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Non-Suicidal Self-Injury in Adolescents: A Systematic Review on Prevention and Intervention Programmes

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ABSTRACT

Background: Non-suicidal self-injury can be defined as self-inflicted behaviour that involves the direct and deliberate destruction of one's own body tissue without suicidal intent. In recent years, scientific evidence has shown a significant increase in the prevalence rates of non-suicidal self-injury among the adolescent population.

Objectives: The aim of this study was to examine the existing psychotherapeutic interventions and prevention programmes available for addressing non-suicidal self-injury in the adolescent population.

Data Sources: A systematic review of the literature was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. This review was not prospectively registered in PROSPERO. However, it was conducted in accordance with established methodological frameworks, including PRISMA and STROBE. Detailed reporting of the methods enhances transparency and supports replicability. The review included observational studies published between 2013 and 2023. The databases consulted were PubMed, CINAHL, SCOPUS and Web of Science. Out of 1343 initial records, 13 studies met the inclusion criteria.

Conclusions: The results indicated that interventions such as the peer-to-peer prevention programme and Happyles programmes significantly reduced non-suicidal self-injurious behaviours and improved emotional regulation. Effective components of the interventions included self-help kits with sensory regulation tools. The main risk factors identified included poor sleep quality, lack of parental support and adverse childhood experiences. Despite the growing concern about this phenomenon, there is little information on specific interventions targeting self-injurious behaviours, or on preventive programmes.

Implications for Practice: The findings from this study offer guidance to enhance nursing competencies in the early identification, risk assessment, and therapeutic management of non-suicidal self-injury among adolescents. Specifically, the results support the integration of evidence-based interventions such as emotional regulation training, mindfulness techniques, and psychoeducation into nursing practice. Moreover, this knowledge can inform the development of school-based prevention programmes led by community nurses and targeted interventions by mental health nurses, aimed at reducing the incidence and recurrence of non-suicidal self-injury behaviours.

1 | Introduction

Non-suicidal self-injury (NSSI) refers to self-inflicted harm to body tissue without suicidal intent (Klonsky 2007 a). This type of behaviour usually starts to occur between 12 and 14 years of

age (Nock 2010; Muehlenkamp et al. 2012). Earlier onset of NSSI increases the risk of developing a more severe pattern (Wasserman et al. 2010). Prevalence rates are consistently higher among females (Wasserman et al. 2010). Scientific evidence indicates a significant increase in NSSI prevalence among

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Summary

- To effectively address NSSI, interventions should be individualized, focusing on emotional regulation while also considering factors such as family and social support, as well as sleep quality.
- Existing literature suggests that early prevention programmes in schools, such as NSSI-PEP and Hapiless, may contribute to improved psychological well-being and reduced NSSI in adolescents.
- Although current evidence on the effectiveness of prevention programmes in NSSI is limited, preliminary findings indicate potential benefits in certain contexts, warranting further research.

adolescents, rising from 14% during 2000–2010 (Ross and Heath 2002), to approximately 22% according to a recent meta-analysis (Xiao et al. 2022). The psychological functions of NSSI are central to understanding its persistence. According to Nock and Prinstein's Four-Function Model (2004), NSSI is maintained through reinforcement mechanisms (positive or negative) and motivation (interpersonal or intrapersonal) (Nock and Prinstein 2004). Intrapersonal functions, such as emotional regulation and relief, are the most common among adolescents (Klonsky, 2007b; Vega et al. 2018). Although NSSI can offer short-term emotional relief, it is often accompanied by negative feelings like guilt and fear (Xiao et al. 2022).

Regarding treatment, Dialectical Behaviour Therapy for Adolescents (DBT-A) and Mentalisation-Based Treatment for Adolescents (MBT-A) are among the most studied interventions addressing NSSI. However, these therapies tend to focus on broader psychopathological issues beyond NSSI alone. More targeted interventions, such as the Cutting Down Programme (CDP) and Treatment for Self-Injurious Behaviours (T-SIB), have demonstrated effectiveness in reducing NSSI frequency, although replication of these studies remains limited (Calvo et al. 2022).

Likewise, preventive efforts remain underdeveloped. Existing programmes such as the Signs of Self-Injury (SOSI), which focuses on tertiary prevention, are over a decade old and may no longer address current needs (Muehlenkamp et al. 2010). Given the increasing prevalence and early onset of NSSI, it is crucial to strengthen primary prevention strategies aimed at adolescents before these behaviours become entrenched.

