

# Nursing interventions promoting the safety of adolescents at risk of suicidal behavior – an integrative literature review

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## Abstract

### Introduction

Adolescence is a stage of human development characterized by changes in multiple dimensions of life. These changes can act as significant stressors for adolescents, influencing their mental health. Suicidal behaviors are an escalating concern, posing a threat to adolescent safety and presenting challenges for nurses across various healthcare settings.

### Objective

To identify the available knowledge on nursing interventions that promote safety in adolescents at risk of suicidal behavior and analyze it through the lens of Betty Neuman's Systems Model.

### Methods

We conducted an integrative literature review following Whittemore and Knaf's framework. The search was carried out in April 2024 in the CINAHL Ultimate and MEDLINE databases. Both natural and indexed language related to the terms "adolescent," "suicide risk," and "nursing" were used. The review included theoretical and empirical articles, regardless of methodology, written in English and Portuguese, and published between 2014 and 2024.

### Results

A total of 16 articles met the inclusion criteria. The analysis revealed two main categories of interventions based on the care context: healthcare services and community. In both contexts, nurses engage in primary, secondary, and tertiary prevention. Primary prevention is predominant in community settings, whereas secondary and tertiary prevention are more prominent in healthcare services. Three key interventions emerged as common across all contexts: suicide risk assessment, therapeutic relationships with adolescents, and psychoeducation.

### Conclusion

Nurses play a crucial role in promoting the safety of adolescents at risk of suicidal behavior. Ensuring safety requires interventions that extend across all systems the adolescent is part of, including family, school, other community settings, and various healthcare services.

### Keywords

Adolescent, Suicide, Safety, Nursing care.

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## Introduction

Adolescence is the stage of human development that encompasses the transition between childhood and adulthood. According to the World Health Organization (WHO)<sup>1</sup>, adolescents are individuals aged 10 to 19 years.

From the perspective of Betty Neuman's Systems Model<sup>2</sup>, adolescents are considered complex, multidimensional, and open systems, with a core structure composed of five interactive variables—physiological, psychological, sociocultural, developmental, and spiritual—which function harmoniously in a state of well-being. Adolescence is marked by significant changes across these dimensions, which can be framed within three essential developmental tasks: changes in relationships with parents (through distancing and the pursuit of autonomy), changes in peer relationships (through increased closeness and strengthened bonds), and changes in self-perception and body image<sup>3</sup>.

Adolescence can be a critical period of heightened psychological vulnerability. As a system in transition, the adolescent is exposed to intrapersonal (internal), interpersonal (immediate relationships such as family, friends, and school peers), and extrapersonal (external but indirectly affecting the adolescent, such as the broader community) stressors, which may compromise well-being. The adolescent's response to stressors determines the system's stability or instability and, consequently, their health status. This response depends on the defense lines compromised by stressors and the system's resilience. According to Neuman<sup>2</sup>, the individual's core structure is surrounded by different concentric layers of protection, which include the normal defense line (corresponding to the usual level of well-being), the flexible defense line (which shields against stressors, preventing the system from reacting), and the resistance lines (activated when a stressor breaches the normal defense line, posing a potentially fatal threat due to its proximity to the core). Just as stressors can affect any of these defense lines, the system's response and reconstitution can also occur at any level. If the system's response is positive, it tends toward balance, well-being, and health; if negative, it shifts toward imbalance, leading to illness and, ultimately, death<sup>2</sup>.

Suicide has emerged as a growing problem and is currently the third leading cause of death in adolescence<sup>4</sup>. In Portugal, in 2022, the suicide rate among individuals aged 15 to 24 reached its highest level in the past two decades. According to the National Institute of Statistics (INE)<sup>5</sup>, the number of deaths caused by intentional self-inflicted injuries reached 4.9 per 100,000 inhabitants, a significant increase compared to the 3.2 recorded in the previous year. The WHO<sup>6</sup> defines suicide as the outcome of a deliberate act initiated and carried out by an individual with full knowledge or expectation of a fatal result. It is a complex, multifactorial phenomenon resulting from the interaction of biological, genetic, psychological, social, cultural, and environmental factors<sup>7,8</sup>.

Suicidal behavior is not limited to completed suicide; it encompasses a spectrum of thoughts (suicidal ideation) and behaviors (suicide attempts), both of which are known to potentially precipitate suicide<sup>3</sup>. It is understood as a gradual

process, beginning with suicidal ideation (thoughts, desire, or plans for suicide, without necessarily leading to an attempt), which may or may not progress to a suicide attempt (a self-inflicted act with the intent to die that does not result in death)<sup>7</sup>. Research indicates that each suicide death is preceded, on average, by more than 20 suicide attempts.<sup>8</sup>

According to the International Classification for Nursing Practice (ICNP)<sup>9</sup>, suicidal behaviors are a priority focus in nursing care. The NANDA-International<sup>10</sup> classification of nursing diagnoses includes Risk for Suicidal Behavior (00298) within the Safety and Protection domain, defining it as a "susceptibility to self-injurious behaviors associated with some intent to die." This diagnosis identifies adolescents as a high-risk population and is linked to several risk factors: psychological (low self-esteem, depressive and anxiety symptoms), situational (access to lethal means), social (dysfunctional family relationships, peer pressure, social isolation), and behavioral (difficulty expressing emotions, reluctance to seek help, and impulsivity)<sup>10,11</sup>. In adolescence, most stressors are related to interpersonal relationships (family and school) and intrapersonal relationships (the adolescent's self-perception)<sup>3</sup>. From the perspective of Neuman's Systems Model, these risk factors can act as potential stressors on the system.

Risk factors are counterbalanced by a set of protective factors, referred to as reconstitution factors, which enhance resilience and well-being. Protective factors against suicide risk in adolescence may be intrapersonal (including personal characteristics such as problem-solving ability, willingness to seek help, sense of self-worth, and engagement in life projects), interpersonal (such as positive, supportive relationships with family and peers), or extrapersonal (such as a positive school environment, easy access to healthcare services, and effective coordination with other social and community institutions)<sup>7</sup>. The creation, maintenance, or reinforcement of these protective factors is one of the main strategies for preventing suicide in adolescence<sup>7</sup>.

