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Review Article

Factors related to psychological stress in postgraduate students: integrative review

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Objective: to analyze scientific evidence on factors related to psychological stress among postgraduate students. **Methodology:** integrative review carried out in the databases Medical Literature Analysis and Retrieval System Online, Scopus, Cumulative Index to Nursing and Allied Health Literature, Nursing Database, bibliographic index Latin American and Caribbean Literature in Health Sciences and Bibliographic Index *Español en Ciencias de la Salud*. The controlled descriptors *Estudantes*/Students, *Estresse Psicológico*/Stress, Psychological and *Educação de Pós-Graduação*/Education, Graduate were used. **Results:** the final sample consisted of 17 studies which showed that postgraduate students have high stress levels and that the related symptoms negatively affected the student's relationship with the course. Difficulties in time management and the high demands of the programs were identified as main predictors of stress. **Conclusion:** the synthesis revealed that difficulties in reconciling time with leisure activities and the program's demands, inattention to to personal life, curricular requirements, insecurity in relation to the professional future, financial problems linked to the costs of self-financing their research, imbalances in relationship with advisors and reduced time for family and friends are all factors related to psychological stress among postgraduate students.

Descriptors: Psychological Stress; Students; Universities; Graduate Education.

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Fatores relacionados ao estresse psicológico em estudantes de pós-graduação: revisão integrativa

Objetivo: analisar as evidências científicas acerca dos fatores relacionados ao estresse psicológico entre estudantes de pós-graduação. **Metodologia**: revisão integrativa realizada nas bases de dados *Medical Literature Analysis and Retrieval System on-line*, *Scopus*, *Cumulative Index to Nursing and Allied Health Literature*, Base de Dados em Enfermagem, índice bibliográfico Literatura Latino-Americana e do Caribe em Ciências da Saúde e *Índice Bibliográfico Español en Ciencias de la Salud*. Foram utilizados os descritores controlados Estudantes/*Students,* Estresse Psicológico/*Stress, Psychological* e Educação de Pós-Graduação/*Education, Graduate*. **Resultados**: a amostra final foi constituída por 17 estudos que evidenciaram que estudantes de pós-graduação apresentam níveis elevados de estresse e que os sintomas a ele relacionados afetaram de forma negativa a relação do estudante com o curso. Dificuldades no gerenciamento do tempo e as elevadas demandas dos programas foram identificados como principais preditores de estresse. **Conclusão**: a síntese revelou que dificuldades em conciliar o tempo com atividades de lazer e as demandas do programa, desatenção com a vida pessoal, exigências curriculares, insegurança quanto ao futuro profissional, problemas financeiros atrelados aos gastos com o autofinanciamento de suas pesquisas, desequilíbrios na relação com os orientadores e tempo reduzido para família e amigos são fatores relacionados ao estresse psicológico entre estudantes de pós-graduação.

Descritores: Estresse Psicológico; Estudantes; Universidades; Educação de Pós-Graduação.

Factores que se relacionan con el estrés psicológico en estudiantes de postgrado: revisión integradora

Objetivo: analizar evidencias científicas sobre los factores que se relacionan con el estrés psicológico entre estudiantes de posgrado. **Metodología:** revisión integradora realizada en las bases de datos *Medical Literature Analysis and Retrieval System online*, Scopus, *Cumulative Index to Nursing and Allied Health Literature*, *Nursing Database*, índice bibliográfico Literatura Latinoamericana y del Caribe en Ciencias de la Salud e Índice Bibliográfico Español en Ciencias de la Salud. Se utilizaron los descriptores controlados *Estudantes/Students, Estresse Psicológico/Stress/Psychological* y *Educação de Pós-Graduação/Education/Graduate*. **Resultados:** la muestra final estuvo compuesta por 17 estudios que demostraron que los estudiantes de postgrado presentan altos niveles de estrés y que los síntomas relacionados afectaban negativamente la relación del estudiante con el curso. Las dificultades en la gestión del tiempo y las altas exigencias de los programas fueron identificadas como principales predictores de estrés. **Conclusión:** la síntesis reveló que las dificultades para conciliar el tiempo con las actividades de ocio y las exigencias del programa, falta de atención a la vida personal, exigencias curriculares, inseguridad respecto al futuro profesional, problemas financieros vinculados a los gastos con el autofinanciamiento de sus investigaciones, desequilibrios en la relación con asesores y la reducción del tiempo con familiares y amigos son factores que se relacionan con el estrés psicológico entre los estudiantes de postgrado.

Descriptores: Estrés Psicológico; Estudiantes; Universidades; Educación de Postgrado.

Introduction

Scientific research plays a fundamentally important role in a country's technical and scientific development and provides considerable advances in various knowledge areas. Despite the positive and beneficial implications of its results, postgraduate study is also characterized as a challenging and complex environment for students, as it requires an arduous and continuous process of adaptation to the multiple stressors that considerably affect the lives of postgraduates[1].

