observational Cohort and Cross-sectional Studies

	Smith et al. (2016)	Elbogen et al. (2020)	Llistosella et al. (2022)	Liu et al. ()2016	Harris et al. (2021)	Yurgil, Barkauskas and Dewleen (2021)	Kumar et al. (2021)	Katz et, al. (2023)	Youssef et al. (2013)	Stockner et al. (2024)
1.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2.	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
3.	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
4.	Y	N	Y	Y	N	Y	Y	Y	Y	Y
5.	N	N	Y	N	Y	N	N	N	N	N
6.	Y	N	Y	Y	Y	N	Y	Y	Y	N
7.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
9.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
10.	N	N	Y	Y	Y	Y	N	N	Y	Y
11.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

12.	N	N	N	N	N	N	N	N	Y	N
13.	N	N	N	Y	Y	N	N	N	N	N
14.	N	Y	Y	Y	Y	Y	N	Y	Y	Y

Appendix 1.5 Study Characteristics and quantitative results

Title, Authors, year of publication & country	Study aim, sample size & characteristics	Results (RRR, OR, 95% CI)	
		Relative/Unadjusted	**Adjusted**
Nature and determinants of suicidal ideation among U.S. veterans: Results from the national health and resilience in veterans study. Smith et al., 2016 USA	Evaluate the prevalence of suicidal ideation in a veterans population over two-years. How sociodemographic, risk and protective factors assessed at baseline impact on Suicidal ideation 2107 of the originally recruited 4750 completed suicidal ideation measures in wave one and two. The rest were excluded due to not completing the measures. US veteran aged 18 and older. Age mean for each group: 62.27 (13.90), 58.80 (14.76), 61.14 (13.95), 50.90 (14.02)	*Remitted vs. No SI* PP= 1.07 (.78-1.47) *SI onset vs. No SI* PP= 0.57 (.45–.74) *Chronic SI vs. No SI* PP= .86 (.63–1.19) *Remitted SI vs. chronic SI* PP= 1.24 (.86–1.79)	*N/A*
Psychosocial protective factors and suicidal ideation: Results from a national longitudinal study of veterans. Elbogen et al., (2020) USA	Investigate potential protective factors for suicidal ideation in military veterans. The authors' hypothesize that psychosocial protective factors including resilience would be associated with lower suicidal ideation in veterans.	*Correlation between resilience and SI at follow-up* $\chi 2 = 50.80$, df=1, $p < .001$; $r = -0.32$, $p < .0001$ *Suicidal Ideation at wave 2:* Resilience (wave 1) = 0.45, (0.26–0.80) p = 0.006	*N/A*

	1090 veterans completed the one-year follow-up in addition to the baseline. US veterans 18 years and older. Medium age: 33 years old.		
Low Resilience Was a Risk Factor of Mental Health Problems during the COVID-19 Pandemic but Not in Individuals Exposed to COVID-19: A Cohort Study in Spanish Adult General Population. Llistosella et al., (2022) Spain	To investigate if participants with low or very low resilience are at higher risk of mental health problems during the COVID-19 pandemic. Total number of 1357 participants completed 12-month follow and included in analysis. Between groups design, groups included: healthy control group (no mental health issues reported), recovery group (those recovering with mental health difficulties that had occurred prior to the pandemic), incident (participants with new onset mental health problems during the pandemic) and persistent group (participants with mental health difficulties before and during the pandemic). Age mean 24.50 (6.93)	**<u>Suicidal thoughts and behaviours</u>** *Incidence* **Very Low Resilience (RI) = 3.13** **(1.20–8.19)** Low RI = 1.79 (0.64–5.01) High RI = 1.74 (0.64–4.75) *Persistence* **Very Low RI = 54.35 (10.44–282.92)** Low RI = 14.57 (2.66–79.78) **High RI = 9.83 (1.76–54.83)** *Recovery* **Very Low RI = 2.43 (1.48–3.998)** Low RI = 1.99 (1.21–3.25) **High RI = 1.31 (0.78–2.19)**	**<u>Suicidal thoughts and behaviours</u>** *Incidence* **Very Low RI = 4.14 (1.47–11.62)** Low RI = 1.81 (0.61–5.34) High RI = 2.36 (0.82–6.84) *Persistence* **Very Low RI = 53.92 (10.21–284.87)** Low RI = 14.38 (2.59–79.86) **High RI = 10.86 (1.91–61.59)** *Recovery* **Very Low RI = 2.11 (1.27–3.51)** Low RI = 1.95 (1.27–3.51) **High RI = 1.24 (0.73–2.11)**