Scientific evidence has supported a set of recommendations for preventing suicidal behaviors, including reducing access to lethal means, training primary healthcare professionals, strengthening the connection between community health services and mental health services, developing broad multidisciplinary teams for suicide prevention, training media professionals, and increasing literacy to combat stigma surrounding mental illness and suicidal behaviors.<sup>3</sup>

Ensuring safety has historically been the guiding principle of psychiatric care, often justifying the institutionalization of patients and the use of restrictive or oppressive measures that were not always humane. However, in contemporary mental health interventions, the concept of safety promotion requires a broader perspective centered on the continuous management of various risks, including suicide risk<sup>12,13</sup>. Within the scope of this review, safety promotion aligns with the principles of the Nursing Interventions Classification (NIC)<sup>14</sup>, in which the safety promotion

domain includes nursing interventions aimed at protecting individuals from harm. This involves both risk management (interventions designed to reduce and monitor a given risk over time) and crisis management (interventions that provide immediate and short-term assistance). The Suicide Prevention intervention (6340) is classified within this domain.

Nurses occupy a privileged position in preventing suicidal behaviors among adolescents and play a fundamental role in promoting their safety<sup>15</sup>. Ensuring safety means maintaining system stability or enabling system reconstitution, ultimately preventing suicide as a potential outcome of suicidal behaviors.

This integrative literature review (ILR) aimed to identify the available knowledge on nursing care interventions that promote safety in adolescents at risk for suicidal behavior and analyze it through the theoretical lens of Betty Neuman's Systems Model.

### Methods

We conducted this literature review following the methodological framework of Whittemore and Knaf<sup>16</sup>, which comprises five stages: problem identification, literature search, data evaluation, data analysis, and presentation of conclusions. This framework was selected because it allows for the development of comprehensive literature reviews, including theoretical and empirical sources from different methodologies, ensuring reproducibility and rigor in assessing the quality of sources and analysis processes.

#### Stage 1 – Problem Identification

We conducted an initial exploratory search, leading to the identification of adolescent suicide as a critical issue and its contextualization within nursing care. After selecting the topic, the research question variables were defined: adolescents as the Population, suicidal behavior risk as the Concept, and nursing care interventions that promote safety in any care setting as the Context. We formulated the research question as follows: What nursing care interventions promote safety in adolescents at risk of suicidal behavior?

#### Stage 2 – Literature Search

We searched the literature in April 2024 using the EBSCO platform to access two databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL) Ultimate and MEDLINE. These databases were selected based on their robustness and potential scope in identifying relevant findings for the research question. The search strategy was developed using CINAHL Subject Headings—Adolescence, Suicide, and Nursing—and MeSH Terms (Medical Subject Headings)—Adolescent, Suicide, Nursing care, and Nursing, combined with natural language for these terms. Filters were applied directly in the databases to refine the results by language (Portuguese and English) and publication period (2014–2024). The decision to include articles published in the past ten years was based on the

limited number of publications available from the last five years. The search strategy is detailed in Table 1.

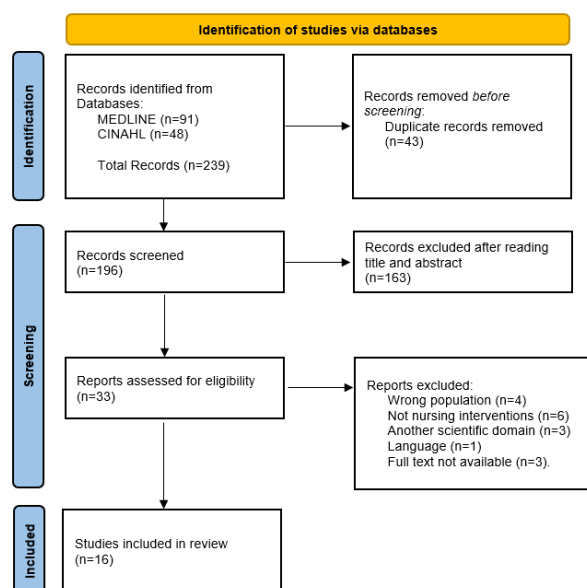
**Table 1.** Search strategy

Database	CINAHL Ultimate	MEDLINE
Access date	10-04-2024	12-04-2024
	CH adolescence OR TI/AB (adolescence OR adolescent OR “teen ager” OR “teen agers” OR teenager* OR teen* youth*)	MH Adolescent OR TI/AB (Adolescent* OR Adolescence OR Teen* OR Teenager* OR Youth*)
	AND	AND
	CH suicide OR TI/AB (suicide OR suicidal)	MH Suicide OR TI/AB (Suicide* OR “Suicidal Ideation” OR “Suicidal ideations” OR “Suicide prevention” OR “Suicide Awareness” OR “Suicide
	AND	AND
Search strategy	CH nursing OR TI/AB (nurse* OR nursing* OR “psychiatric nurs*”) OR teenager* OR teen* youth*)	Preventions” OR “Suicide attempt” OR “Suicide attempts”)
	AND	AND
	TI/AB (intervention* OR prevention OR program* OR strateg* OR trial)	MH (“Nursing care” OR Nursing) OR TI/AB (“Nursing care” OR Nursing*)
Filters		Publication date: 2014-2024 Publication language: Portuguese or English

Legend – CH (CINAHL Subject Headings); MH (Medical Subject Heading); TI – Title; AB – Abstract; \* Truncation for expanded word search

Inclusion criteria were established as follows: articles involving or focusing on adolescents, addressing suicide risk and safety strategies in any setting. The review included both theoretical and empirical studies, regardless of research type, as well as literature reviews. Exclusion criteria were also defined: articles that did not specifically address nursing interventions, studies on self-harming behaviors without suicidal ideation, adaptation and validation studies of instruments, literature review protocols, experimental study protocols, and opinion articles. Whenever studies included samples composed of both adolescents and participants from other age groups, they were only included if the specific results of the adolescent population could be analyzed or if adolescents comprised at least 75% of the sample.

From the conducted search, we identified 239 articles. After removing 43 duplicate articles using Rayyan<sup>®</sup> software, 196 articles remained. Using the same software, we conducted a blinded selection process by reading titles and abstracts. Two researchers independently screened 98 articles, while two others reviewed the remaining. Any disagreements were resolved through consensus with a sixth author. At the end of this process, 33 articles were selected for full-text reading. Following this stage, 16 articles were included in the final sample for review. The selection process is outlined in a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram, in Figure 1.



**Figure 1.** Selection Process - PRISMA flow diagram  
Source: Adapted from The PRISMA 2020 statement: an updated guideline for reporting systematic reviews.

