



REVIEW


Factors associated with suicidal behavior in graduate students: a scoping review

Fatores associados ao comportamento suicida em estudantes da pós-graduação: revisão de escopo
Factores asociados al comportamiento suicida en estudiantes da postgrado: revisión de alcance


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ABSTRACT

Objective: To map the diverse scientific evidence about the factors associated with suicidal behavior in *stricto sensu* graduate students. **Methods:** This is a scoping review systematized according to the *Joanna Briggs Institute* guidelines and conducted in the SCOPUS, LILACS, PubMed/Medline, CINAHL, Web of Science, PsycInfo, OATD and BDTD-CAPES repositories. The bibliographic materials selected and analyzed were those that presented factors associated with suicidal behavior for *stricto sensu* graduate students. **Results:** Seven bibliographic materials met the eligibility criteria of this review. Most of them addressed risk factors for suicidal behaviors, with insufficient emphasis on protective factors. **Conclusion:** Variables related to health, as well as psychological, sociodemographic, relational and of the academic context, were identified as factors associated with suicidal behavior in the academic context. This review highlights the incipience of the scientific production in the knowledge field and the need to confer greater emphasis and visibility to this problem.

Descriptors: Suicide. Suicidal ideation. Risk factors. Association. Education, Graduate.

RESUMO

Objetivo: Mapear as evidências científicas sobre os fatores associados ao comportamento suicida de estudantes da pós-graduação *stricto sensu*. **Métodos:** Trata-se de uma revisão de escopo sistematizada pelas diretrizes do *Joanna Briggs Institute* e realizada nos repositórios SCOPUS, LILACS, PubMed/Medline, CINAHL, *Web of Science*, PsycInfo, OATD e BDTD-CAPES. Foram selecionados e analisados materiais bibliográficos que apresentaram fatores associados ao comportamento suicida para estudantes da pós-graduação *stricto sensu*. **Resultados:** Sete materiais bibliográficos atenderam aos critérios de elegibilidade desta revisão. A maioria abordou fatores de risco para comportamentos suicidas, com ênfase insuficiente em fatores protetivos. **Conclusão:** Foram identificados como fatores associados ao comportamento suicida na pós-graduação variáveis de saúde, psicológicas, sociodemográficas, relacionais e do contexto acadêmico. Essa revisão destaca a incipiência da produção científica nesse campo de saber e a necessidade de se dar maior ênfase e visibilidade a essa problemática.

Descritores: Suicídio. Ideação suicida. Fatores de risco. Associação. Educação de pós-graduação.

RESUMÉN

Objetivo: Mapear las evidencias científicas sobre los factores asociados al comportamiento suicida en estudiantes de postgrado *stricto sensu*. **Métodos:** Revisión de alcance sistematizada de acuerdo a las directrices del *Joanna Briggs Institute* y realizada en los siguientes repositórios: SCOPUS, LILACS, PubMed/Medline, CINAHL, *Web of Science*, PsycInfo, OATD y BDTD-CAPES. Se seleccionaron y analizaron materiales bibliográficos que presentaron factores asociados al comportamiento suicida en estudiantes de postgrado *stricto sensu*. **Resultados:** Siete materiales bibliográficos cumplieron los criterios de elegibilidad de esta revisión. La mayoría abordó factores de riesgo para comportamientos suicidas, con insuficiente énfasis en factores de protección. **Conclusión:** Diversas variables de salud, psicológicas, sociodemográficas, relacionales y del contexto académico se identificaron como factores asociados al comportamiento suicida en la educación de postgrado. Esta revisión destaca el carácter incipiente de la producción científica en este campo del saber y la necesidad de conferir mayor énfasis y visibilidad a esta problemática.

Descritores: Suicidio. Ideación suicida. Factores de Riesgo. Asociación. Educación de Postgrado.

INTRODUCTION

Stricto sensu graduate education is portrayed as a complex period of the university experience, with a series of peculiar demands with stressogenic potential that can exert a deleterious impact on the physical and mental health of researchers in training.^(1,2) Some situations experienced in graduate studies, such as development of a dissertation or thesis, publication of articles, participation in national and international events, qualifying examination, financial difficulties and personal problems, are stressors commonly reported in the literature and that can result in mental distress among graduate students.⁽³⁾

Mental distress in graduate studies has been characterized as a serious academic problem, especially due to its increasing prevalence and severity in the last decades. Recent evidence indicates that graduate students report significantly higher mean rates of depression, anxiety and distress when compared to age- and gender-matched populations.^(4,5) This high prevalence of psychiatric disorders exposes graduate students to an increased risk of suicidal behavior, one of the most worrying mental health problems that affect this population segment. However, despite the notorious deterioration of graduate students' mental health of around the world, the phenomenon in this population group has not received the same attention, especially in the scientific research context, when compared to the study of mental illness in undergraduate students.⁽⁶⁾