Psychological Resilience Provides No Independent Protection From Suicidal Risk. Liu et al., (2016) Australia	Investigate if there is an association between resilience and suicidality over time. To what extent resilience predicts suicidality, and whether suicidality predicts resilience. 1162 participants completed the measures at all four waves. However, only waves three and four were included in this study. Wave 3 **N=** 2404 (28–32 years) Wave 4 **N=** 1191 (32–36 years)	**Logistic Regression Models:** *Suicidality at TP1 predicting resilience score at TP2* Item 1: β = −0.23, p < .001 Item 2: β = −0.16, p < .001 Item 3: β = −0.15, p < .001 Item 4: β = −0.14, p < .001 *Resilience score at TP1 predicting suicidality at TP2* Item 1: Odds ratio (OR) = 0.93 (0.92–0.95) Item 2: OR = 0.94 (0.92–0.95) Item 3: OR = 0.95 (0.93–0.97) Item 4: OR = 0.94 (0.91–0.96) *Resilience change group predicting suicidality at TP2* *Decline in resilience:* Item 1: RRR = 0.85 (0.34–2.07) Item 2: RRR = 0.82 (0.34–1.69) Item 3: RRR = 0.88 (0.30–2.59)

	Item 4, RRR = 0.61 (0.16–2.35) *Improvement in resilience:* Item 1: RRR = 0.64 (0.31–1.31) Item 2: RRR = 0.76 (0.34–1.69) Item 3: RRR = 0.98 (0.43–2.25) Item 4, RRR = 0.68 (0.24–1.96) *Change in suicidality predicting resilience score at TP2* <u>*Item 1*</u> No longer suicidal: β = 1.51, p = .49 Become suicidal: β = −1.51, p = .48 Always suicidal: β = 1.28, p = .61 <u>*Item 2*</u> No longer suicidal β = 1.75, p= .53 Became suicidal β = −2.46, p = .28 Always suicidal β = 2.37, p = .42) <u>*Item 3*</u>	**Logistic Regression Models:**

	No longer suicidal β = 1.97, p = .57 Became suicidal β = −1.39, p = .56 Always suicidal β = 1.17, p = .73). *<u>Item 4</u>* No longer suicidal (β = 9.92, p < .05) Became suicidal (β = −0.14, p = .95) Always suicidal (β = 2.70, p = .72) *Resilience score at TP1 predicting change in suicidality* *<u>Item 1</u>* No longer suicidal: 1.03 (1.00–1.05) Become suicidal: 1.02 (0.99–1.05) Always suicidal: 1.00 (0.98–1.04) *<u>Item 2</u>* No longer suicidal: 1.02 (0.99–1.05) Became suicidal: 1.01 (0.97–1.05) Always suicidal: 1.00 (0.97–1.03) *<u>Item 3</u>* No longer suicidal: 1.02 (0.99–1.06)	*Resilience score at TP1 predicting change in suicidality* *<u>Item 1</u>* No longer suicidal: 1.03 (1.00–1.07) Become suicidal: 1.03 (0.99–1.08) Always suicidal: 1.00 (0.96–1.04) *<u>Item 2</u>* No longer suicidal: 1.02 (0.98–1.06) Became suicidal: 1.01 (0.96–1.06) Always suicidal: 0.99 (0.95–1.04) *<u>Item 3</u>* No longer suicidal: 1.02 (0.98–1.07) Became suicidal: 0.99 (0.93–1.06) Always suicidal: 1.01 (0.96–1.07) *<u>Item 4</u>* No longer suicidal: 1.07 (0.94–1.22) Became suicidal: 1.06 (0.92–1.22) Always suicidal: 1.04 (0.91–1.19)