### Stage 3 – Data Evaluation

We extracted data from the 16 articles based on the variables we defined: year of publication, country, authors, study objective, population/sample, method (study type), and results (nursing interventions). To ensure consistency among all authors, we used a standardized table for data extraction. Given the diversity of methodologies in the included studies, we assessed the quality of the articles using the criteria established by Whittmore and Knaf<sup>16</sup>. We applied a two-point scale (1 - Less appropriate and 2 - Highly appropriate) to classify each article in terms of Methodological Rigor (MR) and Theoretical Rigor (TR). Articles were considered highly appropriate in MR when they presented a clear protocol, including the study sample, objective, and method. When this structure was not explicitly outlined, they were rated as less appropriate. For TR, we classified articles as highly appropriate if they directly and objectively addressed nursing interventions, whereas those that discussed interventions only indirectly were rated as less appropriate. No articles were excluded based on this evaluation. Two members of the author group conducted the assessment, reaching a consensus on each classification.

### Stage 4 – Data Analysis

Data analysis involved reduction, visualization, comparison, and verification. We identified and grouped articles presenting results that fit into two main intervention contexts: nursing interventions in the community and nursing interventions in healthcare services. Within each of these groups, we categorized the interventions according to their level of prevention

(primary, secondary, and tertiary) and their dimension (intrapersonal, interpersonal, and extrapersonal). We then analyzed the data using Betty Neuman's theoretical framework, considering its core concepts. To enhance this analysis, we cross-referenced findings with other scientific sources, identifying similarities and discrepancies both within and across subgroups.

### Stage 5 – Presentation of Conclusions

Following Whittmore and Knaf's<sup>16</sup> recommendations, we prioritized graphical resources to present the conclusions. As part of this approach, we created a table categorizing the nursing interventions identified in the literature, structured according to the selected theoretical framework.

Since this study is a literature review, it was not submitted to an ethics review board. However, we ensured that all primary studies included in the results complied with the necessary ethical principles and procedures for research integrity.

### Results

The results are systematized in Table 2 and stem from data extraction from each article, considering the variables we defined in the data evaluation and analysis stages.

Half of the sample (8) consists of articles published in the last five years, while the remaining articles were published between five and ten years ago. Half of the studies were conducted in the United States (8), while the others were carried out in Indonesia (2), Thailand (2), Canada (1), Portugal (1), Sweden (1), and the United Kingdom (1).

Most studies employed qualitative research methods (7), while only three used quantitative approaches. Additionally, the review identified two literature reviews—one narrative review on suicide risk assessment instruments and one scoping review on the use of the Safety Plan—as well as four theoretical articles.

All articles were published in nursing journals, with six specifically appearing in mental health nursing journals. According to the Scimago Journal Rank<sup>17</sup>, six articles were published in Q2 journals, seven in Q3 journals, and two in Q4 journals.

Among the analyzed articles, seven included adolescent samples. Other studies focused on the school community (6), the general community (1), and nurses providing care to adolescents in school settings and psychiatric services (2). The theoretical articles broadly centered on adolescents (2) and adolescents within a youth camp setting (1).

Regarding the risk of suicidal behavior, nearly half of the articles (7) addressed safety-promoting interventions, focusing on early identification and suicide risk stratification. The remaining studies specifically explored interventions for cases where the risk had already been identified (8), and one study on interventions applicable regardless of whether the risk had been previously identified (1).

The examined articles present a wide range of interventions implemented within healthcare institutions, particularly in mental health services, including both inpatient and

outpatient care (7 articles). These interventions target not only adolescents but also their families, especially parents. Among the identified interventions are suicide risk assessment<sup>18,19,20,21,22,23</sup>, the development of a therapeutic relationship that fosters insight and new coping mechanisms<sup>19,24,25</sup>, the creation of a Safety Plan<sup>19,24,26,27</sup>, and discharge planning after hospitalization, ensuring coordination with parents and schools<sup>23,28</sup>.

Additionally, several community-based interventions were identified (9 articles). Many studies emphasized school-based interventions<sup>20,21,22,27,29,30,31</sup>, but others highlighted

recreational settings for adolescents<sup>32</sup> and the broader community surrounding the adolescent<sup>33</sup>.

Some interventions were common across both settings, including suicide risk assessment<sup>18,19,20,21,22,23</sup>, mental state assessment<sup>22</sup>, emotional support<sup>20,21,23,26</sup>, cognitive-behavioral techniques, and increasing literacy among all stakeholders<sup>22,25,26,27,29,33</sup>.

This review also identified the need for training healthcare professionals, especially nurses, as an essential factor for promoting adolescent safety in the context of suicide risk<sup>28</sup>

**Table 2** – Summary of the obtained results (n = 16)

Year and Country	Authors	Objective	Population/ Sample	Method	Results	Quality Assessment
2015 United States of America	Glodstein	Examine suicide prevention and education in adolescence within youth camps. Suggest suicide prevention strategies for a community of campers.	The article reflects the perspective of a mental health and psychiatric nurse with experience in youth camps.	Theoretical Article	The author of the article proposes a model that includes the following interventions: - One month before the camp: reviewing all health assessments and family forms to identify and raise awareness among responsible adults about adolescents with mental health issues, those taking psychotropic medications, and/or those at risk of suicide; - During orientation: psychoeducation on suicide for adolescents, parents, and camp staff, including the screening of a film that tells the story of a suicidal adolescent to stimulate discussion on the topic; - Providing information on the camp's safety policy, emphasizing that any suicidal statement or gesture should be taken seriously and require evaluation by qualified professionals, as well as an overnight stay in the Emergency Department. Until transported to the hospital, the adolescent must remain under 1:1 supervision by a nurse.	MR- 1 TR- 1  2 Points
2016 United States of America	Matel-Anderson e Bekhet	Explore resilience in adolescents who have survived a suicide attempt from the perspective of mental health nurses.	Nine mental health nurses, aged between 22 and 64 years, with experience ranging from 6 months to 30 years. The nurses were recruited from two mental health and psychiatric services: one dedicated to adolescents aged 13 to 17 years, and another serving children and youth aged 5 to 18 years.	Descriptive qualitative study. A 2-hour focus group was conducted. Seven questions were posed, covering the themes of suicide risk factors, protective factors, and nursing interventions.	- Emotional support; - Encouraging the expression of feelings; - Early suicide risk assessment in all healthcare settings (not only in psychiatric services); - Reducing stigma in schools and the community; - Discharge preparation (acknowledging the adolescent's progress during hospitalization so they can also recognize their ability at discharge); - Maintaining contact after discharge; - Providing crisis helplines in the community.	MR- 2 TR- 2  4 Points
2016 Canada	Patterson	Present and discuss suicide risk assessment tools for the youth population.	Articles on various suicide risk assessment tools	Narrative literature review.	The identified assessment tools were: - Beck Scale for Suicidal Ideation - Columbia Suicide Severity Rating Scale - Modified Scale for Suicide Ideation - Reasons for Living Inventory - Sad Persons Scale - Suicidal Behaviours Questionnaire - Suicide Probability Scale - Tool for Assessment of Suicide Risk. There is limited available evidence on screening tools that accurately identify youth at risk of suicide.	MR- 1 TR- 1  2 -
2016 United States of America	Ramirez	Explore explanatory theories of suicide in vulnerable groups—children,	-	Theoretical Article	- Assessing and recognizing adolescent risk and protective factors; - Establishing a therapeutic relationship based on trust, respect, understanding, and responsibility;	MR- 1 TR- 2  3 Points