In addition to the scarcity of information, available studies devoted to understanding suicidality in *stricto sensu* graduate students constituted heterogeneous samples that indistinctly combined undergraduate and graduate students in their analyses. This fact makes the process of elaborating a specific overview of the mental health of MSc and PhD students challenging and hinders recognizing different factors associated with risk and/or protection for these populations at these two levels of educational training.⁽⁴⁾

The risk and protective factors for suicidal behavior encompass a diversified combination of conditions or attributes that can lead an individual to think, plan, try or commit suicide or not. While the factors associated with the risk of suicidal behavior increase the probability for the occurrence of this outcome, without necessarily being a direct cause, the protective factors act to mitigate this probability.⁽⁷⁾

In view of the important role of Nursing in the work in mental health of different populations, it is recognized that understanding these factors allows for a broader view of the construct for these professionals, enabling guidance of the care provided to students in mental distress, or even supporting specific public policies and greater effectiveness in preventing suicidal behavior and promoting mental health.⁽⁸⁾

Although the scientific production on factors associated with suicidal behavior in graduate students has apparently been increasing in recent years, these data have not been systematically

compiled to the present day. Available reviews did not present specific results for *stricto sensu* graduate students⁽⁹⁾ or did not deepen the understanding of factors associated with the risk or protection regarding suicidal behavior.⁽¹⁰⁾

Thus, the need to carry out a scoping review on the theme is evidenced, as it is a methodological resource of considerable relevance and usefulness to investigate complex and little explored themes, which seems to characterize the current panorama of the literature on the factors associated with suicidal behavior in *stricto sensu* graduate students. In addition to that, this review method makes it possible to provide key characteristics or factors related to a given concept, as well as to discover and analyze gaps in the research literature, actions aimed at by this study.⁽¹¹⁾ Thus, the objective is to map the diverse scientific evidence on the factors associated with suicidal behavior in *stricto sensu* graduate students.

METHODS

This is a scoping review with a methodological approach to review and synthesize relatively recent literature, whose main purpose is to provide an overview of diverse evidence, mapping concepts and limitations of a knowledge field without, however, producing a summarized answer to a specific and delimited research question.⁽¹¹⁾

Study protocol

This review was developed from the basic methodological framework, an updated proposal for scoping reviews by the *Joanna Briggs Institute* (JBI).⁽¹²⁾ The PCC mnemonic structure (Population, Concept and Context) was used to define the study question and objective. The research guiding question, developed from this mnemonic framework was structured as follows: Which are the factors associated with suicidal behavior in *stricto sensu*, graduate students?, where Population: students; Concept: factors associated with suicidal behavior and Context: *stricto sensu* graduate studies in any training area.

The search strategy adopted was developed in three steps: first, a generic survey was carried out in two databases to map the main descriptors and frequently used synonyms. In this step, it was decided to consult the following databases: SCOPUS, due to its wide coverage of journals in the psychological area; and Latin American and Caribbean Literature on Health Sciences (*Literatura Latino-Americana e do Caribe em Ciências da Saúde*, LILACS), for encompassing studies originally published in Portuguese and Spanish. Three groups of descriptors were retrieved from this survey and used according to the mnemonic structure adopted: Population - "graduate student*"; Concept - "suicidal behavior" OR "suicide" OR "suicide attempt" OR "self-harm" OR "self-injury" OR "suicidal ideation" AND "risk factor*" OR "predict*" OR "protective factor*" OR "associated factor*"; Context - "graduate education". The AND and OR Boolean operators were used to combine descriptors (intersection and union), in addition to truncating

techniques considered adequate for each database consulted.

After the first step, all descriptors and/or keywords retrieved were grouped to form a full search strategy, and a new survey was carried out in the SCOPUS and LILACS databases, in this stage adding searches in PubMed/Medical Literature Analysis and Retrieval System Online (Medline), Web of Science, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and PsycInfo from the *American Psychological Association*. The AND NOT exclusion Boolean operator was used in some

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databases to remove from the searches those articles that addressed populations/samples of adolescents.

In this review, it was decided to also search in Gray Literature repositories, including Open Access Thesis and Dissertations (OATD) and the Thesis and Dissertation Catalog of the Coordination for the Improvement of Higher Education Personnel (BDTD-CAPES). The search strategy in these databases was adapted to meet their respective singularities in terms of the search mechanisms, which, in general, are simpler than the first databases mentioned. The final search strategies are presented in **Chart 1**.

Chart 1. Presentation of the final search strategies adopted in this scoping review, according to the database consulted. Cuiabá, Mato Grosso, Brazil, 2022.

