Suicidal risk factors and interventions to reduce risk in the University student population

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This thesis is submitted in partial fulfilment of the Doctorate in Clinical Psychology (DClinPsy)

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Overall abstract

The transition to university can pose a variety of challenges for students to navigate including academic, psychological, financial and social stressors. Such stressors can impact overall wellbeing, increase psychological distress and in some circumstances can result in suicidality and/or self-harm. Suicide and self-harm are major public health concerns worldwide and therefore risk reduction and prevention are key priorities within research. Despite increased awareness of risk factors for suicidality, there is a gap in the research literature relating to effective psychosocial interventions to reduce risk specifically in the student population. Increasing understanding of the multifaceted nature of suicidal risk in students warrants further exploration to ensure that interventions are tailored to meet their needs. The purpose of this thesis was to 1) evaluate the effectiveness of psychosocial interventions offered to university students with suicidality and/or self-harm and 2) explore factors predictive of increased suicidal risk in the student population.

The work comprises two primary components: a systematic literature review and an empirical study. The systematic literature review in Section One was conducted to explore existing evidence relating to the nature, variety and effectiveness of psychosocial interventions offered to university students. The review synthesised evidence from 17 studies identified from four key databases. Methodological quality and intervention outcomes were critically appraised using established frameworks. Studies were categorised based on type of psychosocial intervention offered. The strongest evidence was in support of Cognitive Behavioural Therapy and Dialectal Behavioural Therapy, however delivery of treatment components varied across studies. Other categories of intervention identified were brief psychological interventions, group interventions and stepped-care models, although there was only a small number of studies with mixed-quality evidence in each category. The review highlighted that further research using higher quality research methodologies is needed to

strengthen the evidence base for psychosocial interventions to support university students with suicidality and/or self-harm.

The empirical study in Section Two explored suicidal risk and potential predictors. Longitudinal data from the Nurture-U student wellbeing survey was collated from five universities in the United Kingdom. Survey data from 6,543 student participants was collected including validated measures of suicidal risk, health, wellbeing lifestyle factors and access to support. Statistical analyses indicated that sociodemographic and wellbeing factors including mental health symptomology, ethnic group, sexual orientation, adverse childhood experiences, age and alcohol use were significant predictors of baseline suicidal risk at the start of the academic year. Follow-up data from 1,721 participants at the end of the academic year highlighted that relative changes in mental health and wellbeing symptoms including depression, anxiety, sleep quality, social resources, loneliness and alcohol use were dynamic predictors of changes to suicidal risk.

Taken together, this thesis highlights the importance of understanding vulnerabilities unique to the student population and tailoring approaches to reduce suicidality and/or self-harm that accounts for a diverse range of biopsychosocial risk factors. The thesis includes clinical implications for university services and recommendations for future research, including the provision of interventions that are attuned to the unique challenges faced by university students.

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Abstract

Objective: Suicide is the third leading cause of death amongst young people aged 15-29 years. The evidence base for interventions to support individuals presenting with suicidality and/or-self harm is growing. Psychosocial interventions may offer benefits for risk reduction, yet little is known about utilising these interventions to target such difficulties in the university student population.

Method: A systematic literature review searching four databases (Medline, Scopus, PsycInfo and Embase) was conducted. The search strategy incorporated terms relating to suicidality, self-harm and psychosocial interventions. Studies were from any country of origin, although inclusion in the review required participants to be university students.

Results: 17 papers met the inclusion criteria. Several categories of intervention relating to evidence-based psychological treatments (Cognitive Behaviour Therapy and Dialectical Behaviour Therapy), brief psychological interventions, group interventions and stepped-care models were identified.

Conclusions: Evidence-based psychological interventions may benefit the university student population presenting with suicidality and/or self-harm. Brief psychological interventions, group interventions and stepped-care models demonstrate some promise, although high-quality evidence supporting their effectiveness is limited. Further studies using randomised controlled trial methodology to improve generalisability of the findings is needed to strengthen the research evidence for psychosocial interventions to support the university student population.

Keywords: university; students; suicidality; self-harm; psychosocial interventions

Psychosocial interventions to support university students with suicidality and/or self-harm: A systematic review

Suicide is a major public health concern and the third leading cause of death for young people aged 15-29 years (World Health Organisation, 2025). Data collection in the United Kingdom (UK) indicates that suicide by young people under 25 years has risen since 2010 (National Confidential Inquiry into Suicide and Safety in Mental Health, 2023). Suicidal ideation and attempts are also common in young people, with worldwide data estimating that 29.9% of 12–20-year-olds have experienced thoughts of suicide at some point during their lifetime and 9.7% have attempted suicide (Evans et al., 2005).

Within the UK, young people aged under 25 years account for approximately 63.5% of the university student population (Higher Education Statistics Agency, 2025). The transition to university can bring about several stressors for young people, in particular, academic demands, social/cultural pressures, financial concerns and broader issues such as moving locality and making new friends (Universities UK, 2018). Given these pressures, it is unsurprising that suicidal risk and self-harm have been reported in this population (Eskin et al., 2016; Mortier et al., 2018; Peltzer et al., 2017). An online survey of UK university students (n= 1,273) highlighted that 42.2% of participants had experienced thoughts of suicide in the past 12 months, 37.3% of whom were classed as high-risk for suicidal behaviours (Akram et al., 2020). Individuals that have previously experienced suicidal ideation and behaviours are of particular concern, given that a history of suicidal thoughts and attempts is a strong predictor of future death by suicide (Ribeiro et al., 2016), highlighting the need for early and targeted interventions (Ward et al., 2022).

A systematic review by Kabir et al. (2024) highlighted several risk factors for suicidal behaviours in university students, namely, male gender, mental health problems, non-heterosexual orientation, being unmarried, unemployment, alcohol dependence and adverse

childhood experiences. In relation to self-harm, findings from the multicentre study of self-harm in England suggest that aspects of the student experience such as academic pressures, adjusting to living away from home and independent living are related to self-harm (Clements et al., 2023). As such, supporting student mental health and wellbeing have been identified as priority areas by stakeholders including national governments, universities, research organisations, the higher education sector and charities (Cunningham et al., 2019; Department for Education, 2024; Galán-Muros et al., 2024; Sampson et al., 2022).

Definition of terms

For the purposes of this review, the definition of "suicidality" is consistent with the American Psychological Association definition (2018), relating to a range of suicidal risk behaviours such as thoughts of suicide, suicidal intent, suicide plans and suicide attempts. Self-harm is defined as any act of self-poisoning or self-injury regardless of purpose (National Institute for Health and Care Excellence, 2022).

There is an increasing body of evidence exploring a variety of psychosocial interventions that can support individuals with suicidality and/or self-harm (Taylor et al., 2023). The term psychosocial intervention encapsulates a broad range of non-pharmacological interventions that primarily focus on psychological and/or social factors to improve an individual's wellbeing (Shikuri et al., 2022). This includes evidence-based, structured psychotherapies as well as less formal interventions such as non-directive supportive counselling, peer-support services and remote contact interventions that utilise a range of strategies to improve wellbeing and reduce distress (Hawton et al., 2016).

Rationale for the review

It is important to study both suicidality and self-harm in the student population as these factors may confer risk of future death by suicide (Bould et al., 2019; Mortier et al., 2018). Psychosocial interventions to reduce suicidality and/or self-harm have been

extensively studied, with evidence supporting the effectiveness of treatments such as Cognitive Behavioural Therapy (CBT) and Dialectical Behavioural Therapy (DBT; Arshad et al., 2020; Hawton et al., 2016; Yiu et al., 2021). However, these studies have not tended to focus specifically on the university student population and often include participants with a particular diagnosis and/or within a certain clinical setting (Taylor et al., 2023). One systematic review that did focus on psychological interventions to support university students included studies where students had a diagnosed mental health condition or met symptom criteria on a validated clinical measure (Barnett et al., 2021). This review did not identify any randomised controlled trials measuring interventions for suicidal ideation or self-harm. Similarly, digital interventions have demonstrated some effectiveness for reducing self-harm in community and clinical samples (Cliffe et al., 2021), yet there is limited research exploring potential benefits within the student population (Cliffe & Stallard, 2022).

The lack of psychosocial interventions designed specifically for students to reduce suicidality and/or self-harm has been identified as a gap in the research literature (Barnett et al., 2021; Taylor et al., 2023). Given that students may be at increased risk of experiencing suicidality and self-harm (Clements et al., 2023; Mortier et al., 2018) and the paucity of research in this area, it is important to explore the literature relating to psychosocial interventions to support the student population.

Objectives

A systematic literature review was conducted to explore the existing literature in relation to the research question: how effective are psychosocial interventions to support university students with suicidality and/or self-harm?

The primary aim of this systematic literature review was to provide a better understanding of the nature, variety and effectiveness of psychosocial interventions offered to university students. Exploring which categories of intervention have demonstrated

effectiveness and determining strength of evidence can then be used to determine which psychosocial interventions should be implemented by universities to reduce risk in students with suicidality and/or self-harm. It is hoped that the findings from this review will be used to inform choice of psychosocial interventions offered by universities to support their student population.

The review questions were as follows:

- What is the nature of psychosocial interventions used to support students with suicidality and/or self-harm within university settings?
- How effective are these interventions for reducing suicidality and/or self-harm in students?

Methods

Search strategy and eligibility criteria

The procedure for this systematic review was guided by the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement and checklist (Page et al., 2021). The review consisted of the following:

1) a systematic literature search to identify relevant sources based on the inclusion/exclusion criteria, including quality appraisal of the sources
2) synthesis of these sources in a narrative format to summarise the effectiveness of interventions and identify key themes from the literature, with the view to informing universities when making decisions around interventions to offer students

Searches were carried out between 13th December 2024 and 24th January 2025 on the following databases: Medline (via the PubMed interface), Scopus, PsycInfo and Embase. A review of reference lists from eligible sources was also undertaken to identify any additional evidence that may be relevant for the review. Furthermore, the ProQuest platform was used to

search databases that allow access to unpublished sources, such as the PsycEXTRA database, to identify any "grey literature" that was eligible for inclusion.

The Population, Intervention, Comparison, Outcome (PICO) framework first developed by Richardson et al. (1995) was used for structuring the search strategy and identifying relevant sources of interest, as follows:

- Population: In university students,
- Intervention: are psychosocial interventions effective,
- Comparison: compared to an alternative intervention, treatment-as-usual, waitlist or no control group,
- Outcome(s): for reducing suicidality and/or self/harm?

Eligibility criteria were discussed with members of the research team at University of Newcastle that are involved with the Nurture-U study, a broader research project exploring student wellbeing across six universities. Sources of evidence were included if they 1) utilised a quantitative design 2) reported on findings from the university student population 3) assessed the effectiveness of a psychosocial intervention and 4) measured suicidality and/or self-harm as an outcome of a psychosocial intervention. Student participants could be of any age and from any level of study (i.e. undergraduate or postgraduate) Psychosocial interventions that aimed to reduce suicidality and/or self-harm but did not directly measure the impact on these factors were excluded, as it was not clear whether these interventions were effective in supporting students with these difficulties.

Information sources

Multiple sources of evidence were considered including journal articles, books, reports, theses, policy documents and conference presentations. Sources of evidence were included from any country of origin. All sources were considered regardless of year of

publication or publication status, so as not to exclude valuable data from unpublished sources of evidence such as doctoral theses and conference proceedings.

Search terms

Search terms were determined in an iterative process, initially using terms related to university students, psychosocial interventions, suicidality and self-harm. Searches using this broader terminology were used to identify key terms from the literature and feed back into the initial search terms. The final search terms were as follows: (((student) AND (university OR college)) AND (suicid* OR self-harm OR auto mutilat* OR automutilat* OR cutt* OR head bang* OR headbang* OR overdos* OR self destruct* OR selfdestruct* OR self harm* OR selfharm* OR self immolat* OR selfimmolat* OR self inflict* OR selfinflict* OR self injur* OR selfinjur* OR selfmutilat* OR self mutilat* OR selfpoison* OR self poison*)) AND ("psychosocial intervention" OR "psychosocial treatment" OR "psychological intervention" OR "psychological treatment" OR psychotherapy).

It is recommended that dual review is undertaken for at least a proportion of articles during the screening process (Plüddemann et al., 2018). As such, a second reviewer screened 20% of the articles and assessed for inclusion at each stage (i.e. title screen, abstract screen, full text). Discrepancies were discussed and the final decision for inclusion was made by the author.

Selecting sources of evidence

All sources of evidence were screened at title level to ascertain whether they were relevant to the research question i.e. was the source of evidence exploring the effectiveness of a psychosocial intervention to support university students presenting with suicidality and/or self-harm. Sources of evidence with relevant titles were then screened at abstract level to ensure that the source reported quantitative outcomes on the effectiveness of the intervention.

Finally, sources of evidence deemed relevant from the abstract screening were read in full to determine eligibility for inclusion.

Data collection process

A draft data charting form was developed by one reviewer based on the template from the Joanna Briggs Institute (2007), developed in an iterative process by assessing suitability with two sources of evidence and amending the questions. The final form used for this review is shown in Appendix A. Data charting was undertaken by one reviewer and discussions about the findings were held with the supervisory research team.

Data was extracted from relevant sources of evidence including author(s), year of publication, country where the source was published/conducted, primary aim, participant details and study design. Where data was not available or required clarification, authors were contacted for more information.

Quality appraisal of sources of evidence

The Critical Appraisal Skills Programme (CASP, n.d.) checklists were used depending on the nature of the source of evidence. Checklists are available for different study types including randomised controlled trials, qualitative studies and case-control studies. Using the CASP checklists provided a structured, systematic method of quality appraisal for different study designs, ensuring that important methodological factors were considered and encouraging transparency when making decisions about study quality (CASP, n.d.). The checklists were used to critically appraise different aspects of the source of evidence such as the internal validity of the design, reporting of the results and external validity of the findings.

As recommended by the Joanna Briggs Institute (2017), the quality appraisal process was undertaken by two independent reviewers for all full-text sources of evidence. Once

CASP checklists had been completed separately, both reviewers met to discuss their findings and to reach a decision regarding study quality in terms of high, medium or low-quality.

Sources of evidence were included in the review regardless of study quality. This approach can be taken when availability of evidence is limited, provided that there is transparency regarding the potential limitations of low-quality studies (Popay et al., 2006).

Synthesis of findings

A narrative synthesis approach was adopted, guided by the steps outlined by the Economic and Social Research Council for systematic reviews (Popay et al., 2006). Firstly, sources of evidence were organised into smaller groups based on the categories of psychosocial intervention described by Turton (2015). Sources of evidence deemed beneficial were further divided based on outcome of interest i.e. suicidality, self-harm, or both suicidality and self-harm. Types of psychosocial interventions measuring the same outcome of interest were grouped together to identify which psychosocial interventions appeared most effective for reducing suicidality and/or self-harm, taking into account the quality appraisal of each of the studies.

Results

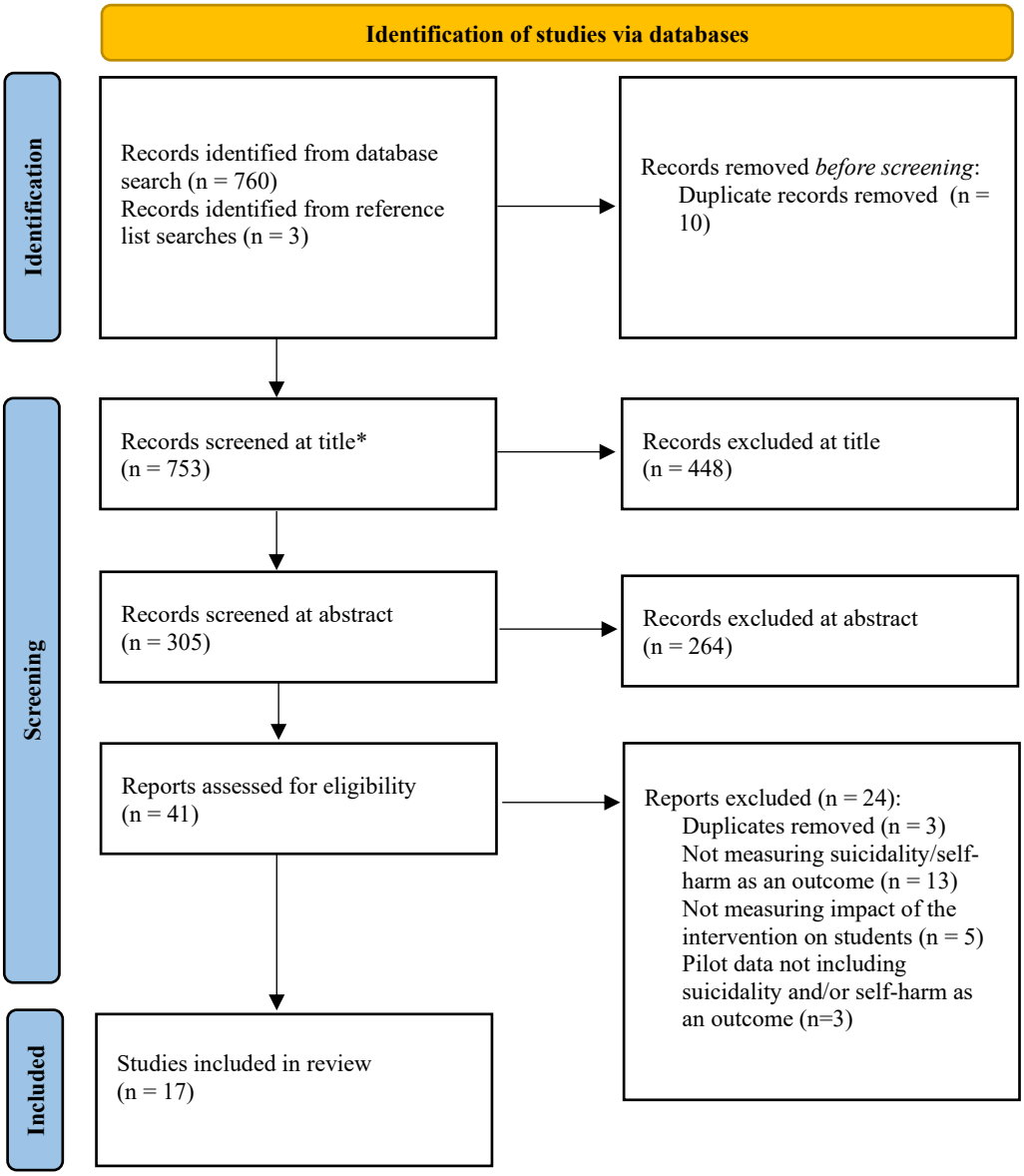
Study selection

The search of all databases returned 760 sources of evidence for consideration, 10 of which were identified as duplicates and removed. A further three articles were identified through reference list searches. 712 sources of evidence were excluded after screening of title and abstract on the basis that they were not relating to psychosocial interventions for suicidality and/or self-harm, or because they did not report on outcomes related to these areas. Of the remaining 41, a further three duplicates were removed and 13 did not report on suicidality and/or self-harm as an outcome. A further five studies reported on the effectiveness of the intervention in terms of other impacts, such as changes to therapist

knowledge and confidence, rather than outcomes specifically for the student population. Finally, three pilot studies with interventions targeting suicidal risk did not include outcome data relating to suicidality. The PRISMA flowchart in Figure 1 depicts the number of articles at the identification, screening and inclusion stage.

Figure 1

PRISMA flow diagram adapted from Page et al. (2021)



Study characteristics

17 studies were included in the final narrative synthesis. The most common study design was a randomised controlled trial (K=8). Of the 17 studies, one was undertaken in Europe, six were in America, eight were in Asia, one in Africa and one in Australia. Characteristics of the sources of evidence are displayed alphabetically by first author in Table 1, outlining the study design, primary aim, participant details and outcome measure(s) for suicidality and/or self-harm.