		Became suicidal: 0.99 (0.95–1.04) Always suicidal: 1.02 (0.98–1.06) *Item 4* No longer suicidal: 1.03 (0.98–1.09) Became suicidal: 1.01 (0.94–1.09) Always suicidal: 1.02 (0.97–1.09)	
The Long-Term Relationship Between Psychological Resilience, Psychosis, Distress, and Suicidal Thoughts and Behaviours. Harris et al., (2021) UK	The extent to which psychological resilience can buffer the relationship between psychosis and suicidality over time. Participants were required to have an experience of or diagnosis of psychosis and lifetime experiences of suicidal thoughts and behaviours. 89 participants completed follow-up data. **N=** 100 included at baseline. Age: 41.07 (13.06) **N=** 90 completed follow-up **N=** 89 included in main analyses. Age: 41.30 (13.35)	**Baseline vs follow-up *t score (p-value)*** Beck Scale for Suicide Ideation scale 2.17 (.04) Resilience Appraisals Scale (*RAS) total* .68 (.51) *RAS emotion coping* .28 (.78) *RAS situation coping* –.07 (.95) *RAS social support* 1.36 (.18)	*N/A*
Deployment and Psychological Correlates of Suicide Ideation: A Prospective, Longitudinal Study of	Examine whether factors known to mitigate suicidal ideation such as resilience are effective for participants with	**Multivariate Associations between SI and resilience scores** *Moderate resilience* OR = 0.50, (0.27-0.93)	*N/A*

Risk and Resilience Among Combat Veterans. Yurgil, Barkauskas and Dewleen (2021). USA	and without Traumatic Brain Injury (TBI). 1805 active armed service members were included in this study. 18 years and older. Age: 22.4 (3.3) Reference groups were used for resilience (high, medium, low).	*High resilience* OR = 0.25, (0.08-0.79)	
Resilience to Suicidal Ideation among U.S. Military Veterans with Posttraumatic Stress: Results from the National Health and Resilience in Veterans Study. Kumar et. al, (2021) USA	To examine four protective factors (including psychological resilience) as moderators of the relation between PTSS and suicidal ideation severity and if they remain protective over time. 713 US veterans completed the data collected at baseline and three-year follow-up. **N=** 713 US veterans Age: 61.2 years (12.9)	**Interaction between initial PTSS and resilience in wave 1 suicidal ideation** B = −0.44, 95% CI [−0.86, −0.18] **Interaction between initial PTSS and resilience in wave 2 suicidal ideation** B = −0.23, 95% CI [−0.40, 0.12]	
Aspects of Positive Identity Buffer the Longitudinal Associations Between Discrimination and Suicidal Ideation Among Bi+ Young Adults.	This study examined whether aspects of positive identity and resilience buffered the longitudinal associations between antibisexual discrimination and suicidal ideation one and two months later.	**Bivariate correlations of all time points of resilience and suicidal ideation scores** r = −.27 to −.37	N/A

Katz et, al. (2023) US	Young adults (18-29 years old) who identified as bisexual. 396 participants included in baseline, 319 at one month follow up and 299 included in two-month follow-up.	
A 3-Year Longitudinal Study Examining the Effect of Resilience on Suicidality in Veterans. Youssef et. al, (2013) USA	Investigating if higher resilience predicts lower suicidality over time. 176 veterans 18 and older. **N=** 176 US veterans Age: 39 (10.6)	**Spearman correlation coefficients between suicidality and resilience:** *Suicidal Ideation* Secure relationships: rs= −0.34 ; p <0.0001 Control: r_S = −0.29; p = 0.0004 Tolerance: rs= −0.16; p = 0.049 **Multivariate regression** **resilience factors most predictive of suicidality across time using:** Secure relationships and positive acceptance of change: (r2=0.04; F =8.19, p=0.005 **Multivariate forward stepwise regression** Resilience at baseline predicting suicidality at follow-up:

		r2=0.17, F =3.95, p= 0.0485
How Mental Health and Suicidality Changed during the COVID-19 Pandemic: A Longitudinal Study in the General and Psychiatric Population Illustrating Risk and Protective Factors Stockner et al., (2024) Italy	Aimed to assess the predictive role of potential risk factors associated with psychological distress and suicidal ideation during the COVID-19 pandemic. **N=** 314 Control group included general population (N= 234) and the patient group included a clinical population (N= 80) Age: 45.62 (12.24) control group and 45.39 (14.23) patient group.	**Intervention Effect of time on groups** *Active suicide* Wilks λ = 0.979, F1;312 = 6.77, p = 0.01; ηp = 0.02 *Passive suicide* Wilks λ = 0.968, F1;312 = 10.23, p = 0.002; ηp = 0.03 *Resilience* Wilks λ = 0.995, F1;304 = 1.52, p = 0.22; ηp = 0.005 **Intervention Effect of groups on time** *Active suicide* Wilks λ = 0.996, F1;312 = 1.39, p = 0.24; ηp = 0.004) *Passive suicide* Wilks λ = 0.982, F1;312 = 5.73, p = 0.02; ηp = 0.02