In this context, nurses play a fundamental role in the care and management of self-injurious behaviour among adolescents (Morrissey et al. 2018). Whether in mental health services, primary care centres, schools or emergency departments, nurses are often the first point of contact with the healthcare system and maintain frequent and close interactions with patients (Ngune et al. 2021). The nursing role is key throughout the entire care process, especially in early detection, the implementation of evidence-based interventions, and ensuring continuity of care (Yue et al. 2024). Nurses possess the necessary competencies to conduct initial risk assessments and identify early warning signs (Carrascal et al. 2012) enabling them to

activate intervention protocols and refer patients to specialised services when necessary (Ngune et al. 2021). Nurses can also lead preventive initiatives at both the individual and community levels, aiming to promote emotional wellbeing and detect self-injurious behaviours early (Carrascal et al. 2012; Yue et al. 2024).

Considering the critical importance of adolescence for optimal psychosocial development (WHO 2013), the increasing prevalence of NSSI in this population (Xiao et al. 2022), and the fact that NSSI is one of the main risk factors for suicidal behaviour (Alvarez-Subiela. 2022; Macedo et al. 2023), a comprehensive review of the literature is warranted to provide an updated perspective on available interventions and prevention programmes, identifying effective strategies to address NSSI among adolescents. This is particularly relevant because, would not only helps to fill the existing gaps in the literature—such as the limited replication of studies and outdated preventive programmes—but also offer nurses and other healthcare professionals practical, evidence-based tools to support adolescents. This aligns with findings that emphasize the need for nurses to expand their therapeutic skillset to respond effectively to these situations (McGough et al. 2021).

2 | Methods

A systematic literature review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Although this review was not prospectively registered in PROSPERO, we followed established methodological standards, including PRISMA and STROBE guidelines. The methodology is described in detail to promote transparency and replicability.

The main objective of this study is to examine existing interventions and prevention programmes targeting NSSI in the adolescent population. This objective led to the identification of the following research question: (1) among adolescents who engage in NSSI, what interventions and prevention programmes are effective in reducing NSSI behaviours or improving psychosocial outcomes?

2.1 | Eligibility Criteria, Information Sources and Search Strategy

The inclusion criteria used for the search were: (1) observational studies published between 2013 and 2023, (2) full-text access, (3) published in English or Spanish, and (4) working with an adolescent population between 13 and 18 years of age, with the inclusion of participants over 18 years old if they constituted a minority. The exclusion criteria were: (1) articles addressing the subject matter only in the adult population, (2) study methodology, systematic reviews, study protocols or experimental studies. The decision to include only observational studies is based on their appropriateness for examining complex behavioural phenomena, particularly in contexts where experimental research is ethically challenging or unfeasible, such as studies involving minors. Due to the ethical sensitivity of investigating self-injurious behaviour in adolescents, experimental designs are often restricted or yield limited

data. Observational research, by contrast, provides meaningful insights while reducing ethical risks, making it a suitable and realistic evidence base for the present review.

The search was conducted in PubMed, CINAHL, Scopus and Web of Science databases from October 2023 to May 2024. First, keywords were selected according to Medical Subject Headings (MeSH) terminology and free text. The publication filter for the last 10 years was applied. The keywords used in the search were: non-suicidal self-injury, prevention, intervention, adolescent and strategies. Subsequently, the following search strategies were used according to databases PubMed, Scopus and Web of Science: non-suicidal self-injury AND prevention OR non-suicidal self-injury AND interventions; and in CINAHL: non-suicidal self-injury AND prevention OR interventions OR strategies.

2.2 | Study Selection Process

Two researchers independently reviewed the aforementioned databases, examining each record by reading the titles and abstracts. To make the final selection, the articles were read carefully, then peer reviewed using the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) criteria. All items from the STROBE checklist related to the methods section were assessed. Duplicate titles were then eliminated. In cases of disagreement decisions were made based on discussion to arrive at a consensus. No other tools were used to assess the risk of bias.

2.3 | Data Collection Process and Data Mining Process

A data extraction form was designed to capture the key study characteristics of each study. The four reviewers independently extracted the details. Discrepancies were resolved through discussion and consensus. For data synthesis, all studies were reviewed by the four researchers to identify key aspects, including study design, country of origin, objectives and main results.

3 | Results

3.1 | Selection of Studies

The search of the databases resulted 1343 publications. Of these, 69 were eliminated due to duplicity, and 480 because the full text was not available or because they were published before 2013. Subsequently, 729 were eliminated after reading the title and 28 after reading the abstract. Finally, 37 articles were evaluated for eligibility. Seven articles were eliminated because they studied a population older than 18 years, 16 for being non-observational studies and 1 for not being written in English or Spanish. Ultimately, a total of 13 articles were included for review. Figure 1 shows the flowchart of the article selection process according to the PRISMA guidelines (see Figure 1).