		adolescents, and older adults—and analyze nurses' responsibilities in suicide prevention, assessment, and treatment of individuals at risk.			<ul style="list-style-type: none"> <li>- Utilizing communication techniques that address the adolescent with empathy;</li> <li>- Promoting hope;</li> <li>- Supporting the recognition of stressful situations that may trigger suicidal thoughts and encouraging the sharing of these thoughts;</li> <li>- Teaching effective coping strategies and new ways to manage emotions;</li> <li>- Promoting simple decision-making;</li> <li>- Providing adolescents and their families with information on mental illnesses, symptom management, warning signs, and stigma;</li> <li>- Supplying a resource list at discharge (24-hour emergency hotline and crisis response instructions);</li> <li>- Ensuring monitoring at high-risk moments (admission, shift changes, unit transfers, discharge, and receiving bad news).</li> </ul>	
2017	Morgan	Discuss the specificities of suicide risk among high school adolescents who have been adopted.	High school adolescents who were adopted	Theoretical Article	<ul style="list-style-type: none"> <li>- Assessing suicide risk in schools;</li> <li>- Evaluating the adolescent's mental state when suicide risk is identified;</li> <li>- Referring adolescents to specialized professionals;</li> <li>- Implementing suicide prevention programs (e.g., the SOS Prevention Program);</li> <li>- Health education on suicide (warning signs) for parents, teachers, and students.</li> </ul>	MR- 1 TR- 2  3 Points
2018	Roberts, Taylor e Pyle	Explain a perspective on suicide as a public health issue, the current challenges faced by students, and the role of school nurses in suicide prevention. Describe an educational suicide prevention program to be implemented as a community-based project in a large suburban public school district in Texas.	School community of a suburban district in Texas, including school nurses, teachers, staff, students, and families	Theoretical Article	<ul style="list-style-type: none"> <li>- Involving school nurses in open and productive discussions with parents and families about suicide-related concerns;</li> <li>- Raising awareness among the school community about suicide prevention;</li> <li>- Assessing suicide warning signs: suicidal ideation, social withdrawal, expressed suicide plan, acute agitation or anxiety, and other sudden and significant behavioral changes;</li> <li>- Evaluating and developing an individualized Safety Plan</li> <li>- Crisis intervention.</li> </ul>	MR- 1 TR- 2  3 Points
2018	Chaniang, Fongkaew, Stone, Sethabouppha, Lirtmunlikaporn e Schepp	Investigate the perceptions of adolescents, teachers, and parents regarding the causes and prevention of suicide.	Participants were recruited from a public school in Thailand: 40 high school adolescents, 4 mothers of students from the adolescent group, and 3 teachers with experience working with students at risk of suicide.	Descriptive qualitative study. The 40 adolescents were divided into groups of 10 participants, and a 60-minute interview was conducted. Parents and teachers also participated in in-depth interviews of the same duration.	<ul style="list-style-type: none"> <li>- Universal strategies: health education on suicide, suicide awareness, and developing suicide prevention skills;</li> <li>- Selective strategies: suicide risk assessment, training adults (teachers and parents) to understand and support at-risk adolescents, and promoting peer support;</li> <li>- Indicated strategies (for youth with identified suicidal thoughts and behaviors).</li> </ul>	MR- 2 TR- 2  4 Points
2018	Chaniang, Fongkaew, Stone, Sethabouppha e Lirtmunlikaporn	Report on the development and implementation of a pilot suicide prevention program.	Participants from a suburban school in Thailand: 12 adolescents (Core Working Group - CWG), 165 school students, 113 parents, and 60 teachers.	Qualitative study. The main study was conducted in three stages: 1- Situation analysis; 2- Collaboration with the CWG for program implementation, adapting it to the context; 3- Program evaluation. The article focuses on stages 2 and 3.	The article presents a suicide prevention program that includes the following interventions: <ul style="list-style-type: none"> <li>- Assessing suicide-related knowledge;</li> <li>- Encouraging experience-sharing and facilitating discussions;</li> <li>- Supporting and stimulating the identification of problem-solving strategies related to suicide prevention;</li> <li>- Educational intervention for parents on adolescent development, parenting styles, communication with adolescents, and expectation management;</li> <li>- Educational intervention for adolescents, parents, and teachers using games, role-playing, and videos;</li> </ul>	MR- 2 TR- 2  4 Points