Database	Final search strategy adopted	Materials retrieved
SCOPUS	("suicide" OR "suicidal behaviour" OR "suicide attempt" OR "self-harm" OR "self-injury" OR "suicidal ideation") AND ("risk factor*" OR predict* OR "protective factor*" OR "associated factor*") AND ("graduate student*" OR "graduate*")	104
LILACS	"suicide" OR "suicidal behaviour" OR "suicide attempt" OR "self-harm" OR "self-injury" OR "suicidal ideation" [Words] and "graduate student*" OR "graduate*" [Words] "comportamento suicida" or "ideação suicida" or "suicídio" or "suicídio" or "comportamento autodestrutivo" or "tentativa de suicídio" [Words] and "pós-graduação" or "pós-graduando" [Words]	07
PubMed/Medline	((("suicide" OR "suicidal behaviour" OR "suicide attempt" OR "self-harm" OR "self-injury" OR "suicidal ideation") AND ("risk factor*" OR predict* OR "protective factor*" OR "associated factor*")) AND ("graduate student*" OR "graduate*"))	649
Web of Science	("suicide" OR "suicidal behaviour" OR "suicide attempt" OR "self-harm" OR "self-injury" OR "suicidal ideation") AND ("risk factor*" OR predict* OR "protective factor*" OR "associated factor*") AND ("graduate student*" OR "graduate*")	288
CINAHL	("suicide" OR "suicidal behaviour" OR "suicide attempt" OR "self-harm" OR "self-injury" OR "suicidal ideation") AND ("risk factor*" OR predict* OR "protective factor*" OR "associated factor*") AND ("graduate student*" OR "graduate*")	42
PsycInfo	("suicide" OR "suicidal behaviour" OR "suicide attempt" OR "self-harm" OR "self-injury" OR "suicidal ideation") AND ("risk factor*" OR predict* OR "protective factor*" OR "associated factor*") AND ("graduate student*" OR "graduate*")	637
BDTD-CAPES	suicídio OR comportamento suicida OR ideação suicida OR tentativa de suicídio AND pós-graduação	182
OATD	((("suicide" OR "suicidal behaviour" OR "suicide attempt" OR "self-harm" OR "self-injury" OR "suicidal ideation")) AND ("risk factor*" OR predict* OR "protective factor*" OR "associated factor*")) AND ("graduate student*" OR "graduate*")	18

Source: Developed by the authors (2022).

Regarding application of the eligibility criteria, articles, theses or dissertations that evaluated factors associated with any aspect of suicidal behavior (suicidal ideation, suicide planning, suicide attempts and/or suicide itself) in *stricto sensu* graduate students (MSc and/or PhD) were considered with no time or geographical restrictions imposed for selecting studies. There were language limitations, having selected only studies published in Portuguese, English or Spanish. The studies excluded were those that analyzed heterogeneous samples of students, combining undergraduate and graduate students in the same inferences, which precludes separating specific information from the researched population, as well as those that did not present original data (books, case studies, experience reports or reviews), as they can potentially generate incomplete and inaccurate information about true associations of explanatory factors with the outcome of interest.

Finally, a manual search was performed in the reference list of the articles retrieved in order to locate any study of interest that had not been retrieved from the databases reviewed. The search, selection and analysis processes were initially performed between July and October 2020 and updated from April 5th to April 10th, 2022. The

searches, selection and extraction of information were carried out by two reviewers acting independently and who, in the extraction phase, used an instrument developed by the authors themselves for use in the context of this study containing guidelines on basic bibliographic information, methodological characteristics of the studies and characterization data of suicidal behavior aspects that should be extracted for further analysis.

It is noted that each reviewer made their own selection of articles based on the eligibility criteria considered and that the extraction forms were later compared. Any and all discrepancies were resolved by consensus between the main reviewers.

The search and selection process of the review studies was presented in the form of a flowchart and followed the recommendations set forth in the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA), with management of aspects references performed in *EndNote X7®*, used mainly for storage of the bibliography retrieved and identification of duplicates.

RESULTS

Characteristics of the studies

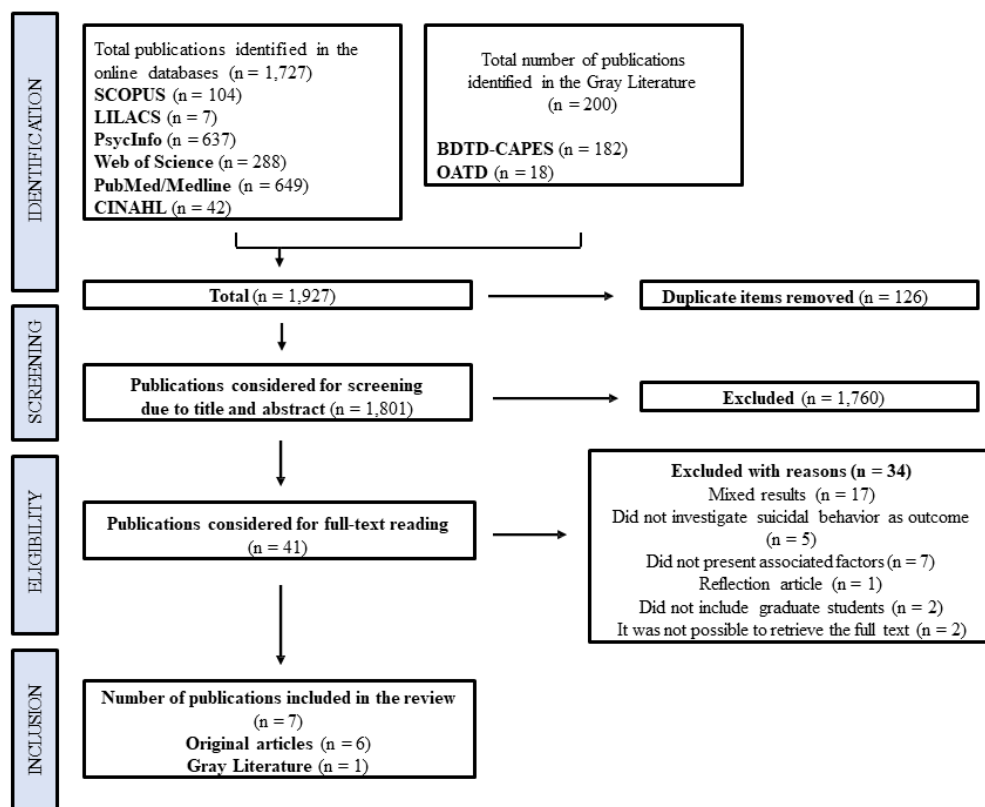
The search strategy adopted in this study was applied and adapted to eight different databases: six repositories for original articles and two exclusive databases for the Gray Literature (theses and dissertations), which made it possible to retrieve a total of 1,927 publications. Of these, 1,727 were found in the following databases: SCOPUS (104), LILACS (7), PsycInfo (637), Web of Science (288), PubMed/Medline (649) and CINAHL (42), whereas the others (200) were retrieved from BDTD-CAPEs (182) and OATD (18).