Table 1

Characteristics of sources of evidence

Authors and country	Study design	Primary aim	Participant characteristics	Outcome measure(s) for suicidality and/or self-harm	Length of follow-up
Farabaugh et al. (2019), United States	Case series	Explore the efficacy of a flexible manual-based CBT intervention	N= 30 undergraduate students with a total score of ≥ 13 on the Beck Depression Inventory and/or a score greater than 0 on the suicide risk item; aged 18-24 years	Beck Depression Inventory (Beck et al., 1961); suicide risk item	Post-intervention only
Fukumori et al. (2017), Japan	Pilot study	Investigate the efficacy of a structured writing program for reducing self-harm ideation and enhancing emotion regulation	N= 22 students with a self-harm ideation score ≥ 1; aged 18-21 years	Self-harm Ideation Scale; a 10-item measure developed specifically for the study	One month
Hasking et al. (2023), Australia	Prospective cohort study	Evaluate the utility of using a multivariable screening algorithm to target a telehealth support intervention	N= 5,454 first-year students. Students identified at future risk of suicide plan and/or attempt by the predictive risk algorithm (n = 184) and those reporting 12-month suicide attempt, but not identified by the algorithm (n = 19); aged 17-36 years	Items from the Self-Injurious Thoughts and Behaviours Interview (Nock et al., 2007)	12 months
Kim et al. (2017), South Korea	Non-randomised controlled trial	Examine the effects of a brief stress management intervention	N= 72 students, male only; mean age 23.1 years (standard deviation= 2.65)	Beck Scale for Suicide Ideation (Beck et al., 1979)	Three months
King et al. (2022), United States	Randomised controlled trial	Improve access to mental health services using web-based screening for students with elevated suicide risk	N= 3,363 students with a positive suicide risk score; aged 18-31+ years	Items from the National Comorbidity Survey (Kessler et al., 2004)	Six months

Knagg et al. (2022), England	Single-arm pilot study	Evaluate the feasibility and acceptability of a brief psychological intervention (Broad-Minded Affective Coping) to university students experiencing suicidality	N= 12 students recruited from University counselling services, experiencing suicidal ideation in the past four weeks; aged 18-22 years	Beck Scale for Suicide Ideation (Beck et al., 1979)	12 weeks
Lin et al. (2019), Taiwan	Randomised controlled trial	Evaluate the effectiveness of a DBT skills group compared to a Cognitive Therapy Group for reducing suicide attempts	N= 82 students meeting criteria for Borderline Personality Disorder with at least one suicide attempt in the last six months; mean age 20.4 years (standard deviation 0.7)	Adult Suicidal Ideation Questionnaire, modified Chinese version (Chou et al., 2013) Suicide attempts using items from the Chinese version of the Modified Schedule of Affective Disorders and Schizophrenia- Lifetime (Wu et al., 2016)	Six months
Muriungi et al. (2013), Kenya	Cross-sectional	Determine the effectiveness of psychoeducation on suicidality symptoms	N= 3,107 students studying medical related subjects across seven Universities; 91% <25 years	Beck Scale for Suicide Ideation (Beck et al., 1979)	Six months
Nyer et al. (2015), United States	Case series	Explore the effects of a six-week individual tailored CBT intervention for students with depression and suicidal ideation	N= 9 students with depression score > 13 and suicide risk item > 0; aged 18-24 years	Beck Depression Inventory (Beck et al., 1961); suicide risk item Suicidal Behaviours Questionnaire – Revised (Osman et al., 2001)	Post-intervention only
Pistorello et al. (2012), United States	Randomised controlled trial	Compare DBT to optimised treatment-as-usual for students with current suicidal ideation and Borderline Personality Disorder symptoms	N= 63 students with three or more Borderline Personality Disorder criteria, suicidal ideation and at least one lifetime attempt; aged 18-25 years	Suicide Attempt Self-Injury Interview (Linehan et al., 2006) Suicidal Behaviours Questionnaire (Linehan, 1981)	18 months

Pistorello et al. (2021), United States	Randomised controlled trial	Explore effectiveness of the Collaborative Assessment and Management of Suicidality compared to treatment-at-usual presenting with suicidality	N= 62 students seeking support at a College Counselling Centre; aged 18-25 years	Beck Scale for Suicide Ideation (Beck et al., 1979) Frequency of suicide attempt and non-suicidal self-injury	Post-intervention only
Saida & Sadiq (2022), Pakistan	Non-randomised controlled trial	Explore the effect of Cognitive Behaviour hypnotherapy on non-suicidal self-injury	N= 60 students with a history of >2 non-suicidal self-injury incidents; aged 18-25 years	Frequency of non-suicidal self-injury	Three months
Wolitzky-Taylor et al. (2023), United States	Open trial	Evaluate effectiveness of suicide risk detection and offering elevated risk cases evidence-based psychological treatment with optional medication management	N= 516 students with elevated suicidal risk based on anxiety, depression and/or suicide risk symptom severity; mean age 22.25 years	Computerised Adaptive Test – Suicide Scale (Gibbons et al., 2017)	40 weeks
Wu & Adamsk (2021), China	Randomised controlled trial	Analyse the effect of CBT on psychological stress, depression and negative emotions	N= 114 students with suicidal ideation; aged 18-21 years	Self-rating Idea of Suicide Scale (Xie et al., 2018)	Two months
Wu et al. (2023), China	Randomised controlled trial	Explore whether a Brief Mindfulness Meditation intervention would help to reduce suicidal ideation	N= 64 students with a score on the score on the Beck Scale for Suicide Ideation ≥ 6; mean age 19.75 years	Beck Scale for Suicide Ideation (Beck et al., 1979)	Post-intervention only
Yang et al. (2020), China	Randomised controlled trial	Explore DBT integrated with Zhong-Yong thinking relative to supportive group therapy and a wait-list group for students presenting with suicidality	N= 97 first-year students if item 1 score ≥ 2 and/or total score ≥ 7 on the suicidality measure; aged 17-21 years	Suicidal Behaviours Questionnaire- Revised (Osman et al., 2001)	Six months
Zhang et al. (2022), China	Randomised controlled trial	Analyse the effects of group counselling on non-suicidal self-injury for students with depression	N=84 students recruited if total score on depression scale >50; aged 18-24 years	Incidence of non-suicidal self-injury Quality System Audit (Xiao et al., 1999)	One month

Number of participants ranged from 9 to 5,454, with age of participants ranging from 18-36 years in the studies reporting on this (K=10). Other studies only reported the mean of ages (K=4) or provided a lower age range with no upper limit (K=2). Only one study, based in China, included participants under the age of 18 (age range 17-21) which may arise from geographical differences in university entrance requirements.

Studies predominantly used non-clinical samples (K=11). The other six studies required participants to have mental health symptoms as an inclusion criterion, with some studies screening participants for inclusion based on depressive symptoms (K=4) and the other studies only including participants with Borderline Personality Disorder symptoms (K=2).

Quality appraisal

Studies were scored based on the sections provided in the CASP checklists. The key methodological features relating to study quality for the review research questions were adequate reporting of results, validity of results and generalisability to the local population. An additional point was provided for whether studies used randomisation, given that randomised controlled trial methodology is considered "gold standard" in terms of evaluating the effectiveness of an intervention (National Collaborating Centre for Mental Health, 2018). A further additional point was provided for studies that described the randomisation procedure. This is because randomisation methods are dependent on the study size and design (McPherson et al., 2012), therefore it was deemed important for authors to provide a clear rationale for their method of choice. Quality rating on these areas was used to compare different types of study design to one another and ascertain which studies had the strongest evidence in relation to the research questions. Table 2 depicts the key areas of quality appraisal and list of studies from highest to lowest quality based on the CASP checklists, with a final column displaying the decision about study quality agreed by the two reviewers.

Table 2

Quality appraisal of included studies using the CASP checklists

Author	Reporting of the results (possible score: 3)	Validity of the results (possible score: 6)	Will the results help locally? (possible score: 2)	Randomised (possible score: 1)	Randomisation described (possible score: 1	Total score (possible score: 13)	Percentage (%)	Study quality
Pistorello et al. (2012)	3	5	2	1	1	12	92.3	High
Pistorello et al. (2021)	3	4	2	1	1	11	84.6	High
Lin et al.	2	5	2	1	1	11	84.6	High
King et al.	3	4	1	1	0	9	69.2	Medium
Wu et al.	3	3	1	1	1	9	69.2	Medium
Yang et al.	3	4	1	1	0	9	69.2	Medium
Hasking et al.	3	4	1	0	0	8	61.5	Medium
Kim et al.	3	4	1	0	0	8	61.5	Medium
Wolitzky-Taylor et al.	3	4	1	0	0	8	61.5	Medium
Nyer et al.	2	4	1	0	0	7	53.8	Low
Zhang et al.	2	3	1	1	0	7	53.8	Low
Farabaugh et al.	2	3	1	0	0	6	46.2	Low
Fukumori et al.	1	3	1	1	0	6	46.2	Low
Knagg et al.	3	2	1	0	0	6	46.2	Low
Muriungi et al.	1	4	1	0	0	6	46.2	Low
Sadia & Sadiq	1	3	1	0	0	5	38.5	Low
Wu & Adamsk	2	2	1	0	0	5	38.5	Low

Overall, quality appraisal revealed significant methodological limitations, with few studies including rigorous design features such as randomisation, adequate sample sizes and intention-to-treat analyses. Study findings frequently failed to include key details such as distribution of baseline characteristics, potential confounding factors and precision of treatment effects. Risk of bias was also noted due to lack of blinding, although it is acknowledged that blinding participants to the intervention can be challenging. Some studies conducted measures at baseline by assessors that were blinded to treatment group, however, most studies did not report using blinding at any stage of the study. Outcome measures varied across studies with some using bespoke measures with limited psychometric data or only using one item to measure suicidality or self-harm, therefore the validity and reliability of these measures is questionable. Finally, sample size and attrition affected the quality of many studies, with small sample sizes (particularly due to dropout) reducing statistical power.

In terms of studies utilising randomisation, there was variability in terms of whether details about sequence generation or method utilised were provided, with most studies stating that randomisation was implemented but providing no further explanation. Lin et al. (2019) and Pistorello et al. (2012) applied the most robust strategy of the studies by using urn randomisation, which ensures random assignment is the primary basis for allocation whilst also balancing several covariates (Stout et al., 1994). Other studies reported using randomisation but provided no further details. The stronger studies conducted (Lin et al., 2019; Pistorello et al., 2012; Pistorello et al., 2021) all utilised high-quality, well-conducted randomised controlled trial methodology with a clearly defined protocol. Reporting of the results was also comprehensive including power calculations, blinding outcome assessors to treatment condition and accounting for all participants within the analyses.

Synthesis of results

Review Question One: What is the nature of psychosocial interventions used to support students with suicidality and/or self-harm within university settings?

Frequency counts were used to summarise the type of psychosocial interventions delivered in order to identify the most common type of intervention used within universities to support students with suicidality and/or self-harm. Interventions were initially categorised based on whether they offered a DBT or CBT approach, as these interventions have a strong evidence base within the research literature for reducing suicidality and self-harm (Hawton et al., 2016; Witt et al., 2021). DBT and CBT were the most common categories of intervention, with four studies that utilised a DBT approach and four studies that utilised a CBT approach (K=8 in total).

The remaining interventions were grouped based on categories of psychosocial interventions provided by Turton (2015). Where there was overlap between categories, studies were allocated to a category depending on the primary purpose of the intervention. For example, where a brief psychological intervention was delivered in a group setting, the study was allocated to the group category if being part of a group was deemed an important factor to determining effectiveness of the intervention rather than due to resource implications. The categories were as follows:

- Brief psychological interventions (K=3)
- Group interventions (K=3)
- Self-help interventions (K=0)
- Interventions to enhance practical skills (K=0)

No studies meeting the inclusion criteria for this review utilised psychosocial interventions focused specifically on self-help interventions or on enhancing practical skills, therefore these categories were excluded from the narrative synthesis. The remaining three

studies all shared a common theme in terms of implementing a stepped-care approach to suicide risk intervention, therefore a new grouping category was created for these three studies.

Table 3 outlines the results of the 17 included studies in terms of category of psychosocial intervention, focus of the intervention, description of the psychosocial intervention, method(s) of statistical analysis and key findings in relation to the review questions. Studies were sorted firstly in order of category of psychosocial intervention, then focus of the intervention (suicidality, self-harm or both) and then in alphabetical order.

Table 3

Results of individual sources of evidence

Authors	Category of psychosocial intervention	Focus of intervention	Brief description of psychosocial intervention	Method(s) of statistical analysis	Key findings in relation to the review questions
Yang et al. (2020)	DBT	Suicidality	DBT group skills training incorporating Zhong-Yong thinking including developing a balanced approach to problem-solving and dealing with interpersonal conflicts. DBT elements included acceptance-oriented skills, mindfulness, distress tolerance, change-oriented skills, emotion regulation, interpersonal effectiveness and telephone coaching; two-hour weekly sessions delivered over a 12-week period	Repeated measures Analysis of Variance	Reductions in suicidal ideation observed in both intervention groups however intervention effects were better maintained in the DBT group at follow-up as shown in the statistically significant differences in group effects; $p< 0.01$
Fukumori et al. (2017)	DBT	Self-harm	Individual structured writing based on the DBT workbook incorporating emotion regulation, psychoeducation and self-reflection activities; delivered over three consecutive days	Friedman test	No significant between-time differences from pre- to post-intervention in either group
Lin et al. (2019)	DBT	Both	Manualised DBT skills training group consisting of mindfulness, distress tolerance skills, emotion regulation, interpersonal effectiveness, crisis management and relapse prevention; two-hour weekly sessions delivered over a 12-week period	Generalised Estimating Equations	A group by time effect for suicidal ideation as observed at 32 weeks ($\beta = -.85$,$p < .01$), indicating significantly lower suicidal ideation in the experimental compared to the control group The main effect of time on suicide reattempt was significant at the following time points: 4 weeks ($\beta = -.59$, $p < .01$), 8 weeks ($\beta = -.42$, $p < .01$), 20 weeks ($\beta = -.33$, $p < .01$) and 32 weeks ($\beta = -.25$, $p < .01$).

					Group by time effects on suicide reattempt did not reach significance at any time point
Pistorello et al. (2012)	DBT	Both	Manualised DBT including 1) 50-minute weekly individual psychotherapy 2) 90-minute weekly group skills training 3) therapist contact between sessions as needed for skills coaching, with additional family interventions if required; treatment was delivered over a 7-12 month period	Hierarchical Linear Modelling	Experimental group demonstrated significantly greater reductions in suicidality compared to the treatment-as-usual group evident at 18-month follow-up; t(57) = 2.36, p= 0.022, d = 0.63, confidence interval [0.12–1.13] Rate of suicide attempts was too low and follow-up to warrant separate analysis
Farabaugh et al. (2019)	CBT	Suicidality	Manual-based CBT using selected modules such as relaxation, behavioural activation, cognitive restructuring, and/or exposure, depending on individual need; one-hour weekly sessions delivered over a 12-week period	Paired samples t-test	Suicidality significantly decreased from pre- to post-treatment; T=3.53, df=29, p< .001
Nyer et al. (2015)	CBT	Suicidality	Manual-based CBT including psychoeducation on depression and anxiety, with therapists then choosing modules including behavioural activation, cognitive restructuring, and/or exposure, depending on individual need; one-hour weekly sessions delivered over a six-week period	Paired samples t-test	Significant reductions on suicide risk item and suicidal ideation measure (significance levels p< .05)
Wu & Adamsk (2021)	CBT	Suicidality	CBT adapted to take into account suicidal ideation including psychoeducation, group activities, cognitive restructuring, emotion regulation and teaching coping skills; one-hour weekly sessions delivered over an eight-week period	Independent samples	Suicidal ideation scores were significantly lower in the experimental group compared with the control group post-intervention; p< .05

Sadia & Sadiq (2022)	CBT	Self-harm	Manual-based Cognitive Behaviour Hypnotherapy integrating CBT and hypnosis including thought record forms and between-session homework tasks to practice skills; weekly sessions delivered over a 12-13 week period	Repeated measures Analysis of Variance	The intervention significantly reduced frequency of non-suicidal self-injury relative to the control group; $F(1, 58) = 53.16$, $p < .001$
Knagg et al. (2022)	Brief psychological intervention	Suicidality	Broad-Minded Affective Coping (BMAC) delivered primarily online due to the Covid-19 pandemic. Sessions consisted of socialisation to the BMAC exercise, the exercise itself (brief relaxation followed by guided imagery of a positive memory), feedback and debriefing; one-hour weekly sessions delivered over a six-week period	Wilcoxon signed-rank test Summary effect sizes Reliable Change Index	Mean difference in suicidality scores demonstrated significant reductions from pre- to post-intervention; mean difference= -8.6, 95% confidence interval [-12.98, -4.22], $p = 0.009$, Cohen's $d = -1.216$. 8 out of 10 participants demonstrated reliable change in suicidal ideation at follow-up
Wu et al. (2023)	Brief psychological intervention	Suicidality	Brief mindfulness meditation consisting of psychoeducation, understanding mindfulness concepts, practical exercises involving mindfulness meditation and self-help training; 30-minute weekly sessions delivered over a one-month period	Independent-samples t-test	Suicide ideation scores decreased significantly post-intervention in both groups, however the effect size was larger in the intervention group; experimental group $t=4.81$, $p<.001$, $d=1.12$, control group $t=2.17$, $p<.05$, $d=0.49$
Pistorello et al. (2021)	Brief psychological intervention	Both	Collaborative Assessment and Management of Suicidality intervention consisting of core assessment of suicide risk, suicide-focused intervention depending on target problems increasing suicidal risk for the individual (e.g. relational issues, academic difficulties, low self-esteem) and a stabilisation plan; weekly sessions delivered over a four to eight week period	Hierarchical Linear Modelling	No statistically significant between-group differences for measures at post-treatment, although the intervention group demonstrated more rapid reductions in suicidal ideation during the course of treatment Moderation findings indicated that the intervention was more beneficial for participants with fewer Borderline Personality Disorder symptoms, no prior

					suicide attempts and older in age (22-25 years)
Kim et al. (2017)	Group intervention	Suicidality	Stress management group aiming to target self-awareness, cognitive restructuring, interpersonal skills and emotion regulation; five four-hour sessions delivered over five consecutive days	Repeated measures Analysis of Variance	The level of suicidal ideation in the intervention group reduced post-intervention and at three-month follow-up, however there were no significant time-by-group interactions for suicidal ideation
Muriungi et al. (2013)	Group intervention	Suicidality	Group psychoeducation sessions focusing on predisposing and precipitating factors of depression, hopelessness, suicidality and substance abuse, followed by symptom recognition and developing coping strategies; four two-hour sessions were delivered over within a two-month period, followed by a repeat of the same programme three months later	Analysis of Variance	Both the experimental and control groups showed reductions in suicidality; significantly greater reduction in suicidality in experimental group relative to the control group at 6-month follow up (suicidal ideas F= 15.90, $p< .001$, suicidal plans F= 2.75, $p= 0.097$)
Zhang et al. (2022)	Group intervention	Both	Group psychological counselling including group activities focused on embracing individuality, accepting themselves and others, gratitude, recognising difficulties and engaging in positive emotional experiences; 1.5 hour weekly sessions delivered over a six-week period	Chi-square Analysis of Variance	Suicidality scores for the intervention group were significantly higher than the control group after the intervention (higher scores indicate lower suicidal risk); $p<0.05$ The incidence of non-suicidal self-injury was significantly lower in the intervention group compared to the control group; $\chi 2=6.83$, $p=0.01$
Hasking et al. (2023)	Stepped-care model	Suicidality	Telephone contact offered within 24 hours focusing on safety planning and referrals to services tailored to individual need (e.g. emergency department, primary health care services, student support services); follow-up call four weeks later to update suicide risk	Simple slopes analysis	Intervention students were less likely to report suicide plans and/or attempt at 12-month follow-up; $b = -0.09$, 95% confidence interval [−1.08 to 0.89], $z = -0.18$, $p = 0.654$

			assessment and offer further referrals as required		
King et al. (2022)	Stepped-care model	Suicidality	"eBridge" intervention offering two online components following suicide risk screening 1) access to personal feedback and 2) online counselling with a mental health professional focusing on facilitating links with mental health services	Multivariate logistic regression analysis	No significant main effects found for suicidal ideation or suicide attempt
Wolitzky-Taylor et al. (2023)	Stepped-care model	Suicidality	Individual evidence-based psychological treatment including cognitive restructuring, self-management, problem solving, relaxation training and behavioural approaches depending on individual need, with optional medication management; weekly sessions over a 12-16 week period	Hierarchical Linear Modelling	Suicide risk severity declined over time; b=–0.52, t=–11.05, P<.001. 78 participants (59.5%) showed ≥30% improvement in suicide risk severity scores after treatment

Suicidality was measured in various ways across studies. The most commonly used measure for suicidal ideation across studies was the Beck Scale for Suicide Ideation (K=5). Studies measuring a combination of suicidality and self-harm (K=4) used measures that captured a range of outcomes such as the Suicidal Behaviours Questionnaire (Linehan, 1981) which includes suicidal ideation, suicidal behaviours and non-suicidal self-injury, and the Suicide Attempt and Self-Injury Count (Linehan et al., 2006) which makes a distinction between suicidal and non-suicidal behaviours.

