ABSTRACT
Objective: To analyze the literature on interventions to prevent suicidal behavior in university students. Method: integrative review conducted in the Latin American and Caribbean Literature in Health Sciences, Web of Science, Medical Literature Analysis and Retrieval System Online, Cumulative Index to Nursing and Allied Health Literature and SCOPUS databases, between May and July 2018 , using the descriptors: “students”, “suicide” and “health promotion”. Results: six articles comprised a sample, 50% of which addressed interventions using software or internet links, 16.6% traditional methodology and 33.3% traditional interventions associated with technology. Conclusion: interventions for the prevention of suicide in university students must capacitate individuals in an accessible way, consistent with the context where university students are inserted.

Descriptors: Students, Universities, Suicide, Health promotion, Mental health.
INTRODUCTION
Suicidal behaviors are associated, in a serious gradient, with ideas, desires, statements about wanting to die, planning of death and thinking about how such an attitude would influence people around them, as well as the suicidal act itself, characterized as a deliberate, intentional, conscious action, even if there is ambivalence, performed by the individual oneself, whose intention is death, using a means he believes to be lethal.\(^1\)

Approximately 800,000 people commit suicide annually worldwide, which is equivalent to one person every 40 seconds, with a rate of 10.7 deaths per 100,000 inhabitants. It is estimated that by the year 2020, there may be a 50% increase in the annual incidence of suicide deaths worldwide, which would exceed the number of deaths resulting from combined homicide and war.\(^2\)

Studies that discuss suicide are of fundamental importance when they include specific groups as they allow the planning of strategies aimed at prevention and appropriate intervention according to the identified needs. Although studies involving university students are still restricted and scarce, suicide has a relevant magnitude and intensity in this population.\(^3\)

Different factors are associated with suicidal ideation in university students, hopelessness, impulsivity, aggressiveness, perception of the body, communication difficulties and lack of social belonging are highlighted as possible factors that trigger this process. This moment is marked by a series of transformations considered as part of the personal, social and academic development process, which demands maturity and autonomy for decision-making in the face of the rigid determinations of the environment.\(^4\)

The planning of strategies for coping with suicidal behavior based on identified risk and protective factors allows university students to experience academic life more comfortably. Otherwise, the changes and challenges that students face can bring intense psychological suffering and, in extreme cases, lead them to suicide.\(^5\)

Although it is known about suicide prevention guidelines, the lack of planning, inability to manage risk, unavailability of resources, taboo and stigma, as well as the difficulty faced by the individual in seeking help condition barriers to the implementation of policies and actions that achieve a more comprehensive understanding of this behavior.\(^6\)

In this context, it is necessary to carry out studies that allow a broader and more in-depth knowledge about interventions that prevent suicidal behaviors, enabling the planning of appropriate preventive strategies and actions, in order to minimize or even solve the problems faced during the academic life.

Therefore, this study aims to analyze the literature on interventions to prevent suicidal behavior in university students, answering the following research question: what interventions can be developed to prevent suicidal behavior in university students?

METHODS
This is an integrative literature review study conducted through six stages of investigation, with the research question being elaborated based on the PICO strategy (Population: students; Interest: suicide; Context: health promotion); What interventions can be developed to prevent suicidal behavior in university students?\(^7,8\)

The search was carried out by two reviewers, simultaneously and independently, from May to July 2018, in the following databases: "Literatura Latino-Americana e do Caribe em Ciências da Saúde" (LILACS), "Web of Science, Medical Literature Analysis and Retrieval System Online" (MEDLINE/Pubmed), "Cumulative Index to Nursing and Allied Health Literature" (CINAHL) and SCOPUS. Descriptors indexed in "Descritores em Ciências da Saúde" (DeCS) and Medical Subject Headings (MeSH) were used,
combined with Boolean operatives “AND” and “OR” (Table 1).