The largest volume of these publications was excluded in the early stages of the review, during removal of duplicate items (126) and screening of titles and abstracts (1,760). A total of 41 publications were selected for full-text reading. Of this subtotal, 17 studies were excluded for presenting mixed results (they included data from undergraduate and

graduate students in the same analysis), as well as five for not investigating suicidal behavior as an outcome, seven for not presenting any associative analysis, one for being a reflective article, two for not including *stricto sensu* graduate students as sample and, in another two, it was not possible to retrieve the full texts, despite the researchers' efforts.

Finally, it is noted that the search strategy adopted in this study resulted in a sample consisting of seven bibliographic materials, including six original articles (85.7%) and one Gray Literature material (14.3%) in dissertation format, which represents 0.36% of the initial number of searches and 17.07% of the materials selected for full-text reading. The details regarding the number of results retrieved and selected in each stage of the review can be seen in the flowchart below (Figure 1):

Figure 1. Flowchart corresponding to the process to search and select materials for the review. Cuiabá, Mato Grosso, Brazil, 2022.



Source: Developed by the authors (2022).

Although the oldest article that presented results of factors associated with the risk of suicidal behavior in *stricto sensu* graduate students dated back to 1997, the highest percentage of materials on the topic (57.1%) was published only after 2018. Geographically, the studies found came from three different countries: United States, China and Brazil. Regarding the outcomes analyzed, three articles evaluated factors associated with suicide risk, two evaluated associations between different nuances of the suicidal spectrum (ideation, planning and attempts), two evaluated associations only with

suicidal ideation and one evaluated associations with suicide itself (Chart 2).

In relation to design, predominance of cross-sectional studies is noted (85.7%), with only one longitudinal study. In addition, methodologically, it was found that the *Suicidal Behaviors Questionnaire-Revised* (SBQ-R) instrument was used in three studies to measure the prevalence of suicidal behavior, while the others resorted to other validated instruments or questions prepared by the researchers themselves (Chart 3).

Chart 2. Bibliographic characterization of the studies about factors associated with suicidal behavior among *stricto sensu* graduate students (n=7). Cuiabá, Mato Grosso, Brazil, 2022.

Identification	Title	Type of Publication	Journal/Institution	Year Country	Outcome(s) studied
A1 ⁽¹³⁾	<i>The Big Ten Student Suicide Study: a 10-year study of suicides on Midwestern university campuses</i>	Original Article	<i>Suicide and Life-Threatening Behavior</i>	1997 United States	Suicide
A2 ⁽⁴⁾	<i>Mental health and suicidal behavior among graduate students</i>	Original Article	<i>Academic Psychiatry</i>	2014 United States	Suicidal ideation Suicide planning Suicide attempts
A3 ⁽¹⁴⁾	<i>Major differences: variations in undergraduate and graduate student mental health and treatment utilization across academic disciplines</i>	Original Article	<i>Journal of College Student Psychotherapy</i>	2016 United States	Suicidal ideation
A4 ⁽¹⁵⁾	<i>Protective factors as predictors of suicide risk among graduate students</i>	Original Article	<i>Journal of College Counseling</i>	2018 United States	Risk of suicide Suicidal ideation
A5 ⁽¹⁶⁾	<i>Depressive symptoms, post-traumatic stress symptoms and suicide risk among graduate students: The mediating influence of emotional regulatory self-efficacy</i>	Original Article	<i>Psychiatric Research</i>	2018 China	Risk of suicide Suicidal ideation Suicide planning Suicide attempts
A6 ⁽¹⁷⁾	<i>Sofrimento mental e comportamento suicida em pós-graduandos stricto sensu: prevalência e fatores associados</i>	Dissertation	<i>Universidade Federal do Piauí</i>	2019 Brazil	Suicidal ideation Suicide planning Suicide attempts
A7 ⁽¹⁸⁾	<i>Fatores associados ao risco de suicídio em pós-graduandos</i>	Original Article	<i>Revista Latino-Americana de Enfermagem</i>	2021 Brazil	Risk of suicide

Source: Developed by the authors (2022).