Review Question Two: How effective are these interventions for reducing suicidality and/or self-harm in students?

DBT. The strongest evidence for psychosocial interventions, including some higher quality studies, was in support of DBT. Two high-quality studies evaluating DBT for students presenting with Borderline Personality Disorder symptoms and suicidal risk at baseline demonstrated effectiveness in reducing suicidal behaviours at follow-up (Lin et al., 2019; Pistorello et al., 2012). Both studies included an active control group which strengthened the validity of the findings in relation to the DBT intervention and observed effects. It should be noted that, although both experimental and control groups in these studies demonstrated reductions in suicidality, the effects of DBT were superior in terms of greater reductions in suicidality at all follow-up timepoints. Lin et al. (2019) highlighted a group by time effect at 32 weeks ($\beta = -.85, p < .01$), whilst Pistorello et al. (2012) identified significantly greater reductions in suicidality in the DBT versus the control group at 18-month follow-up ($t(57) = 2.36$, $p = 0.022$, $d = 0.63$ (0.12–1.13)). The longer follow-up for the study by Pistorello et al. (2012) also strengthens confidence in the findings that intervention effects for DBT can be maintained. Both studies may have benefitted from monitoring of treatment adherence within the control groups, as neither study addressed the possibility of treatment diffusion.

A study by Yang et al. (2020) evaluated a culturally-adapted DBT skills group which replaced the concept of dialectical thinking with Zhong-Yong thinking, based on interpersonal psychology, compared to two control groups: supportive therapy and waitlist. This study demonstrated reduced suicidal ideation in students presenting with suicidality at baseline, with a significant time by group effect at six-month follow-up for scores on the Suicidal Behaviours Questionnaire ($F (2, 126) = 3.20$; $p = .044$). Several limitations reduce the quality of the study and confidence in the findings. A power calculation was not conducted, thus treatment effects were potentially overestimated. Additionally, treatment

adherence was not monitored in either the treatment or control groups, therefore it is unclear if treatment was delivered in accordance with the manuals. Furthermore, the waitlist control group did not complete outcome measures at follow-up. It is therefore possible that other factors may have led to improvements in all three groups that were not accounted for.

A further DBT-based study delivered in a group setting was conducted by Fukumori et al. (2017). This intervention was designed to reduce self-harm ideation through a structured writing program using a three-day intervention based on elements of DBT, particularly emotion regulation. The findings indicated that there were no significant reductions in self-harm ideation at one-month follow-up, however, this study had several methodological limitations which suggested it was of low-quality. The measure of self-harm had been specifically designed for this study and therefore psychometric properties were unknown. Additionally, only self-harm ideation was measured and not behaviours, therefore it is unclear if there were effects of the intervention for acting on self-harm ideation. Additionally, the group was based on DBT components rather than adhering to the treatment manual, which reduces the trustworthiness of the findings in relation to manualised DBT.

CBT. Four studies explored the effectiveness of a CBT-based approach with beneficial outcomes for students with suicidality and/or self-harm, although all four studies were of relatively low-quality. Three studies with suicidality as an outcome evaluated manualised CBT for students with depression and comorbid suicidal ideation, with all findings suggesting that individual CBT can be effective for this population (Farabaugh et al., 2019; Nyer et al., 2015; Wu & Adamsk, 2021). Farabaugh et al. (2019) reported effectiveness in terms of pre-post treatment paired t-tests of means of the Beck Depression Inventory item 9 (mean reduction 0.30, $t=3.53$, $p< .001$). Nyer et al. (2015) reported on the Suicidal Behaviours Questionnaire total score (mean reduction 1.11, Cohen's $d = 0.35$, $p<.05$), however, the small sample sizes of both studies ($n=30$ and $n=9$, respectively) limit the

generalisability of the findings. Furthermore, the lack of control group for both studies precludes the ability to draw causal conclusions about the effectiveness of CBT or rule out the impact of other confounding factors. Although Wu and Adamsk (2021) had a larger sample (n=114) and control group, several exclusion criteria including mental health conditions, poor compliance and ability to participate in groupwork limits the generalisability of the findings, particularly given that suicidality often occurs in the context of comorbid mental health diagnoses (Cavanagh et al., 2003). It is unclear what the effect size of the reduction in suicidal ideation was for this study, although it was significantly lower at two-month follow-up than the control group ($p < 0.05$).

Methodological limitations affecting study quality reduces confidence in the findings from CBT studies for suicidality. All three studies used a self-selecting sample of students which may have skewed the results based on willingness to help-seek and/or self-disclose. The outcome measures also warrant consideration. Farabaugh et al. (2019) utilised a single Beck Depression Inventory item to measure suicidal ideation, whereas a validated suicidality measure may have captured other elements of suicidal risk. Wu and Adamsk (2021) used a self-report suicidal ideation scale consisting of items relating to sleep, despair and optimism. The psychometric properties and validity of this measure for accurately capturing suicidal ideation is unclear.

Only one study explored the effects of a CBT-based intervention for self-harm (Sadia & Sadiq, 2022), utilising an intervention integrating CBT with hypnosis (Robertson, 2018). This study suggested that CBT interventions can be adapted as a useful treatment for self-harm without suicidal intent (i.e. non-suicidal self-injury), with a large, significant effect size for reducing frequency of non-suicidal self-injury days (Cohen's $d= 4.90$, $p= .01$). However, several methodological limitations highlighted in the quality appraisal indicated that this study was of low-quality including use of convenience sampling, non-randomisation of

participants and referring to a power calculation that was conducted to determine sample size, although the sample required was not reported. As such, conclusions should be drawn tentatively due to the issues regarding study quality.

Brief psychological interventions. Three studies suggested that brief psychological interventions (lasting up to 12 weeks) were beneficial for reducing suicidality. The three studies varied significantly in terms of the therapeutic approach taken. A high-quality study utilising randomised controlled trial methodology exploring the Collaborative Assessment and Management of Suicidality intervention for treating both suicidality and self-harm demonstrated beneficial effects for both the intervention and control (treatment-as-usual) groups (Pistorello et al., 2021). At post-treatment, 48.3% (14/29) of the participants allocated to the Collaborative Assessment and Management of Suicidality intervention reported no suicidal ideation compared to 30.4% (7/23) of control group participants, however this difference was not statistically significant. It should be noted that moderation analyses demonstrated favourable results for the intervention in comparison to treatment-as-usual for individuals with fewer Borderline Personality Disorder symptoms, no suicide attempt history and who were older in age. Greater statistical power with a larger sample size and a longer follow-up beyond post-treatment would likely improve the generalisability of the findings and demonstrate whether the Collaborative Assessment and Management of Suicidality intervention would have sustained benefits for this population.

A further study utilising randomised controlled trial methodology was of a brief mindfulness intervention delivered in a group setting, compared with a one-month waitlist control group (Wu et al., 2023). This study was included within the brief psychological interventions category as the primary purpose was to evaluate the effectiveness of brief mindfulness meditation and did not include a rationale as to why this was delivered in a group setting. A single-blind design was reported, which was a strength of this study, with

participants being unaware of the purpose of the intervention according to the authors. Reductions in suicidal ideation were observed in both the intervention and control groups, however the effect size was larger for those receiving the intervention (Cohen's d=1.12 and 0.49, respectively). A medium effect size was still observed for the waitlist control group; this indicates that there may be other factors contributing to reductions in suicidal ideation whilst waiting for treatment, or that control participants accessed other interventions that may have helped but were not monitored. The findings of this study should be interpreted with caution, as a power calculation indicated that the sample size was too small to detect statistically significant effects for most variables. Although the study benefitted from high-quality elements including randomisation and a single-blind design, a larger sample size would be required to improve confidence in the results.

Some support for the use of a brief psychological intervention, namely Broad-Minded Affective Coping, was demonstrated through a pilot study by Knagg et al. (2022). Although the findings should be viewed as preliminary, this study indicated positive effects of a six-session 1:1 intervention, focusing on guided imagery of a positive memory, with significant reductions from baseline to follow-up on the suicidal ideation measure (follow up mean difference -9.2, 95% confidence interval -13.76, -4.64, p= 0.012). Due to the small sample size (n=10 completing the intervention) and single-arm design, a larger powered randomised controlled trial with a control group is needed to improve study quality and attribute the demonstrated benefits to the effectiveness of the Broad-Minded Affective Coping intervention.

Group interventions. Three studies yielded mixed results regarding whether group interventions are helpful for reducing suicidality and/or self-harm in students, however, the quality appraisal identified several methodological issues within these studies. Kim et al. (2017) evaluated a brief stress management intervention lasting five days and found

reductions in suicidal ideation at the end of the intervention (pre mean score= 1.53, post mean score= 0.68), but no significant differences in comparison to the control group not receiving the intervention. It is possible that the low suicidal ideation scores across participants at baseline (average score of 2.07 out of 38, with higher scores indicating higher suicidal ideation; n= 72) limited the impact of the intervention on suicidal ideation. Moreover, the study only included male participants, which limits the generalisability of the results.

A further study targeting students with depression and comorbid suicidality offering six sessions of psychoeducation showed some promise at six-month follow-up for reduced suicidal ideation (Muriungi et al., 2013; $F= 15.903$, $p< 0.01$). However, almost 20% of participants dropped out of the experimental group which was not accounted for in the follow-up timepoint analyses, therefore potentially overestimating the effects of receiving the intervention. It is also important to note that only participants studying medicine-related subjects were included, which may limit generalisability to other disciplines. Moreover, participants were not randomised, with some sites being allocated to the experimental condition and other sites to the control condition which may have introduced systematic bias in terms of the chosen sites. It was unclear whether there were any differences in the distribution of demographic and clinical characteristics between the experimental and control groups at baseline, thus the findings should be interpreted with caution given the potential biases identified.

A study targeting students with depression aiming to primarily reduce non-suicidal self-injury offered a six-week group psychological counselling programme (Zhang et al., 2022). The authors highlighted that this intervention was beneficial for reducing suicidal cognitions and non-suicidal self-injury, based on the finding that only one student had engaged in non-suicidal self-injury in the intervention group at follow-up, compared with five students in the control group ($\chi^2= 6.83$, $p= 0.01$). However, there was no definition provided

for non-suicidal self-injury, therefore behaviours constituting non-suicidal self-injury may have been missed at follow-up. No information about the outcome measure used to capture occurrence of these behaviours at baseline or follow-up was provided, thus reducing confidence in the findings. Additionally, no data was provided in terms of frequency of self-harm at baseline or the distribution across groups, therefore it is unclear if there were any differences at baseline that could bias the results.

Stepped-care models. All three studies utilising a stepped-care approach aimed to reduce suicidality by screening students and providing additional interventions where elevated risk of suicide was identified. The studies included some high-quality elements such as large sample sizes, use of standardised outcome measures and comprehensive reporting of results. However, poor response rates and attrition were identified as methodological concerns within the studies, thus reducing overall quality and limiting conclusions that can be made from the findings regarding intervention effectiveness.

The higher quality of these studies conducted by King et al. (2022) using randomised controlled trial methodology evaluated the effectiveness of an approach named “eBridge” that aimed to link students at risk of suicide (reporting recent suicidal ideation) with professional mental health services. This approach utilised web-based personal feedback with the option of online counselling, based on motivational interviewing techniques, provided by mental health professionals who facilitated links with local services appropriate to the student’s presenting difficulties. The findings suggested that there were no significant main effects for suicidal ideation or attempts at six-month follow-up. The authors reported that concerns about confidentiality and credibility were possible barriers to engagement for students participating in this study, with only 21.2% of participants posting a message to their online counsellor.

Two studies offered additional support to students with elevated suicidal risk in the form of digital interventions, either through telephone contact (Hasking et al., 2023) or telephone and video contact (Wolitzky-Taylor et al., 2023). Both studies demonstrated promise for a stepped-care approach to suicidality interventions, with reductions in suicidality at follow-up for those identified as higher risk of suicidal behaviours at the screening stage. Hasking et al. (2023) identified students at high-risk of suicidal behaviour based on a predictive algorithm or through a 12-month history of such behaviours. Participants in this group were offered additional telephone support, safety planning and referral to other services, and demonstrated a 41.7% reduction in odds of subsequent suicidal behaviour at 12-month follow-up. Wolitzky-Taylor et al. (2023) offered evidence-based psychological treatments and optional medications as part of "Tier 3" provision for participants based on higher symptom severity, using scores from the screening of the Columbia Suicide Severity Rating Scale (Posner et al., 2011) where participants had current suicidal intent, access to means or recent suicidal behaviour. Suicide risk severity in this group significantly declined over the 10-month study period ($b=–0.52$, $t=–11.05$, $p<.001$). It should be noted that there was a poor response rate of 19.2% (Hasking et al., 2023) and 14.4% (Wolitzky-Taylor et al., 2023) from students identified as high-risk participating in the interventions in both studies. Therefore, while the findings are suggestive of a positive effect, they should be interpreted with caution as it is unclear whether those initiating treatment were more inclined to help-seek than those that did not participate.

Discussion

Summary of evidence

This systematic review aimed to explore the current literature in relation to the effectiveness of psychosocial interventions for university students presenting with suicidality and/or self-harm. The primary contribution of this review is the categorisation of current

psychosocial interventions, demonstrating those with supporting evidence and areas where gaps in the literature exist. While several studies suggested that psychosocial interventions may reduce suicidality and/or self-harm in university students, the overall evidence is limited by methodological weaknesses in some studies, including small samples and non-randomised designs. Key themes identified from this review are outlined below:

Existing evidence-based interventions for suicidality/self-harm

Evidence in favour of DBT included two high-quality studies by Lin et al. (2019) and Pistorello et al. (2012), thus improving the confidence in the findings relative to DBT as an effective psychosocial intervention to support university students. This is consistent with extensive research supporting the effectiveness of DBT for suicidal behaviours (DeCou et al., 2019). The study by Pistorello et al. (2012) highlighted differential treatment effects dependent on risk, with greater benefits for students with multiple suicide attempt history relative to no attempt history. DBT was effective even when longer follow-up time points were included, suggesting sustained treatment effects for this intervention. However, DBT was initially developed as a treatment for Borderline Personality Disorder and is primarily utilised within clinical populations (Linehan & Wilks, 2015). Further research with non-clinical student populations is warranted, although the training of DBT skills has been evaluated within non-clinical populations including modifications for school children (Mazza et al., 2016). Furthermore, it is unclear whether a comprehensive DBT package including all components of standardised DBT (i.e. individual psychotherapy, skills group training, therapist skills coaching as needed; Linehan et al., 1993) is necessary if offered to students within university support services, or whether individual components would be effective for the student population. Lin et al. (2019) were able to demonstrate effectiveness of the DBT skills group as a standalone treatment for students, however, further research is needed to replicate this finding. As highlighted by Pistorello et al. (2012), universities may prefer to

offer the DBT skills group due to reduced cost and resource implications, yet the therapist's wider role within the full DBT package may support attendance and engagement with the treatment.

This review was consistent with previous literature reviews demonstrating the effectiveness of CBT for reducing suicidality (Tarrier et al., 2008). Studies measuring CBT identified in this review were of low-quality and delivery of CBT varied across studies, therefore it is unclear what the mechanisms of change are when utilising CBT to reduce suicidality and/or self-harm for students. Nevertheless, the findings from these studies are consistent with findings from a meta-analysis by Hawton et al. (2016) highlighting that CBT-based psychotherapy is one of the few effective interventions for reducing suicidality and self-harm. This suggests that it would be worthwhile exploring better-powered trials with a CBT intervention tailored for students presenting with these difficulties. Larger studies utilising a randomised sample with an active control group would add strength to the conclusions of existing research and improve generalisability.

Identifying those "at-risk"

Studies varied in terms of whether the student population was targeted on a universal basis, regardless of level of risk, or whether "at risk" students were offered intervention(s). Risk screening varied across each study, with some defining risk in terms of recent suicidal ideation (ranging from the past four weeks to the past 12 months), recent suicidal attempts, endorsing risk items on a particular measure and/or the presence of comorbid mental health risk factors e.g. depression, Borderline Personality Disorder. As such, it is difficult to compare the outcomes across studies as definition and measurement of suicidal risk was not consistent. Nevertheless, previous studies evaluating large-scale screening approaches in the adolescent population have demonstrated benefits for reducing suicidality (Pena & Caine; 2006; Wasserman et al., 2015). As such, identifying students at elevated risk of suicide may

be an effective method of targeting individuals that are most likely to benefit from psychosocial interventions (Horowitz et al., 2009).

Delivery method

Due to the small number of studies included within this review, it was difficult to make comparisons with regards to whether a particular method of delivery was more effective i.e. individual vs group, face-to-face vs digital or telephone. Group interventions demonstrated some effectiveness for suicide or self-harm related outcomes, however, attrition within these studies may have introduced bias where outcomes were only obtained for those that engaged with the intervention. Nevertheless, meta-analytic data highlights that group therapies are effective for a range of mental health conditions including anxiety, depression and substance use disorders (Rosendahl et al., 2021). For suicidal risk, a scoping review exploring the effectiveness of group therapies suggested that these interventions can be beneficial for reducing suicidality, although only 10 studies were included (Sullivan et al., 2021). Further research is needed to explore whether group interventions are effective within the student population and to identify possible mechanisms of change.

Evidence exploring the effectiveness of digital interventions for suicidality and self-harm is mixed. Meta-analytic data indicates some benefits of self-guided digital interventions for reductions in suicidal risk post-intervention but no significant effects at follow-up where such results existed (Torok et al., 2020). This reflects the need to consider strategies to engage students with online interventions and offer a variety of intervention methods to reach those at-risk (King et al., 2022). Emerging evidence for mobile app-based interventions for individuals at elevated risk of suicide show promise for reductions in depression, psychological distress and self-harm, however, such apps were not significantly more effective than control conditions for reducing suicidal ideation (Melia et al., 2020). Consistent with studies in this review, low usage rates and attrition bias can affect the

methodological quality of research in this area. The findings from this review highlight that better quality research with larger samples completing the interventions are needed to improve understanding of differences across sociodemographic groups and factors influencing the effectiveness of digital interventions.

Strengths and limitations

Some important strengths of this systematic literature review include utilising a search strategy that did not limit sources exploring a particular type of psychosocial intervention (such as only psychological treatments). Search terms encapsulated a range of possible interventions under the umbrella term of "psychosocial interventions". The search strategy also included a range of international variations to describe "self-harm" and "students", with the aim of identifying studies from across countries. Additionally, the quality appraisal for each study was conducted by two reviewers, thus minimising bias and increasing reliability.