	Resilience
	Wilks λ = 0.976, F1;310 = 7.56, p = 0.006; ηp = 0.02
	Predictors of Active Suicidal Ideation in the Post-Test:
	R2 change = 0.03, p < 0.001
	Predictors of Passive Suicidal Ideation:
	R2 change = 0.05, p < 0.001

Appendix 2.1

Potential moderators of the relationship between **external entrapment** on vulnerability factors of suicidal ideation (n = 2944)

Effect	*B*.	SE	95% CI		P
			LL	UL	
Anxiety Symptoms					
Constant	-1.294	.054	-1.400	-1.189	< 0.001
External Entrapment	.337	.027	.284	.390	< 0.001
Anxiety Symptoms	.067	.012	.044	.091	< 0.001
External Entrapment * Anxiety Symptoms	-.011	.004	-.018	-.004	.002
Depression Symptoms					
Constant	-1.341	.054	-1.447	-1.235	< 0.001
External Entrapment	.270	.027	.217	.323	< 0.001
Depression Symptoms	.089	.010	.068	.109	< 0.001
External Entrapment * Depression Symptoms	-.006	.003	-.012	.000	.067
Mental Health Condition					
Constant	-1.746	.065	-1.874	-1.619	< 0.001
External Entrapment	.356	.028	.301	.410	< 0.001
Mental Health Condition	1.308	.109	1.094	1.523	< 0.001
External Entrapment * Mental Health Condition	-.094	.042	-.176	-.011	.026
Loneliness					
Constant	-1.383	.053	-1.487	-1.279	< 0.001
External Entrapment	.314	.024	.268	.360	< 0.001

Loneliness	.223	.029	.166	.279	< 0.001
External Entrapment * Loneliness	-.004	.011	-.025	.016	.671

Appendix 2.2

Potential moderators of the relationship between **external entrapment** on protective factors of suicidal ideation (n = 2944)

Effect	B.	SE	95% CI		P
			LL	UL	
Employment					
Constant	-1.344	.050	-1.442	-1.247	< 0.001
External Entrapment	.391	.020	.352	.430	< 0.001
Employment	.058	.055	-.051	.166	.298
External Entrapment * Employment	.021	.023	-.024	.067	.357
Resilience					
Constant	-1.376	.052	-1.478	-1.274	< 0.001
External Entrapment	.332	.022	.288	.376	< 0.001
Resilience	-.092	.014	-.118	-.065	< 0.001
External Entrapment * Resilience	.000	.005	-.009	.010	.924
Social Support					
Constant	-1.355	.051	-1.454	-1.256	< 0.001
External Entrapment	.369	.021	.328	.410	< 0.001
Social Support	-.047	.011	-.069	-.025	< 0.001
External Entrapment * Social Support	.000	.004	-.008	.009	.089

Appendix 2.3: External entrapment moderation figures

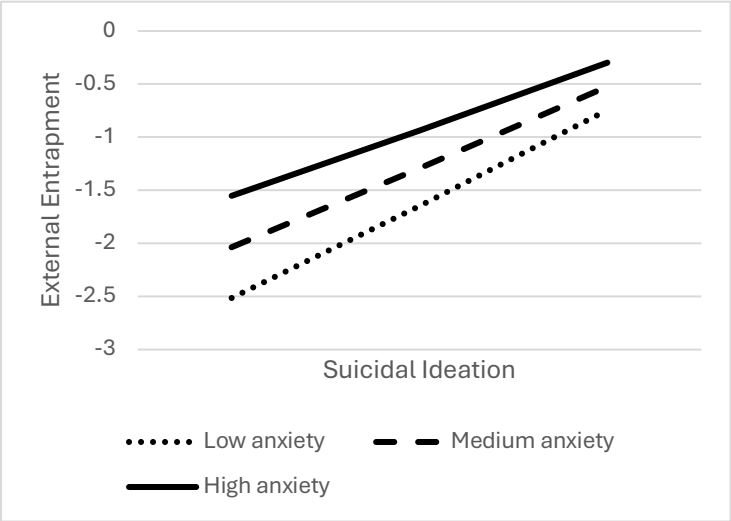

Fig. 4. External entrapment as a moderator between anxiety symptoms and suicidal ideation.