3.2 | Characteristics of the Studies

The characteristics of the studies and the main findings are summarised in Table 1. All 13 studies followed an observational design; six were longitudinal studies (Voon et al. 2014; Claes et al. 2015; Liu et al. 2017; Cipriano et al. 2022; Nguyen et al. 2023; Zheng et al. 2023) and seven were cross-sectional (Santens et al. 2018; Wan et al. 2019; Syed et al. 2020; Greenberg et al. 2022; Fenton et al. 2023; Baetens et al. 2024; Yuan et al. 2024). The studies were conducted in nine different countries; four in China (Liu et al. 2017; Wan et al. 2019; Zheng et al. 2023; Yuan et al. 2024), one in Germany (Nguyen et al. 2023), 1 in Canada (Syed et al. 2020), one in Australia (Voon et al. 2014), two in Belgium (Santens et al. 2018; Baetens et al. 2024), one in England (Fenton et al. 2023), one in the United States of America (Greenberg et al. 2022), one in Italy (Cipriano et al. 2022) and one multi-centre study that took place in Belgium and the Netherlands (Claes et al. 2015). The participants in nine of these articles were students (Voon et al. 2014; Claes et al. 2015; Liu et al. 2017; Wan et al. 2019; Cipriano et al. 2022; Greenberg et al. 2022; Zheng et al. 2023; Baetens et al. 2024; Yuan et al. 2024). In one article, a clinical sample was used (Nguyen et al. 2023), one article used family surveys, (Syed et al. 2020), one sample consisted of professionals from Child and Adolescent Mental Health Services (CAMHS) (Fenton et al. 2023), and in one study, the sample involved children in the follow-up by the Child Welfare System (CWS) in Belgium (Santens et al. 2018).

3.3 | Quality Assessment

The quality assessment of the selected studies is presented in Table 1. Of the 13 studies, 8 scored between 7 and 9, indicating high quality (Santens et al. 2018; Wan et al. 2019; Cipriano et al. 2022; Greenberg et al. 2022; Nguyen et al. 2023; Zheng et al. 2023; Baetens et al. 2024; Yuan et al. 2024). Five studies scored between 4 and 6, corresponding to medium methodological quality (Voon et al. 2014; Claes et al. 2015; Liu et al. 2017; Syed et al. 2020; Fenton et al. 2023). No study included in the review scored between 0 and 4 points, which would correspond to low methodological quality.

3.4 | Prevention Strategies

Two studies evaluated NSSI prevention strategies. One researched the peer-to-peer prevention programme (Cipriano et al. 2022), whose characteristics are detailed in Table 2. Both studies were assessed as having high methodological quality, as determined by adherence to the STROBE criteria. The results indicated that students did not report new occurrences of NSSI after the intervention. A significant improvement in emotional regulation skills was detected, as measured by the Difficulties in Emotion Regulation Scale (DERS-18) [$t(58) = 2.126$, $p = 0.038$, $d = 0.27$]. In addition, there was an increase in self-esteem [$t(58) = 4.753$, $p < 0.001$, $d = 0.62$] and body image acceptance [$t(58) = 2.945$, $p = 0.005$, $d = 0.39$], as assessed by the Eating Disorder Inventory-3 (EDI-3) scale.