Chart 3. Methodological characterization and prevalence values of suicidal behavior among *stricto sensu* graduate students (n=7). Cuiabá, Mato Grosso, Brazil, 2022.

Identification	Study objective(s)	Design (Sample)	Instrument(s) used	Prevalence value(s)
A1 ⁽¹³⁾	To determine suicide rates on university campuses	Ambispective and longitudinal during 10 years (5 years retrospective and 5 years prospective) (261)	Own instrument to break down suicide cases	Suicide rate: 10.6/100,000 among graduate students Suicide: 32.2% of all the suicide cases analyzed were among graduate students.
A2 ⁽⁴⁾	To describe the graduate students' mental health, emphasizing associations between suicidal behavior and use of the services	Cross-sectional (301)	Questions formulated by the researchers	Suicidal ideation Last two weeks: 7.3% Suicide plans Last two weeks: 2.3% Attempts Throughout life: 9.9%
A3 ⁽¹⁴⁾	To analyze variations of mental health indicators and search for treatment among different university disciplines	Cross-sectional (9,872 MSc students and 5,980 PhD students)	Question formulated by the researchers	Suicidal ideation In the last year: It varied from 1.55% (Nursing MSc students) to 9.81% (Human Sciences PhD students)

A4 ⁽¹⁵⁾	To analyze protective factors as suicide risk predictors among graduate students in a large-size university from the USA Midwest region	Cross-sectional (413)	<i>Suicidal Behaviors Questionnaire-Revised</i> (SBQ-R)	Current risk of suicide: 21.2% Suicidal ideation or behavior Throughout life: 63.2% Suicidal ideation Last 12 months: 27.8%
A5 ⁽¹⁶⁾	To examine the relationship between depressive symptoms, post-traumatic stress symptoms, emotional regulation self-efficacy and risk of suicide among graduate students	Cross-sectional (3257)	<i>Suicidal Behaviors Questionnaire-Revised</i> (SBQ-R)	Suicidal ideation Throughout life: 25.7% Last 12 months: 6.3% Suicide plans Throughout life: 1.6% Attempts Throughout life: 1.1% Suicidal behavior throughout life: 28.4%
A6 ⁽¹⁷⁾	To analyze the incidence of mental distress, suicidal behavior and associated factors in <i>stricto sensu</i> graduate students	Cross-sectional (227)	<i>Beck Suicidal Ideation</i> (BSI) scale	Suicidal ideation Throughout life: 32.2% Suicide plans Throughout life: 19.4% Attempts Throughout life: 6.8%
A7 ⁽¹⁸⁾	To analyze factors associated with the risk of suicide in graduate students	Cross-sectional (565)	Module C of the <i>Mini International Neuropsychiatric Interview</i> - adapted for self-application	Risk of suicide Last 30 days: 40.18%

Source: Developed by the authors (2022).

Factors associated with suicidal behavior

The associations found in the studies were divided into two main categories: risk factors and protective factors; and the risk factors, due to their higher number and wide variability of variables studied, were also grouped into five smaller categories: 1. Health-related variables, a category that gathered elements related to conditions and perceptions about the students' physical and mental health, behaviors and history of psychological/or psychiatric treatments; 2. Psychological variables, a category

that included variables related to emotions and personality traits; 3. Sociodemographic factors, which encompassed gender, age and aspects related to income and religiousness; 4. Relational factors, which included variables related to the different social interactions established by graduate students in the academic and family contexts; and 5. Academic factors, which brought together variables related to the university education process in the context of graduate studies (Chart 4).

Chart 4. Frequency of categories and risk/protection factors associated with suicidal behavior among *stricto sensu* graduate students. Cuiabá, Mato Grosso, Brazil, 2022.