2019 Indonesia	Nasution, Keliati e Wardani	Determine the effects of Cognitive Behavioral Therapy (CBT) and Peer Leadership (PL) on suicidal ideation among high school adolescents.	Adolescents (n=86) from a secondary school. They were randomly divided into two groups. Group 1 received CBT and PL. Group 2 received the standard approach from mental health nurses.	Quasi-experimental quantitative study with pre- and post-test evaluation.	- Combining Cognitive Behavioral Therapy (CBT) and Peer Leadership (PL). This intervention reduced suicidal ideation, depression, anxiety, and suicide attempts in depressed adolescents.	MR- 2 Points TR- 1 point 3 Points
2019 United States of America	Kim, Walsh, Pike e Thompson	Investigate whether cyberbullying and victimization increase suicide risk.	Ninety-three adolescents (61 male), with an average age of 15 years.	Longitudinal quantitative study. Data from a bullying prevention program for high school students were used, with a follow-up period of 2.5 years.	- Facilitating connections between students, teachers, and other school personnel; - Providing emotional support - Assessing suicide risk in both cyberbullying victims and perpetrators; - Intervening in bullying-related behaviors and situations.	MR- 2 TR- 1 3 Points
2019 Indonesia	Wulandari, Keliati e Mustikasari	Assess the role of school connectedness in cyberbullying and suicide risk.	Forty-three adolescents, aged 15 to 18 years, recruited from a secondary school in Indonesia	Quasi-experimental quantitative study with pre- and post-test evaluation, without a control group. A peer leadership training intervention was implemented through structured sessions. Assessments were conducted before and after the intervention (3 weeks later), using the Beck Scale for Suicide Ideation.	- Peer leadership training The intervention reduced suicidal ideation among adolescents.	MR- 2 TR- 1 3 Points
2020 Portugal	Simões, Santos e Martinho	Determine the effect of peer leadership training on suicidal ideation in high school adolescents.	Adolescents (n=33), aged 10 to 19 years, with suicidal behavior and a history of hospitalization in a child psychiatric unit	Descriptive exploratory qualitative study. Data were collected through semi-structured interviews and analyzed using content analysis.	- Protective factors against recurrent suicidal behavior: family, friends, and other trusted individuals, as well as coping strategies learned during hospitalization; - Key aspects of hospitalization: psychological support, healthcare professionals, occupational activities, individual therapeutic interventions, and improvements in the hospital environment (e.g., extended visitation hours and greater privacy); - Post-discharge expectations: maintaining contact with nurses after hospital discharge.	MR- 2 TR-2 4 Points
2020 Sweden	Omerov, Kneck, Karlsson, Cronqvist e Bullington	Identify protective factors against recurrent suicidal behaviors in adolescents, recognize key aspects of hospitalization, and discuss expectations for follow-up nursing care after hospital discharge.	Six nurses recruited from psychiatric outpatient services and specialists in suicide prevention	Qualitative study. Semi-structured interviews were conducted.	- Knowledge of warning signs; - Presence and use of an empathetic approach; - Establishing a trusting relationship with the adolescent by actively listening, valuing their concerns, allowing them to speak without interruption or judgment, reassuring them they are not alone, and avoiding minimization of their difficulties; - Using physical touch and comforting words; - Forming a partnership with the adolescent as “two experts,” working together to identify triggers for suicidal behavior and develop a Safety Plan; - Creating space for new ways of thinking; - Supporting problem-solving and assisting in developing coping strategies; - Helping adolescents analyze the benefits of choosing life.	MR- 2 TR- 2 4 Points
2020 United States of America	Polacek e Delaney	Understand how psychiatric outpatient nurses perceive their contribution to suicide prevention in young people	Community in the state of Oregon, United States	Case Study	The initiative adopted a community participation model designed to strengthen community capacity and included strategies such as: - Increasing knowledge about youth suicide risk; - Training individuals to become “suicide gatekeepers”; - Raising public and professional awareness of the impact of adverse childhood experiences; - Reducing stigma to encourage help-seeking behaviors.	MR-1 TR- 1 2 Points

		with suicidal behaviors.				
2022 United States of America	Bradley e Toole	Report and discuss a local community initiative developed by the first author (a nurse) as part of a national challenge to reduce adolescent suicide.	One 15-year-old adolescent with self-harming behaviors and depression	Case Study	<ul style="list-style-type: none"> <li>- Using screening tools and inquiries about depression, suicidal thoughts, and other suicide-related risk factors in routine consultations (for history-taking and follow-up);</li> <li>- Ensuring close interprofessional follow-up;</li> <li>- Addressing adolescent concerns openly and honestly, listening attentively, and expressing compassion and empathy;</li> <li>- Identifying coping strategies with the adolescent;</li> <li>- Developing an individualized Safety Plan;</li> <li>- Educating about the removal of lethal means at home;</li> <li>- Listing useful resources – nurses should be familiar with local, regional, and national suicide prevention resources for adolescents, such as crisis hotlines, community mental health centers, and community crisis intervention teams;</li> <li>- Engaging a multidisciplinary team focused on the adolescent, including community outreach teams, to ensure effective care coordination.</li> </ul>	MR- 1 TR- 2  3 Points
2022 United Kingdom	Abbott-Smith, Ring, Dougall e Davey	Discuss and evaluate risk signs, assessment tools, and nursing interventions regarding suicide risk in adolescents with depression.	Articles from studies involving children and youth up to 18 years old with suicidal ideation	Scoping Literature Review	<p>Seven key elements should be included in the adolescent's Safety Plan:</p> <ul style="list-style-type: none"> <li>- Warning signs indicating the onset of a crisis;</li> <li>- Coping strategies to divert suicidal thoughts;</li> <li>- Places and people who can help distract from suicidal thoughts;</li> <li>- Trusted individuals who can be contacted during a crisis;</li> <li>- Mental health professionals and their availability, as well as emergency contact numbers to use in a crisis;</li> <li>- Removal of potential suicide means from the environment;</li> <li>- Important reasons for living.</li> </ul> <p>Parental/Caregiver involvement is a key component of the Safety Plan. Nurses should ensure:</p> <ul style="list-style-type: none"> <li>- Sharing the Safety Plan with parents and encouraging its use;</li> <li>- Psychoeducation on warning signs and appropriate crisis response;</li> <li>- Supporting parents in building their own support network and identifying emergency contacts;</li> <li>- Providing education and encouragement for supervision and monitoring.</li> </ul>	MR- 1 TR- 2  3 Points

## Discussion

The diversity of interventions identified in this ILR underscores the critical role of nurses in preventing suicidal behaviors and highlights the broad scope of their involvement across various settings where they provide care for adolescents.

The findings encompass two primary contexts of intervention for adolescents at risk of suicide: the community and healthcare services. We classified articles discussing adolescents within their social environments (neighborhood, city, country), family settings, schools, or other recreational contexts under the category “Community-Based Interventions.” Meanwhile, the category “Healthcare Services Interventions” includes all studies related to healthcare services, ranging from primary care to specialized mental health services, including emergency departments, outpatient clinics, and inpatient units. Although primary healthcare could logically fall into either category due to its geographic location within community structures, we opted to classify studies on primary care within healthcare services. This decision was based on the idea that this category more specifically reflects the structured healthcare approach to adolescent

care, such as adolescent health surveillance consultations. Some studies also explored interventions aimed at bridging these settings, such as post-discharge support for parents to enhance adolescent monitoring and emotional support<sup>19,25,26</sup> or strategies to strengthen collaboration with school-based nurses.<sup>27</sup>

The analysis of data through the lens of Betty Neuman's theoretical framework enabled the identification of nursing interventions within the three levels of prevention—primary, secondary, and tertiary. We classified primary prevention interventions as those that empower adolescents to manage difficulties and negative emotions, primarily by strengthening their protective factors. This approach aims to prevent suicidal behaviors—whether in the form of ideation or suicide attempts—from emerging while also promoting recognition of the need to seek help. Secondary prevention focuses on intervening after a stressor has triggered a response but before it has breached all of the client's defense lines. At this level, interventions target adolescents already displaying suicidal behaviors and, consequently, at risk of suicide. These individuals require early intervention, often including crisis management, to enhance resilience and support stressor regulation and self-

management of negative events. Lastly, tertiary prevention encompasses interventions following a crisis, aiming at integrating and maintaining new behaviors that ensure safety and prevent relapse. According to the systems

mode<sup>12</sup>, nursing interventions can simultaneously align with multiple levels of prevention. The results of this analysis are presented in Table 3.