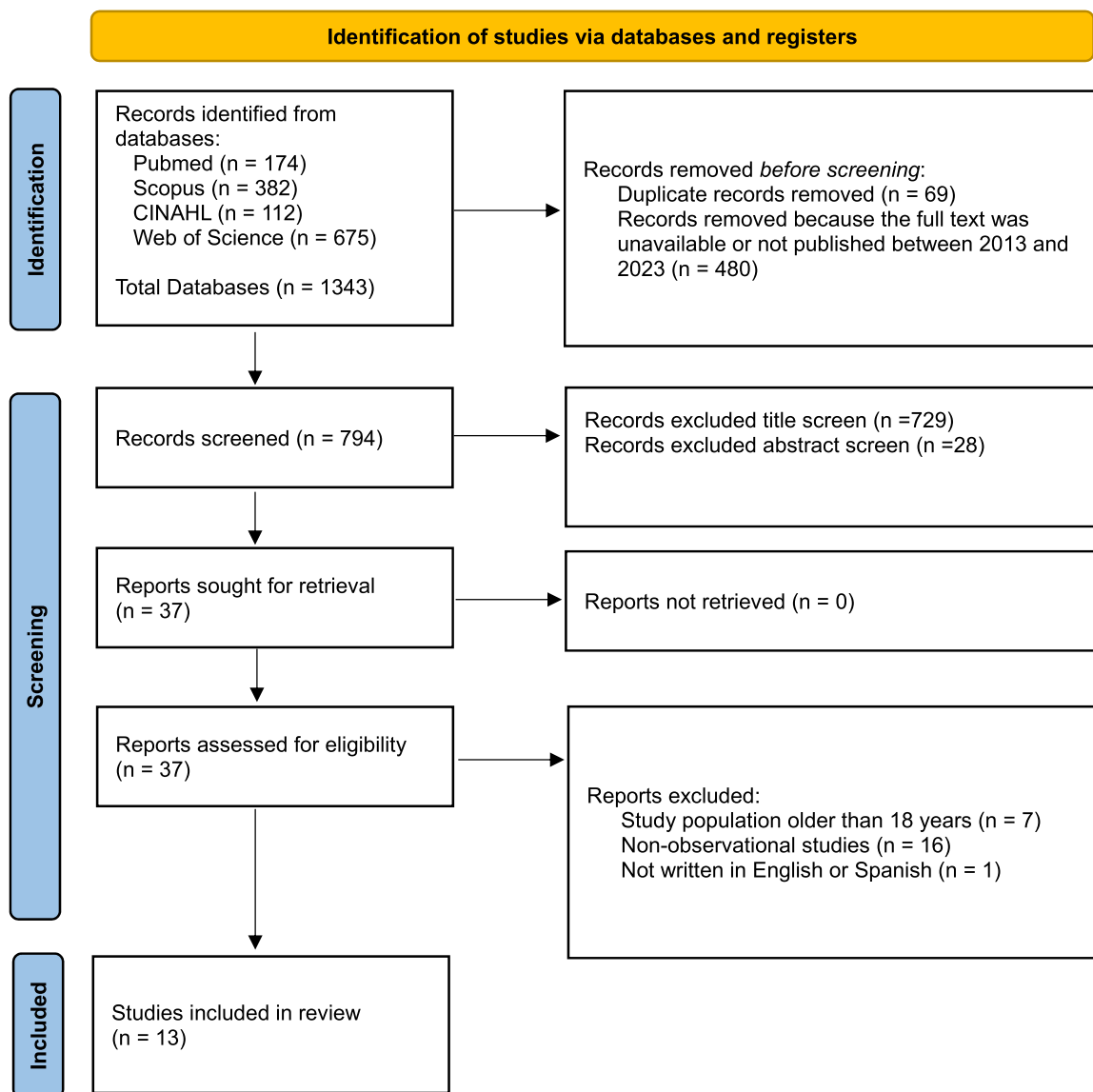


FIGURE 1 | PRISMA diagram of reviewed articles-Search and screening outputs. [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

The second study evaluated the Happyles programme, specifically the KRAS module focused on psychoeducation in the NSSI context (Baetens et al. 2024). The characteristics are detailed in Table 2. The results showed a significant reduction in NSSI, particularly among adolescents with a history of NSSI [$F(1, 327) = 5.12, p = 0.024, \eta^2 = 0.015$], as assessed by the Non-Suicidal Self-Injury Behaviour Scale (NSSI-BS). Additionally, there was a decrease in psychological stress [$F(1, 327) = 8.54, p = 0.004, \eta^2 = 0.025$], measured with the Perceived Stress Scale (PSS), and an increase in help-seeking behaviours [$F(1, 327) = 11.23, p = 0.001, \eta^2 = 0.033$], assessed through the Help-Seeking Behaviour Questionnaire (HSBQ). Furthermore, there was an improvement in emotional regulation strategies [$F(1, 327) = 6.78, p = 0.010, \eta^2 = 0.020$], measured by DERS-18, compared to the control group.

Neither of these studies were implemented by nurses. The NSSI-PEP programme was delivered by peers, who received training provided by psychologists (Cipriano et al. 2022). The Happyles programme was facilitated by school counsellors (Baetens et al. 2024). Additional studies were not included due

to the limited availability of relevant research. One article was excluded specifically because it was a study protocol, rather than an original research article (Kaess et al. 2019).

3.5 | Interventions

Only one article examined interventions for managing NSSI. The study demonstrated moderate methodological quality. The study involved a sample of 251 CAMHS professionals in England who provided feedback on the content needed in self-help kits for adolescents with NSSI. These included sensory elements ($n = 203$), such as tactile, visual, olfactory and auditory objects, which provide a comforting experience. In addition, the inclusion of distracting activities ($n = 49$), such as artistic creation, is recommended to divert attention from negative thoughts. It is also suggested to incorporate reminders of positive experiences ($n = 47$), such as pictures or motivational visuals, and coping strategies ($n = 21$), such as tips and coping lists. Relaxation and mindfulness ($n = 10$) are highlighted as important elements,

TABLE 1 | Summary of study characteristics with key findings and score.