RISK FACTORS
Health-related (n=13): depressive symptoms ^(4,16,18) ; anxiety symptoms ^(4,18) ; PTSD symptoms ⁽¹⁶⁾ ; self-report of drinking alcohol more than usual ⁽⁴⁾ ; use of psychotropic drugs during the course ⁽¹⁸⁾ ; being in therapy/counseling ⁽⁴⁾ ; diagnosis of mental disorder at some point in life ⁽¹⁷⁾ ; feeling extremely worried about being thin or losing weight ⁽⁴⁾ ; and feeling of not controlling what they eat ⁽⁴⁾ .
Psychological (n=6): Negative emotions (loneliness, rage, despair, hopelessness, feeling out of control) ⁽⁴⁾ ; low emotional stability ⁽¹⁵⁾ .
Sociodemographic (n=5): female gender ^(13,17) ; age over 30 years old ⁽¹⁸⁾ ; concern about the financial situation ⁽¹⁸⁾ ; religious denomination ⁽¹⁷⁾ ; absence of faith-related practices ⁽¹⁸⁾
Relational (n=3): disagreeing that they have a good relationship with their graduate peers ⁽¹⁸⁾ ; family relationships harmed by the demands of graduate studies ⁽¹⁸⁾ ; unsatisfactory family relationships ⁽¹⁷⁾ .
Academic (n=3): disagreeing that academic work is significant or inspiring ⁽¹⁸⁾ ; having experienced a situation of humiliation by the advisor ⁽¹⁷⁾ and concentration area of the graduate course ⁽¹⁴⁾ .
PROTECTIVE FACTORS
Psychological (n=2): emotional regulation self-efficacy ⁽¹⁶⁾ ; high emotional stability ⁽¹⁵⁾

Source: Results of the scoping review (2022).

In relation to Chart 4, it is also noted that the highest number of factors associated with the risk of suicidal behavior were related to the graduate students' physical and mental health, with 13 different variables from four studies^(4,16-18). Among

these conditions, psychopathological symptoms were the most frequently evaluated as risk factors for suicidal behavior (n=6), especially depressive symptoms^(4,16,18), anxiety symptoms^(4,18) and post-traumatic stress disorder (PTSD) symptoms⁽¹⁶⁾. The

psychological variables were the only elements identified both as risk and as protective factors for the outcome reviewed, and the relational and academic factors were the least frequently associated with suicidal behavior (n=3).

Factors associated with suicidal behavior in graduate students.. promoted for each group according to their weaknesses and needs.

In relation to design, the only longitudinal study found⁽¹³⁾ ambispectively evaluated suicide rates in American graduate students over a 10-year period, reflecting on the magnitude of these rates and their associations with some characteristics of the sample. The other studies that evaluated other nuances of suicidal behavior maintained the cross-sectional study standard. The scarcity of longitudinal studies can be related to the inherent complexities of this methodology, which, in general, demand more time, resources and investments for their conduction.⁽¹⁹⁾

The prevalence of suicidal behaviors among *stricto sensu* graduate students in these associative studies was quite diverse and difficult to compare, given the wide variety of possible outcomes to be evaluated (suicidal ideation, suicide planning, suicide attempts and risk), the heterogeneity of time periods considered in the evaluation of outcomes (throughout life, in the last year, in the last month or in the last two weeks), as well as the variability of assessment instruments and methodologies used.

In relation to the factors associated with suicidal behavior, specifically in the context of *stricto sensu* graduate studies, the results of this review show that most of the publications selected were devoted to the study of risk factors, with limited evidence available on protective factors. Regarding the elements that pose more risk for suicidal behavior, the psychopathological symptoms were the ones most frequently pointed out, with depressive symptoms standing out. The association between depressive symptoms and suicidal behavior is widely recognized in the specialized literature, with both phenomena being mutually implicated, in general terms.⁽²⁰⁾ This coexistence relationship is worrying for *stricto sensu* graduate students, as there is evidence pointing out that this population segment seems to be more vulnerable to developing depressive disorders when compared to the general population or to other students^(4,21).

As well as the depressive disorders, anxiety disorders are also a prevalent problem among these students⁽²¹⁾, and one of the explanatory possibilities for this high prevalence lies in the fact that this training level has peculiar academic demands, which, when coupled to other psychosocial factors, may influence greater genesis of anxiety symptoms in this population segment.⁽³⁾

Anxiety disorders themselves are not always associated with a higher prevalence of suicidal behavior; however, when they occur concomitantly with other psychiatric comorbidities, such as depressive disorders, they result in a summative effect on suicide risk.^(20,22) The hypothesis of a summative effect on the risk of suicide caused by the co-occurrence of depressive symptoms and post-traumatic stress disorder symptoms was also observed in Chinese graduate students.⁽¹⁶⁾

Use of substances such as alcohol and psychotropic drugs, and eating problems, depending on their severity, are also serious mental distress problems, especially when they occur during graduate studies, as they are associated with a higher risk for suicidal behavior in this population

DISCUSSION

This scoping review identified risk and protective factors associated with suicidal behavior in *stricto sensu* graduate students, as well as characteristics of the literature on the topic.