Despite the strengths of the review methodology, there are several improvements that could be made. Eligibility for inclusion of sources of evidence was assessed primarily by one reviewer, with only a proportion appraised by a second reviewer. To improve this process, screening of all sources of evidence could be undertaken by two independent reviewers to assess eligibility and reduce the possibility of missing studies meeting the inclusion criteria. Another key limitation was the variation in methodological rigour of the studies identified, which can impact the reliability and generalisability of the findings. Few studies used a randomised controlled trial design, suggesting that better quality research is needed to provide more robust evidence within this area. It is acknowledged that there are some unique challenges relevant to this endeavour, particularly in terms of the ethical issues raised when conducting research with individuals at risk of suicide, including concerns around adverse events and patient safety (Fisher et al., 2002). Nevertheless, strategies to address these

concerns exist within the research literature including risk management procedures, safeguarding protocols and informed consent considerations (Hom et al., 2017).

A further limitation is that the presence of significant findings in some studies may be partially attributable to methodological weaknesses in the outcome measures used. While some outcome measures were well-established and reliable e.g. the Beck Scale for Suicidal Ideation, other measures lacked sufficient validation. The reliance on self-report measures, while common, can introduce bias, further limiting the validity of outcomes. Furthermore, the relatively short follow-up periods (six months or less) in many studies raises questions about the longer-term maintenance of the reported outcomes. Attrition was a common issue across studies, which may affect the internal validity and generalisability of the results.

A further point to consider with regards to this literature review is whether the focus of the psychosocial intervention was suicidality, self-harm or both. The small number of studies identified for each of these categories respectively made it difficult to compare studies exploring the same outcomes. As this review included studies from any country of origin, definitions of suicidality and self-harm were either absent or inconsistent with other studies. Heterogeneity within cross-cultural terminology and lack of consistent definitions for suicidal behaviours is a challenge within this research area (Nock, 2010). The absence of a universal definition for suicide attempts and related behaviours hinders comparisons across studies and highlights the need for clearer, standardised nomenclature across research (De Leo et al., 2021). This limitation is widely recognised within the suicidality literature, such that there is a special interest group dedicated to developing a standardised nomenclature (International Association for Suicide Prevention, 2018).

Finally, although studies were included from several countries of origin, it should be acknowledged that cultural factors may influence the generalisability of the findings to different university contexts worldwide.

Implications for practice and future research

The findings of this review have important implications for future practice. This review highlighted that there are limited studies that have evaluated psychosocial interventions to support university students presenting with suicidality and/or self-harm utilising randomised controlled trial methodology, where these outcomes are directly measured using validated tools. This highlights the need for more robust, well-designed trials to inform evidence-based practice in this research area. More randomised controlled trial data comparing CBT and DBT to an alternative intervention would strengthen evidence for effectiveness within the student population. Further research is needed to determine whether DBT treatment is effective if offered to non-clinical populations within universities, or whether signposting students that may benefit from DBT to specialist mental health treatment providers is sufficient.

In relation to students at elevated risk of suicide, embedding screening procedures within university support services may be an effective way of detecting students at risk of suicide and/or self-harm. The Suicide-Safer universities strategy (Universities UK, 2018) highlights that vulnerabilities such as academic difficulties, disciplinary issues and lack of engagement with academic studies may be possible warning signs of suicidal risk that warrant addressing by universities. The stepped-care models included within this review utilised screening programmes with triaging of symptoms, stratified treatment and additional support for those at risk, which may prove valuable for allocation of treatment resources (Hasking et al., 2023; King et al., 2022; Wolitzky-Taylor et al., 2023). A stepped-care approach to suicide prevention with systems-level care has been trialled within university counselling centres in the United States (Jobes et al., 2018). Stepped-care models currently exist in the UK within mental health provision, offering therapeutic intervention hierarchically from low to high-intensity dependent on the severity of symptoms and/or

changes to risk/need (Bower & Gilbody, 2005). However, replication of such models for suicide risk prevention with the student population warrants further exploration.

Additionally, the findings suggest that it is important to consider method of intervention delivery. University students represent a unique population with regards to relocation to a new area, often with limited social support systems, which may be particularly challenging for students with mental health problems (Vicary et al., 2024). As such, group interventions with university students may offer advantages over individual formats by increasing social connectedness, social support and interpersonal learning (Di Consiglio et al., 2022). Furthermore, digital methods of delivery may improve access to psychosocial interventions for suicidality and/or self-harm, with students highlighting benefits such as anonymity and convenience for those individuals that would not otherwise help-seek (Cliffe & Stallard, 2022). Key aspects such as individual preference, integration with face-to-face treatment and developing interventions appropriate to the target population would need to be considered prior to offering such interventions (O'Toole et al., 2019).

Conclusions

This systematic review addressed a gap in the literature with regards to the effectiveness of psychosocial interventions to support students with suicidality and/or self-harm (Barnett et al., 2021; Taylor et al., 2023). The findings are consistent with previous reviews exploring the research literature for interventions to reduce suicidality and self-harm, with the strongest evidence in favour of CBT and DBT (Hawton et al., 2016; Zalsman et al., 2016). However, there were few high-quality studies identified in this review, indicating that the existing evidence is of generally low quality. Higher quality research including randomised controlled trials is needed to ensure that psychosocial interventions offered to students are tailored to meet the needs of this population and designed to encourage help-seeking (Ebert et al., 2019). Co-production and co-design of interventions with students to

address their needs and preferences may be important in this endeavour (Cliffe & Stallard, 2022). It is hoped that the results of higher quality studies identified in this systematic review can be used by universities to guide implementation of effective psychosocial interventions to support students with suicidality and/or self-harm, as well as highlighting areas for future research.

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Appendix A

Data charting form adapted from the Joanna Briggs Institute (2007) template

Literature Review Details	
Literature Review title:	
Review objective/s:	
Review question/s:	
Inclusion/Exclusion Criteria	
Population - Involved university students?	Yes/No
Psychosocial intervention implemented?	Yes/No
Intervention accessed within a university context (even if delivered off-site) i.e. individual eligible on the basis of being a student?	Yes/No
Evidence source Details and Characteristics	
Type of evidence source	
Citation details (e.g. author(s), date, title, journal, volume, issue, pages)	
Country – where source was conducted/published	
Primary aim	
Secondary aim(s)	
Participants (e.g. sample size, age range, level of study, subject)	
Study design	
Method of statistical analysis	
Details/Results extracted from source of evidence	
Category of psychosocial intervention	
Nature of psychosocial intervention (including structure, method of delivery, length of intervention, designed to support suicidality, self-harm or both)	
How is suicidality/self-harm measured (describe outcome measure)	
How is effectiveness of the intervention measured?	
Key findings that relate to the narrative review question	Describe results relating to the effectiveness of the psychosocial intervention for university students with suicidality and/or self-harm

Section Two: Empirical Paper

An exploration of factors that are predictive of suicidal risk in university students in the United Kingdom (UK): Analysis of the Nurture-U student wellbeing survey

7,998 words

Abstract

Objectives: Promoting positive student health and wellbeing are important considerations for universities in the United Kingdom (UK). Despite national efforts, students may experience a range of mental health difficulties as well as suicidal thoughts and behaviours. This study aimed to explore suicidal risk and potential predictors in the UK student population.

Methods: The Nurture-U wellbeing survey captures student experience across the academic year on a range of health and wellbeing areas including family history, psychological difficulties, lifestyle factors and social connectedness. Data was collated from five UK universities. Regression analyses were conducted to explore baseline predictors of suicidal risk (at the start of the academic year; n=6,543) and changes to suicidal risk at follow-up (from baseline to the end of the academic year; n=1,721).

Results: 43.8% of students had experienced lifetime suicidal ideation, with around 10.0% having at least one lifetime suicide attempt. Binary logistic regression analyses showed that mental health symptoms, ethnic group, sexual orientation, adverse childhood experiences, age and alcohol use were significant predictors of baseline suicidal risk. Multinomial logistic regression predicted trajectory of risk across the academic year (stayed low, stayed high, increased, reduced). Relative changes in depression, anxiety, sleep quality, social resources, loneliness and alcohol use were significant predictors of risk trajectory.

Conclusions: This study highlighted possible static and dynamic factors that may contribute to suicidal risk in university students. These findings highlight potential at-risk groups and modifiable predictors that should be considered within intervention and prevention strategies.

Keywords: university; students; suicide risk; mental health

An exploration of factors that are predictive of suicidal risk in university students in the United Kingdom (UK): Analysis of the Nurture-U student wellbeing survey

Suicide is a concern within the young adult population and the third leading cause of death for 15–29-year-olds (World Health Organisation, 2021). Within the UK, 319 university students died by suicide between 2017 and 2020, with the highest rates for males in their first year of study (7.8 deaths per 100,000 students; Office for Students, 2022). Global estimates of lifetime prevalence of suicidal ideation, plans and attempts from student data collected in eight countries was reported at 32.7%, 17.5% and 4.3%, respectively (Mortier et al., 2018).

The transition to university involves major life changes which can increase students' susceptibility to greater psychological distress and mental health difficulties (Campbell et al., 2022). A UK-based online survey of students (n= 1,273) identified that 42.2% of participants had considered suicide in the past 12 months and 37.3% were classed as high-risk of suicidal behaviours (Akram et al., 2020). A large-scale survey of over 21,000 students from 140 UK universities highlighted increasing levels of suicidal behaviours and mental health difficulties in this population, with one in five students having a mental health diagnosis (Pereira et al., 2020). The prevalence of suicidal ideation and behaviours within this population is of particular concern given that these factors have been identified as strongly predictive of future death by suicide (Ribeiro et al., 2016).

Suicide risk factors in students

Models of suicide recognise the complex interplay between biopsychosocial factors in the development of suicidal risk (Tio et al., 2024; Turecki et al., 2019). Previous research has identified several possible factors predictive of suicidal ideation in students including sociodemographic variables, physical health, history of adversity, gender identity, substance misuse, mental health problems and economic difficulties (Lázaro-Pérez et al., 2023; O'Neill et al., 2018). Meta-analytic data of studies from UK universities highlighted that factors such

as being male, having mental health difficulties, being of non-heterosexual orientation and having experienced adverse childhood events were associated with elevated suicidal risk (Kabir et al., 2024). First-year undergraduate students may be at increased risk of suicidal behaviours, particularly those of male gender (Ennis et al., 2019; O'Neill et al., 2018). It is argued that there are several unmet needs within the student population that contribute to suicidal risk, with one in five students reporting that they would not seek support for psychological difficulties (McLafferty et al., 2017).

The Nurture-U survey

Previous studies exploring mental health and wellbeing in students have been constrained by the focus on cross-sectional surveys, lack of validated psychometric and clinical measures, and limited exploration of potential mechanisms of risk including biopsychosocial factors (Marshall et al., 2025). To account for these limitations, the "Nurture-U" survey was implemented across five UK universities to explore factors influencing student wellbeing. This work was supported by UK Research and Innovation administered by the UK Medical Research Council within the Adolescence, Mental Health and Developing Minds scheme, grant number (MR/W002442/1). The Nurture-U study is part of a larger longitudinal programme of work ("U-Flourish") that commenced in Canada exploring factors that contribute to positive mental health and academic success in students (Goodday et al., 2019).

Research questions

The current study aimed to explore suicidal risk within UK university students using Nurture-U survey data. The study expanded on previous research by using longitudinal data to identify static and dynamic predictors of suicidal risk. The three key research questions were as follows:

1) What is the level of suicidal risk in the student population undertaking the Nurture-U wellbeing survey?
2) What are the variables predictive of suicidal risk in this population?
3) What are the dynamic predictors of changes to suicidal risk from the start to the end of the academic year?

Consistent with previous literature, it was hypothesised that the key predictors of suicidal ideation in UK students would be gender, sexual orientation, mental health difficulties and poor wellbeing. Regarding dynamic predictors of change, it was expected that changes in mental health symptomology would predict whether students traversed between suicidal risk groups from the start to the end of the academic year.

It is hoped that this research will improve understanding of risk factors specific to the student population, including potentially modifiable variables, such that universities can intervene at the earliest opportunity and tailored support can be offered to meet the needs of students presenting with suicidal risk.

Methods

Design

This study used a prospective longitudinal design with data collected from the Nurture-U student wellbeing survey across five partner universities (Newcastle, Exeter, Southampton, Oxford and Cardiff). The survey is open at two time points within the academic year on a rolling basis. Baseline data is collected at the start of the academic year (between the third week of September and third week of October) and at the end of the academic year (end of the spring term prior to university examinations). Specific dates are dependent on university site. More information about the Nurture-U study accurate as of May 2025 can be found at https://www.nurtureuniversity.co.uk/survey.

Data for this study was collated over a two-year period (2022-23 and 2023-24 academic years). Participants were only included in follow-up analyses if they completed baseline measures within the same academic year.

Participants

Inclusion criteria for the survey were as follows:

1) students aged 18 and over
2) enrolled in part-time or full-time study at one of the five partner universities
3) provided consent to participate

Participants could be from any country of origin, however, the survey was only provided in the English language.

Ethics

The Nurture-U survey project has ethical approval from the University of Newcastle (ref: 24735/2022). Additional approval was sought from the Nurture-U team to analyse the suicidal risk data in accordance with the questions for this study.

Students were under no obligation to complete the survey. Participation in the study was voluntary, and informed consent was obtained as part of the study procedure. Participants could withdraw their consent at any time without reason.

There were no implications for participants' current or future university support, as outlined in the information provided to participants. All participants were provided with debriefing information signposting them to available support services tailored to their university.

Sampling and recruitment

This study utilised convenience sampling to recruit participants. Participants were recruited through various methods including university mailing lists, online learning

platforms, lecture shout-outs and on-campus promotion. Incentives to participants varied across sites and included cash rewards, shopping vouchers and prizes.

Procedure

Survey data was collected online through Qualtrics. The participant information sheet and consent form can be found in Appendix A. The only compulsory questions within the survey were the consent to participate questions; other questions had a "prefer not to say" option or participants could skip any question.

At the University of Newcastle, procedures were in place for any participants scoring one or above on suicidal risk that questions. Participants had the option to provide their contact details such that appropriate support services could be considered in conjunction with the research team. Participants were required to opt-in rather than opt-out of this contact as per recommendations from the Student Advisory Group (SAG).

Participants completing a baseline survey were contacted via email inviting them to complete a follow-up survey, thus data from participants repeating the survey could be analysed across the academic year.

Measures

Nurture-U survey

Survey questions were adapted from the original U-Flourish survey; the psychometric properties for all measures are in the protocol paper (Marshall et al., 2025). An overview of survey measures is available in Appendix B.

The survey takes around 20 minutes to complete. The follow-up survey includes additional questions about participants' experiences during the academic year in relation to wellbeing, academic experience and barriers to care.

Suicidal risk questions

Questions measuring suicide risk were from the Columbia Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011). The C-SSRS is used to measure severity of suicidal ideation and history of suicidal behaviours. Within the Nurture-U study, participants were asked a shortened version of the questionnaire with the following questions relating to suicide risk:

1) Thinking about your past, have you ever… Wished you were dead or wished you could go to sleep and never wake up?
2) Thinking about your past, have you ever… Had thoughts about ending your life?
3) Thinking about your past, have you ever… Made any suicide attempts?
4) Thinking about your past, have you ever… Hurt yourself on purpose without trying to end your life?

All questions had a binary response (yes or no). Participants answering "yes" to any of the above questions were presented with signposting information including links to crisis mental health support, primary care and wellbeing services which students could download. For follow-up surveys, participants were asked the same four questions but relating to the academic year i.e. "During this academic year, have you ever…"

Participants also completed the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) which explores depressive symptomology in the previous two weeks. The final question on the PHQ-9 asks participants to rate whether the individual has been bothered by "Thoughts that you would be better off dead, or of hurting yourself in some way?" on a scale of 0-3 (0= not at all, 1= several days, 2= more than half the days, 3= nearly every day). Follow-up questions about acute suicidal risk and a prompt for the participant to be contacted by the research team appeared for individuals scoring >1 (n=27 utilised this option).

Defining suicidal risk

A “suicidal risk” variable score was computed for the baseline sample. Given the evidence highlighting that a history of suicide attempts is one of the strongest risk factors for future suicidal behaviours and death by suicide (Joiner, 2005; O’Connor & Kirtley, 2018; Ribero et al., 2016), participants were deemed to be higher risk of suicide if they had a historical suicide attempt (identified through the C-SSRS question “Thinking about your past, have you ever… Made any suicide attempts?”) and current suicidal ideation (identified by a score of 1 or above on the PHQ-9 suicidal risk question). The “suicidal risk” variable was scored as either 0 (“lower risk” group: no suicide attempt/no current ideation, historical suicidal attempt/no current ideation, no historical suicide attempt/current ideation) or 1 (“higher risk” group: historical suicide attempt/current ideation).

For follow-up data, four groups were created for the “suicidal risk change” variable based on suicidal risk at baseline and follow-up, as follows:

1) “Risk remains”: “Higher risk” at baseline where suicidal ideation was also present at follow-up (score of 1 or above on PHQ-9 risk question)
2) “Risk decreases”: “Higher risk” at baseline where suicidal ideation was absent at follow-up (score of 0 on PHQ-9 risk question)
3) “Risk absent”: “Lower risk” at baseline where suicidal ideation was absent at follow-up (score of 0 on PHQ-9 risk question)
4) “Risk increases”: “Lower risk” at baseline where suicidal ideation was present at follow-up (score of 1 or above on PHQ-9 risk question)

Descriptive information for the four risk category groups can be found in Appendix C.

Student involvement

The SAG was set up across participating universities and included over 100 members. Details of the SAG involvement for the Nurture-U research have been published (Dooley et al., 2023). For the current study, members of the SAG were provided a copy of the research

proposal and invited to a face-to-face meeting to discuss the proposed methodology. Feedback from the SAG was positive and the consensus was that the rationale, clinical context and research questions to be addressed were clear and appropriate.

Data management

The Nurture-U team downloaded and securely stored all Qualtrics survey data. Participant data was anonymised using a unique identifier therefore the dataset did not contain direct identifiers and, when combining datasets across institutions, superordinate categories were created for any demographic variables that contained fewer than 20 participants. This limited the potential for participant identification via combinations of rare demographic characteristics. All research data was confidential and stored in password protected files. Only the research team had access to the data. Personal details were stored separately to ensure that survey data was not linked to any possible identifiers.

Data analysis

All statistical analyses were undertaken using Statistical Package for Social Science (IBM SPSS) Version 29.

Missing data replacement strategy

Baseline data was filtered based on complete data for essential variables, namely, age, gender and ethnicity due to their association with suicidal risk (Knipe et al., 2024; National Confidential Inquiry into Suicide and Safety in Mental Health, 2025). Additionally, participants without data for the CSSR-S suicide attempt question and/or PHQ-9 current suicide risk question were removed, as these variables were required for calculating a baseline “suicidal risk” score.