Reference	Year of publication	Title of the journal	Methodology	Age of participants	Objectives	Conclusions	STROBE score
Nguyen et al. (2023)	2023	Journal of psychiatric research	Longitudinal observational	Participants between 11 and 17 years	To examine the relationship between sleep disorders and self-harming behaviours in clinical adolescents with risk and self-harming behaviours	Sleep disturbances and depressive symptoms are predictors of the risk of suicide attempts. However, only depressive symptoms were found to predict NSSI attempts, and not sleep disturbance.	8
Santens et al. (2018)	2018	Child abuse & neglect	Cross-sectional observational	Participants between 10 and 21 years	To explore whether trust in caregiver support and communication about their experiences with their primary caregivers are associated with depressive symptoms and/or self-harm in young people.	Young people's trust in the availability and support of their caregivers is a protective factor for adaptive development. Therefore, attachment relationships between the child and caregivers should be taken into account when preventing or treating depressive symptoms and self-harm in young people. The results of the study suggest that interventions aimed at restoring trust and communication with parents or an alternative caregiver may help to reduce depressive symptoms and self-harm.	8

(Continues)

TABLE 1 | (Continued)

Reference	Year of publication	Title of the journal	Methodology	Age of participants	Objectives	Conclusions	STROBE score
Syed et al. (2020)	2020	Acta Psychiatrica Scandinavica	Cross-sectional observational	Participants between 14 and 17 years	To determine whether knowledge of NSSI in a friend is associated with NSSI and suicidal behaviour in adolescents.	There was consistent evidence of a spillover effect of NSSI in adolescents. Knowledge of a friend's non-suicidal self-injury was additionally associated with personal suicidal ideation and intent. These associations were not explained by mental disorders.	7
Wan et al. (2019)	2019	The British journal of psychiatry: the journal of mental science	Cross-sectional observational	Participants between 10 and 20 years	To examine individual effects and the interaction of adverse childhood experiences and social support on NSSI, suicidal ideation and suicide attempts in adolescents, and to explore gender differences.	Adverse childhood experiences (ACEs) and social support have independent effects on NSSI and suicide in adolescents. Interactions between ACEs and social support were observed in suicide attempts, especially in boys. Girls showed greater vulnerability to NSSI and suicide when social support was low. Social support had an independent effect on NSSI and suicide, even after adjusting the analysis for risk factors.	7
Zheng et al. (2023)	2023	Child abuse & neglect	Longitudinal observational	Participants between 10 and 14 years	To investigate the long-term relationship	A longitudinal relationship was	7

(Continues)

TABLE 1 | (Continued)

Reference	Year of publication	Title of the journal	Methodology	Age of participants	Objectives	Conclusions	STROBE score
Fenton et al. (2023)	2023	International journal of mental health nursing	Cross-sectional observational	Young people, age < 18 years	between childhood emotional maltreatment and NSSI in adolescents, exploring whether sleep problems mediate this association and whether rumination moderates this effect.	found between childhood emotional maltreatment and NSSI over a 12-month period, with sleep problems mediating this effect. This is moderated by the adolescents' level of rumination. This suggests that adolescents who ruminate more and have sleep problems resulting from emotional maltreatment are more likely to resort to NSSI as an emotional regulation strategy.	6

(Continues)

TABLE 1 | (Continued)

Reference	Year of publication	Title of the journal	Methodology	Age of participants	Objectives	Conclusions	STROBE score
Greenberg et al. (2022)	2022	Psychiatry research	Cross-sectional observational	Participants between 14 and 18 years	To explore the relationship between problematic internet use and NSSI with a focus on difficulties in controlling impulses.	These kits should be individualised and contain elements that are meaningful to young people. Problematic internet use and NSSI share issues with impulse control and motivation to change. Impulsivity and sensation seeking are associated with problematic internet use and NSSI. Interventions focused on strengthening impulse control and sensation seeking can prevent and treat both problematic internet use and NSSI.	9
Yuan et al. (2024)	2024	Current Psychology	Cross-sectional observational	Average age participants was 16.22 ± 0.99 years old	The overall aim of the study is to investigate the impact of perceived social support on NSSI in adolescents. It also aims to explore the internal mechanism through which resilience mediates the relationship between perceived social support and NSSI in adolescents and to examine how	Greater perceived social support reduces the likelihood of NSSI. Likewise, resilience has a mediating role between perceived social support and the occurrence of NSSI, which highlights the importance of strengthening resilience to prevent NSSI. The study also highlights hope and resilience as positive	7

(Continues)

TABLE 1 | (Continued)

Reference	Year of publication	Title of the journal	Methodology	Age of participants	Objectives	Conclusions	STROBE score
Cipriano et al. (2022)	2022	Frontiers in Psychiatry	Longitudinal observational	Participants between 11 and 13 years	perceived social support may promote levels of resilience in adolescents through hope, which may reduce the frequency of NSSI.	psychological traits that influence protection against self-injurious behaviour. Finally, the study also highlights the importance of providing a safe external environment for reducing NSSI, as greater perceived social support can reduce emotional negativity and consequently the likelihood of NSSI. The peer education programme can be an effective way to prevent the onset of NSSI and address vulnerability factors that predispose adolescents to NSSI, such as pubertal transformation, body image, self-esteem and emotional regulation. Improvements in emotional regulation and self-esteem in participants suggest the programme positively impacts adolescent well-being.	8