Wide heterogeneity of outcomes related to suicidal behavior was observed, in addition to the variability of both the assessment instruments used and the time periods for the manifestation of these behaviors. Regarding the instruments used, it is noted that, despite being diversified, most of the researchers opted for validated measures with good psychometric properties, and only two of the studies used their own questionnaire for data collection, namely the two oldest in the sample.^(4,13) This use can be justified due to the limited availability of instruments that specifically assess suicidal behavior in graduate students, or to the absence of validated instruments with relevant psychometric properties for this population segment at the time when these research studies were conducted, mainly the study from the late 1990s.⁽¹³⁾

With the exception of one study⁽¹³⁾, all the others were published between 2014 and 2020, which may indicate that discussion and investigation of factors associated with suicidal behavior specifically in *stricto sensu* graduate students is a relatively new topic that is still incipient today. It is noted that there are other studies published in the last decades that investigated suicidal behavior in university students and included graduate students in their samples^(9,10); however, as they encompass undergraduate and graduate students as the same analysis category, the comparisons and reflections between these different academic levels became dilemmatic and precluded finding specific risk or protective factors for graduate students.⁽⁴⁾

It is also noteworthy that the studies identified were limited to a specific group of countries (United States, China and Brazil), which can denote two possible scenarios: a possible deviation in selection of the materials due to the languages chosen for the searches (English, Spanish and Portuguese); or a geographic restriction in carrying out research studies on the theme, even though there is diverse evidence that suicidal behavior among graduate students is a global problem, along with other mental distress indicators. The challenges encountered by graduate students are more intense and require a higher degree of dedication when compared to those faced by undergraduate students, predisposing this population segment to the development of mental distress in an increasingly worrying proportion.⁽¹⁷⁾ Thinking together in this regard can exert negative influences on the possible interventions that may originate from the results of these research studies carried out, thus making it indispensable to carry out studies that present specific results among these populations, so that functional strategies can be

segment.^(4,18) Substance use seems to be a negative coping strategy used relatively frequently among graduate students, in order to minimize recurrent symptoms of anxiety, depression, insomnia and nervous breakdown.⁽³⁾

Suicidal behavior is strongly related to mental distress. Thus, it is recognized that suffering any psychiatric disorder increases the risk for suicidal behaviors⁽²³⁾, and this association can be explained by the experience of distress or losses by the individual.⁽²⁴⁾ The greater the severity of the psychiatric disorder and/or the higher the number of concomitant disorders, the mental illness process can become intolerable, driving individuals to suicidal behavior, as most people who attempt against their own lives aim to escape from pain or distress they perceive intolerable.⁽²⁵⁾ This situation of perceived intolerability generally happens when mental distress is neglected and not adequately treated.⁽²⁶⁾

In the literature specializing in suicide, it is recognized that, when successful and effective, the treatment of mental disorders reduces the risk of mortality due to suicide, with an increase in the prevalence of this behavior associated with untreated adverse psychological conditions.⁽²⁷⁾ The association between the search for treatment or specialized monitoring and the higher prevalence of suicidal behaviors found in these studies can be interpreted from a positive and optimistic perspective, indicating that, when they perceive themselves in greater severity of mental distress, the students recognize the need to search for help and treatment for their conditions.

It is also noted that gender was a factor associated with the risk of suicidal behavior, where the studies that evaluated this association pointed to graduate women as being at higher risk. It is known that the suicidal behavior *continuum* has recognized peculiarities when analyzed from a gender perspective, evidencing greater vulnerability to mental illness and risk of suicide in women.⁽²⁴⁾

Also in relation to the social and demographic characteristics presented by the students, an association was verified between suicidal behavior and variables related to religiousness and to faith-related practices. The relationship between aspects of religion and suicidal behavior has been better understood over the last few years, and it is now known that each religion provides a series of effective strategies that, in general, act as protective factors against the deleterious effects of everyday stressors, situations of crisis and distress, such as suicidal behavior.⁽²⁸⁾

Religions are a multidimensional phenomenon and the ways in which they act as protective factors are varied, making it difficult to attribute their beneficial effects to a single factor or element, mainly for mental health. It is believed that the combination of beliefs, behaviors and interactions promoted within the scope of religiousness work together to promote health and well-being.⁽²⁹⁾ These positive aspects of religiousness can help graduate students to attribute new meanings to distress and face the demands and challenges inherent to graduate studies in a healthy way.

Factors associated with suicidal behavior in graduate students..

Age group was also a factor associated with a higher prevalence of recent suicide risk in Brazilian graduate students, namely, being over 30 years old; in other words older graduate students may suffer from additional stressors such as greater pressure to enter the labor market or greater difficulties to reconcile the vicissitudes of academic, family and social routines with the potential to culminate in mental distress and increased risk for self-inflicted death.⁽¹⁸⁾

It was also evidenced that the notoriously recognized association between financial stress and suicidal behavior in the general population also affects *stricto sensu* graduate students.⁽¹⁸⁾ The requirement of exclusive dedication to the graduate activities demanded by some programs forces the students to leave their jobs, resign or remain unemployed, which can inevitably compromise family income. Financial insecurity and excessive concern about their economic situation are potential stress factors that can culminate in mental distress and suicidal behavior.⁽¹⁸⁾

In the studies researched, the prevalence of the association between various negative emotions and suicidal behavior stood out. The literature shows that, in the study of risk factors for suicidal behavior, negative emotions are one of the most widely investigated elements.⁽³⁰⁾ In addition to that, it is noted that the psychological characteristics were the only variables recognized as protective factors against suicidal behavior in the studies reviewed. Emotional regulation self-efficacy and high levels of emotional stability were significantly associated with a lower prevalence of suicide risk, respectively, in American⁽¹⁵⁾ and Chinese graduate students.⁽¹⁶⁾

