

Suicidal thoughts and behaviours among student nurses and midwives: A systematic review

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Abstract

Aim: To synthesize research investigating suicide, suicide attempts, self-harm and suicide ideation in nursing and midwifery students, a group of interest due to high rates of suicide among qualified nurses. Specific areas of interest for this review included prevalence, factors which may contribute to or mitigate risk and suicide prevention interventions.

Design: A systematic review was conducted, and Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines were followed.

Data Sources: Three electronic databases were searched, and additional articles identified using hand-searching. Studies were included if they examined suicide, suicide attempts, self-harm or suicide ideation in nursing or midwifery students.

Review Methods: Studies were deduplicated and assessed for inclusion. Data from included studies were extracted, quality of studies assessed and data synthesized, informed by study focus, design and assessed quality.

Results: About 46 studies of largely moderate to low quality were identified. A high-quality study demonstrated increased risk of suicide in Swedish female nursing students, and increased risk of self-harm in nursing students of both sexes. Prevalence of suicide ideation did not appear to differ across course year, or between nursing students and students on other programmes. Psychiatric conditions, particularly depression, were associated with suicide ideation. Three studies related to suicide prevention interventions were identified. Integration of wellness initiatives into the curriculum and peer support were preferred interventions among nursing students and teaching staff.

Conclusions: To understand the extent of suicide and self-harm among nursing and midwifery students there is a need for further epidemiological research stratified by programme of study. To develop prevention interventions and initiatives for nursing students, high-quality longitudinal studies should examine characteristics associated with suicide and self-harm.

Impact: Current findings suggest interventions could include support for students experiencing mental health difficulties, foster peer support, and help develop wellness. No patient or public contribution.

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KEYWORDS

self-harm, student midwife, student nurse, suicide, suicide ideation

1 | INTRODUCTION

Nursing professionals have been identified as an occupational group at increased risk of suicide, with strongest evidence for increased risk among females (Groves et al., 2023). Multiple factors may be associated with risk, including psychiatric, physical health, substance use, occupational and interpersonal problems (Groves et al., 2023).

Despite this known risk, the temporality of risk is not known. The nursing profession may attract individuals who already have underlying characteristics related to suicide risk. For example, some mental health nurses enter the role due to lived experience of mental illness (Oates et al., 2018). In addition, nursing practice may introduce factors such as stress (Feskanich et al., 2002) which contributes to risk. Understanding the temporality of risk will inform the development of suicide prevention interventions for nurses. Developing interventions for nurses before and after qualification also presents an opportunity to target risk factors at multiple timepoints.

Concerns regarding the suicide risk of nursing students have been highlighted for many years (Goetz, 1998; Stubin, 2020). However, rates of suicide are not known. Research has shown higher levels of depression and anxiety in nursing students than students on other courses (Tung et al., 2018), and it is known that rates of suicide and self-harm in students (alike the general population) are increasing (Gunnell et al., 2020; McManus & Gunnell, 2020). However, rates of suicide among students overall remain lower than in the general population (Gunnell et al., 2020).

Nursing and midwifery training may expose students to stressors not encountered by students of many other disciplines. This includes having clinical placements (alongside didactic teaching), where nurses may experience stressors including traumatic events and interpersonal challenges with staff (Chernomas & Shapiro, 2013). The COVID-19 pandemic, where some students were deployed into practice, introduced further stressors, such as isolation from family and friends (Swift et al., 2020). The impact of the pandemic on nursing students' well-being has been documented, including a high prevalence of depression, anxiety and PTSD (Mendez-Pinto et al., 2022).

Suicide prevention interventions have been developed for qualified nurses. This includes the Healer Education Assessment and Referral (HEAR) program, which involves educating nurses about risk factors for suicide, anonymous screening for risk and referral of nurses for further treatment (Accardi et al., 2020). Interventions have also been introduced for students generally including gatekeeper training programmes (e.g. for university faculty or residential advisors), and interventions targeting students directly (e.g. screening, education and counselling) (Black et al., 2023). However, due to the unique experiences of nursing students (e.g. exposure to traumatic events), additional content may need to be considered for suicide prevention interventions targeted at nursing students.

2 | THE REVIEW

2.1 | Aims

In response to the known suicide risk among qualified nurses, alongside concerns regarding associated students, there is a need to review related evidence. We aimed to synthesize evidence from studies examining suicidal thoughts and behaviours among student nurses and midwives, focusing on prevalence, associated factors and suicide prevention interventions. Implications for research and prevention initiatives were identified from the findings.