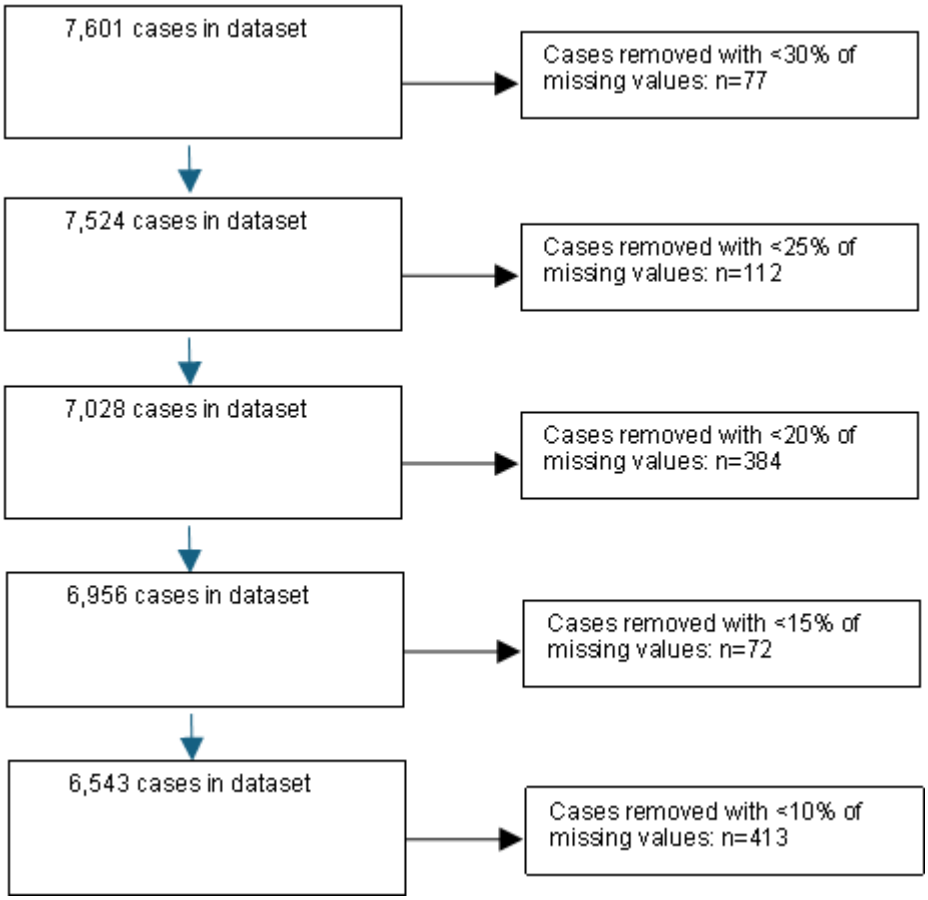
Missing data analysis was performed for the 7,601 participants in the baseline dataset. Cases were excluded where less than 70% complete data had been provided for the measures to be used in the regression analysis. As variable-wise missingness exceeded 10%, the

threshold of participant-wise missingness was increased in 5% increments from 70% to the point at which variable-wise missingness dropped below 10%, as data with more than 10% missingness is likely to be biased (Bennett, 2001).

Sterne et al. (2009) recommend including values for the number of individuals removed at each stage because of missing data; this is depicted in Figure 1:

Figure 1

Flow chart for removal of cases



The final baseline dataset contained 6,543 cases where all variables for the regression had less than 5% missingness. This excluded the disability status variable, which contained 7.4% missingness. Remaining missing values (1,440; 1.16% of total values) were replaced using multiple imputation. Multiple imputation is deemed an appropriate method to preserve statistical power and reduce the bias associated with analysing complete cases only, provided that data are missing at random or systematic differences between the missing and observed

values can be explained (Dong & Peng, 2013; Sterne et al., 2009). Thus, multiple imputation allows for cases with incomplete data for the variables of interest to be included in statistical analyses.

Paired follow-up data was available for 2,358 participants. 576 were removed as they did not answer questions about suicidal risk during the past academic year, either in terms of the C-SSRS questions or the PHQ-9 risk question. 41 cases had less than 70% complete data and an additional 20 cases had 70-75% complete data; removing these cases reduced variable-wise missingness to acceptable levels for imputation. The final dataset contained 1,721 participants. Remaining missing values (474; 2.30% of total values) for all 11 possible dynamic predictor variables were replaced using multiple imputation.

Three to five imputations are deemed adequate for replacing missing data using multiple imputation (Rubin, 1996), with relative efficiency improving slightly with the higher imputations. Thus, five imputations were chosen, which is sufficient according to the literature (Allison, 2000; Carpenter et al., 2007). Imputed datasets were used for the regression analyses.

Statistical analysis

Baseline suicidal risk. Possible predictors of suicidal risk were identified based on meta-analytic data of risk factors within the suicide literature (Franklin et al., 2017) and risk factors relevant to the UK student population (Akram et al., 2020; Kabir et al., 2024; O'Neill et al., 2018). A binary logistic regression was undertaken to identify predictors of the "suicidal risk" variable (0= lower risk group, 1= higher risk group) including the following variables:

1) Age
2) Gender
3) Sexual orientation

4) Ethnic group
5) Course current year
6) Physical health diagnosis
7) History of mental health/learning disability diagnosis
8) Family history of mental health diagnoses
9) Previous treatment for a mental health condition
10) Adverse childhood experiences: four questions from the Childhood Experience of Care and Abuse (CECA; Bifulco et al., 1994) exploring harsh parenting, physical abuse at home, bullying and unwanted sexual experiences
11) Three additional questions about childhood including parental death, parental divorce/separation and experience of care
12) Psychosis symptoms: Youth Psychosis At Risk Questionnaire two-item version (YPARQ-2; Phalen et al., 2018)
13) Eating disorders: two questions from the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders (SCID-5; First et al., 2015) for bulimia and anorexia symptoms
14) Wellbeing: total score on the Warwick Edinburgh Mental Wellbeing Scale seven-item (WEMWBS-7; Clarke et al., 2011). Total score range 7-35; higher scores indicate better mental wellbeing
15) Anxiety: total score on the General Anxiety Disorder (GAD-7; Spitzer et al., 2006) Total score range 0-21; higher scores indicate higher anxiety severity
16) Depression: total score on the PHQ-9 (Kroenke et al., 2001) Total score range 0-27; higher scores indicate higher depression severity

17) Alcohol Use: total score on the Alcohol Use Disorders Identification Test for Consumption (AUDIT-C; Bush et al., 1998) three-item questionnaire for screening problem drinking. Total score range 0-12; a total of 5 or more is a positive screen

Suicidal risk change (baseline to follow-up). A multinomial logistic regression was undertaken to identify dynamic predictors of the four risk change categories. Dynamic predictors were based on risk factors relating to personality/individual differences, cognitive and social factors, as well as possible predictors relevant to the student population (Kabir et al., 2024; O'Connor & Nock, 2014). Change scores were calculated by subtracting the baseline score from the follow-up score for each of the following measures:

1) Wellbeing: total score on the WEMWBS-7 (Clarke et al., 2011). A positive change score indicates an improvement in wellbeing
2) Anxiety: total score on the GAD-7 (Spitzer et al., 2006). A negative change score indicates an improvement in anxiety symptoms
3) Depression: total score on the PHQ-9 (Kroenke et al., 2001). A negative change score indicates an improvement in depressive symptoms
4) Alcohol Use: total score on the AUDIT-C (Bush et al., 1998). A negative change score indicates a reduction in alcohol use
5) Loneliness: total score on the four-item version of the University of California Los Angeles Loneliness Scale (UCLALS; Roberts et al., 1993). Each item is scored on a scale of 0-3 (total score range 0-12; higher scores indicate higher loneliness). A negative change score indicates a reduction in loneliness
6) Emotion Regulation: three items from the Lack of Emotional Clarity subscale from the Difficulties in Emotion Regulation Scale (DERS; Gratz et al., 2004). Each item is scored on a scale of 1-5 (total score range 3-15; higher scores indicate greater

difficulties with emotion regulation). A negative change score indicates an improvement in emotion regulation

7) Brooding: total score on the five-item Brooding subscale from the Ruminative Responses Scale (RSS; Treynor et al., 2003). Items were scored on a scale of 1-4 (total score range 5-20; higher scores indicate higher levels of brooding). A negative change score indicates a reduction in brooding
8) Social resources: total score on four items measuring Social Resources subscale of the Resilience scale for Adolescents (READ; von Soest et al., 2010). Each item is scored on a scale of 1-5 (total score range 4-20; higher scores indicate greater access to social resources). A positive change score indicates increased access to social resources
9) Resilience: total score on the six-item Brief Resilience Scale (BRS; Smith et al., 2008). Each item is scored on a scale of 1-5 (total score range 6-30; higher scores indicate higher resilience). A positive change score indicates increased resilience
10) Self-compassion: the six-item Self-Care subscale from the Self-Compassion Scale (SCS; Raes et al., 2010). Each item is scored on a 1-5 scale (total score range 6-30; higher scores indicate higher self-compassion). A positive change score indicates improvements in self-compassion
11) Sleep: total score on the eight-item Sleep Condition Indicator (SCI; Espie et al., 2014) screening tool. Each item was given a score on a 0-4 scale (total score range 0-32; higher values indicate better sleep quality. A positive change score indicates improvements in sleep quality

Assumption testing

Assumptions for regression analyses were tested using the steps outlined by Field (2017). Firstly, logistic regression was run in SPSS to include interactions between continuous predictors and the log of itself. Results for the binary logistic regression were

non-significant, indicating that the linearity of the logit assumption was met (Hosmer & Lemeshow, 1989). Exploration of this assumption for the multinomial logistic regression analysis indicated that this assumption was violated; consultation with a statistician indicated that the analysis could still be conducted provided that additional steps were taken to assess goodness-of-fit of the regression model.

Testing was undertaken for multicollinearity using linear regression. Suggested cut-offs indicating potentially high collinearity between predictor variables is variance inflation factors of over 5-10 (Craney & Surles, 2002; Myers, 1990); all variance inflation factors had a value of between 1 and 2, indicating low multicollinearity. Data for each case was independent of one another for baseline data, thus the independence of errors assumption was not violated.

It is recommended that a sensitivity analysis is undertaken to examine the robustness of findings when using multiple imputation (Sterne et al., 2009). A crude measure of sensitivity was undertaken by comparing the effects of the logistic regression outputs for complete cases only compared with the imputed dataset.

Archival data was used for this study therefore post-hoc power analyses were undertaken using G*Power for the binary logistic regression. Methods for conducting power analyses for multinomial logistic regression are computationally complex and still in the process of being embedded into existing software (Pate et al., 2023).

Results

Research Question One: What is the level of suicidal risk in the student population undertaking the Nurture-U wellbeing survey?

Descriptive statistics for the 7,601 participants in the baseline sample prior to imputing missing data are displayed in Table 1:

Table 1

Descriptives for the baseline sample

Variable	Mean/n	S.d./%
Age (range 46; 18-64 years)	22.13	5.99
Gender		
Male	2371	31.2
Female	4994	65.7
Gender diverse	236	3.1
Ethnicity		
White	4860	63.9
Black	195	2.6
Asian (other)	1060	13.9
Mixed or other	635	8.4
Asian Chinese	850	11.2
Sexual orientation		
Heterosexual	5117	67.3
Homosexual	375	4.9
Bisexual	1239	16.3
Other	553	7.3
Missing	317	4.2
Course current year		
Year one	4551	69.6
Year two or above	1983	30.3
Missing	9	0.1

S.D = standard deviation

In terms of suicidal risk, historical data from the C-SSRS and current data from the PHQ-9 suicide risk question are displayed in Table 2:

Table 2

Suicidal risk data for the baseline sample

Variable	n	%
Historical suicidal ideation		
Yes	2869	43.8
No	3674	56.2
Historical suicide attempts		
Yes	652	10.0
No	5891	90.0
Current suicidal ideation (last two weeks)		
Not at all	5425	82.9
Several days	768	11.7
More than half the days	227	3.5
Nearly every day	123	1.9

Table 2 highlights that nearly half of the sample had experienced lifetime suicidal ideation (n= 2,869), with around 10.0% (n= 652) having at least one suicide attempt historically. 17.1% (n= 1,118) of the sample reported some level of suicidal ideation in the previous two weeks. This resulted in 312 participants categorised into the "higher risk" group at baseline (historical suicide attempt and current suicidal ideation).

Research Question Two: What are the variables predictive of suicidal risk in this population?

A total of 23 predictor variables were entered into a forced entry binary logistic regression with "suicidal risk" as the dependent variable. Appendix D (Tables D1-D3) displays outputs from the binary logistic regression. The model was statistically significant, explaining between 14.2% (Cox and Snell R^2) and 44.5% (Nagelkerke's adjusted R^2) of the variance, and correctly classifying 95.9% of cases. The Hosmer-Lemeshow goodness-of-fit statistic was non-significant indicating that the model was a good fit for the data ($\chi 2$ (8) = 7.97, p =.436). Results of the binary logistic regression for the pooled output of imputations are provided in Table 3.

Table 3

Results of the binary logistic regression with suicidal risk as the dependent variable

Variable	*B*	Exp(B)	Lower bound CI	Upper bound CI
Psychosis (two symptoms)	1.137	3.117**	2.143	4.534
Ethnic group (Asian Other)	1.116	3.054**	1.956	4.768
Ethnic group (Asian Chinese)	0.993	2.698**	1.514	4.808
Sexual orientation (Homosexual)	0.847	2.332**	1.374	3.956
Mental health treatment	0.731	2.077**	1.4	3.083
Unwanted sexual experiences	0.621	1.861**	1.373	2.522
Sexual orientation (Other)	0.583	1.791*	1.136	2.824
Physical abuse during childhood	0.461	1.586*	1.102	2.283
Sexual orientation (Bisexual)	0.43	1.538*	1.086	2.177
Bullied during childhood	0.401	1.493*	1.095	2.036
Ethnic group (Mixed or other)	0.239	1.27	0.79	2.04
Harsh parenting	0.228	1.255	0.909	1.735
Depression total	0.167	1.182**	1.141	1.224
Disability	0.158	1.172	0.84	1.633
Psychosis (one symptom)	0.13	1.138	0.803	1.613
Anorexia score	0.128	1.137	0.82	1.576
Alcohol use total	0.092	1.096**	1.04	1.155
Family mental health history	0.086	1.09	0.788	1.508
Course current year	0.041	1.042	0.775	1.403
Anxiety total	-0.003	0.997	0.961	1.034
Parent divorce	-0.004	0.996	0.719	1.38
Gender (Female)	-0.029	0.972	0.668	1.415
Age	-0.047	0.954**	0.922	0.987
Wellbeing total	-0.052	0.949*	0.91	0.991
Foster care	-0.07	0.932	0.426	2.039
Gender (Gender diverse)	-0.132	0.877	0.483	1.593
Bulimia score	-0.141	0.868	0.65	1.161
Parent death	-0.317	0.728	0.356	1.489
Ethnic group (Black)	-0.667	0.513	0.139	1.894
Mental health diagnosis	-0.828	0.437**	0.29	0.659
Constant	-4.566	0.01	0.002	0.049
Model fit indices***	-2LL= 1506.83	$\chi 2$= 1000.97**		

CI= Confidence Interval (95%). *p< .05 **p< .01. ***pooled values. Reference categories categorical variables: Ethnic group= white; Sexual orientation= heterosexual; Mental health treatment= no history; Unwanted sexual experiences= no; Physical abuse during childhood= no; Bullied during childhood= no; Harsh parenting= no; Disability= none; Anorexia score= 0; Family mental health history= no history; Course current year= Year one; Parent divorce= no; Gender= male; Bulimia score= zero; Parent death= no; Mental health diagnosis= at least one diagnosis.

In terms of significant predictors, odds ratios can be interpreted as follows:

- A history of psychosis symptoms (3.12 times more likely to be in the higher risk group relative to the lower risk group)
- Being of Asian ethnicity, categorised as either “Asian other” or “Asian Chinese” (3.05 and 2.70 times more likely to be in the higher risk group relative to the lower risk group, respectively)
- Being homosexual, bisexual or “other” in terms of sexual orientation (2.33, 1.54 and 1.79 times more likely to be in the higher risk group relative to the lower risk group, respectively)
- A history of treatment for a mental health condition (2.08 times more likely to be in the higher risk group relative to the lower risk group)
- A history of unwanted sexual experiences as a child or teenager (1.86 times more likely to be in the higher risk group relative to the lower risk group)
- A history of physical abuse as a child or teenager (1.59 times more likely to be in the higher risk group relative to the lower risk group)
- A history of bullying by peers as a child or teenager (1.49 times more likely to be in the higher risk group relative to the lower risk group)
- Higher current severity of depressive symptoms; mean PHQ-9 score lower risk group= 6.53, mean PHQ-9 score higher risk group= 16.33 (a 1-unit increase in depressive symptoms increases the odds of being in the higher risk group by 18.2%)
- Higher alcohol consumption; mean score lower risk group= 3.63, mean score higher risk group= 4.54 (a 1-unit increase in alcohol use score increases the odds of being in the higher risk group by 9.6%)

- Being younger in age; mean lower risk group= 22.09 years, mean higher risk group= 21.01 years (a 1-year increase in age decreases the odds of being in the higher risk group by 4.6%)
- Lower subjective wellbeing; mean score lower risk group= 23.85, mean score higher risk group= 18.49 (a 1-unit increase in wellbeing score was decreases the odds of being in the higher risk group by 5.1%)
- Lifetime diagnosis of mental health condition or learning difficulty (having no diagnosis reduced the odds of being in the higher risk by 56.3%)

Appendix E illustrates the distribution of significant categorical predictors in the lower and higher suicidal risk groups, respectively.

Sensitivity analysis

The output for the complete cases only binary logistic regression can be found in Appendix F. History of physical abuse during childhood, bullying by peers and sexual orientation "other" were significant predictors in the imputed dataset but not in the complete cases dataset. As such, these effects are less robust and should be interpreted with caution.

Post-hoc power analysis

Analyses showed that the power of the sample to demonstrate significant differences at the 0.05 level for a small effect size (odds ratio <1.5) ranged from 0.95 to 1.00, suggesting that the sample size provided adequate statistical power to detect statistically significant effects for predictor variables with small effect sizes.

Research Question Three: What are the dynamic predictors of changes to suicidal risk from the start to the end of the academic year?

The 11 dynamic predictor variables were entered into a forced entry multinomial logistic regression (n=1,721), with "risk absent" as the reference category. Firstly, model fitting information using the chi-square test of change was significant. This suggested that the

model using the predictor variables explained a significant amount of variability in comparison to the intercept-only baseline model and hence was a better fit of the data ($\chi 2$ (33)= 209.49, p< .001). Secondly, both the Pearson and deviance statistics measuring goodness-of-fit were not significant (p>.05), thus indicating that the predicted values from the model were not significantly different from the observed values i.e. the model was a good fit of the data. Thirdly, the classification table indicated that the model correctly predicted the response category 75.4% of the time. Finally, additional checks of the model accuracy were undertaken by visually checking the boxplots of all dependent predictor variables across each of the four risk categories to assess whether the distribution fit with the model output.

The results of the multinomial logistic regression indicated that the full model explained between 11.4% (Cox and Snell R^2) and 15.0% (Nagelkerke's adjusted R^2) of the variance. Values for significant predictors only are displayed in Table 4. The full output of the multinomial logistic regression is displayed in Tables G1-G3 in Appendix G.

Table 4

Results of significant predictors only in the multinomial logistic regression with suicidal risk change as the dependent variable

Risk comparison category	Predictor	*B*	Exp(B)	Lower bound CI	Upper bound CI
Risk increases (n=340)	Δ Depression	.142	1.152**	1.113	1.193
	Δ Social resources	-.030	.970**	.948	.993
	Δ Sleep quality	.029	1.030*	1.006	1.054
Risk decreases (n=23)	Δ Depression	-.241	.785**	.705	.875
	Δ Sleep quality	.086	1.089*	1.011	1.173
	Δ Alcohol use	-.279	.757*	.584	.981
Risk remains (n=76)	Δ Anxiety	.144	1.155**	1.049	1.271
	Δ Loneliness	-.075	.928*	.869	.990
Model fit indices***	-2LL= 2321.06	$\chi 2$= 209.49			

Reference category= risk absent (n=1,282). CI= Confidence Interval (95%). *p< .05 **p< .01. ***pooled values.