Although graduate studies are characterized as potentially detrimental to the students' mental health⁽²¹⁾ and are even identified as a precursor to suicidal behaviors,^(10,16-18) it is clear that specific academic aspects of this training level were scarcely explored in the studies that investigated factors associated with suicidality, and even less frequent were the significant associations found. Most of the significant associations in this category come from the Brazilian literature,⁽¹⁷⁻¹⁸⁾ pointing out higher risks of suicide in the last 30 days among graduate students who did not perceive their academic work (dissertation or thesis) as significant or inspiring; such perception might perpetuate a discouragement and disengagement cycle with the potential to generate mental distress.⁽¹⁸⁾ In graduate studies, dissatisfaction with the theme researched constitutes a risk factor for the emergence of mental distress in even higher proportions, due to the need to devote almost entirely to the research development.⁽¹⁷⁾

Having experienced any humiliating situation by the advisor was also an academic factor associated with the higher proportion of suicidal ideation cases in the students. Among all the factors related to the academic scope of graduate studies, possibly the quality of the relationship between graduate students and their advisors is one of the best explored and emblematic in the international scientific literature.⁽³¹⁾ This type of relationship is commonly characterized as the process in which a professional with a higher level of academic and

research experience provides support and assists in the professional development of a subject with less experience in their work/research field.^(31,32)

It is noted that, in addition to the support for professional development, the relationship with an academic advisor is a potential and expected source of emotional support, which would help the student face the challenges encountered in the graduate experience with more confidence and less distress.⁽³³⁾ Thus, in this perspective, when the advisor assumes roles that are contradictory to the ones expected, adopting an insensitive, authoritarian and inaccessible stance⁽³⁴⁾ or with humiliating practices, this established relationship starts to present a deleterious potential for the student's mental health.

In addition, regarding the academic aspects, an American study evidenced variations in the risk of suicidal ideation in the last year among graduate students from different concentration areas.⁽¹⁴⁾ The authors pointed out that, among MSc students, those enrolled in courses in the Humanities, Natural Sciences and Arts/Design were at a higher risk when compared to MSc students in the area of Social Sciences. Among PhD students, a difference was only found among medical graduate students, who were 54% less likely to report suicidal ideation in the last year when compared to Social Sciences students.⁽¹⁴⁾

Finally, aspects of the social relationships established by the graduate students, directly or indirectly related to the academic context, also showed potential to increase the risk of suicidal behavior in these students, highlighting unsatisfactory family relationships or impaired by the graduate course. Poor quality of the family relationships, or even dissatisfaction with them, has been associated with an increase in symptoms of mental illness and suicidal behavior since, in general, good family dynamics are a beneficial source for coping with life problems and difficulties, which helps promote mental health and well-being. However, when the family dynamics built is permeated by weak bonds and conflicting situations or neglect, family relationships can assume a stressogenic and pathologizing character.⁽³⁵⁾

Finally, when of good quality, the interactions with academic peers in the context of graduate studies constitute relational factors for the experience of potential stressors, which can be found in the researchers' training process, being associated with better indicators of academic success and even of mental health.⁽³⁶⁾

Despite using a search strategy considered comprehensive and encompassing several repositories to try to identify most of the evidence available on the topic, some significant materials may have been omitted, given that materials published in languages other than English, Spanish and Portuguese were not considered, which may have contributed to restriction in the findings. In contrast, opening the searches to two important repositories of the Gray Literature made it possible to survey a wide range of materials that might have been neglected in other types of reviews.

The diverse evidence included in this review contributes to synthesizing the knowledge about

Factors associated with suicidal behavior in graduate students.. factors associated with the risk or protection in terms of suicidal behavior in the scope of *stricto sensu* graduate studies, giving emphasis and visibility to this problem that afflicts researchers in training around the world. The results pointed out in this study can help health professionals promote actions that can alleviate such behaviors, as well as enable screening for early care of these students. It is added that the findings can support managers in the planning and implementation of academic policies that provide assistance to the students, aiming to minimize distress during this training period.

CONCLUSION

In this review, it was observed that the study of factors associated with suicidal behavior in graduate students is quite incipient, with few authors having dedicated themselves to investigating this problem exclusively within the scope of *stricto sensu* graduate studies. Risk factors have been the most recurrently studied, while there is a large gap in the literature regarding understanding of elements with a potential to protect these students against suicidal behavior.

It is noted that physical or mental health conditions, as well as psychological and sociodemographic characteristics were the groups of factors that gained greater prominence in the literature reviewed and whose relationships with suicidal behavior in graduate studies were most frequently evaluated. The role of the relational variables and of those of the teaching academic context in *stricto sensu* graduate education was less frequently researched in the studies reviews, with few significant associations.

In view of the incipience of studies, the severity and magnitude of suicidal behavior among MSc and PhD students, the need for better understanding the phenomenon in this population is recognized as imperative, resorting to studies with different methodologies in order to ground interventions or policies for the prevention of suicidal behavior in university environments.

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