2.2 | Search methods

The electronic databases, Medline, PsycINFO and CINAHL were searched on 5 August 2021 using MESH headings and keywords (see File S1 for search terms). Databases were selected based on their relevance to the topic area. Supplementary hand-searching, including forward and backward citation searching and searching of reference lists of included studies, was subsequently conducted to capture additional articles. The search was updated on 5 October 2022.

2.3 | Inclusion criteria

Empirical studies were eligible if published in English language from 1996 onwards, reflecting the cut-off date of the last systematic review published at the time of searching (Hawton & Vislisl, 1999). Eligible studies examined suicide, suicide attempts, self-harm, suicide ideation or used composite measures related to suicide (e.g. suicide risk) among nursing or midwifery students. Suicide attempts were defined as acts in which a person harms oneself, with the intention to die, and survives (De Leo et al., 2021), and self-harm was defined as intentional self-poisoning or self-injury, irrespective of motivation (Hawton et al., 2003).

2.4 | Search outcome

After identification, articles were deduplicated and reviewed for inclusion using title and abstract screening. One author screened all articles (SG) with a second (KL) reviewing 20%. Full-text assessment was subsequently conducted, with 98.2% agreement. The third author (KH) assisted inclusion decisions when required. Articles examining suicide among qualified nurses and midwives were identified and synthesized in a separate systematic review (Groves et al., 2023). Database searching identified 11,414 articles. Following

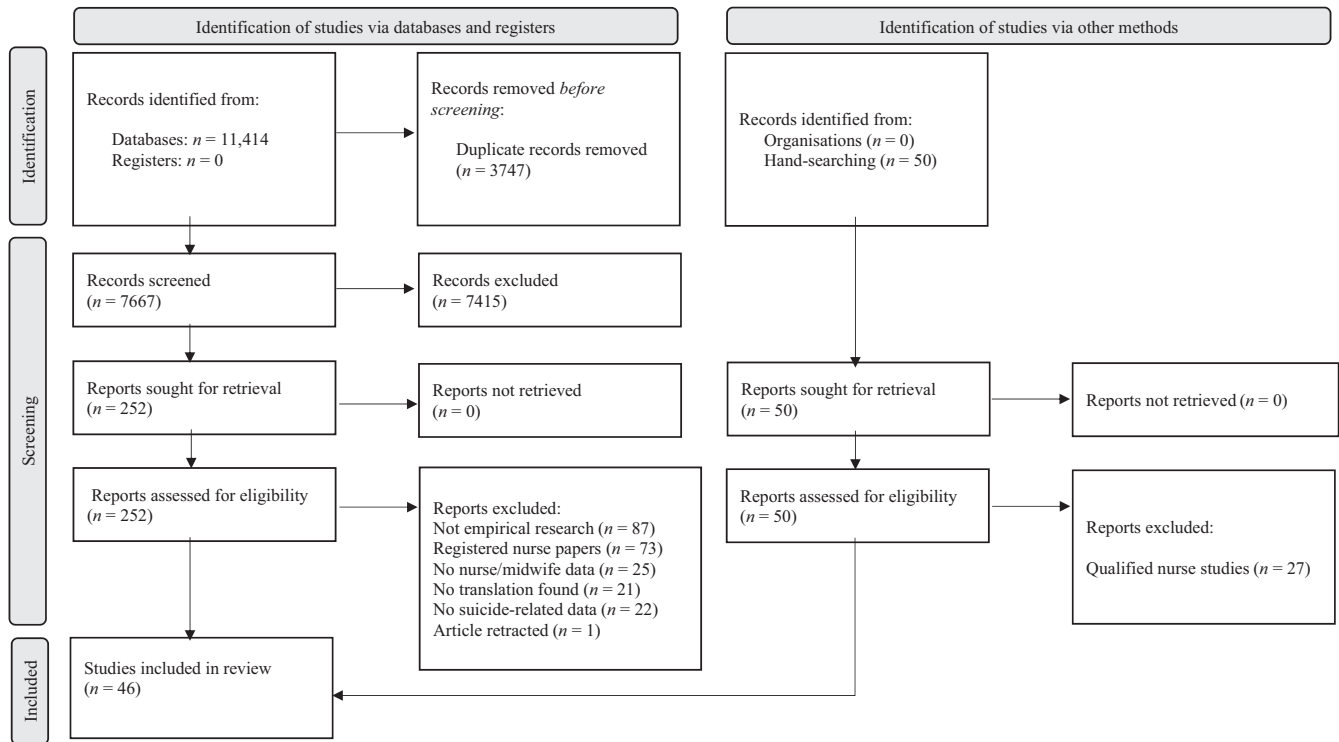


FIGURE 1 PRISMA diagram of inclusion assessment.