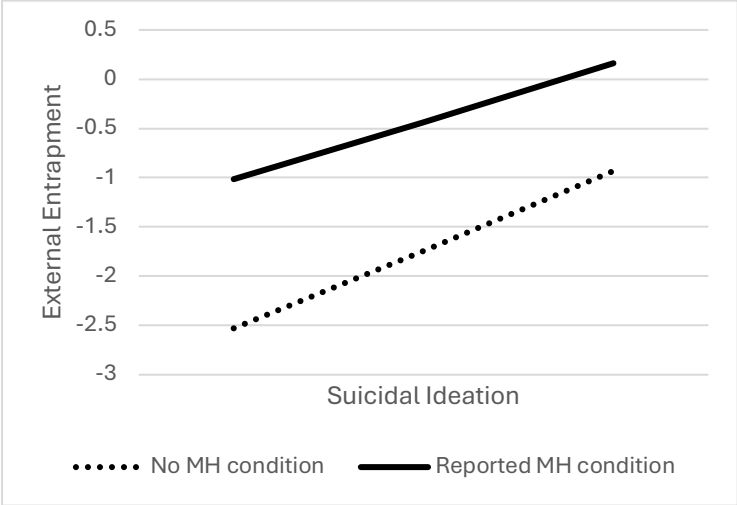

Fig. 5. External entrapment as a moderator between mental health condition and suicidal ideation.

Appendix 2.4

Potential moderators of the relationship between **internal entrapment** on vulnerability factors of suicidal ideation (n = 2944)

Effect	B.	SE	95% CI		P
			LL	UL	
Anxiety Symptoms					
Constant	-1.257	.054	-1.363	-1.151	< 0.001
Internal Entrapment	.400	.030	.342	.458	< 0.001
Anxiety Symptoms	.053	.012	.029	.077	< 0.001
Internal Entrapment * Anxiety Symptoms	-.015	.003	-.021	-.008	< 0.001
Depression Symptoms					
Constant	-1.322	.055	-1.428	-1.215	< 0.001
Internal Entrapment	.307	.029	.250	.365	< 0.001
Depression Symptoms	.077	.011	.056	.098	< 0.001
Internal Entrapment * Depression Symptoms	-.006	.003	-.013	.000	.040
Mental Health Condition					
Constant	-1.702	.064	-1.828	-1.576	< 0.001
Internal Entrapment	.368	.029	.311	.424	< 0.001

Mental Health Condition	1.210	.110	.995	1.424	< 0.001
Internal Entrapment * Mental Health Condition	-.089	.042	-.171	-.007	.034
Loneliness					
Constant	-1.346	.053	-1.451	-1.242	< 0.001
Internal Entrapment	.348	.025	.299	.398	< 0.001
Loneliness	.204	.029	.147	.261	< 0.001
Internal Entrapment * Loneliness	-.019	.011	-.040	.002	.073

Appendix 2.5:

Potential protective factors as moderators of the relationship between **internal entrapment** on and suicidal ideation (n = 2944)

Effect	B.	SE	95% CI		P
			LL	UL	
Employment					
Constant	-1.337	.050	-1.434	-1.239	< 0.001
Internal Entrapment	.404	.020	.365	.443	< 0.001
Employment	.083	.055	-.025	.191	.130
Internal Entrapment * Employment	.003	.023	-.043	.049	.897
Resilience					
Constant	-1.359	.052	-1.461	-1.257	< 0.001
Internal Entrapment	.352	.023	.306	.397	< 0.001
Resilience	-.079	.014	-.106	-.052	< 0.001
Internal Entrapment * Resilience	.002	.005	-.008	.011	.735
Social Support					
Constant	-1.334	.051	-1.434	-1.235	< 0.001
Internal Entrapment	.392	.022	.350	.434	< 0.001
Social Support	-.040	.011	-.063	-.018	< 0.001
Internal Entrapment * Social Support	.005	.004	-.003	.013	.195