(Continues)

TABLE 1 | (Continued)

Reference	Year of publication	Title of the journal	Methodology	Age of participants	Objectives	Conclusions	STROBE score
Baetens et al. (2024)	2024	Journal of Clinical Medicine	Cross-sectional observational	Participants between 11 and 14 years	To determine whether early intervention in schools can improve emotional regulation, reduce internalising and externalising symptoms, and decrease the frequency of NSSI in adolescents.	After the intervention, improvements in emotional regulation, a decrease in internalising and externalising symptoms, and a reduction in NSSI frequency were observed. Early school-based interventions can be effective in addressing adolescent mental health problems.	8
Voon, et al. (2014)	2014	British Journal of Clinical Psychology	Longitudinal observational	Participants between 12 and 18 years	To examine the association between sleep variables and NSSI in adolescents, independent of demographic factors and mental health problems.	The results suggest that poor sleep quality and nightmares are important risk factors for NSSI in adolescents.	6
Liu et al. (2017)	2017	European Child and Adolescent Psychiatry	Longitudinal observational	Participants between 11 and 18 years	The study researched the associations between bullying,	Bullying and victimisation increased the risk of	6

(Continues)

TABLE 1 | (Continued)

Reference	Year of publication	Title of the journal	Methodology	Age of participants	Objectives	Conclusions	STROBE score
Claes et al. (2015)	2015	Journal of Child and Family Studies	Longitudinal observational	Participants between 12 and 19 years	<p>victimisation, depressed mood and NSSI in adolescents. In addition, it explored the moderating role of parental support in these associations.</p> <p>To analyse the relationship between cognitive reappraisal, anticipatory rumination and non-suicidal self-injury in adolescents.</p>	<p>NSSI, with depressed mood partially mediating these relationships. Parental support moderated these associations, indicating that adolescents with high parental support showed less pronounced relationships between bullying/victimisation and NSSI.</p> <p>Anticipatory rumination significantly moderated the relationship between psychological distress and NSSI, with high levels of anticipatory rumination increasing the likelihood of NSSI in adolescents with high psychological distress.</p>	6

TABLE 2 | Characteristics of studies on prevention strategies.

Study	Description of the intervention	Place of implementation	Programme duration
Cipriano et al. (2022)	Peer-to-peer prevention programme. Focused on improving emotional regulation, self-esteem and body image acceptance.	Implemented in the classroom by older peers	Five weeks. One session per week, lasting 2 h per session.
Baetens et al. (2024)	Universal classroom intervention focusing on emotional regulation, mental health and specific strategies to prevent NSSI and reduce stigma.	Implemented in the classroom by trained teachers	4 h. The allocation of sessions is not specified.

including warm baths, relaxing images and sensory resources. The importance of an individualised approach is emphasised ($n = 11$), allowing the adolescents to participate in selecting the items for their self-help kit, thereby personalising it and making it meaningful.

3.6 | Associated Risk Factors

Ten articles addressed risk factors associated with the occurrence of NSSI that may impact recommendations for prevention strategies and interventions aimed at managing NSSI.

Three articles addressed sleep deprivation as a risk factor (Liu et al. 2017; Nguyen et al. 2023; Zheng et al. 2023). In the study by Zheng et al. (2023), sleep problems were associated with NSSI presentation ($b = 0.13$, $p < 0.001$, 95% CI [0.061, 0.199]). In the study by Liu et al. (2017), it was found that variables such as sleeping < 6 h during the weekend (OR = 1.96, 95% CI = 1.12–3.41), having nightmares during the last year (≥ 1 time per week, OR = 2.96, 95% CI = 1.49–5.88), poor sleep quality (OR = 2.17, 95% CI = 1.35–3.47) and dissatisfaction with sleep (OR = 1.84, 95% CI = 1.01–3.35) were associated with an increased likelihood of NSSI. Conversely, in the study by Nguyen et al. (2023), sleep disorders were not found to predict the occurrence of NSSI (-0.033 , $p > 0.05$). Among the studies reviewed, the one conducted by Nguyen et al. (2023) demonstrated the highest methodological quality. In addition, the studies by Zheng et al. (2023) were also rated as having high methodological quality. Conversely, the study by Liu et al. (2017) was assessed as having moderate methodological quality. These variations in quality should be taken into account when interpreting the findings and drawing conclusions from the overall evidence.

Two articles examined the influence of parental support and relationship quality on the development of NSSI (Claes et al. 2015; Santens et al. 2018). These concluded that the impact of victimisation on the occurrence of NSSI is stronger in contexts of low parental support ($\beta = 0.24$, $p < 0.001$). Santens et al. (2018) found that greater reliance on parental support is related to lower NSSI scores ($r = -0.18$, $p = 0.010$) and ($\beta = -0.14$, $p < 0.05$).