**Table 1** - Search expressions generated in the databases according to descriptors selected using the PICo strategy. Teresina, PI, Brazil, 2018

<table>
<thead>
<tr>
<th>Descriptors in Ciência da Saúde - DESC/Medical Subject Headings - MEDLINE</th>
<th>Descriptors</th>
<th>Data base</th>
<th>Full search expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>P - Students/Estudantes</td>
<td>UNICAMP</td>
<td>LILACS</td>
<td>Estudantes AND Suicide AND Promovação da saúde</td>
</tr>
<tr>
<td>I - Suicide/Suicide</td>
<td>Web of Science, CRANIAL and SCOPUS</td>
<td>Colege students AND Suicide OR Suicide attempt OR Suicide intent OR Suicide mortality AND Mental health promotion</td>
<td></td>
</tr>
<tr>
<td>Co- Promovação da saúde/Health promotion</td>
<td>MEDLINE/Pubmed</td>
<td>Students AND Suicide AND Health promotion</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Research data, 2018.

The inclusion criteria were: primary studies, related to the theme, available in full in the databases. Duplicate articles, review studies, theses, dissertations and editorials were excluded, as well as studies involving high school and child students (Figure 1).

**Figure 1** - Flowchart of process of the investigation, selection and inclusion of articles. Teresina, PI, Brazil, 2018

For data collection, an elaborate instrument was used containing information about the year of publication, country of origin, authors, details of the method, intervention, description, evaluation of the intervention and classification of the level of evidence, for which the recommendation of the Oxford Center for Evidence-based Medicine was based.

**RESULTS AND DISCUSSION**

The publication period for the six selected articles varied between 2003 and 2018. Most articles were published in 2018 in the United States of America. As for the level of evidence, three (50%) articles were classified as level 1B and three (50%) as level 2B (Table 2).

**Table 2** - Distribution of references by year of publication, country of origin, authors, details of the method and level of evidence. Teresina, PI, Brazil, 2018

<table>
<thead>
<tr>
<th>Article</th>
<th>Year of publication</th>
<th>Country</th>
<th>Authors</th>
<th>Details of the method</th>
<th>Level of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>2018</td>
<td>United States of America</td>
<td>Reen 8A, Meche</td>
<td>Training and research with 2,729 participants. Data were collected from the online application of the Gatekeeper behavior scale in pre and post-training groups.</td>
<td>1B</td>
</tr>
<tr>
<td>A2</td>
<td>2003</td>
<td>Australia</td>
<td>Pearson</td>
<td>Application of the intervention and evaluation (through questionnaires) pre and post-test with 43 university students from the University of Cadiz.</td>
<td>2B</td>
</tr>
<tr>
<td>A3</td>
<td>2017</td>
<td>United Kingdom</td>
<td>Silk &amp; Perrault</td>
<td>Qual-experiment with control condition. Intervention and evaluation developed with 848 freshmen and 292 graduates on two neighboring campuses.</td>
<td>1B</td>
</tr>
<tr>
<td>A4</td>
<td>2018</td>
<td>United States of America</td>
<td>Reiff &amp; Kumar</td>
<td>Training of 1,956 participants through a workshop. Pre and post-test were applied between groups.</td>
<td>2B</td>
</tr>
<tr>
<td>A5</td>
<td>2004</td>
<td>United States of America</td>
<td>Clemmens &amp; Engle</td>
<td>Evaluation and self-assessment through interviews with 115 students on the implementation of a course on health maintenance.</td>
<td>2B</td>
</tr>
<tr>
<td>A6</td>
<td>2018</td>
<td>Iran</td>
<td>Bridges</td>
<td>Study based on a pre-experimental and post-test stage with online intervention with 28 educators and 300 university students from a university in the south of the United States of America.</td>
<td>2B</td>
</tr>
</tbody>
</table>

**Source:** Research data, 2018.

The productions addressed the application of interventions aimed at training university students, faculty and/or other campuses employees, in which interventions based on the use of software or internet links were predominantly adopted in three (50%) studies, one (16.6%) with traditional methodology (pamphlets, newsletters and printed articles in newspapers) and two (33.3%) encompassing traditional interventions associated with technology. It is noteworthy that these interventions were evaluated, by their executors, as effective and efficient (Table 3).