**Table 3.** Analysis of results according to Betty Neuman’s Systems Model

Interventions in Healthcare Services e			
	Primary Prevention	Secondary Prevention	Tertiary Prevention
Intrapersonal	<ul style="list-style-type: none"> <li>- <b>Assess suicide risk</b> using assessment tools<sup>18</sup> and suicide risk-related questions<sup>19</sup> across all care settings, including routine consultations.<sup>23</sup></li> <li>- <b>Establish a therapeutic relationship</b> with the adolescent by adopting an approachable stance and addressing their concerns openly and honestly.<sup>19,24,25</sup></li> <li>- <b>Identify risk factors</b> (stressors) and <b>protective factors</b> (reconstitution factors).<sup>25</sup></li> <li>- Provide education on <b>local mental health resources</b> and support hotlines.<sup>19</sup></li> </ul>	<ul style="list-style-type: none"> <li>- <b>Assess suicide risk</b> using assessment tools.<sup>18</sup></li> <li>- Identify <b>warning signs</b>.<sup>24,25</sup></li> <li>- Provide <b>emotional support</b>.<sup>23</sup></li> <li>- Establish <b>empathetic communication</b>, listening attentively.<sup>24,25</sup></li> <li>- Use <b>therapeutic touch</b>.<sup>24</sup></li> <li>- Assist in <b>identifying triggers</b> for suicidal behaviors.<sup>25</sup></li> <li>- Support the development of <b>adaptive coping strategies</b>.<sup>19,24,25</sup></li> <li>- Provide education on <b>local mental health resources</b> and support hotlines.<sup>19</sup></li> <li>- Ensure <b>vigilance</b>, with particular attention to high-risk moments (admission, shift changes, transfers, and discharge).<sup>25</sup></li> <li>- Develop a <b>Safety Plan</b>.<sup>19</sup></li> </ul>	<ul style="list-style-type: none"> <li>- <b>Assess suicide risk</b> using assessment tools.<sup>18</sup></li> <li>- Maintain <b>post-discharge contact</b>.<sup>23,28</sup></li> <li>- Develop a <b>Safety Plan</b>.<sup>19,24</sup></li> </ul>
Interpersonal		<ul style="list-style-type: none"> <li>- Encourage <b>parental monitoring</b> of suicidal behaviors (including restricting access to lethal means).<sup>19</sup></li> <li>- Develop <b>psychoeducational interventions</b> with the family and the adolescent during hospitalization.<sup>28</sup></li> <li>- <b>Extend family visitation time</b> in healthcare facilities.<sup>28</sup></li> <li>- Implement <b>individualized therapeutic activities</b>.<sup>28</sup></li> </ul>	<ul style="list-style-type: none"> <li>- Promote <b>parental involvement</b> in the use of the Safety Plan.<sup>26</sup></li> <li>- Encourage <b>parental monitoring</b> of suicidal behaviors (including restricting access to lethal means).<sup>26</sup></li> <li>- <b>Prepare for discharge</b>.<sup>23</sup></li> <li>- <b>Enhance parents’ mental health literacy</b> (warning signs and crisis response strategies).<sup>25,26</sup></li> <li>- Provide information on <b>local mental health resources</b> and support hotlines.<sup>19,23,25</sup></li> <li>- Assist in <b>developing a support network</b>.<sup>26</sup></li> </ul>
Community Interventions			
	Primary Prevention	Secondary Prevention	Tertiary Prevention
Intrapersonal	<ul style="list-style-type: none"> <li>- <b>Assess adolescents’ knowledge</b> of suicide.<sup>31</sup></li> <li>- <b>Promote mental health literacy</b> among adolescents, particularly regarding suicide and its prevention.<sup>22,27,31,33</sup></li> <li>- <b>Evaluate suicide risk</b> in the school setting.<sup>20,21,22</sup></li> <li>- Assess the adolescent’s <b>clinical history</b>.<sup>32</sup></li> <li>- Provide <b>emotional support</b>.<sup>20</sup></li> <li>- Assist in identifying <b>problem-solving strategies</b> (prevention).<sup>21</sup></li> </ul>	<ul style="list-style-type: none"> <li>- Identify <b>warning signs</b>.<sup>27</sup></li> <li>- Conduct a <b>mental status assessment</b> when suicide risk is identified.<sup>22</sup></li> </ul>	
Interpersonal	<ul style="list-style-type: none"> <li>- Promote <b>mental health literacy</b> among parents and teachers, particularly regarding suicide and its prevention.<sup>22,27,31</sup></li> <li>- <b>Engage parents and teachers</b> in suicide prevention.<sup>27</sup></li> <li>- Develop <b>interventions targeted at parents and teachers</b> to ensure they form an effective support network for adolescents.<sup>31</sup></li> <li>- <b>Facilitate connection</b> among adolescents, teachers, and other school staff.<sup>20</sup></li> <li>- Intervene in <b>bullying</b> situations. <b>Assess suicide risk</b> for both bullying victims and perpetrators and provide <b>emotional support</b> in bullying cases.<sup>20</sup></li> <li>- Encourage <b>experience sharing</b> among peer groups, fostering adolescent peer support.<sup>31</sup></li> <li>- Conduct <b>peer leadership training</b> in classrooms.<sup>30</sup></li> </ul>	<ul style="list-style-type: none"> <li>- Implement <b>group interventions</b> using <b>cognitive-behavioral therapy</b> and <b>peer leadership</b> to reduce suicidal ideation.<sup>29</sup></li> <li>- Involve the school nurse in the care plan and the development of a <b>Safety Plan</b>.<sup>27</sup></li> <li>- Refer adolescents to <b>specialized professionals</b>.<sup>22</sup></li> </ul>	<ul style="list-style-type: none"> <li>- Involve the school nurse in the care plan and the development of a <b>Safety Plan</b>.<sup>27</sup></li> </ul>
Extrapersonal	<ul style="list-style-type: none"> <li>- <b>Reduce stigma</b> associated with suicide in schools and communities.<sup>23,33</sup></li> <li>- Promote <b>help-seeking behaviors</b>.<sup>33</sup></li> <li>- Implement <b>community programs</b> for suicide prevention.<sup>22,31</sup></li> </ul>		

**Interventions in Healthcare Services**

Nursing interventions implemented within healthcare services primarily focus on secondary and tertiary prevention, given that most interactions between adolescents at risk of suicidal behavior and healthcare services occur after a stress response has already developed. According to Teixeira<sup>34</sup>, adolescents most frequently seek

emergency services due to acute situations, including behavioral changes, intentional overdoses, and suicide attempts. Healthcare-based interventions mainly target intrapersonal dimensions (centered on the adolescent) and interpersonal dimensions (focused primarily on relationships with parents). Notably, we did not identify any extrapersonal-level interventions, underscoring the need

for healthcare services to expand their outreach into broader community-based settings.