Three articles examined the influence of social support and adverse childhood experiences on NSSI. Claes et al. (2015), found that adolescents with NSSI had a higher victimization score (1.55, SD = 0.63) compared to those without NSSI (1.27, SD = 0.42).

Wan et al. (2019) showed that adverse childhood experiences are significantly associated with an increased risk of NSSI. Adolescents with 1–2 adverse experiences had an adjusted odds ratio of 1.86 (95% CI 1.56–2.23, $p < 0.001$), while those with 5–6 adverse experiences had an odds ratio of 4.65 (95% CI 3.79–5.70, $p < 0.001$). In addition, social support proved to be a significant protective factor. Low social support also increased the risk of NSSI (adjusted odds ratio = 2.00, 95% CI 1.77–2.27, $p < 0.001$). Similarly, Yuan et al. (2024) found that higher perceived social support was associated with lower NSSI levels ($\beta = -0.121$, SE = 0.019, $p < 0.001$, 95% CI = [-0.158, -0.084]).

Three other articles examined different factors associated with NSSI, such as emotional regulation, impulsivity and social learning. In the study by Voon et al. (2014), high levels of anticipatory rumination increased the likelihood of NSSI in adolescents with high psychological distress ($\beta = 0.03$, $p < 0.01$). Greenberg et al. (2022) found that impulsivity and sensation-seeking were associated with both problematic internet use and NSSI. Finally, in the research by Syed et al. (2020), the results showed that knowledge of NSSI in a friend was significantly associated with the personal presence of NSSI (OR = 2.03, CI = 1.05–3.90).

4 | Discussion

This review aimed to examine existing interventions and prevention programmes for NSSI in the adolescent population. Two articles were found on NSSI prevention strategies (Cipriano et al. 2022; Baetens et al. 2024). The results suggest that both the peer-to-peer prevention programme (Cipriano et al. 2022) and the Happyles programme with the KRAS module (Baetens et al. 2024) can improve aspects of psychological well-being and reduce NSSI behaviours in adolescents. The peer-to-peer prevention programme (Cipriano et al. 2022) demonstrated significant improvements in emotional regulation skills, self-esteem and body image acceptance. The absence of a control group in this study limits the ability to attribute these changes exclusively to the intervention. The Happyles programme, which includes the KRAS module focusing on psychoeducation about NSSI (Baetens et al. 2024), showed positive results, such as a significant reduction in NSSI behaviours, decreased psychological stress, increased help-seeking behaviours and improved emotional regulation strategies. Both studies emphasize the importance of school-based preventive interventions, aligning with previous research on the effectiveness of programmes like SOSI in addressing adolescent

mental health issues (Muehlenkamp et al. 2010). Although leadership in mental health prevention is part of the nursing role, none of the preventive programmes were implemented by nurses. This aligns with findings from a meta-analysis on the effectiveness of mental health programmes offered in schools, which identified only one programme led by nurses (Amado-Rodríguez et al. 2022; Casañas et al. 2022). The *EspaiJove.net* mental health literacy programme, implemented in school settings and led by nurses, has demonstrated positive outcomes in its evaluation. Notably, students highlighted the opportunity to openly discuss mental health issues as the most valued aspect of the intervention (Casañas et al. 2020). This finding may be associated with nursing-specific competencies, such as active listening and a non-stigmatizing approach to care.

Only one article addressed NSSI interventions (Fenton et al. 2023). The study provides information on health professionals' perceptions of the components of self-help kits for adolescents with NSSI. The contents were grouped into six categories: sensory elements, distracting activities, reminders of positive experiences, coping strategies, relaxation and mindfulness, and an individually tailored approach. Sensory elements, such as tactile, visual, olfactory and auditory objects, can produce sensory modulation by regulating physiological arousal levels (Scanlan and Novak 2015). Distracting activities are recommended, as attention-intensive activities have been found to be effective in reducing impulsivity (Webb et al. 2012). Reminders of positive experiences promote hope and are particularly useful during episodes of emotional dysregulation (Hughes and Asarnow 2013). Relaxation and mindfulness can promote stress tolerance by promoting relaxation (Gratz 2007; Klonsky and Glenn 2009). These findings are consistent with a systematic review by Turner et al. (2014), which highlights the efficacy of various structured therapies focused on emotional regulation and enhancing coping skills in reducing NSSI. The self-help kit components identified by Fenton et al. (2023) align well with the holistic and person-centred approach inherent to nursing care. Furthermore, many of these strategies can be integrated into nurse-led health promotion sessions or individual care plans. The use of such tools, guided by nursing professionals, could enable timely, low-threshold interventions that are accessible and adaptable to each adolescent's needs.