deduplication and screening, 23 articles remained. Reasons for exclusion of screened articles are shown in File S1. An additional 23 articles were identified through hand-searching, resulting in 46 included studies. A PRISMA diagram is displayed in Figure 1.

2.5 | Data extraction and quality appraisal

Procedures for data extraction and quality assessment for this review are described elsewhere (Groves et al., 2023). Author SG extracted data with support from the research team. Quality assessment was informed by The Mixed Methods Appraisal Tool (Hong et al., 2018) alongside a quality assessment tool developed for a systematic review regarding suicide in anaesthetists (Plunkett et al., 2021). Studies were deemed as 'high quality' where 70% of criteria were met, 'moderate' at 50%–69% and 'low quality' at lower than 50%. Studies were assessed by one author (SG), with 10% reviewed by a second (KL) (agreement 96.0%).

2.6 | Synthesis

Meta-analytic methods were not appropriate due to the heterogeneity of data reporting across studies. Findings are instead tabulated and summarized using synthesis without meta-analysis. Synthesis was informed by study focus (e.g. ideation, self-harm), design (e.g. survey), and quality, with greater emphasis given to higher quality studies. The systematic review protocol was published on PROSPERO (CRD42021270297), and PRISMA 2020

guidelines (Page et al., 2021) were followed (see File S1 for PRISMA checklist).

3 | RESULTS

This review included 46 studies. An overview of study characteristics is displayed in Table 1. Full study characteristics are shown in File S1. Most studies were published from 2018 onwards ($k=34$) and were of survey design ($k=41$). Studies were conducted in South America ($k=12$), Asia ($k=11$), Europe ($k=8$), North America ($k=7$), the Middle East ($k=5$), Africa ($k=2$) and Oceania ($k=1$). Most studies were moderate ($k=23$), or low quality ($k=17$), with few high-quality studies ($k=6$) (see File S1 for quality assessment scores). Studies related to COVID-19 ($k=2$) were synthesized separately.

3.1 | Suicide

One study in Sweden examined suicide risk among nursing students using a national cohort study (Lageborn et al., 2023). Female nursing students had increased risk of suicide compared to a reference group of education students, including after adjustment for age and calendar year (OR: 2.4 (1.0–5.8)). Male nursing students did not have increased risk (OR: 0.9 [0.3–3.3]). To examine the role of prior vulnerability, risk was further adjusted to account for hospitalization for self-harm and mental illness before university registration. The suicide risk of female nursing students was no longer increased (OR: 0.9 [0.3–3.2]) following adjustment.

TABLE 1 Characteristics of included studies.

Characteristic	Number of studies
Year of publication	
2009–2013	4
2014–2017	8
2018–2022	34
Study area	
Africa	2
Asia	11
Europe	8
Middle East	5
South America	12
North America	7
Oceania	1
Suicide data ^a	
Suicide	1
Attempt	11
Self-harm	5
Ideation	32
Risk/composite	9
Study coverage ^a	
Prevalence	43
Contributory factors	
Mental health and substance use	16
Academic	17
Interpersonal	9
Sociodemographic	12
Other	13
Method of Harm used	0
COVID-19	2
Study design	
Survey ^b	41
Epidemiological	2
Mixed method	0
Intervention	2
Qualitative	1
Quality rating	
High (70% +)	6
Moderate (50–69%)	23
Low (<50%)	17

^aSome studies examined multiple factors and frequencies include factors examining COVID-19 ($N=2$).

^bOne survey included intervention content.

3.2 | Suicide attempts

Eleven studies examined suicide attempts (Albuquerque et al., 2019, 2023; Aradilla-Herrero et al., 2014; Botti et al., 2016; de Moissac et al., 2022; Ebrahim et al., 2021; Moraes et al., 2021; Poreddi

et al., 2021; Quarshie et al., 2019; Silva et al., 2020; Van Hoek et al., 2019). Methods of suicide attempts were not described. Lifetime prevalence of suicide attempts ranged from 1.8% of a sample of nursing students in India (Poreddi et al., 2021) to 22.7% of a Brazilian sample (Moraes et al., 2021). One study compared attempt prevalence to that in non-nursing students. Canadian nursing students at a French-speaking university were more likely to report an attempt than students at an English-speaking university or non-nursing students attending either French or English-speaking courses. Rates of ideation and planning did not differ between groups (de Moissac et al., 2022).