Among the multidimensionality of these contexts, the pressure to continuously produce innovative studies, the high academic and work demands, financial difficulties, conflicting relationships with the advisor, as well as uncertainties about the professional future are some of the different stressors associated with postgraduate studies that can result in high stress levels and/or physical and emotional exhaustion for students[2].

Stress can be characterized by the body's own reactions to situations that require an effort to adapt. Accentuated stressors can influence psychosocial adjustment and alter students' ability to respond, affecting their physical state, mental and affective behavior, and relationships. In addition, they can trigger an increase in feelings of malaise, suffering and/or discomfort, whether transitory or persistent. When prolonged, they can cause significant health problems, as well as damage to student performance, leading to vertiginous drops in engagement patterns and academic career stimulation[3-4].

Increased stress levels in postgraduate studies are a major factor in dissatisfaction and discouragement about continuing in an academic career. Even though the resulting deterioration in quality of life stems from the overload of demands and activities in the academic system, students are often repressed when their performance drops[5].

Analyzing these scenarios in higher education institutions highlights the complex relationship between postgraduate studies and students' mental health. In an international study carried out with postgraduate students from 26 countries, it was found that these students were six times more vulnerable to developing depression or anxiety when compared to the general population. In Brazil, in a study carried out in 66 higher education institutions in the five Brazilian regions, the outcomes found also revealed an increased risk of psychological problems among master's and doctoral students: of the 2,157 postgraduate students who took part in the study, almost half (46.8%) had high or very high stress levels[6-7].

Changes in psychological stress levels interfere qualitatively with aspects such as memorization, attention, concentration, creativity, and interpersonal relationships. As a result, these imbalances can lead to a potential risk of dropping out of the course and to psychological problems such as depressive episodes, mood swings and increased anxiety symptoms. This reiterates the importance of ongoing studies into the health of postgraduate students since, although also surrounded by satisfying experiences, the process of training these students can involve unfavorable and adverse conditions that can hinder healthy academic development[4].

It is important to note that, although the scientific literature provides relevant references on the physical and mental health of postgraduate students, the persistence of this problem and the need to recognize the diversity of factors influencing the mental health of these students make it essential to continue reviewing the contexts, predictive factors and health situations associated with the physical and psychological well-being of this population.

In view of the above, this study aims to analyze the scientific evidence on factors related to psychological stress among postgraduate students.

Methodology

This is an integrative literature review study, developed according to the following stages: elaboration of the guiding question, search and selection of primary studies, evaluation of primary studies, data analysis and presentation of the review[8].

To conduct this review, the research question was: "What is the scientific evidence on factors related to psychological stress among postgraduate students?". The acronym PICo (P= Population, I= Interest and Co= Context)[9] was used to elaborate this question, where P= students, I= factors associated with psychological stress and Co= postgraduate studies.

The bibliographic evidence survey was carried out in August 2023, by accessing the Medical Literature Analysis and Retrieval System online (MEDLINE via PubMed), Scopus (Elsevier), Cumulative Index to Nursing and Allied Health Literature (CINAHL-Ebsco) databases, Nursing Database (BDENF via Virtual Health Library/VHL), bibliographic index Latin American and Caribbean Literature in Health Sciences (LILACS via VHL) and Bibliographic Index *Español en Ciencias de la Salud* (IBECS via VHL). The databases and bibliographic indexes were accessed free of charge through the CAPES Journal Portal, via the Federated Academic Community (*Comunidade Acadêmica Federada*, CAFe), logged in by the Piauí Federal University (*Universidade Federal do Piauí*, UFPI).

To search these references, we selected the descriptors in English from the Medical Subject Headings (MeSH) and in Portuguese from the Health Sciences Descriptors (*Descritores em Ciências da Saúd*e, DeCS): Students, Stress, Psychological and Education, Graduate. The terms were combined using the Boolean operator AND and strategically applied to the aforementioned databases and bibliographic indexes.

The inclusion criteria were, as follows: primary studies related to the topic, with no time or language restrictions. The following were excluded: term papers, dissertations, theses, editorials, and studies that did not answer the guiding question.

The references identified in the databases were exported to the Rayann reference manager[10], which helped to detect and exclude duplicates and to select the eligible studies. The selection stage followed the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[11] and was carried out by two reviewers, independently, in two stages.

In the first stage, the titles and abstracts were read, and the eligibility criteria were met. The studies selected in this stage were then read in full and the eligibility criteria applied again. At the end of the stages, any disagreements were resolved through the opinion of a third reviewer.

In order to extract the data corresponding to the studies' characterization, the instrument prepared by the authors was used, consisting of the following variables: authorship, publication year, country, journal, study objective, study design, main results and evidence level (EL).