The results also highlight sleep deprivation as a risk factor for NSSI, showing that poor sleep quality and nightmares significantly increase its likelihood (Liu et al. 2017; Zheng et al. 2023). These findings are consistent with the existing literature, suggesting that there is a relationship between sleep problems and NSSI (Hysing et al. 2015). Conversely, in the study by Nguyen et al. (2023), sleep disorders were not found to predict the occurrence of NSSI. Further investigation with control groups is needed.

Studies by Claes et al. (2015) and Santens et al. (2018) highlight the importance of parental support in reducing NSSI. This aligns with Nock and Favazza (2009) and Yap et al. (2014), who emphasize that parental support and positive family relationships are crucial in decreasing the prevalence of NSSI. Social support and adverse childhood experiences emerged as significant factors, with studies by Wan et al. (2019) and Yuan et al.

(2024) demonstrating that adverse experiences and low social support increase the risk of NSSI. However, these studies face limitations due to heterogeneity and lack of standardisation in the tools for measuring parental support, adverse experiences and social support.

Impulsivity and emotional regulation are associated with NSSI. The studies by Voon et al. (2014) and Greenberg et al. (2022) identified impulsivity and anticipatory rumination as risk factors for NSSI. Along with Nock and Prinstein (2004), Gratz (2007), and Lockwood et al. (2017), they argue that difficulty in regulating emotions and impulsivity are key predictors of NSSI in adolescents. However, most of these studies did not adequately consider cultural and socioeconomic differences. Finally, Syed et al. (2020) suggest that social learning may also condition self-injurious behaviour, noting that knowing someone with NSSI may trigger the occurrence of NSSI in oneself (Jarvi et al. 2013).

This review has limitations. Only observational research was reviewed, potentially excluding relevant studies with other methodologies. The number of articles analysed is limited, and most of them, while providing guidelines on interventions and preventive strategies, do not address the subject matter, but rather focus on risk factors. This limited number of studies reflects the current lack of research in this area, highlighting the need for further studies to better understand and address preventive strategies for NSSI. Furthermore, although some studies use the same scales, most of them research different topics and use different analysis methods, which makes it difficult to compare results. Additionally, the review was not prospectively registered in PROSPERO. Finally, no formal tools were used to assess the risk of bias in the included studies. While a quality assessment was conducted using the STROBE checklist, and a peer-review process was applied to ensure consistency and reduce subjectivity in the evaluation.

5 | Conclusion

Prevention is key for addressing NSSI in adolescents. Despite growing concern about NSSI, there is little evidence on the benefits of specific interventions and preventive programmes. Evidence from programmes such as peer-to-peer prevention programme and HappyPles show significant results in reducing NSSI behaviours. Implementing these strategies in educational settings can offer an effective approach. Incorporating regular assessments of sleep quality, encouraging parental and social support, and strengthening emotional regulation skills are essential components.

It is essential to continue researching and replicating effective prevention interventions that have demonstrated to be successful in reducing NSSI. Nurses involved in mental health promotion and prevention should actively participate in research to increase visibility of their interventions. Future research should incorporate long-term follow-up. Replication studies are particularly needed to validate preliminary findings and ensure the sustainability and transferability of successful programmes.

6 | Relevance for Clinical Practice

The findings of this review underscore the critical role that nurses can play in the prevention and early intervention of NSSI among adolescents. By offering a deeper understanding of the risk factors and contextual variables associated with NSSI, this study supports nurses in identifying vulnerable individuals before the behaviour becomes chronic or more severe.

In clinical practice, these insights can inform the development and implementation of targeted interventions led by nurses. Strengthening emotional regulation skills, incorporating mindfulness-based strategies, and promoting relaxation techniques are evidence-based approaches that nurses can integrate into both individual care plans and group-based programmes. These competencies are not only aligned with holistic nursing care but also contribute to reducing stigma and building therapeutic relationships based on trust and empathy. Importantly, the review highlights the effectiveness of preventive programmes such as the Peer-to-Peer Prevention Programme and the Happyles programme with its KRAS module, both of which can be successfully delivered in school settings by trained nurses. The integration of these initiatives into educational environments reinforces the nurse's role as a key agent in health promotion and prevention among youth.

Author Contributions

All authors have contributed significantly to developing the present work, including study design, data collection and analysis, interpretation of results and drafting the manuscript. All authors have reviewed and approved the final version of the manuscript. Specifically, **Itziar Escofet Colet**: Introduction, methodology, validation, analysis, writing and editing of the manuscript. **Lina Cristina Casadó Marín**: Conceptualisation, methodology, validation and editing. **Rosa Raventós Torner**: Conceptualisation, methodology, validation and editing. **Lydia Orós Navas**: Conceptualisation, methodology, validation, analysis, editing and translation of the manuscript.

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Ethics Statement

Approval of the Clinical Research Committee of the Rovira I Virgili University was not required to carry out this study.

Conflicts of Interest

The authors declare no conflicts of interest.

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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