3.2.1 | Contributory factors

Two studies examined factors related to suicide attempts. Student nurses in Belgium with a past suicide attempt were 2.4 times more likely to report intention to leave their course than those without (OR 2.4 [1.4–4.4]) (Van Hoek et al., 2019). A low-quality study examining substance use found that almost all students with a lifetime history of attempted suicide had used legal drugs (e.g. alcohol) within the last 3 months (10 out of 11, 90.9%), and 18.2% (2 out of 11) had used illegal drugs (Botti et al., 2016).

3.3 | Self-harm

Five studies examined self-harm (Heath et al., 2021; Lageborn et al., 2023; Mao et al., 2021; Ramluggun et al., 2018; Safira et al., 2022). Self-harm methods were not described. A study examined frequency and risk of self-harm in a national cohort of Swedish nursing students ($N=62,073$). Prior to starting university, 1.5% had been hospitalized due to self-harm (0.9% males, 1.6% females). During the 3 years following course registration, nursing students of both sexes had increased risk of hospitalization for self-harm compared to a reference group of education students. This trend persisted following adjustment for age, calendar year and prior hospitalization for mental illness or self-harm (OR males: 1.8 [1.1–2.9]; OR females: 1.3 [1.1–1.6]) (Lageborn et al., 2023).

3.3.1 | Contributory factors

Two studies examined the relationship between emotional regulation (ability to manage and respond to own emotions) and self-injury among nursing students. Among a sample in Indonesia, a positive correlation was found between difficulties in emotional regulation as measured by the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004) and self-injury (Safira et al., 2022). The contribution of specific emotion regulation strategies was explored in China using latent profile analyses (Mao et al., 2021). Students categorized as having high (using a range of positive

and negative emotion regulation strategies) and medium (average emotion regulation engagement) emotional regulation profiles had higher incidence of self-injury and alexithymia than students with low (rarely engaging in emotional regulation strategies), or adaptive reaction profiles (engaging in planning and positive reappraisal instead of rumination, catastrophizing and blaming others) (Mao et al., 2021).

A qualitative study conducted in England explored the experiences of nursing students with pre-existing mental health problems, including self-harm (Ramluggun et al., 2018). Students spoke about difficulties surrounding hearing suicide-related content, and hearing stigmatizing views regarding suicide and self-harm from other students. Positive experiences were reported related to support seeking, including non-stigmatizing reactions when self-harm was disclosed to supervisors.

3.4 | Suicide ideation

Thirty-two studies examined suicide ideation among nursing or midwifery students (Abdollahi et al., 2018; Albuquerque et al., 2019, 2023; Alexandrino-Silva et al., 2009; Amazue et al., 2019; Aradilla-Herrero et al., 2014; Balay-odao et al., 2019; Botti et al., 2016; Chiarelo et al., 2021; Chipas et al., 2012; de Moissac et al., 2022; Divya et al., 2022; Fernandes et al., 2018; Ferrara et al., 2022; Harikrishna et al., 2016; Heath et al., 2021; Livingston et al., 2022; McDermott et al., 2020, 2021; Melissa-Halikiopoulou et al., 2011; Monya et al., 2021; Nagaraja et al., 2015; Poreddi et al., 2021; Quarshie et al., 2019; Ren et al., 2021; Risal et al., 2016; Shamsaei et al., 2019; Silva et al., 2020; Sousa et al., 2022; Vedana et al., 2020; Vedana & Zanetti, 2019; Yeh et al., 2016). Measurement of suicide ideation varied widely, including measurement tools used and measurement period (e.g. lifetime or past week). Studies comparing the prevalence of suicide ideation of student nurses with non-nursing students (including other health-related students), found no significant differences (Alexandrino-Silva et al., 2009; de Moissac et al., 2022; McDermott et al., 2021; Sousa et al., 2022).