At the primary prevention level, we identified only intrapersonal interventions, which focused on enhancing adolescents' awareness of available resources, early identification of risk and protective factors, and suicide risk assessment, including during routine adolescent health check-ups. The National Suicide Prevention Plan (PNPS)<sup>7</sup> underscores the significance of these interventions, reinforcing the essential role of nurses in promoting adolescents' overall health. This involves minimizing their exposure to potential stressors and strengthening their protective factors.

From the perspective of Betty Neuman's theoretical framework, health is understood as a dynamic equilibrium continuously shaped by the complex interaction of psychological, physiological, developmental, spiritual, and sociocultural variables.<sup>2</sup> Within primary healthcare settings, nurses play a pivotal role in fostering adolescents' overall well-being by strengthening protective factors by promoting healthy lifestyles, expanding their knowledge about developmental challenges (such as risky sexual behaviors or substance use), and encouraging the development of positive social and family relationships.<sup>35</sup>

Secondary prevention plays a prominent role in healthcare services, with most data derived from mental health services, both outpatient and inpatient. Within the intrapersonal dimension, the findings highlight the importance of interventions focused on suicide risk assessment and the identification of suicidal behaviors. These also include establishing a therapeutic relationship between the nurse and the adolescent, empowering them to recognize and manage triggers while developing effective coping mechanisms. The NIC<sup>14</sup> also underscores the need to engage adolescents in their own therapeutic plan and provide education on coping strategies.

Building a trusting nurse-adolescent relationship requires nurses to acknowledge and validate the adolescent's emotions and feelings. Regular interactions create opportunities for the adolescent to express their emotions, fostering a sense of care and openness. Addressing the topic of suicide openly and without judgment allows the adolescent to articulate their current feelings and provides a space for sharing knowledge, meanings, and fears and evaluating the severity of warning signs and symptoms associated with suicidal behaviors, including suicidal ideation, planning, and past attempts.<sup>14</sup>

The findings on secondary prevention further emphasize the importance of collaboratively developing a Safety Plan. This plan serves as a written resource, often structured as a checklist, co-created by the adolescent and the healthcare professional. It outlines a set of coping strategies and resources the adolescent can utilize in crisis situations.<sup>36</sup>

Regarding tertiary prevention, the identified interventions targeted the period following contact with healthcare services, particularly after discharge from inpatient care, focusing on promoting the adolescent's rehabilitation and reintegration into society. Within the intrapersonal dimension, interventions included maintaining contact with

the adolescent after discharge to ensure regular suicide risk assessment and continuous monitoring of the Safety Plan.

In the interpersonal dimension, interventions primarily centered on parents, emphasizing mental health literacy promotion, parental involvement, encouragement of adolescent supervision, and the establishment of a secure support network. The NIC<sup>14</sup> also incorporates suicide prevention interventions that highlight the necessity of parental involvement in discharge planning, including education on the illness, pharmacological treatment, and available community resources.

As cross-cutting interventions across all levels of prevention, we identified the establishment of a therapeutic relationship through empathetic communication and emotional support, education on local mental health resources and helplines, and continuous suicide risk assessment. According to NIC<sup>14</sup>, suicide risk should be assessed regularly and continuously, considering the presence of a plan and the availability of means to carry it out. It is also crucial to observe changes in mood or behavior that may indicate an increased risk of suicide. Additionally, we identified two interventions as bridging secondary and tertiary prevention: developing and monitoring a Safety Plan and promoting mental health literacy among adolescents and their parents.

NIC<sup>14</sup> primarily includes suicide prevention interventions aimed at inpatient settings. Although we did not find several of these activities in the articles included in this review, it is important to mention them despite this IRL's lack of empirical support. Some examples include interventions related to pharmacological treatment (administration, supervision of medication intake, and monitoring of side effects and therapeutic responses) and environmental safety measures, such as restricting access to windows, implementing physical and area restrictions, and ensuring frequent monitoring. In terms of safety, NIC<sup>14</sup> also highlights the importance of restricting access to potentially lethal objects, such as sharp instruments and cords. While Bradley and Toole<sup>19</sup> mentioned this intervention in the study included in this review, it was solely directed at the family setting. However, this measure is equally essential for ensuring adolescent safety within healthcare services.

### Community Interventions

Unlike the findings regarding interventions in healthcare settings, nursing interventions developed in the community primarily fall within the scope of primary prevention. This is because many identified interventions are implemented directly with adolescents—in schools, among peer groups, with families, and with teachers—before stressors affect the system or to minimize their exposure to potential stressors. Primary prevention not only focuses on promoting health by enhancing resilience-building skills and resources but also on the timely prevention of illness among individuals with specific vulnerabilities<sup>37</sup>, such as those who perpetrate or experience bullying in school environments.<sup>20</sup>

At the primary prevention level, interventions were identified across all three dimensions. In the intrapersonal dimension, interventions included suicide risk assessment<sup>20,21,22</sup>, adolescent medical history evaluation<sup>32</sup>, and assessment of their knowledge about suicide.<sup>31</sup> Additional interventions aimed at strengthening adolescents' capacities by promoting health literacy and teaching problem-solving strategies to prevent suicidal behavior.<sup>21,22,27,31,33</sup> The interpersonal dimension encompassed interventions targeting not only parents but also teachers, school staff, and peer groups, engaging them in the adolescent's protective process through literacy promotion, relationship facilitation, and experience sharing.<sup>20,22,27,30,31</sup>

These interventions align with the guidelines set forth in the Portuguese National Suicide Prevention Plan<sup>7</sup>, which emphasizes the need for a support network across the various environments surrounding adolescents as a means of ensuring their safety. Unlike the interventions identified in healthcare services, community-based interventions also addressed the extrapersonal environment, calling for a broader nursing role in suicide prevention. This includes developing community programs<sup>22,31</sup>, reducing societal stigma<sup>23,33</sup>, and encouraging help-seeking behaviors.<sup>33</sup> These approaches also align with PNPS<sup>7</sup> recommendations, which advocate for raising public awareness about suicide and suicidal behaviors. Additionally, the Nursing Interventions Classification (NIC)<sup>14</sup> includes implementing community programs within the "Suicide Prevention" intervention framework.