Appendix 2.6: Internal entrapment moderation figures

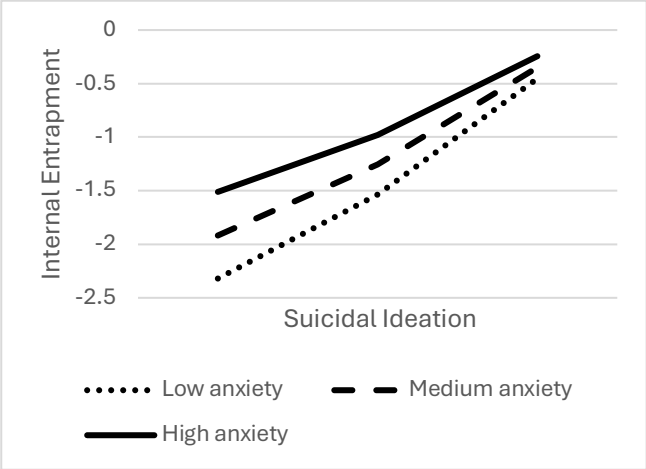

Fig. 6. Internal entrapment as a moderator between anxiety symptoms and suicidal ideation.

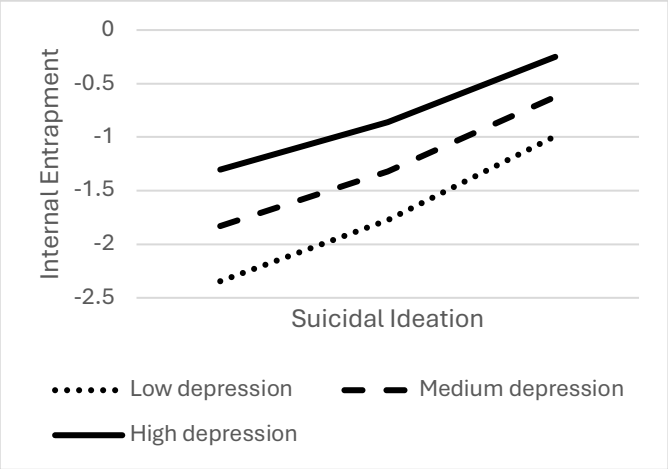

Fig. 7. Internal entrapment as a moderator between depression symptoms and suicidal ideation.

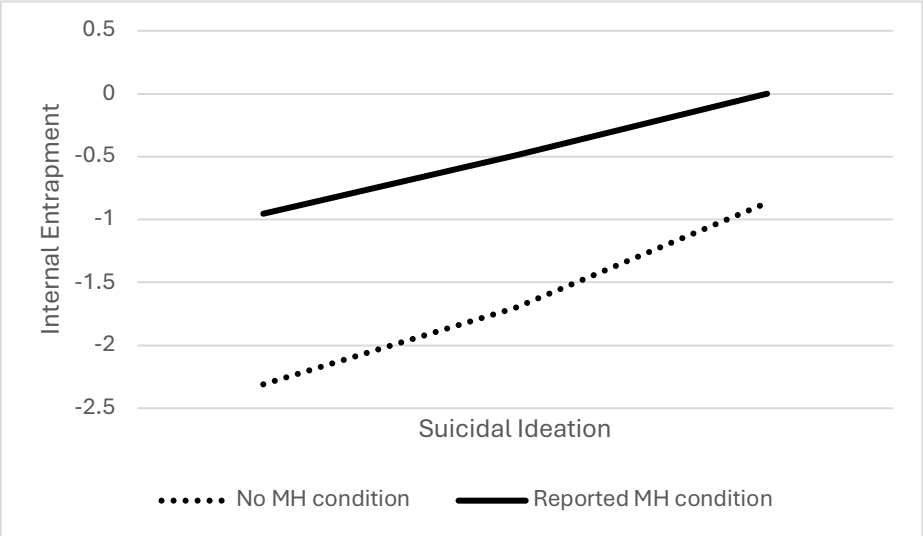

Fig. 8. Internal entrapment as a moderator between mental health condition and suicidal ideation

Appendix 2.7: STROBE Statement Checklist

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	38
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	38
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	39
Objectives	3	State specific objectives, including any prespecified hypotheses	43
Methods			
Study design	4	Present key elements of study design early in the paper	44
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	44
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	44/45
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	45
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	45
Bias	9	Describe any efforts to address potential sources of bias	n/a
Study size	10	Explain how the study size was arrived at	48
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	45
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	47
		(*b*) Describe any methods used to examine subgroups and interactions	47
		(*c*) Explain how missing data were addressed	47
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	47