3.4.1 | Contributory factors

Sixteen studies examined factors which contributed to suicidal ideation (Abdollahi et al., 2018; Alexandrino-Silva et al., 2009; Amazue et al., 2019; Balay-odao et al., 2019; Botti et al., 2016; Chiarelo et al., 2021; Chipas et al., 2012; Ferrara et al., 2022; Harikrishna et al., 2016; Melissa-Halikiopoulou et al., 2011; Ren et al., 2021; Risal et al., 2016; Shamsaei et al., 2019; Vedana et al., 2020; Vedana & Zanetti, 2019; Yeh et al., 2016). These included studies examining sociodemographic characteristics ($k=8$), mental health, well-being and substance use ($k=10$), academic characteristics ($k=10$), interpersonal issues ($k=6$), alongside other factors ($k=7$). No studies examined physical health conditions.

3.4.2 | Sociodemographic

Most studies found no evidence for an association between sex (note sex was often conflated with gender within studies) and suicide ideation (Amazue et al., 2019; Balay-odao et al., 2019; Chipas et al., 2012; Vedana et al., 2020; Vedana & Zanetti, 2019). However, one study in Greece found male student nurses had higher prevalence of suicidal thoughts 'without wanting to carry them out' than female nursing students (Melissa-Halikiopoulou et al., 2011). Three studies looked at the relationship between age and suicide ideation. Among nursing students in Nepal, a correlation was found between older age and ideation (Risal et al., 2016); however, no correlation was found among nurses in Brazil (Vedana & Zanetti, 2019). In another study with students in Nigeria, a significant correlation was found, but was no longer associated once other variables were controlled for (Amazue et al., 2019). No associations were found between suicide ideation and race, ethnicity (Risal et al., 2016) or religious belief, following adjustment (Chiarelo et al., 2021).

3.4.3 | Mental health, well-being and substance use

When examining mental health generally, nursing students in Brazil who reported experiencing a mental health condition or less hope were more likely to report having had lifetime suicide ideation. However, reporting receipt of mental health treatment, or psychotropic drugs was not predictive of ideation (Chiarelo et al., 2021). Multiple studies demonstrated the relationship between depression (or mental pain) and suicide ideation (Amazue et al., 2019; Melissa-Halikiopoulou et al., 2011; Ren et al., 2021; Risal et al., 2016; Shamsaei et al., 2019; Yeh et al., 2016), and weaker evidence was found regarding the contribution of anxiety (Ren et al., 2021; Shamsaei et al., 2019; Yeh et al., 2016). A study examining the network structure of depression and anxiety symptoms among female nursing students in China found that 'thoughts of death' could be partially predicted by other depression and anxiety symptoms. 'Psychomotor agitation/retardation' and 'feelings of worthlessness' had the highest direct relations to these thoughts (Ren et al., 2021).

Only one study examined substance use and suicidal ideation, describing prevalence among student nurses who reported suicidal ideation in their lifetime. Many had used legal drugs (12 out of 17, 70.6%), and some had used illegal drugs (3 out of 17, 17.6%) within the last 3 months (Botti et al., 2016). The contribution of stress has also been explored. Within a sample of students in Malaysia, stress significantly predicted ideation (Abdollahi et al., 2018). Furthermore, among student registered nurse anaesthetists in Canada, those with suicide ideation had higher stress scores than controls (Chipas et al., 2012). Another study found that stress was correlated with, but did not predict, ideation among student nurses in Iran (Shamsaei et al., 2019).

3.4.4 | Academic

Multiple studies examined suicide ideation related to characteristics of nursing courses, such as qualification level (Risal et al., 2016), discipline studied (Vedana et al., 2020) and year/level of study (Alexandrino-Silva et al., 2009; Amazue et al., 2019; Balay-odao et al., 2019; Melissa-Halikiopoulou et al., 2011; Risal et al., 2016; Vedana et al., 2020). All of these characteristics showed no relation to ideation, apart from one study which found students experiencing ideation were mainly in their first or final year (Melissa-Halikiopoulou et al., 2011). Related to academic learning, several studies examined education regarding suicide (e.g. related reading) and perceived professional competence and suicide ideation (Chiarello et al., 2021; Ferrara et al., 2022; Vedana et al., 2020; Vedana & Zanetti, 2019). One such study examining predictive ability of these characteristics found no associations between educational factors or perceived competence and ideation (Chiarello et al., 2021).