The EL of the studies was classified according to methodological design: level I - evidence derived from a systematic review or meta-analysis of all relevant randomized controlled clinical trials or from clinical guidelines based on systematic reviews of randomized controlled clinical trials; level II - evidence derived from at least one well-designed randomized controlled clinical trial; level III - evidence obtained from well-designed clinical trials without randomization; level IV - evidence from well-designed cohort and case-control studies; level V - evidence from systematic reviews of descriptive and qualitative studies; level VI - evidence from a single descriptive or qualitative study; and level VII - evidence from the opinion of authorities and/or expert committee reports[12].

The data was analyzed and summarized in a qualitative and descriptive manner, respectively. The information obtained was presented in tables, in which the studies are characterized according to the variables of interest collected.

Results

The initial search resulted in 369 studies, of which 34 were chosen for full reading. The final sample identified was 17 articles, as shown in the flowchart drawn up using PRISMA in Figure 1 below.

The characterization of the included studies is shown in Figure 2.

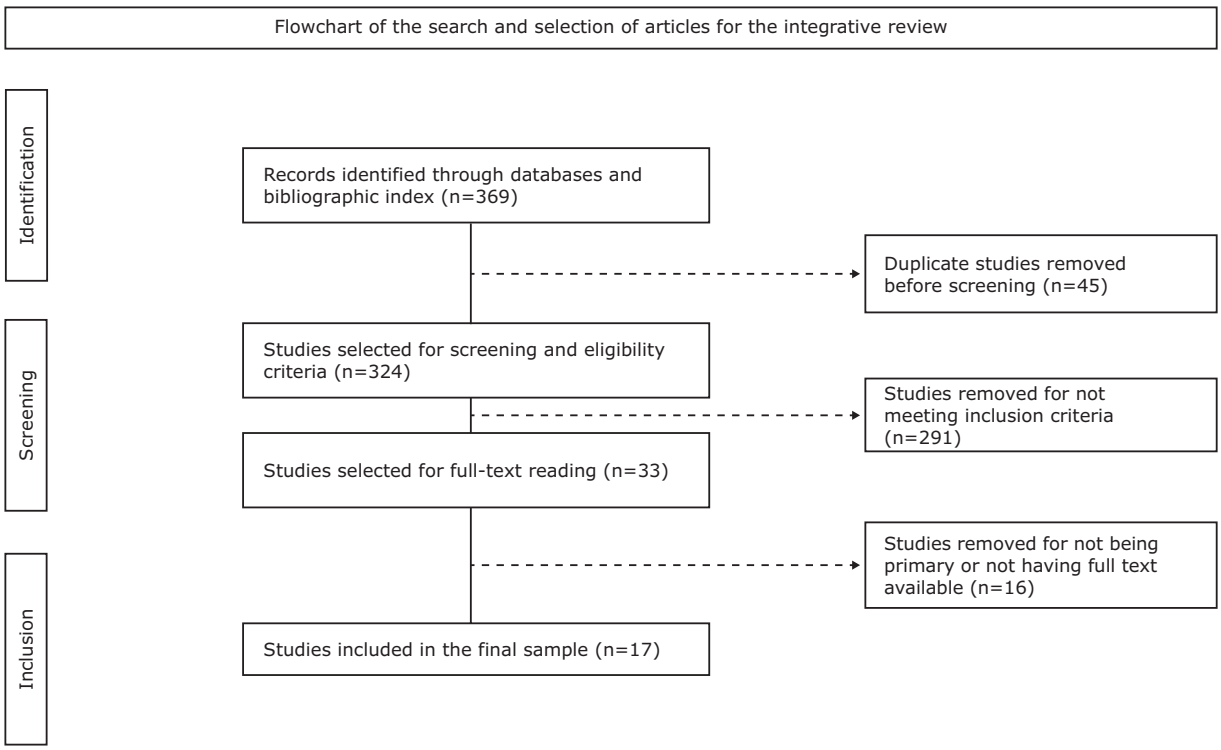

Figure 1 - Flowchart of the selection process for the studies included in the review, based on the PRISMA recommendation. Teresina, PI, Brazil, 2024