		(*e*) Describe any sensitivity analyses	n/a
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	48
		(b) Give reasons for non-participation at each stage	n/a
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	48
		(b) Indicate number of participants with missing data for each variable of interest	n/a
Outcome data	15*	Report numbers of outcome events or summary measures	48
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	50
		(*b*) Report category boundaries when continuous variables were categorized	n/a
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	51
Discussion			
Key results	18	Summarise key results with reference to study objectives	58
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	61
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	61
Generalisability	21	Discuss the generalisability (external validity) of the study results	62
Other information			

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

*Give information separately for exposed and unexposed groups.

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

Appendix 2.8: Final approved MRP proposal

[https://osf.io/86mnw]

Appendix 2.9: Project Approval Letter

University of Glasgow

School of Health & Wellbeing

BC/PR

24 May 2023

[redacted]

Major Research Project Proposal

Exploring Risk and Protective Factors in the Relationship Between Entrapment and Suicidal Ideation

The above project has been reviewed by your University Research Supervisor and by a member of staff not involved in your project and has now been deemed fit to proceed to ethics.

Congratulations and good luck with the study.

Yours sincerely

[redacted]

School of Health & Wellbeing
College of Medical, Veterinary and Life Sciences
University of Glasgow
Mental Health and Wellbeing, Clarice Pears Building
90 Byres Road, Glasgow G12 8TB
Email: dclinpsy@glasgow.ac.uk

The University of Glasgow, charity number SC004401

Appendix 2.10: Original Ethics email confirmation

FW: 200190146 - Secondary data analysis

[redacted] confirmation that a new ethics application is not needed.

Bw
Rory

From [redacted]
Date: Wednesday, 14 June 2023 at 10:42
To: [redacted]
Subject: FW: 200190146 - Secondary data analysis

Hi Rory

Just forwarding on Jesse's approval for your records

[redacted]
MVLS Ethics Committee Administrator

School of Infection & Immunity
College of Medical, Veterinary & Life Sciences
Glasgow Biomedical Research Centre
Room 314, Sir Graeme Davies Building
University of Glasgow
120 University Place
Glasgow G12 8TA
The University of Glasgow, charity number SC004401

[redacted]

Thanks,

It seems as if this is using existing data, and is not really new research but research in keeping with the original aims.

I don't think we need a re application and can just keep this on file!

Ta.

Jesse

Jesse Dawson
MD, BSc (Hons), MBChB (hons), FRCP, FESO
Professor of Stroke Medicine
Consultant Physician
Chair MVLS Research Ethics Committee

School of Cardiovascular and Metabolic Health

College of Medical, Veterinary & Life Sciences
University of Glasgow
Room M0.05
Office Block
Queen Elizabeth University Hospital
Glasgow
G51 4TF

0141 4515868

[redacted]

Hi Jesse

Will we need an application for this or can I just store the details of the email in the files for reference?

Regards

[redacted]

Hi Neil

I hope you are well. One of our clinical psychology trainees, Shaunagh Hendry, is using the UK Covid-19 Mental Health & Wellbeing dataset (Approval number: 200190146) for her doctorate. The aims of her project are consistent with the aim of the original study which was to investigate "people's mental health and wellbeing" during COVID. Her aims are summarised below which are simply investigating the inter-relationship between different mental health variables within the dataset.

She just needs an email from you to confirm this.

I look forward to hearing from you.

Best wishes
Rory

Shaunagh Hendry's Aims/Research Questions:

This project will investigate factors that moderate the relationship between entrapment and suicidal ideation. In the case of vulnerability factors, pre-existing mental health condition, anxiety, depression and loneliness will be investigated. Protective factors such as resilience and social support will also be investigated. The following are the proposed research questions for this research project:

1. How does entrapment differentiate between those who reported suicidal ideation compared to those who did not report suicidal ideation?
2. Do established vulnerability factors strengthen the relationship between entrapment and suicidal ideation?
3. What protective factors are associated with suicidal ideation, and do they weaken the relationship between entrapment and suicidal ideation?
4. To what extent does internal and external entrapment mediate the relationship between defeat and suicidal ideation?

Appendix 2.11: Original Study Survey

[https://osf.io/3fqhk]