3.4.5 | Interpersonal

Several studies explored contact of student nurses with individuals with suicidal behaviours (e.g. family, friends, fellow students). This included 6.3% of student registered nurse anaesthetists who knew of fellow nurse anaesthesia students who had died by suicide during training (Chipas et al., 2012). Of studies examining the relation between contact with individuals with suicidal behaviours and ideation, mixed results were found (Chiarello et al., 2021; Vedana et al., 2020; Vedana & Zanetti, 2019), including one study finding contact was associated with, but not predictive of ideation after adjustment (Chiarello et al., 2021). Two studies examined relationship issues, with one finding dissatisfaction with social support was predictive of suicide ideation (Chiarello et al., 2021), and another finding no predictive association of family interaction type (e.g. communication style) and ideation (Yeh et al., 2016).

3.4.6 | Other factors

Additional factors examined included those related to personality traits, and personal skills. Poor problem-solving skills, stress and low levels of 'hardiness' (ability to have emotional control during stressful situations (Maddi, 2006)), were predictive of suicide ideation among a sample of Malaysian students. Hardiness acted as a moderator whereby students with higher hardiness were less likely to experience ideation, regardless of stress or problem-solving skills (Abdollahi et al., 2018). Among nursing students in Nigeria, mental pain and expression suppression (inhibiting expressing emotions) were associated with greater levels of suicide ideation, whereas cognitive reappraisal was associated with lower levels. Moderation analyses revealed that higher cognitive

reappraisal attenuated the relationship between mental pain and ideation, whereas expression suppression potentiated the relationship (Amazue et al., 2019).

Several studies examined the relation between attitudes towards suicide and suicide ideation (Chiarello et al., 2021; Ferrara et al., 2022; Vedana et al., 2020; Vedana & Zanetti, 2019). Among students from Brazil, belief in the 'right to suicide' predicted reporting experiences of suicidal thoughts (Chiarello et al., 2021). Negative feelings towards people with suicidal behaviours were not related to ideation in three studies (Chiarello et al., 2021; Vedana et al., 2020; Vedana & Zanetti, 2019). However, one study from Italy found students who had experienced ideation had more positive feelings towards people with suicidal behaviours (Ferrara et al., 2022).

3.5 | Composite measures of suicidal thoughts and behaviour

Nine studies used a varying composite measure of suicidal thoughts and behaviours (Aradilla-Herrero et al., 2014; Ciydem & Bilgin, 2021; Divya et al., 2022; Leal & Santos, 2016; López-Narváez et al., 2020; Moraes et al., 2021; Poreddi et al., 2021; Quarshie et al., 2019; Uğurlu & Ona, 2009). Regarding prevalence, one study found no difference in occurrence of suicidal behaviours in nursing students compared with that in medical students (10.3% vs. 11.6%, respectively $p=.73$) (López-Narváez et al., 2020), and another found that students nurses had a lower suicide probability score than students training to be 'health officers' (mean Suicide Probability Scale score 65.96 [19.22] vs. 73.16 [21.65], $p<.05$) (Uğurlu & Ona, 2009).

3.5.1 | Contributory factors

Seven studies examined contributory factors. A study in Ghana found that calculated suicide risk (a score of 7 or more on the Suicide Behavior Questionnaire-Revised [Osman et al., 2001]) was not associated with sex, age, marital status, religion, ethnicity, sexuality, programme of study (midwifery, community nursing or general nursing), school residential status or truancy among nursing and midwifery students (Quarshie et al., 2019). However, the authors highlighted that survey responses may be biased due to the illegality of suicide in Ghana. Another study using the same scale found psychological distress was positively correlated with 'suicidality' among students in Oman (Divya et al., 2022).

Of other studies examining mental health and psychological factors, depression alongside heightened emotional attention predicted suicide risk score in Spanish nursing students; however, other components of emotional intelligence, anxiety, and sex did not (Aradilla-Herrero et al., 2014). Among nursing students in Portugal, using psychotropic medications were associated with suicidal behaviours (OR 2.4 [1.3–4.2]) whereas satisfaction with social support,

alongside reporting more reasons for living, was protective (Leal & Santos, 2016). A study of nursing students in Brazil found not having a partner was related to suicide risk; however, age, sex, year of study, ethnicity, income and religion were not (Moraes et al., 2021). Experience of peer pressure, and lower levels of resilience was found to be associated with suicidal tendency among nursing students in Turkey. However, moderator analysis examining whether resilience moderated the relationship between peer pressure and suicidal tendency was not significant (Ciydem & Bilgin, 2021). Finally, no evidence was found between attitudes towards suicide and experiences of suicidal thoughts or behaviours among students in India (Poreddi et al., 2021).