**Table 3** - Summarization of publications according to intervention, description and evaluation of the intervention. Teresina, PI, Brazil, 2018

<table>
<thead>
<tr>
<th>Article</th>
<th>Intervention</th>
<th>Description of the intervention</th>
<th>Evaluation of the intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Cognitive Training</td>
<td>Modules available online at the University of West Virginia. Participation was encouraged students at risk for suicidal behaviors.</td>
<td>Preparticipation and help seeking behaviors related to mental health, changing attitudes and beliefs around mental health care.</td>
</tr>
<tr>
<td>A2</td>
<td>Suicide Intervention Project (SIP)</td>
<td>Face-to-face workshops.</td>
<td>Participants were invited to complete the project through a self-assessment questionnaire and after the training was completed.</td>
</tr>
<tr>
<td>A3</td>
<td>Mental health promotion</td>
<td>Mental health messages disseminated through posters, digital signs and e-mails with contact numbers for counseling centers.</td>
<td>Participants became better prepared to identify problems related to mental health and to advise seeking help in counseling centers.</td>
</tr>
</tbody>
</table>
characterization of publications, interventions of a traditional nature, interventions of a technological nature and traditional interventions associated with technologies.

Characterization of publications
The limited number of publications found as an answer to the research question may be related to the fact that suicide continues to have a low priority in relation to public health actions, despite the interest in the subject having increased considerably in the last decades. In the United States of America, suicide is considered one of the main causes of death in university-age youth, being considered a priority population to be reached with mental health campaigns.

In the academic environment, students, teachers and other employees are in an ideal position to intervene in situations of risk. These individuals can be trained to act as guardians and, therefore, be aware of the risk factors for suicide, recognizing them and recommending support services.

Effective strategies mediated by technologies are due to advances in the means of communication and expansion of technologies, mainly via the Internet, leading to the emergence of a new virtual and social space in society, offering opportunities for the acquisition of knowledge.

Traditional interventions
Within the scope of traditional suicide interventions are psychoeducational. These assist in the management of mental disorders based on behavioral, social and emotional changes, allowing prevention in health. Their educational character is geared towards the patient and family so that they acquire awareness and preparedness to deal with changes based on coping strategies, strengthening communication and adaptation.

The Suicide Intervention Project (SIP) had the distribution of pamphlets, newsletters, conversations with health professionals and articles published in newspapers circulating on campus as a strategy to help subjects recognize mental health problems and promote safety to talk about these problems, in addition to publicizing the existence of available mental health support services among the academic community.

After the application of the questionnaires to evaluate the intervention, comparative analysis of the averages of the responses before and after the intervention demonstrated significant results such as improvement in the ability of the participants in the approach to talk about mental health, contributing to the demystification of the subject and breaking the prejudice and stigma involved.

It is noteworthy that the stigma or labeling of suicide is something that makes it difficult to care for individuals with this behavior, which can culminate in other comorbidities or even hamper the process of seeking help, as they feel discriminated and marginalized.

Technological interventions
Technological interventions are relevant for the young population, including university students, as they are considered easy to access, cost-efficient for large populations and less stigmatizing than the more traditional ones. Although the internet is considered a risk factor for suicidal behavior, sites that spread suicide prevention have been developed by professionals.

The articles that addressed the use of technology presented the gatekeeper training style, which are programs designed with the objective of directing people, who are in frequent contact with others, to improve knowledge, attitudes and skills to identify individuals at risk, determine risk levels and refer to an appropriate support service when necessary.

The Kognito training program consists of multiple online modules, in which the interaction with virtual human characters that show signs of psychological distress, allows users to develop skills to identify risk characteristics and choose the best way to intervene. Participants completed pre and post-test surveys which showed significantly improved scores, higher levels of self-efficacy and user preparation.