Mean change scores were able to provide greater clarity with regards to the results of the multinomial logistic regression relative to direct interpretation of the odds ratios in the context of change scores. Table 5 demonstrates the mean score for each of the predictors across the four risk change categories:

Table 5

Baseline mean, endpoint mean and mean change of each dynamic predictor variable within the four suicidal risk change groups

Measure	Group	Baseline mean (s.d.)	Endpoint mean (s.d.)	Mean change (M)
Wellbeing (WEMWBS)	Risk absent	24.40 (4.36)	23.61 (4.34)	-0.79
	Risk increases	20.53 (4.45)	18.53 (4.18)	-2.00
	Risk decreases	20.41 (3.44)	21.52 (4.41)	1.12
	Risk remains	17.77 (3.75)	17.16 (3.67)	-.061
Anxiety (GAD-7)	Risk absent	6.06 (4.75)	6.62 (4.75)	0.56
	Risk increases	10.09 (5.29)	12.47 (5.21)	2.38
	Risk decreases	12.66 (4.74)	10.57 (4.65)	-2.09
	Risk remains	**14.97 (4.30)**	**14.45 (4.33)**	**-0.52****
Depression (PHQ-9)	Risk absent	5.62 (4.72)	6.44 (4.93)	0.82
	Risk increases	**11.23 (6.42)**	**15.30 (5.57)**	**4.07****
	Risk decreases	**15.00 (4.98)**	**9.30 (5.22)**	**-5.70****
	Risk remains	17.32 (5.53)	17.90 (5.29)	0.58
Alcohol use (AUDIT-C)	Risk absent	3.19 (2.51)	2.96 (2.42)	-0.23
	Risk increases	3.24 (2.79)	3.02 (2.77)	-0.22
	Risk decreases	**3.78 (3.05)**	**2.74 (2.50)**	**-1.04***
	Risk remains	3.96 (2.93)	3.61 (2.86)	-0.35
Loneliness (UCLALS)	Risk absent	5.34 (3.03)	5.25 (3.19)	-0.09
	Risk increases	7.29 (3.07)	7.72 (2.95)	0.43
	Risk decreases	8.09 (2.53)	7.57 (2.46)	-0.52
	Risk remains	**8.16 (2.91)**	**8.79 (2.54)**	**0.63***
Emotion regulation (DERS)	Risk absent	5.28 (2.31)	5.63 (2.70)	0.35
	Risk increases	6.16 (3.16)	7.10 (3.37)	0.94
	Risk decreases	5.91 (2.29)	6.65 (2.67)	0.74
	Risk remains	7.36 (3.60)	6.97 (3.56)	-0.39
Brooding (RSS)	Risk absent	10.91 (3.31)	10.98 (3.30)	0.07
	Risk increases	12.66 (3.45)	13.17 (3.51)	0.51
	Risk decreases	14.52 (3.59)	12.39 (3.55)	-2.13
	Risk remains	14.59 (3.69)	14.66 (3.69)	0.07
Social resources (READ)	Risk absent	14.66 (5.43)	17.59 (3.03)	2.93
	Risk increases	**13.45 (4.74)**	**15.38 (3.74)**	**1.93****
	Risk decreases	12.91 (4.23)	15.52 (3.07)	2.61
	Risk remains	13.18 (3.84)	14.96 (3.83)	1.78
Resilience (BRS)	Risk absent	18.81 (4.72)	19.29 (4.85)	0.48
	Risk increases	15.84 (4.85)	15.55 (4.56)	-0.29
	Risk decreases	13.70 (3.23)	15.87 (3.59)	2.17
	Risk remains	13.13 (4.50)	13.83 (4.34)	0.70
Self-compassion (SCS)	Risk absent	19.57 (5.28)	19.45 (5.27)	-0.12
	Risk increases	16.07 (4.86)	15.70 (4.54)	-0.37
	Risk decreases	16.91 (4.88)	16.91 (4.76)	0.00
	Risk remains	14.55 (4.55)	14.67 (4.67)	0.12
Sleep (SCI)	Risk absent	22.06 (6.97)	20.90 (6.91)	-1.16
	Risk increases	**17.65 (8.24)**	**16.05 (7.30)**	**-1.60***
	Risk decreases	**13.00 (6.43)**	**17.22 (5.18)**	**4.22***
	Risk remains	12.07 (7.89)	11.72 (6.78)	-0.35

Bold font indicates significant predictors relevant to the reference category (risk absent). *$p < .05$ **$p < .01$

In relation to significant predictors, Table 5 demonstrates that depressive symptoms increased in both the "risk increases" and "risk absent" groups over the course of the

academic year, however depression increased to a greater extent in the “risk increases” group (M=4.07 compared to M=0.82). Similarly, sleep quality reduced in both groups, although to a greater extent in the “risk increases” group (M=-1.60 compared to M=-1.16). Access to social resources increased in both groups, with students in the “risk absent” group demonstrating on average greater improvements at follow-up (M=2.93 compared to M=1.93). Comparing the “risk decreases” and “risk absent” groups, students in the “risk decreases” group experienced an average improvement of 5.70 points for the PHQ-9 indicating a reduction in depressive symptoms, whereas the “risk absent” group experienced a slight increase in depressive symptoms (M=0.82). Sleep quality increased by an average of 4.22 points in the “risk decreases” group but reduced by an average of 1.16 points in the “risk absent” group. Alcohol use reduced in the “risk decreases” and “risk absent” groups, although to a greater extent in the former (M=-1.04 and M=-0.23, respectively). Anxiety was a significant predictor for “risk remains” relative to “risk absent”, with a slight improvement in symptoms for the “risk remains” group (M=-0.52) and a slight increase in symptoms for the “risk absent” group (M=0.56). Finally, loneliness decreased slightly in the “risk absent” group (M=-0.09) whereas students in the “risk remains” group experienced an increase in loneliness symptoms (M=0.63)

Sensitivity analysis

Statistics for the complete cases regression analysis is available in Appendix H. The finding that a relative reduction in change in loneliness reduced the likelihood of being in the “risk remains” group relative to the “risk absent” was not replicated. Similarly, change in sleep as a significant predictor for the “risk increases” and “risk decreases” groups relative to “risk absent” was not replicated. Finally, the finding in relation to a relative decrease in change to alcohol use reducing the likelihood of being in the “risk decreases” group relative

to the “risk absent” group was not replicated. These findings are therefore less robust than other findings and should be interpreted with caution.

Discussion

This is the first study to date evaluating suicidal risk and possible predictors from the Nurture-U survey data. At baseline, 43.8% of students reported lifetime suicidal ideation, with 10.0% reporting at least one historical suicide attempt. Meta-analytic data for UK university students shows considerable variability in estimates of lifetime suicidal ideation, ranging between 28-72% (Kabir et al., 2024). The results of the current study are consistent with a previous UK-based study estimating that 10.8% of students had a historical suicidal attempt (Akram et al., 2020), although other studies have indicated higher estimates within this population (e.g. 24%; Dhingra et al., 2019). It is acknowledged that differences in outcome measures, study design and inconsistent definitions of suicidal behaviours may partially account for this wide range of estimates (Nock & Kessler, 2006).

Significant predictors of suicidal risk at baseline

Consistent with the research hypotheses, sexual orientation, mental health difficulties and poor wellbeing were significant predictors at baseline. These finding supports existing research proposing that students experiencing mental health difficulties, those with negative childhood experiences and non-heterosexual students are at increased risk of suicidal behaviours (Kabir et al., 2024).

Mental health difficulties and psychiatric diagnoses have consistently been associated with suicidal risk (Arsenault-Lapierre et al., 2004; Chesney et al., 2014; Nock et al., 2008). This finding was replicated within the current study, with a historical mental health diagnosis and/or learning difficulty emerging as a significant predictor of suicidal risk. Previous research has identified that self-reported mental health difficulties, namely depression and psychosis symptoms, are associated with increased risk of suicidal ideation in UK university

students (Akram et al., 2020). Psychosis in particular may be an important risk factor, with meta-analytic data highlighting that a diagnosis of a psychotic disorder had the highest suicide risk ratio of the mental health conditions studied (Too et al., 2019). Campbell et al. (2022) suggested that targeting psychological factors such as adaptive coping strategies, resilience and self-efficacy may be protective against poor mental wellbeing as students navigate university life.

The findings indicated that Asian students were around three times more likely than White students to belong in the suicidal risk group at baseline. Although not presented within the results, further scrutiny of the baseline dataset highlighted that 80% of Asian participants were international students. International students may experience distinct stressors when transitioning to university including reduced social support, acculturation, financial pressures, language difficulties and discrimination (Zhang & Goodson, 2011). Further research to improve understanding of suicidal risk factors for Asian students is warranted, including exploration of any disparities in access to mental health support for students from ethnic minority backgrounds (Chen et al., 2019).

In terms of sexual orientation, the Lesbian, Gay, Bisexual, Transgender, Queer or Questioning (LGBTQ+) community may experience difficulties in educational settings including hate crime, bullying, feelings of alienation and lack of support for specific needs (Hudson-Sharp & Metcalf, 2016). A report from UK charity Student Minds recommended that universities work to promote inclusivity within support services and raise awareness of the challenges faced by the LGBTQ+ community (Smithies & Byrom, 2018). Victimisation and mental health difficulties may play a role in increased suicidal experiences for such individuals, therefore initiatives that challenge discrimination and focus on resilience may be helpful (Williams et al., 2021).

Adverse childhood experiences were also significantly associated with increased suicidal risk; this finding has consistently been reported within the literature (Bruffaerts et al., 2010; Bunting et al., 2023; Evans et al., 2004). The impact of adverse childhood experiences has been identified as a significant public health issue in the UK requiring a government-led approach to prevention (Clark et al., 2024). Promoting trauma-informed systems in educational institutions may help these efforts to improve support for students that have experienced such difficulties during childhood (Goddard, 2021; Thomas et al., 2019).

Dynamic predictors of suicidal risk

As hypothesised, mental health symptoms (i.e. depression and anxiety) were significant predictors of change in suicidal risk. This finding is consistent with previous literature highlighting that depression is a strong predictor of suicidal behaviours (Hawton et al., 2013; Ribeiro et al., 2018) and as a psychiatric correlate within student-specific research (Kabir et al., 2024). Recognising such symptoms appears to be an important component of reducing suicidal risk in students.

Students that remained suicidal at follow-up or where risk increased reported greater levels of loneliness. Research indicates that social support is associated with reduced likelihood of future suicidal behaviours (Arango et al., 2024; Kleiman & Liu, 2014; Van Orden et al., 2021). As such, improving social connectedness may be a potentially modifiable factor within interventions aimed at promoting positive wellbeing and reducing suicidal risk in universities.

Alcohol use was a significant predictor at baseline and for follow-up data. Alcohol misuse has been identified as a common antecedent prior to suicide in young people under 25 (Appleby et al., 2017). Similarly, higher alcohol use indicating likely alcohol dependence has been identified as a risk factor for suicidal behaviours in university students (O'Neill et al.,

2018). Efforts to target alcohol consumption in students may therefore be of benefit for reducing suicidal risk.

An additional significant predictor was self-reported sleep quality. Research evidence has highlighted a possible link between suicidal risk and aspects of sleep, for example, studies with undergraduate students have found that sleep disturbances such as poor sleep quality, shorter length of sleep, clinical insomnia and nightmares are associated with increased likelihood of suicidal ideation (Bernert et al., 2017; Tubbs et al., 2023). Treating poor sleep may be an important, non-stigmatising health concern relevant to suicide prevention in young adults, although understanding of the causal mechanisms between sleep and suicidal risk requires further exploration to identify targets for intervention (Tubbs et al., 2019).

It is interesting to note that within the "risk increases" and "risk remains" categories, there were greater proportions of non-heterosexual students (47.6% and 61.9%, respectively) than within the total dataset (35.7%). This is consistent with the findings from baseline data that sexual orientation was a significant predictor of suicidal risk category. It is important for universities to consider factors that may increase difficulties faced by non-heterosexual students, such as stigma, increased barriers to help-seeking and tailored interventions to promote positive wellbeing within this population (McDermott et al., 2017).

Strengths and limitations

This study has addressed some of the previous weaknesses of research exploring student wellbeing by utilising a multisite, longitudinal design. Validated measures were used across universities, allowing for comparisons across sites and improving the generalisability of the findings. However, some limitations of this study should be noted. Participants were obtained through a convenience sample of self-selecting students who were offered incentives to participate. This may affect generalisability to the broader student population and/or lead

to overrepresentation of individuals that have a particular interest in the research area (Marshall et al., 2025).

Additionally, all survey data utilised self-report measures. Previous research has highlighted the inconsistencies in participant self-reports of suicidal ideation and behaviours, perhaps to avoid perceived stigma or due to confusion around suicide-related terms (Deming et al., 2021). The full C-SSRS risk measure was not used, therefore it is possible that the coded risk groups did not capture the level of suicidal risk accurately. Nevertheless, Ammerman et al. (2021) argued that single-item measures of lifetime suicide attempts have good response consistency, therefore it is unclear to what extent this limitation impacted the coding of groups.

A further limitation relates to missing data. Using multiple imputation to account for missing data allows participants with incomplete data to be included in analyses (Sterne et al., 2009). However, comparison with complete cases analysis for both the baseline and follow-up data sets highlighted changes to significant predictors and reduced confidence in the findings where effects were only significant in one dataset. It is unclear how missing data impacted the results and how predictors that were only significant in the complete cases analysis are representative of the wider student population.

Finally, although participants were able to select subethnicities within each of the broader ethnicity categories, these could not be directly analysed due to small group sizes and a high risk of re-identification. The exception was participants who chose "Asian and Asian British" followed by "Chinese", where group sizes were large enough to mitigate the risk. Aggregating data from diverse groups into a single category may mean that underlying trends are not accurately captured (Race Equality Unit, 2023; Samaritans, 2022). As such, it is unclear whether there were any differences in terms of suicidal risk amongst subethnic groups.

Clinical and research implications

The findings of this study have important implications for supporting students with suicidal risk. Embedding mental health screening within universities and effective liaison with local healthcare services may help with addressing symptoms at the earliest opportunity (Universities UK, 2018). As identified in Section One of this thesis, stepped-care models implemented within universities that include suicidal risk screening, identifying students at-risk and offering treatment accordingly demonstrate promise (Hasking et al., 2023; King et al., 2022; Wolitzky-Taylor et al., 2023), although more research utilising randomised controlled trial methodology is warranted.

An additional clinical implication is offering tailored interventions to at-risk groups. As highlighted in the literature review in Section One of this thesis, there is a lack of high-quality evidence-based interventions to support students at-risk of suicide. Although some effective interventions exist that primarily target mental health symptoms, the findings of this empirical research suggest that interventions aimed at reducing dynamic risk factors such as social resources, sleep quality, alcohol use and loneliness warrant further exploration.

Furthermore, the findings indicate the importance of providing inclusive services to support students from a range of sociodemographic backgrounds. Culturally sensitive services, screening programmes and proactive engagement strategies may be important for suicide prevention for students from minority ethnic groups (McKay et al., 2023). Further research to explore suicidal risk factors associated with students of Asian ethnicity and those from the LGBTQ+ community may help improve understanding of specific support required from university services, as well as addressing any barriers to help-seeking.

Furthermore, it is important to consider how the findings map onto the wider literature in relation to suicide risk factors. National data has highlighted a now well-established trend that men are more likely to die by suicide than women (NCISH, 2025), although this was not

replicated within the study. This may reflect the higher proportion of females (65.7%) undertaking the survey. However, it is also possible that perceived stigma may have impacted on lack of disclosure of suicidal thoughts and/or behaviours, particularly as participants provided their student number as part of consent and data collection processes. Previous research has indicated that male help-seeking for suicidal risk may be impacted by factors such as self-stigmatising attitudes and consequences of disclosure (Rasmussen et al., 2018; Richardson et al., 2021). Services are seeking to address these issues through provision targeted specifically at men in suicidal crisis (Farr et al., 2024; Saini et al., 2024). Further research to identify risk factors specifically for male students may highlight important aspects of interventions aimed at promoting positive wellbeing within this group.

Finally, the multinomial logistic regression model explained between 11.4% and 15.0% of the variance which suggests that there are other factors contributing to the variability. Demographic variables were not included as predictors as the focus was to identify modifiable risk factors; inclusion may have increased the percentage of explained variance. Previous research testing the Integrated Motivational-Volitional Model of suicidal behaviour with student populations has explored the impact of moderator variables in the relationship between defeat and entrapment such as resilience, coping and rumination in the trajectory towards suicidal behaviours (Souza et al., 2024). Such factors could be integrated within existing evidence-based interventions to improve understanding of the dynamic nature of suicidal risk and address these factors within treatment (Sandford et al., 2022).

Reflection on ethical issues encountered during the project (499 words; excluded from word count)

Research involving participants with suicidal risk can raise several ethical issues. Suicide is a sensitive and distressing topic, yet developing the evidence base inevitably involves exploring participants' experiences to improve understanding of risk factors. Thus,

research in the field involves balancing the pursuit of knowledge with the need to minimise distress to participants. In the context of the British Psychological Society Four Component Model (Rest, 1982), the issues raised in this empirical research project can be summarised as follows:

Ethical sensitivity: It was important to recognise ethical issues raised around potential harm to participants. Immediate risks raised due to participation in the study were minimal, although asking students about their suicidal risk and childhood adverse experiences may have resulted in difficult emotions. Possible issues raised during the course of this project included increased emotional distress and feeling pressured to continue participation in the study when sensitive questions arose.

Ethical reasoning: It was important to emphasise autonomy throughout participation in the research study and exercise the principle of beneficence i.e. acting in the best interests of participants to minimise harm as much as possible. The research design and questions to be explored where shared with the SAG and the researcher attended a meeting for feedback prior to conducting the study. Attendees of the SAG were keen to learn more about student-specific factors influencing wellbeing. They fed back that the study had a clear rationale and would add value to students' experiences of support systems at university. The group were interested in demographic and lifestyle factors influencing risk, which were integrated within the statistical analyses.

Ethical motivation: The Nurture-U team were motivated to act on any ethical issues arising and prioritised participant safety within the research design. The team had input from students at all stages of the research design and critically reflected on methods of improving collaboration to increase student-led decision-making throughout the duration of the project (Dooley et al., 2023). Additional safety protocols were agreed within the survey, given that students involved in the research may be experiencing current suicidal risk. Participation in

the study did not impact student access to resources or clinical input, regardless of whether participants withdrew from the study.

Ethical implementation: Risk procedures were an important component of the research design. Protocols for participants reporting current suicidal ideation were in place, such that students could be contacted by a member of the research team and signposted to appropriate support services. The possible risks to participants were outlined in the information sheet and participants could stop the survey or skip questions; this component of the research design was valued by the SAG. As part of debriefing procedures, all participants were offered a downloadable PDF tailored to their university with details of further support services. The SAG were keen for the findings to be shared with University support services; the researcher intends to feed back the findings to the Mental Health Steering Group/Student Suicide Working Groups within the University of Newcastle and to the wider project team.

Conclusions

This study has highlighted some key demographic and clinical predictors of suicidal risk, including both static and dynamic risk factors. Such findings can be utilised by universities to ensure that student wellbeing services are tailored to meet the needs of at-risk groups and ensure they receive appropriate support prior to their suicidal risk escalating. The study findings may also help universities to consider allocation of resources for student support services and identify gaps in interventions offered to students. It is hoped that these findings will inform the development of future interventions and service provision to support students with elevated suicidal risk.

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Appendix A

Nurture-U participant information sheet and consent form

Background and purpose of the study

You are invited to participate in a study to understand what helps to improve students' wellbeing and academic outcomes and what may contribute to poor mental health. We also want to identify barriers and gaps that students experience if they try to access mental health care. We intend to use the information you provide to inform the development of services and resources to help students like you flourish emotionally and academically.

This study is supported by a grant from the UKRI Medical Research Council and is being carried out here at Newcastle University in partnership with five other UK universities (University of Exeter, Oxford University, Kings College London, University of Southampton, and Cardiff University). The study has received ethical approval from the University of Exeter Psychology Research Ethics Committee.