3.6 | COVID-19

Two studies in Brazil examined factors related to COVID-19. Of 147 students, 10.9% reported suicide ideation '*because of difficulties faced during the pandemic*' and 2.0% reported self-injuring during the pandemic (Jantara et al., 2022). Students reporting either ideation or self-injury scored higher on a loneliness scale than those without. However, ideation and self-injury data used for association tests included reports before the pandemic. Among another sample, 10.2% reported suicide ideation within the last week (data collected January–March 2021) (Carneiro et al., 2022). Students reporting ideation reported multiple problems, including sleep disorder (92.3%), using medication (53.9%) and alcohol (53.9%). Over a third (38.5%) reported using mental health services during the pandemic (Carneiro et al., 2022).

3.7 | Interventions

Three studies examined suicide prevention initiatives. A low-quality study in India examined the attitudes of nursing teachers towards supporting nursing students at risk of suicide (Shah et al., 2016). Teachers thought that student risk may relate to stress, relationship problems, and loneliness. Barriers to providing support included time constraints and perceived preference for peer support among students. Facilitators included training for staff, a dedicated counsellor and increased student-to-teacher ratio. Another study explored ideas which student registered nurse anaesthetists in Canada thought may reduce student stress. Suggestions included provision of peer support, education surrounding stress and health management, and integration of wellness within the training curriculum (Chipas et al., 2012).

An American study explored nursing student's experiences of the '*Cultivating Practices for Resilience*' programme, consisting of several initiatives to support students' well-being and prevent suicide (Heath et al., 2021). Such interventions included provision of a staff member with allocated time to support student mental health, wellness activities (e.g. pet therapy) and a space for resilience-based activities. Over half of students (55%) felt the

programme was valuable for '*managing stress and preventing burn-out and suicide*'.

4 | DISCUSSION

In this systematic review we aimed to synthesize the international literature related to suicidal thoughts and behaviours among student nurses and midwives. Our review identified one study demonstrating increased suicide risk among female nursing students. Most studies examined suicide ideation and were of moderate to low quality, demonstrating a clear need for additional high-quality studies.

The only epidemiological study of suicide within the review demonstrated increased risk among female nursing students, echoing findings regarding qualified female nurses (Davidson et al., 2020; Windsor-Shellard & Gunnell, 2019). Female nursing students had comparatively high prevalence of hospitalization for self-harm prior to registration as a nursing student, and adjustment of suicide risk for previous hospitalization (self-harm or mental illness) reduced the suicide risk of female nursing students to below statistical significance. This preliminary evidence suggests that increased risk among nursing students may be partially explained by vulnerability prior to commencement of training.

Increased inclusivity of university courses, and active encouragement of lived experience involvement within nursing, has likely resulted in greater participation of students with pre-existing mental health conditions and self-harm (Ramluggun et al., 2021). Inclusion of nurses with lived experience enhances the workforce; for example, nurses with personal experience of mental health conditions report increased understanding and empathy towards patients (e.g. Gilbert & Stickley, 2012). However, related to enhanced representation of individuals with lived experience within nursing, universities have a responsibility to ensure prospective students are adequately prepared for what training and practice will entail, and informed choice regarding the suitability of nursing training should be supported. Furthermore, students experiencing mental health conditions need to be appropriately supported, and stigmatization of help seeking challenged. Faculty staff who provide care for students who disclose mental health concerns should be appropriately prepared and supported (Ramluggun et al., 2022). In addition to the importance of support within universities, where students may undergo clinical placement, senior clinical staff or mentors should also have a responsibility for student well-being and implement necessary support strategies. This may include ensuring link-tutors or mentors have resource capacity to provide adequate support to students, preparing staff to support students and establishing effective communication between university and placement tutors to promote consistent support across settings.

The studies showed a range of factors may be related to suicide ideation, self-harm, suicide attempts or related phenomena. Strongest evidence appears to be for the contribution of mental health conditions, particularly depression. This echoes evidence

regarding the contribution of psychiatric conditions to suicide among qualified nurses (Groves et al., 2023), alongside research on university students generally (National Confidential Inquiry into Suicide and Homicide by People with Mental Illness, 2017). Further research should examine the contribution of specific mental health conditions alongside substance use.