The I CARE training consisted of a program made available in an online environment, presenting topics such as students' mental health, psychoeducation, support resources made available on campus, among others. These resources prepared those involved for the recognition, understanding and processing of difficult emotions that can prevent communication with someone, offering ways to identify and differentiate situations of stress, suffering and crisis, using a variety of didactic and interactive techniques.

The comparison of pre-workshop and post-workshop questions suggested significantly higher mean scores after completion in terms of knowledge and readiness to help. The evaluation of the participants was positive, with 97.9%
of the participants reporting that they would recommend the workshop to others.\textsuperscript{20}

The PRECEDE-PROCEED educational program worked, through its four online teaching modules, with the dissemination of knowledge to educators and university students on statistical suicide data in the United States and among African Americans, risk factors, signs, symptoms, early detection, treatment, how to identify and help someone with depression or suicidal attitudes, the benefits of help, self-care to manage stress and support resources, responsibilities, counseling, psychotherapy and off-campus resources.\textsuperscript{21}

Analysis of the mean scores and standard deviations obtained in the evaluation of the program demonstrated improvement in the educators' attitudes about aspects related to the identification of depressive symptoms. Approximately 86% of those trained scored satisfactorily in terms of attitudes about depression, control, skills to help people, reinforcing and empowering factors and behavior after completing online training.\textsuperscript{21}

Traditional technological-related interventions

It is important that people are seen as trustworthy when they occupy a position of influence over actions that their peers take, a form of "social marketing" in order to persuade them to maintain similar attitudes.\textsuperscript{22}

One of the productions brought a strategy developed with the support and participation of celebrities and influential people on campuses, transmitting messages of motivation and information about suicide through videos and advertisements in addition to the distribution of informational materials. Scales completed by the participants indicated a significantly higher number of students who would recommend university counseling centers and improved their perceptions about the stigma of mental health. Informing and recommending the availability of help is an important and effective strategy for the individual to feel supported and protected.\textsuperscript{22}

The course entitled "Introduction to Health", conducted by the University of Connecticut School of Nursing, included in its approach health promotion and disease prevention through the use of an electronic book containing links to access various health-related sites and workshops. When asked to give their opinion on the course, students reported changes in bad behavior and the adoption of healthy lifestyle habits. In addition, it promoted reflection on how everyday factors — overload, stress and daily tension — can reflect on mental health and contribute to self-destructive behaviors.\textsuperscript{23}

The publications demonstrate that the university provides a universe of health-related issues, especially with regard to unhealthy lifestyles. College students, most of the time, focus more on university activities and leave aside their social and recreational relationships. When they get time for some activity not related to the university, they are already at the limit of stress. Mental, physical and social health are intertwined and deeply interdependent.\textsuperscript{24}

One of the limitations of this study is related to the limited number of publications on prevention of suicidal behavior in university students, since most of the publications found in the searches presented their interventions aimed at high school students, which made it difficult to discuss the topic. In addition, during the stages of this study, studies at the national level were not included, which did not meet the pre-defined objectives.

Studies like this contribute to the construction of subsidies for the planning and implementation of effective interventions to prevent suicidal behavior in the academic environment in order to promote the health of university students and minimize the rates related to this public health problem.

CONCLUSIONS

The reduced number of publications found made it difficult to discuss the topic.

Interventions applied in the university environment, through different models, have significant potential for promoting health and developing strategies that demystify the theme of suicidal behavior.

The interventions found are aimed at training the subjects and improving related knowledge, which favor the perception about the risk factors for suicide and the action either through dialogue and counseling or referring to a health service. Attitudes like this allow preventing or even reducing risk behaviors, favoring the health of university students.

Studies in this area are encouraged, so that the evidence base for this approach is significantly strengthened as well as contributing scientific inputs for the prevention of suicidal behavior in academia, minimizing the alarming rates related to this eminent problem.

REFERENCES


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