What will happen in the study?

Your participation in this study is voluntary. If you decide to take part, you will be asked to complete a survey by clicking on the link below. The survey asks about your background, past emotional experiences, lifestyle, wellbeing, physical and mental health, and school/ university experience. There are also some questions about the impact of the COVID-19 pandemic on your wellbeing and academic life. The survey should take approximately 20 minutes to complete.

As an important part of the Nurture-U study, we would like to compare how you feel at the beginning and end of the academic year. Therefore, if you complete this survey, we will send you the link to a brief follow-up survey towards the end of the academic year (e.g., May). The follow-up survey will ask about your experiences during the year, focusing on wellbeing, academic experience, and barriers to care. The follow-up survey should take approximately 10 minutes to complete.

To understand the association between health, lifestyle, and academic outcomes, with your consent, your survey responses will be linked via your student email or student identification number to specific academic data (e.g., course grades, exam grades), for the duration of your course.

We are funded until summer 2025; therefore, we will contact you again at the start and end of the academic year for each of the next few years. You do not have to agree to complete subsequent surveys if you do not wish.

Are there any risks to doing this study?

Some of the questions that we ask may cause upset or bring up painful memories, although this distress should not be more than would occur normally during your daily life. If you experience any distress from participating in this study, you may stop the survey at any time or skip any upsetting questions. If your distress continues after leaving the survey, we have

provided a list of supportive services that can be helpful and that you might consider contacting. You can find this list at the end of the survey and on our study website.

What help is provided?
The Nurture-U survey only assesses mental health - it does not provide therapy, and the survey is not directly monitored nor supported by clinicians or therapists. If you report increased distress or thoughts of harming yourself during the survey on our website, the survey will give you automated advice and automatically point you to sources of help such as your GP or university wellbeing services. You will also be given the option to request that the university wellbeing services contact you directly to provide support. Your GP (family doctor) remains responsible for your medical care.

Are there any benefits to doing this study?
We do not expect participants to directly benefit from the study. However, we hope that the findings will help us to better understand the health needs of university students, and which factors are associated with academic success. This information will help us to improve resources and services to support students.

Payment or reimbursement:
For completing the survey, every 30th participant will automatically receive a £6 university catering credit on their student account. Additionally, all participants will be entered into a draw to win one of three available cash prizes of £100. One winner will be drawn at the end each week when the survey is open for completion.

Confidentiality and use of research data:
Please be assured that your survey answers and linked data are strictly confidential: Your information will be kept confidential and stored securely and password protected. We aim to publish the research in academic journals. Your identity will not be revealed in any report or publication.

The data you enter when you complete the online survey will be collected on a third-party specialist password protected secure survey website called Qualtrics. By default, Qualtrics records device identity or IP address. You will access this website via a link from our social media or through our website (https://www.nurtureuniversity.co.uk/). The Newcastle University Nurture-U team will download, and securely store data entered into our Qualtrics survey website.

With your consent, the survey response records will be linked to administrative academic and health data through student email addresses. Academic outcome data linked in this study will include course grades, overall grade percentage, rate of failed courses, and any instance of academic probation or suspension.

Reports of this study will use group data and will not discuss individual information and will be anonymised.

Study data will be assigned a unique identifier so that individuals cannot be identified in any analysis. Your personal contact details (name, email, telephone number, university number)

will be kept separately from all other data. Your responses on the survey will be only linked to a unique project identification number, not with your contact details, to keep your personal responses private, i.e., the data will be pseudonymised.

Only selected researchers within the Nurture-U research team at Newcastle can access your contact details. This is so they can contact you about later surveys, further research or to respond to your questions or requests for help.

Anonymised data will be shared with partner universities for the purpose of scientific research, we ask that when providing responses in open text sections you do not input details that would directly identify you.

If selected as one of the survey winners for the catering credit, your name and student ID number will also be shared with the Newcastle University Catering Service to allow the credit to be added to your student card.

Encrypted password protected data files will be stored on password-protected computer. Only the research team will have access to the research data. Research data will be stored in a secure repository for a minimum of 10 years after study close. Personal data (e.g., contact details) will be deleted at the end of the study.

Who will have access to your data?
Our research team at Newcastle University is the 'Data Controller' with respect to your personal data, and as such will determine how your personal data is used in the study. Qualtrics (the platform hosting the online survey) is a 'Data Processor' with respect to your personal data and processes this data as instructed by our research team.

Your data will be stored in password-protected files that only members of our research group will be able to access.

Our research team and Qualtrics will process your personal data for the purpose of the research outlined above. Research is a task that we perform in the public interest. Further information about your rights with respect to your personal data is available from our privacy and personal data protection policy (attached) and our website www.nurtureuniversity.co.uk.

What if I change my mind about being in the study?
Your participation is voluntary, and you are free to withdraw at any time. If you have completed the first survey, you can email the investigators and ask to be withdrawn from the study. In cases of withdrawal, no new data will be collected or linked to other data from that point on. If you do not want to answer some of the questions you do not have to, but you can still be in the study. Your decision whether or not to be part of the study will not affect your academic standing or your access to university support.

How do I find out what was learned in this study?
The overall study is expected to be completed by approximately July 2025. We will be sharing preliminary results at annual intervals before this date. If you would like a brief summary of the results, please write to us by email (nurtureu@newcastle.ac.uk) to request

information. We will share key findings from the study in peer reviewed journals, social media, through the Newcastle University Student Union, and our website.

Questions about the study
Any questions about study participation may be directed to the investigators and their research team by email (nurtureu@newcastle.ac.uk).

What if there is a problem?
If you have a concern about any aspect of this project, please speak to a researcher at nurtureu@newcastle.ac.uk who will do their best to answer your query. The researcher should acknowledge your concern within 10 working days and give you an indication of how they intend to deal with it. If you remain unhappy or wish to make a formal complaint, please contact Gail Seymour (G.M.Seymour@exeter.ac.uk), or Nick Moberly (n.j.moberly@exeter.ac.uk) - Chair of the Psychology Research Ethics Committee at the University of Exeter.

Who has reviewed the study?
This study has been reviewed and given a favourable opinion by the research ethic committees of the participating Universities.

We want to thank you for considering taking part in this research and having your say. The responses you and other students provide will identify areas where we can improve services and resources to better help students flourish and promote their wellbeing.

CONSENT TO PARTICIPATION – **Nurture-U Student Wellbeing Survey Study**

I confirm that I have read the information provided in information sheet dated 22.7.2022 (version 1.3) and I consent to participate in this prospective survey study on student wellbeing and mental health.
◯ Yes

I understand that by taking part in the survey study I will be invited to complete an online survey about my wellbeing, health, university experiences and access to care, at the start and end of each academic year, until I complete my studies or the project finishes (whichever is the earlier).
◯ Yes

I understand that all my data will be kept confidential and stored securely. My contact details will be kept separately from other information. My contact details will be permanently deleted at the end of project (anticipated study end autumn 2025). My other data will be kept for 10 years for research purposes only. This is in line with good research practice.
◯ Yes

I understand that my participation is voluntary. I am free to withdraw at any time without giving any reason.
◯ Yes

I understand that the data collected from me (without my contact details; i.e., de-identified data) will be shared with researchers and collaborators within the Nurture-U project team and may anonymously be used to support other research in the future.
◯ Yes

I understand that the Nurture-U study does not provide therapy and my answers are not monitored nor supported by clinicians or therapists. I understand that I am responsible for seeking help if I feel distressed or at risk.

◯ Yes

I would like to be contacted about opportunities to take part in other research studies. I understand that agreeing to be contacted does not oblige me to participate in any further studies, and that being contacted about future studies is independent of participation in this study (i.e., I can refuse future contact yet still take part in the current study).
◯ Yes
◯ No

I consent for my responses in the tool to be linked via my student email or student identification number to my academic data (e.g., course grades, exam grades)
◯ Yes
◯ No

To confirm your consent to participating in the survey, please enter your Newcastle University student email address in the box below.

Appendix B

Measures included in the Nurture-U survey (from Marshall et al., 2025)

Construct	Measure (items)	Time-point
Section 1: Personal Factors		
Demographics	Student ID number Student email address Disability*	Baseline and follow-up
Demographics	Age Gender identity [33] Sexual orientation [33] Ethnicity [33] Year of study and course length* Undergraduate or Postgraduate* Faculty / Division* Home / international student* Accommodation – on/off campus, private/university owned*	Baseline
Section 2: Family factors		
Parental mental health	Family history of mental illness*	Baseline
Parental education	Parental highest level of education*	Baseline
Parental impact	Divorce [33] Death [33] Age of divorce and/or death of parent [33][1]	Baseline
Adverse childhood experiences	Childhood Experience of Care and Abuse (CECA) [34]	Baseline
Section 3: Psychological and emotional health		
Mental health history	Mental health or learning disability diagnosis* Age of diagnosis* Previous mental health treatment*	Baseline
Psychosis	Youth Psychosis At Risk Questionnaire 2-item (YPARQ-2) [35]	Baseline and follow-up
Lifetime suicidality	Columbia Suicide Severity Rating Scale (C-SSRS) [36]	Baseline and follow-up
Current mental health	Mental health rating and functioning (day-to-day and school) Current mental health treatment	Baseline and follow-up
Wellbeing	Warwick Edinburgh Mental Wellbeing Scale 7-item (WEMWBS-7) [37]	Baseline and follow-up
Anxiety	Generalised Anxiety Disorder Scale 7-item (GAD-7) [38]	Baseline and follow-up

[1] The items from the WHO-ICCS web questionnaire [33] initially adapted for Canada, were further adapted for cultural appropriateness in the UK and to align with UK census categories.

Depression	Patient Health Questionnaire 9-item (PHQ-9) [39]	Baseline and follow-up
Eating behaviour	Structured Clinical Interview for DSM-5 (SCID-5) – Screening questions for eating disorders [40] Sick, Control, One, Fat, Food (SCOFF) questionnaire [41]	Baseline and follow-up
Emotional clarity	Emotional Clarity - Difficulties in Emotion Regulation Scale 18-item (DERS-18) - Emotional Clarity Subscale [42]	Baseline and follow-up
Section 4: Lifestyle, habits, mechanisms, and behaviour		
Loneliness	UCLA Loneliness Scale 8-item (UCLALS-8) [43]	Baseline and follow-up
Self-compassion / self-care	Self-Compassion Scale Short Form (SCS-SF) - Self-Care Subscale [44]	Baseline and follow-up
Rumination / brooding	Ruminative Responses Scale 5-item (RRS-22) - Brooding Subscale [45]	Baseline and follow-up
Resilience	Resilience scale for Adolescents (READ) - Social Resources Subscale [46] Brief Resilience Scale (BRS) [47]	Baseline and follow-up
Response to stress	Cognitive and Behavioural Response to Stress Scale (CB-RSS) - 2-item: Cognitive Frequency and Helpfulness and Behavioural Frequency and Helpfulness [48]	Baseline and follow-up
Alcohol use	Alcohol Use Disorders Identification Test for Consumption 3-item (AUDIT-C) [49]	Baseline and follow-up
Substance use	Frequency of substance use [33]	Baseline and follow-up
Substance use concern	Concern from others on drug / alcohol use*	Baseline and follow-up
Lifestyle factors	Exercise, smoking, caffeine, self-care frequency*	Baseline and follow-up
Stress	Perceived Stress Scale 14-item (PSS-14) [50]	Baseline and follow-up
Sleep behaviour	Sleep Condition Indicator 8-item (SCI) [51]	Baseline and follow-up
Physical health	Physical health conditions*	Baseline and follow-up
BMI	Height and weight	Baseline
Section 5: Supplementary		
COVID questions	Pandemic Anxiety Scale (PAS) – Consequence and disease anxiety subscales [52]	Baseline
Section 6: Academic connectedness and seeking support		
University connectedness	College Student Subjective Wellbeing Questionnaire (CSSWQ) - School Connectedness Subscale *(with researcher questions added)* [53]	Follow-up

Barriers to accessing care	Barriers to care checklist (BCC) [54] Barriers to Access to Care Evaluation scale (BACE) [55]	Follow-up
Student stress	Post-Secondary Student Stressors Index (PSSI) – Modified [56]	Follow-up
Access to support	Accessing mental health support in academic year* Experience of accessing support**	Follow-up

**Single-item questions created by the research team*
***Multi-item questions created by the research team*

Appendix C

Descriptives for the four suicidal risk change categories (n=1,721)

Variable	Risk absent (n=1,282)		Risk increases (n=340)		Risk decreases (n=23)		Risk remains (n=76)	
	Mean/n	S.d./%	Mean/n	S.d./%	Mean/n	S.d./%	Mean/n	S.d./%
Age	23.05	7.33	22.46	6.65	21.27	4.68	21.77	6.01
Age range	18-64 years		18-64 years		18-39 years		18-53 years	
Gender								
Male	351	27.4	89	26.2	2	8.7	11	14.5
Female	880	68.6	220	64.7	19	82.6	51	67.1
Gender diverse	37	2.9	28	8.2	2	8.7	13	17.1
Missing	14	1.1	3	0.9	0	0	1	1.3
Ethnicity								
White	904	70.5	236	69.4	12	52.2	50	65.8
Black	24	1.9	9	2.6	0	0	1	1.3
Asian (other)	116	9.0	36	10.6	4	17.4	16	21.1
Mixed or other	110	8.6	25	7.4	6	26.1	7	9.2
Asian Chinese	94	7.3	27	7.9	1	4.3	2	2.6
Missing	34	2.7	7	2.1	0	0	0	0
Sexual orientation								
Heterosexual	831	64.8	163	47.9	3	13.0	27	35.5
Homosexual	60	4.7	29	8.5	1	4.3	7	9.2
Bisexual	212	16.5	80	23.5	13	56.5	23	30.3
Other	114	8.9	53	15.6	5	21.7	17	22.4
Missing	65	5.1	15	4.4	1	4.3	2	2.6

S.D. = standard deviation

Appendix D

Binary logistic regression output for predicting the baseline suicidal risk variable

Table D1

Omnibus tests of model coefficients

Imputation Number			Chi-square	df	Sig.
Original data	Step 1	Step	751.147	29	<.001
		Block	751.147	29	<.001
		Model	751.147	29	<.001
1	Step 1	Step	1000.040	29	<.001
		Block	1000.040	29	<.001
		Model	1000.040	29	<.001
2	Step 1	Step	1001.189	29	<.001
		Block	1001.189	29	<.001
		Model	1001.189	29	<.001
3	Step 1	Step	1001.474	29	<.001
		Block	1001.474	29	<.001
		Model	1001.474	29	<.001
4	Step 1	Step	1003.135	29	<.001
		Block	1003.135	29	<.001
		Model	1003.135	29	<.001
5	Step 1	Step	999.006	29	<.001
		Block	999.006	29	<.001
		Model	999.006	29	<.001

Table D2

Model summary

Imputation Number	Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
Original data	1	1086.876[a]	.142	.454
1	1	1507.764[b]	.142	.445
2	1	1506.615[c]	.142	.446
3	1	1506.331[d]	.142	.446
4	1	1504.669[e]	.142	.446
5	1	1508.799[f]	.142	.445

Table D3

Statistics for variables in the equation

	B	S.E	Sig.	Exp(B)	Lower Bound CI	Upper Bound CI	Fraction Missing Info.	Relative Increase Variance	Relative Efficiency
Age	-.047	.017	.007	.954	.922	.987	.001	.001	1.000
Gender(1)	-.029	.192	.882	.972	.668	1.415	.002	.002	1.000
Gender(2)	-.132	.305	.666	.877	.483	1.593	.006	.006	.999
Sexual orientation(1)	.847	.270	.002	2.332	1.374	3.956	.003	.003	.999
Sexual orientation(2)	.430	.177	.015	1.538	1.086	2.177	.023	.023	.995
Sexual orientation(3)	.583	.232	.012	1.791	1.136	2.824	.008	.008	.998
Ethnic group(1)	-.667	.666	.317	.513	.139	1.894	.000	.000	1.000
Ethnic group(2)	1.116	.227	<.001	3.054	1.956	4.768	.004	.004	.999
Ethnic group(3)	.239	.242	.324	1.270	.790	2.040	.004	.005	.999
Ethnic group(4)	.993	.295	<.001	2.698	1.514	4.808	.000	.000	1.000
Course year(1)	.041	.151	.785	1.042	.775	1.403	.011	.012	.998
Family mental health(1)	.086	.166	.603	1.090	.788	1.508	.042	.043	.992
Parent divorce(1)	-.004	.166	.982	.996	.719	1.380	.007	.007	.999
Parent death(1)	-.317	.365	.384	.728	.356	1.489	.005	.005	.999
Foster care(1)	-.070	.399	.861	.932	.426	2.039	.028	.028	.994
Harsh parenting(1)	.228	.165	.168	1.255	.909	1.735	.002	.002	1.000
Physical abuse(1)	.461	.186	.013	1.586	1.102	2.283	.018	.018	.996
Bullying(1)	.401	.158	.011	1.493	1.095	2.036	.005	.005	.999
Unwanted sexual experiences(1)	.621	.155	<.001	1.861	1.373	2.522	.027	.027	.995
Mental health diagnosis(1)	-.828	.209	<.001	.437	.290	.659	.006	.006	.999
Mental health treatment1)	.731	.202	<.001	2.077	1.400	3.083	.002	.002	1.000
Psychosis symptoms(1)	.130	.178	.466	1.138	.803	1.613	.003	.003	.999
Psychosis symptoms(2)	1.137	.191	<.001	3.117	2.143	4.534	.004	.004	.999
Wellbeing total	-.052	.022	.017	.949	.910	.991	.029	.029	.994
Anxiety total	-.003	.019	.864	.997	.961	1.034	.011	.011	.998
Depression total	.167	.018	<.001	1.182	1.141	1.224	.010	.010	.998
Anorexia score(1)	.128	.167	.441	1.137	.820	1.576	.002	.002	1.000
Bulimia score(1)	-.141	.148	.341	.868	.650	1.161	.005	.005	.999
Alcohol use total	.092	.027	<.001	1.096	1.040	1.155	.025	.025	.995
Disability(1)	.158	.169	.350	1.172	.840	1.633	.030	.031	.994
Constant	-4.566	.789	<.001	.010	.002	.049	.020	.020	.996

**p< .05 **p< .01.* S.E= standard error. CI= Confidence Interval. (95%). Reference categories categorical variables: Ethnic group= white; Sexual orientation= heterosexual; Mental health treatment= no history; Unwanted sexual experiences= no; Physical abuse during childhood= no; Bullied during childhood= no; Harsh parenting= no; Disability= none; Anorexia score= 0; Family mental health history= no history; Course current year= Year one; Parent divorce= no; Gender= male; Bulimia score= zero; Parent death= no; Mental health diagnosis= at least one diagnosis.