The studies underline the importance of social support as a protective factor. Social integration is associated with decreased risk of suicide among qualified female nurses (Tsai et al., 2015). Furthermore, loneliness is a predictor of suicidal thoughts and behaviour, particularly for females aged 16–20 years (McClelland et al., 2020). Interventions to increase social integration and support for student nurses may be beneficial. Peer support programmes have valuable personal and professional effects for nursing students (Carey et al., 2018; Cust & Guest, 2019), and may be preferred to professional help (Morton, 2022). Studies concerning nursing students outside of their country of origin were not identified. Such students may experience multiple interpersonal stressors such as isolation, loneliness, and discrimination. Peer support may be particularly beneficial for this group (Mitchell et al., 2017).

4.1 | Strengths and limitations

The use of a tailored search strategy, data extraction and quality assessment facilitated a thorough review. Studies from multiple countries were included, with several from lower and middle-income countries, where such studies are often under-represented. The varied measurement of suicide-related phenomena within this review limits comparability of results and prevented use of meta-analyses. Included studies were limited to English language publications and academic sources from three databases (alongside hand-searching). Searching of further databases may facilitate identification of additional relevant articles.

4.2 | Implications for future research

Only one study measured suicide risk of student nurses. In the United Kingdom, suicide statistics are collated for all university students (Office for National Statistics, 2022). Stratification of suicide rates by broad programme of study would allow risk among student nurses to be identified (including over time) and would identify university courses where additional preventative measures may be required. Additionally, introducing real-time surveillance of student suicides (including of nursing and midwifery students), would inform the implementation of targeted interventions and facilitate identification of emergent clusters across universities and programmes of study (Marzano et al., 2023). The use of a theoretical or psychological framework may enhance the exploration of suicide among nursing students. For example, the Integrated Motivational-Volitional Model of Suicidal Behaviour (O'Connor & Kirtley, 2018) may be appropriate to explore the complex interplay of factors which may

contribute to suicide risk among such students, alongside the temporality of suicide risk.

Most included studies were cross-sectional. Development of national prospective cohorts of student nurses and midwives which follow students throughout their career would allow contributory factors alongside suicide risk temporality to be further studied. Many studies within the review used a composite score or looked at factors impacting 'suicide risk'. Future studies should separate analyses by suicidal phenomena (e.g. thoughts, attempts). Further studies should also examine risk related to gender and sexuality, given sexual and gender minority university students have been demonstrated to have increased prevalence of suicidal thoughts and attempts than cisgender and heterosexual counterparts (Horwitz et al., 2020), and qualitative evidence has demonstrated experiences of discrimination and harassment targeted at sexual and gender minority nurses by colleagues, management and patients (e.g. Eliason et al., 2011). Only one qualitative study was identified. Such studies exploring the experiences of nursing students with lived experience of suicidal thoughts and behaviours will aid the development of tailored suicide prevention interventions.

5 | CONCLUSIONS

Preliminary evidence suggests that nursing students may have increased risk of self-harm and suicide (in females) than students of other disciplines, with evidence so far showing psychiatric factors are associated with suicidal thoughts and behaviours. Further high-quality studies should examine the prevalence of suicide among such students, alongside associated risk and protective factors. Longitudinal and qualitative studies may be particularly valuable for addressing these research needs. Interventions to prevent suicide and self-harm, including means of fostering peer support, should be developed and implemented from point of student recruitment through to practice. Such initiatives may help enhance student welfare, which might contribute to reducing suicide risk after qualification.

AUTHOR CONTRIBUTIONS

Keith Hawton, Samantha Groves and Karen Lascelles were responsible for study conception and design, and interpretation of the results. Samantha Groves conducted database searches and hand-searching. Samantha Groves and Karen Lascelles assessed studies for eligibility with input from Keith Hawton where required. Samantha Groves extracted and synthesized the data with support from Karen Lascelles and Keith Hawton. Samantha Groves drafted the report, which all authors critically revised for intellectual content. All authors approved the final report and are accountable for all aspects of this work.

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CONFLICT OF INTEREST STATEMENT

KH declares grants from the National Institute for Health Research and the Department of Health and Social Care. He is a member of the National Suicide Prevention Strategy for England Advisory Group and is a National Institute for Health Research (NIHR) Senior Investigator (Emeritus). All other authors declare no competing interests. The views expressed are those of the authors and not necessarily those of the NHS, NIHR or the Department of Health and Social Care.

PEER REVIEW

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DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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