At the secondary prevention level, we identified interventions in both the intrapersonal and interpersonal dimensions, particularly among peer groups. Findings highlight the need for nurses to engage at the intrapersonal level by identifying warning signs and assessing the mental health status of adolescents already identified as at risk for suicide.<sup>22,27</sup> In the interpersonal dimension, results suggest the implementation of group interventions for adolescents experiencing depressive symptoms and suicidal ideation. These interventions incorporate cognitive-behavioral therapy techniques and peer leadership approaches<sup>29</sup>, as well as referrals to specialized professionals.<sup>22</sup> Such strategies play a crucial role in preventing suicidal behaviors in schools by promoting early recognition and timely intervention.

Considering that more than 20% of adolescents exhibit depressive symptoms<sup>11</sup> and that most spend a significant portion of their day in school settings, the involvement of school health nurses is essential in supporting these adolescents.<sup>38</sup> Findings highlight the critical role of these nurses in developing a Safety Plan<sup>27</sup> and providing follow-up and monitoring, particularly when an adolescent returns to school after a crisis.<sup>27</sup>

Although not directly aligned with the specific objectives of this review, the results also indicate a pressing need for greater investment in nurse training. Several studies emphasize the necessity for health professionals, particularly nurses, to improve their practice by undergoing specialized training on suicidal behaviors.<sup>28</sup> According to

DGS<sup>7</sup>, nurses working with adolescents in primary healthcare settings still exhibit limited competencies in addressing and intervening in mental health and suicide-related issues. This gap likely stems from insufficient knowledge on how to approach suicide-related discussions, fear of incompetence in managing such cases, and a lack of awareness of available resources, infrastructure, and the mental health referral system.<sup>7</sup> Additionally, reducing stigma among healthcare teams unfamiliar with mental health and psychiatric care remains a critical step. Addressing this barrier will help ensure that healthcare professionals are open to learning and engaging with this area of intervention.<sup>39</sup>

Finally, the findings highlight the need for nursing interventions to be developed within a multidisciplinary framework, as this is a key strategy for effectively addressing suicide risk in adolescents.<sup>19</sup>

In summary, nurses play a crucial role across multiple settings, enabling interventions at the primary, secondary, and tertiary levels of suicide prevention. Their expertise in identifying stressors that may affect adolescent well-being and health allows them to intervene to restore the adolescent's system, either by preventing exposure to stressors or by fostering resilience to those already present. Ensuring adolescent safety requires an early, multidisciplinary intervention primarily focused on strengthening the normal and flexible lines of defense. This approach must encompass intrapersonal, interpersonal, and extrapersonal environments, engaging the adolescent, their family, peers, teachers, healthcare professionals, and society as a whole.

## Conclusion

This literature review successfully addressed the defined objectives by identifying a significant body of theoretical and empirical studies that reflect the available nursing knowledge on interventions that promote the safety of adolescents at risk of suicidal behavior. Additionally, it allowed for analyzing this knowledge through a nursing-specific theoretical framework.

Integrating nursing theoretical perspectives into research enhances the recognition of the breadth and depth of current disciplinary knowledge in a given field. In this regard, integrative literature reviews serve as a valuable research method for generating or testing theories, contributing to the consolidation and expansion of nursing knowledge<sup>40,41</sup>. Using a systemic theoretical framework, such as Betty Neuman's model, provided a comprehensive understanding of nursing interventions for adolescents at risk of suicide. By conceptualizing adolescents as open systems constantly interacting with other systems and being influenced by dynamic forces that may act as stressors or protective factors affecting mental health, this theory underscores that nursing interventions aimed at ensuring safety in suicide risk must focus not only on reducing risk factors but also on strengthening the adolescent's protective factors and support network. Neuman's perspective thus facilitated the systematization of nursing interventions across all levels of prevention and in all contexts relevant to

adolescents, including their homes, neighborhoods, schools, and healthcare services.

We concluded that the existing body of nursing knowledge is extensive but still presents some gaps. Based on the findings of this review, further research on this topic is recommended, particularly through quantitative and mixed-method studies that focus on determining the effectiveness of nursing interventions in reducing the risk of suicidal behavior among adolescents. The results also highlight the need to improve the accuracy of suicide risk assessment tools.

Additionally, the findings emphasize the importance of investing in the training of healthcare professionals. All nurses, regardless of their care setting, should have access to education and training for suicide risk assessment and crisis intervention. The evidence suggests that suicide risk should be proactively discussed with adolescents, for example, during routine health surveillance visits, rather than being addressed solely within specialized mental health services. Moreover, using validated assessment tools could contribute to early risk identification.

Several studies point to the need for implementing both global and local community-based suicide prevention initiatives. Nurses should actively engage in these initiatives and contribute to adolescent safety across all aspects of their lives. This involvement can be achieved by promoting mental health literacy in general and suicide awareness in particular. The evidence on school-based interventions further supports the need to strengthen the role of nurses in schools.

### Study limitations

We acknowledge certain limitations in this integrative literature review. First, we searched only two databases, which may have led to the omission of relevant evidence not included in this review. However, we consider that the 16 retrieved articles provided access to a substantial body of results.

Additionally, the quality of the identified articles represents another limitation. Although we assessed their methodological rigor, no articles were excluded based on this evaluation.

Finally, despite the breadth of studies identified, most were theoretical articles, literature reviews, or qualitative research. The scarcity of quantitative studies, particularly experimental or quasi-experimental designs, prevented us from analyzing the effectiveness of the identified nursing interventions.

### Authorship

Coimbra H: Conception and design of the study; Data collection; Data analysis and interpretation; Writing the manuscript;

Correia R: Conception and design of the study; Data collection; Data analysis and interpretation; Writing the manuscript;

Alves A: Conception and design of the study; Data collection; Data analysis and interpretation; Writing the manuscript;

Costa S: Conception and design of the study; Data collection; Data analysis and interpretation; Writing the manuscript;

Moutinho L: Data analysis and interpretation; Approval of the final version of the manuscript and taking responsibility for it;

Nunes IR: Conception and design of the study; Data collection; Data analysis and interpretation; Writing the manuscript; Approval of the final version of the manuscript and taking responsibility for it.

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