Appendix E

Comparisons of significant categorical predictors of suicidal risk

Variable	Lower risk (n=6231) %	Higher risk (n=312) %
Sexual orientation		
Heterosexual	71.0	34.3
Homosexual	5.1	9.1
Bisexual	16.6	39.7
Other	7.3	16.9
Ethnic group		
White	66.0	64.4
Black	2.3	0.9
Asian other	13.2	17.0
Mixed or other	8.3	7.4
Asian Chinese	10.2	10.3
Childhood physical abuse		
Yes	10.6	30.9
No	89.4	69.1
Childhood bullying		
Yes	28.6	68.6
No	71.4	31.4
Childhood unwanted sexual experiences		
Yes	16.8	55.8
No	83.2	44.2
History of mental health/learning disability diagnosis		
Diagnosis	34.8	82.1
No diagnosis	65.2	17.9
History of treatment for a mental health condition		
Yes	35.3	80.1
No	64.7	19.9
Psychosis symptoms		
None	83.8	46.2
One	12.0	23.7
Two	4.2	30.1

Appendix F

Complete cases only (n=4,900) output for binary logistic regression for predicting the baseline suicidal risk variable

	Variable	B	S.E	Wald	df	Sig.	Exp(B)	Lower Bound CI	Higher Bound CI
Step 1	Age	-.041	.019	4.431	1	.035*	.960	.924	.997
	Gender			1.274	2	.529			
	Gender (Female)	-.247	.220	1.258	1	.262	.781	.507	1.203
	Gender (Gender diverse)	-.164	.377	.188	1	.665	.849	.405	1.779
	Sexual orientation			8.070	3	.045			
	Sexual orientation (Homosexual)	.737	.320	5.311	1	.021*	2.090	1.117	3.911
	Sexual orientation (Bisexual)	.435	.204	4.542	1	.033*	1.545	1.036	2.306
	Sexual orientation (Other)	.475	.297	2.555	1	.110	1.609	.898	2.881
	Ethnic group			26.084	4	<.001			
	Ethnic group(Black)	-.687	.700	.965	1	.326	.503	.128	1.982
	Ethnic group(Asian Other)	1.237	.270	21.060	1	<.001**	3.446	2.032	5.845
	Ethnic group(Mixed or other)	.448	.288	2.409	1	.121	1.565	.889	2.753
	Ethnic group(Asian Chinese)	.973	.352	7.635	1	.006**	2.646	1.327	5.278
	Course current year	.170	.182	.872	1	.350	1.185	.830	1.692
	Family mental health	.185	.189	.956	1	.328	1.203	.830	1.744
	Parent divorce	.044	.198	.050	1	.824	1.045	.709	1.540
	Parent death	-.391	.445	.771	1	.380	.676	.283	1.619
	Foster care	.351	.457	.591	1	.442	1.421	.580	3.477
	Harsh parenting	.405	.194	4.385	1	.036*	1.500	1.026	2.192
	Physical abuse during childhood	.436	.223	3.819	1	.051	1.546	.999	2.394
	Bullied during childhood	.242	.187	1.670	1	.196	1.273	.883	1.837
	Unwanted sexual experiences	.512	.182	7.882	1	.005**	1.668	1.167	2.384
	Mental health diagnosis	-.811	.248	10.645	1	.001**	.445	.273	.723
	Mental health treatment	.582	.245	5.616	1	.018*	1.789	1.106	2.894
	Psychosis symptoms			29.867	2	<.001			
	Psychosis one symptom	.140	.210	.447	1	.504	1.151	.762	1.737
	Psychosis two symptoms	1.235	.229	28.974	1	<.001**	3.438	2.193	5.390
	Wellbeing total	-.063	.025	6.224	1	.013*	.939	.894	.987
	Anxiety total	-.005	.022	.049	1	.825	.995	.953	1.040
	Depression total	.177	.021	68.381	1	<.001**	1.193	1.144	1.244
	Anorexia score	.006	.204	.001	1	.977	1.006	.675	1.500
	Bulimia score	-.174	.176	.972	1	.324	.841	.595	1.187
	Alcohol use total	.117	.032	13.093	1	<.001**	1.124	1.055	1.198
	Disability	.267	.201	1.761	1	.185	1.306	.880	1.937
	Constant	-4.446	.904	24.203	1	<.001	.012		

**p< .05 **p< .01.* S.E= standard error. CI= Confidence Interval. (95%). Reference categories categorical variables: Ethnic group= white; Sexual orientation= heterosexual; Mental health treatment= no history; Unwanted sexual experiences= no; Physical abuse during childhood= no; Bullied during childhood= no; Harsh parenting= no; Disability= none; Anorexia score= 0; Family mental health history= no history; Course current year= Year one; Parent divorce= no; Gender= male; Bulimia score= zero; Parent death= no; Mental health diagnosis= at least one diagnosis.

Appendix G

Multinomial logistic regression output for predicting the suicidal risk change variable

Table G1

Model fitting information

Imputation Number	Model	Model Fitting Criteria AIC	BIC	-2 Log Likelihood	Likelihood Ratio Tests Chi-Square	df	Sig.
Original data	Intercept Only	2175.574	2191.435	2169.574			
	Final	2065.788	2256.116	1993.788	175.786	33	<.001
1	Intercept Only	2536.550	2552.902	2530.550			
	Final	2391.848	2588.072	2319.848	210.703	33	<.001
2	Intercept Only	2536.550	2552.902	2530.550			
	Final	2392.028	2588.252	2320.028	210.522	33	<.001
3	Intercept Only	2536.550	2552.902	2530.550			
	Final	2393.587	2589.811	2321.587	208.964	33	<.001
4	Intercept Only	2536.550	2552.902	2530.550			
	Final	2394.492	2590.716	2322.492	208.058	33	<.001
5	Intercept Only	2536.550	2552.902	2530.550			
	Final	2393.346	2589.569	2321.346	209.205	33	<.001

Table G2

Pseudo R-Square statistics

Original data	Cox and Snell	.113
	Nagelkerke	.147
	McFadden	.081
1	Cox and Snell	.115
	Nagelkerke	.150
	McFadden	.083
2	Cox and Snell	.115
	Nagelkerke	.150
	McFadden	.083
3	Cox and Snell	.114
	Nagelkerke	.148
	McFadden	.083
4	Cox and Snell	.114
	Nagelkerke	.148
	McFadden	.082
5	Cox and Snell	.114
	Nagelkerke	.149
	McFadden	.083

Table G3

Statistics for variables in the equation

		B	S.E	Wald	df	Sig.	Exp(B)	Lower Bound CI	Upper Bound CI
risk reduces	Intercept	-4.959	.384	166.356[g]	1, 374740.410	<.001			
	wemwbschange	-.066	.070	.897[g]	1, 3740.903	.344	.936	.816	1.073
	gadschange	.004	.060	.005[g]	1, 51221.788	.942	1.004	.894	1.129
	phqchange	-.241	.055	19.198[g]	1, 338560.599	<.001**	.785	.705	.875
	uclalschange	.060	.089	.447[g]	1, 17228319.4	.504	1.061	.891	1.264
	derschange	.073	.066	1.210[g]	1, 375475.361	.271	1.075	.945	1.224
	scschange	-.047	.045	1.088[g]	1, 24276.667	.297	.954	.873	1.042
	rsschange	-.081	.067	1.434[g]	1, 635628.066	.231	.923	.808	1.053
	readchange	-.011	.043	.065[g]	1, 79023277.2	.799	.989	.910	1.076
	brschange	.043	.057	.573[g]	1, 191828.564	.449	1.044	.934	1.166
	auditchange	-.279	.133	4.422[g]	1, 11815.862	.036*	.757	.584	.981
	scichange	.086	.038	5.115[g]	1, 812449.554	.024*	1.089	1.011	1.173
risk remains	Intercept	-2.803	.140	403.463[g]	1, 57286890.7	<.001			
	wemwbschange	.003	.038	.005[g]	1, 641704.660	.946	1.003	.931	1.080
	gadschange	-.075	.033	5.083[g]	1, 1246010.61	.024*	.928	.869	.990
	phqchange	.024	.033	.534[g]	1, 2189711.43	.465	1.025	.960	1.094
	uclalschange	.144	.049	8.700[g]	1, 4407253.69	.003**	1.155	1.049	1.271
	derschange	-.068	.037	3.370[g]	1, 367803013	.066	.934	.868	1.005
	scschange	.006	.026	.055[g]	1, 14393469.1	.815	1.006	.956	1.059
	rsschange	.004	.037	.012[g]	1, 470.737	.912	1.004	.933	1.081
	readchange	-.033	.023	2.175[g]	1, 16512162.4	.140	.967	.925	1.011
	brschange	.010	.035	.083[g]	1, 55121.178	.774	1.010	.944	1.081
	auditchange	-.045	.075	.361[g]	1, 3279995.53	.548	.956	.825	1.107
	scichange	.025	.022	1.356[g]	1, 29673.043	.244	1.026	.983	1.070
risk increases	Intercept	-1.545	.081	361.440[g]	1, 436160.577	<.001			
	wemwbschange	.029	.020	2.239[g]	1, 3628801.77	.135	1.030	.991	1.070
	gadschange	.016	.018	.785[g]	1, 26871.145	.375	1.016	.981	1.052
	phqchange	.142	.018	63.928[g]	1, 37785.161	<.001**	1.152	1.113	1.193
	uclalschange	.000	.025	.000[g]	1, 681567.266	.990	1.000	.952	1.051
	derschange	.019	.019	.965[g]	1, 15830934.5	.326	1.019	.981	1.059
	scschange	.012	.014	.711[g]	1, 47079.342	.399	1.012	.984	1.040
	rsschange	.001	.020	.001[g]	1, 545.060	.977	1.001	.962	1.041
	readchange	-.030	.012	6.775[g]	1, 16234.430	.009**	.970	.948	.993
	brschange	-.013	.018	.537[g]	1, 8660.831	.464	.987	.952	1.022
	auditchange	-.033	.040	.678[g]	1, 1442.932	.410	.968	.895	1.046
	scichange	.029	.012	6.310[g]	1, 4302.385	.012*	1.030	1.006	1.054

Reference category = risk absent. *p<.05 **p<.01. S.E= standard error. CI= Confidence Interval (95%).

Appendix H

Complete cases only (n=1,448) output for multinomial logistic regression for predicting the suicidal risk change variable

		B	S.E.	Wald	df	Sig.	Exp(B)	Lower Bound CI	Upper Bound CI
risk reduces	Intercept	-4.841	.401	145.877	1	<.001			
	wemwbschange	-.037	.071	.275	1	.600	.964	.839	1.107
	gadschange	.021	.065	.100	1	.752	1.021	.898	1.160
	uclalschange	.022	.099	.050	1	.823	1.022	.842	1.241
	phqchange	-.216	.058	14.006	1	<.001**	.806	.720	.902
	derschange	.148	.085	3.031	1	.082	1.159	.982	1.368
	scschange	-.289	.290	.994	1	.319	.749	.425	1.322
	rsschange	-.096	.072	1.781	1	.182	.908	.789	1.046
	readchange	-.151	.188	.646	1	.422	.860	.594	1.243
	brschange	.180	.238	.574	1	.449	1.197	.751	1.908
	auditchange	-.253	.142	3.177	1	.075	.776	.588	1.026
	scichange	.100	.040	6.294	1	.012*	1.105	1.022	1.195
risk remains	Intercept	-2.997	.165	330.035	1	<.001			
	wemwbschange	.009	.040	.055	1	.815	1.009	.934	1.091
	gadschange	-.076	.037	4.252	1	.039*	.927	.862	.996
	uclalschange	.091	.056	2.647	1	.104	1.095	.982	1.222
	phqchange	.035	.036	.937	1	.333	1.035	.965	1.111
	derschange	.212	.044	23.828	1	<.001**	1.237	1.136	1.347
	scschange	-.001	.173	.000	1	.993	.999	.711	1.402
	rsschange	-.002	.039	.002	1	.960	.998	.925	1.077
	readchange	-.368	.102	13.013	1	<.001**	.692	.567	.845
	brschange	.230	.154	2.219	1	.136	1.258	.930	1.702
	auditchange	-.089	.083	1.148	1	.284	.915	.777	1.077
	scichange	.029	.024	1.502	1	.220	1.029	.983	1.078
risk increases	Intercept	-1.611	.092	306.362	1	<.001			
	wemwbschange	.028	.021	1.732	1	.188	1.029	.986	1.073
	gadschange	.005	.020	.077	1	.781	1.005	.968	1.045
	uclalschange	.012	.029	.167	1	.683	1.012	.956	1.071
	phqchange	.141	.020	51.415	1	<.001**	1.151	1.108	1.196
	derschange	.101	.030	11.359	1	<.001**	1.106	1.043	1.173
	scschange	.162	.096	2.848	1	.092	1.176	.974	1.420
	rsschange	-.004	.021	.033	1	.855	.996	.955	1.039
	readchange	-.241	.060	16.398	1	<.001**	.785	.699	.883
	brschange	.002	.115	.000	1	.987	1.002	.799	1.256
	auditchange	-.022	.044	.251	1	.617	.978	.898	1.066
	scichange	.023	.013	3.321	1	.068	1.023	.998	1.049

Reference category = risk absent. *p<.05 **p<.01. S.E= standard error. CI= Confidence Interval (95%).

Appendix I

Research project sign-off sheet

NEWCASTLE UNIVERSITY
DOCTORATE IN CLINICAL PSYCHOLOGY

Research Course: Sign off sheet for Research Projects

	Please tick if it does not apply	Please tick if completed. If not ticked, please provide an explanation	**Trainee name:** **Sophie Brown** **Project title: Suicidal risk factors and interventions to reduce risk in the University student population** *Please add date for each action Please provide brief comment as necessary.*
In line with participant consent, raw and electronic data where consent has been subsequently withdrawn has been dealt with appropriately (e.g. removed) and communicated in writing to the supervisor with responsibility for data keeping.	☑	☐	Date completed: Archival data used from the Nurture-U study.
In line with participant consent, where permission to use data in future studies has been asked for and not been granted, this has been appropriately identified in data bases (e.g. properly labelled) and communicated in writing/document to the supervisor with responsibility for data keeping.	☑	☐	Date completed:
In line with your approved data management plan/ethical approval, the informed consent forms and contact details are a) securely stored in a separate place from any other data, or b) securely destroyed, as the case may be.	☑ ☐	☐ ☐	Date completed: This is managed by the Nurture-U study project team.
In line with your approved data management plan/ethical approval, IDs or codes linking personal data to other data have been securely destroyed.	☑	☐	Date completed: This is managed by the Nurture-U study project team.
In line with your approved data management plan/ethical approval, recruitment logs and other documents containing personally identifiable information have been securely destroyed.	☑	☐	Date completed: This is managed by the Nurture-U study project team.
In line with your approved data management plan/ethical/HRA/sponsors approval, the raw data (e.g. questionnaires, test sheets, data collection logs) have been a) pseudonymized,	☑	☐	Date completed: This is managed by the Nurture-U study project team.

b) properly labelled and c) appropriate arrangements for their storage have been made; d) indications for date of destruction are clearly indicated		☐ ☐ ☐ ☐	

	Please tick if it does not apply	Please tick if completed. If not ticked, please provide an explanation	*Please add date for each action* *Please provide brief comment as necessary.* **:**
Any concerns about participants, adverse effects, follow-up with participants due to distress, concerns raised by participants, disagreements/ incidents that could lead to participant complaint, etc., have been discussed with supervisors, suitably recorded in an appropriate manner, addressed (if required), and signalled (if necessary) to the appropriate ethics and governance frameworks, including the Course and the sponsors. Any correspondence about these matters has either been archived (and pseudon/anonymized if necessary) or destroyed as appropriate Please seek guidance about what is appropriate.	☑	☐ ☐ ☐	Date completed: This is managed by the Nurture-U study project team.
Participants have been debriefed as laid out in Ethics approval.	☑	☐	Date completed: This is managed by the Nurture-U study project team.
Participants have received a lay summary of the results of the study if requested or originally announced.	☑	☐	Date completed: Not offered as part of this study.
Gatekeepers and others facilitating access to participants have been thanked and, wherever relevant, sent a copy of the lay summary.	☐	☑	Date completed: The Nurture-U study project team have been thanked and the findings fed back via email.
Participants and/or institutions, groups, organizations that have facilitated access have received the announced vouchers/course credits/reimbursements and/or the prize draw has been completed.	☑	☐	Date completed: Any survey incentives are managed by the Nurture-U study project team.
Contact details for gatekeepers have been provided to supervisors.	☐	☑	Date completed: Dr Lucy Robinson (supervisor) has contact details for the Nurture-U project study team.
All study advertisements have been removed from websites or other postings.	☑	☐	Date completed:

	Please tick if it does not apply	Please tick if completed. If not ticked, please provide an explanation	*Please add date for each action* *Please provide brief comment as necessary.*
Note: At least one final report should be completed for each project**.* *As a minimum a final report should indicate a) title, b) number, c) statements to the effect that study has been completed, no/some adverse incidents were noted, all obligations toward participants and gatekeepers have been completed, and all data and study materials have been securely destroyed/archived according to the data management plan, d) contact person (normally supervisor) for any further correspondence about the study.* *Some organizations have specific reporting requirements – see their websites/information.* ***If no final report has been submitted, please indicate clearly why not. A final report has not been completed for this project as it is part of a larger programme of work across five UK universities to explore factors influencing student wellbeing. The wider Nurture-U survey project has ethical approval from the University of Newcastle (ref: 24735/2022) however the study is ongoing therefore a report was not provided.			
NHS Ethics Committee has received, as required, progress and final reports about the study.	☐	☐	Date completed: Name of person contacted:
University Ethics Committee has received, as required, a final report about the study.	☐	☐	Date completed: Name of person contacted:
Other approving body or Ethics Committee (e.g. charitable organization) has received a final report about the study.	☐	☐	Date completed: Name of person contacted:
Relevant R & D Departments or other sponsoring organizations have received a final report about the study.	☐	☐	Date completed: Name of person contacted:
HRA site file has been completed and archived according to sponsoring organizations wishes.	☐	☐	Date completed: Name of person contacted:

	Please tick if it does not apply	Please tick if completed. If not ticked, please provide an explanation	*Please add date for each action* *Please provide brief comment as necessary.*
All project related costs have been appropriately been dealt with and outstanding financial issues with the Course, supervisors, or funders have been resolved (e.g. copy costs, travel expenses, vouchers, materials, etc.).	☑	☐	Date completed:
Doctorate Director informed that all project related expenses have been claimed Employer's representative that all project related expenses have been claimed	☑ ☑	☐ ☐	Date completed: Date completed:
Funding bodies have received any required progress and final reports about the study.	☑	☐	Date completed:
Any test materials (including unused recording sheets if purchased), manuals, programs, software belonging to the Course, supervisors, University or other sources or purchased for the study have been returned to the appropriate organization/person.	☑	☐	Date completed:
Any equipment (including recording devices, storage media, mobile phones, sim cards, credit, software, books, manuals, etc.) that belongs to the Course, supervisors, University or other sources or purchased for the study have been returned to the appropriate organization/person. *(add additional items as needed)*	☑	☐	Item: Returned to: Date returned: Item: Returned to: Date returned:
If literature review has been registered on PROSPERO or other data base, status has been updated including closing it down if there is no intention to publish. Note who holds registration (trainee or supervisor)	☑	☐	Review Registration Number: Status: Who holds registration? Updated on:

	Please tick if it does not apply	Please tick if completed. If not ticked, please provide an explanation	*Please add date for each action* *Please provide brief comment as necessary.*
All correspondence concerning the study (e-mails, .pdfs or image files, or paper documents that have been scanned) has been handed over to the supervisors in either/both hard media and/or as an electronically transferred zip file. This includes approvals (peer, ethics, funding agencies), extensions to approvals, amendments, registrations, letters of support or permission, etc.	☑		Date completed:
All study materials in electronic form have been handed over to the supervisors in either/both hard media (CD/DVD; flash drive) and/or as an electronically transferred zip file. This includes: project proposals, ethics applications, requests for amendments, protocols, invitation/ recruitment materials, information sheets, consent forms, questionnaires, tasks and induction materials developed for the study including those on various platforms (e.g. E-Prime, Matlab, Qualtrics, apps, etc.), SOPS, debriefing materials, etc.	☑	☐ ☐	Date completed:
Final copies of the electronically saved raw data, transformed data, and syntax files been handed over to the supervisors in either/both hard media and/or as an electronically transferred zip file.	☐ ☐	☑	Date completed: All copies of data are stored on the Nurture-U team MS teams shared file which supervisor has access to.
Final electronic copies of thesis as well as the project presentation power point have been sent to supervisors.	☐	☑	Date completed: 09.07.25
If appropriate, data has been archived (along with all meta-data) in NU's Data Repository.	☑	☐	Date completed:
Other: Please specify	☐	☐	Date completed:

Signature  *Date: 09.07.25*

Updated By M. H. Freeston, June 2021.