Nº	Year	Country	Journal	Study design/EL
A1[13]	1993	Canada	Academic Medicine	Comparative cross-sectional/VI
A2[14]	1999	Australia	Australian Critical Care	Longitudinal qualitative/VI
A3[15]	2001	United States	Psychological Reports	Cross-sectional quantitative/VI
A4[16]	2006	United States	Psychological Reports	Correlational/VI
A5[17]	2008	Brazil	*Revista de Saúde Pública*	Exploratory qualitative/VI
A6[18]	2011	Greece	European Journal of Dental Education	Transversal/VI
A7[19]	2011	United States	Journal Genetic Counselors	Mixed-methods/VI
A8[20]	2014	United States	Journal of American College Health	Transversal/VI
A9[21]	2015	Australia	BMC Medical Education	Longitudinal/VI
A10[22]	2015	Australia	Australasian Psychiatry	Transversal/VI
A11[23]	2016	Jamaica	Nurse Education in Practice	Cross-sectional descriptive/VI
A12[24]	2016	Iran	The Health Care Manager	Qualitative/VI
A13[25]	2017	United Kingdom	BMC Res Notes	Comparative cross-sectional/VI
A14[26]	2018	United States	Nurse Education Today	Cross-sectional descriptive/VI
A15[27]	2019	United States	Life Sciences Education	Cross-sectional descriptive/VI
A16[28]	2020	Australia	PloS One	Cohort/IV
A17[29]	2021	United States	Psychology, Health & Medicine	Cross-sectional descriptive/VI

Figure 2 - Characterization of the studies included in the review according to year, country, journal, study design and Evidence Level. Teresina, PI, Brazil, 2024

The final sample consisted of 17 studies[13-29]. It was found that the studies were published between 1993 and 2021 and showed a wide variety of places of origin, being carried out in eight different countries: Canada[13], Australia[14,21-22,28], United States[15-16,19-20,26-27,29], Brazil[17], Greece[18], Jamaica[23], Iran[24] and United Kingdom[25]. In particular, the United States accounted for 41.1% of all studies. Two studies[15-16] were published in the journal Psychological Reports. As for the research design, studies classified as EL VI prevailed[13-27,29].

Figure 3 shows the objectives and main results of the studies included in the review.

Nº	Objectives	Main Results
A1[13]	To assess stress levels and stress factors among medical undergraduates and postgraduates.	Postgraduate students had higher stress-related symptom scores.
A2[14]	To identify facilitators or limiters during the course among postgraduate nursing students.	Main limiting factors: change between clinical and student roles, frustrated expectations, and exhaustion.
A3[15]	To analyze the relationship between success, stress, and positive attitudes among doctoral students in psychology.	Successful students: use of emotional release as coping and greater medical care utilization.
A4[16]	To explore the relationship between stress and habits among postgraduate psychology students.	Sleep patterns and negative mood were correlates and stress predictors.
A5[17]	To analyze the relationship between stress, postgraduate studies, and work among master's students in nursing.	The master's degree was considered less stressful than work, being an escape/support strategy.
A6[18]	To determine levels of perceived stress and burnout among postgraduate dental students.	Perceived stress was positively correlated with the dimensions of Burnout.
A7[19]	To explore types of stressors and coping strategies among postgraduate students in genetic counseling.	The stressors identified were as follows: professional uncertainty, interpersonal and academic demands.
A8[20]	To examine the prevalence of mental health needs among international graduate students at a North American university.	Around 44% of students have experienced some stress-related problem that has affected their well-being or academic performance.
A9[21]	To compare stress levels and ways of coping between undergraduate and postgraduate medical students.	There was a difference in stress levels between the groups at the beginning, but there was no difference in any of the subsequent years.
A10[22]	To determine levels and factors related to depression, anxiety, and stress in postgraduate medical students.	Related factors: content volume; insecurity about studying; little time for family and friends.
A11[23]	To determine the levels and sources of academic stress among master's students in nursing.	50.9% had moderate stress levels. Research was not listed as a stressor.
A12[24]	To identify the causes and different coping strategies for stress and anxiety among medical doctoral students.	Intentional direction and guidance can be coping measures to reduce the cause of stress and anxiety.
A13[25]	To compare stress levels and coping styles between undergraduate and postgraduate medical students.	Both reported high levels of perceived stress; postgraduates were more likely to actively cope.
A14[26]	To examine the effects of stressors on the intention to abandon the course among doctoral students in nursing.	The following were associated with the intention to drop out: student/advisor relationship (direct relationship) and support from family/friends (inverse relationship).
A15[27]	To evaluate mediators of the stress-burnout relationship among biomedicine doctoral students.	Academic stressors were predictive of Burnout; stress-Burnout was partially mediated by advisor support.
A16[28]	To determine the baseline level of psychological distress in medical undergraduates and postgraduates.	It was found that financial worries are associated with higher stress levels in postgraduates.
A17[29]	To analyze stress and burnout in psychology doctoral students, by program year.	Third- and fourth-year students reported higher stress levels and Burnout scores.

Figure 3 - Characterization of the studies included in the integrative review according to objectives and main results. Teresina, PI, Brazil, 2024

In predominance, the studies were concentrated among postgraduate students in medicine[13,19,21-22,24-25,28], nursing (23.53%)[14,17,23,26] and psychology (17.65%)[15-16,29], both in relation to clinical residency programs and master's and doctoral courses in these areas.

The studies assessed stress levels[13,28], identified stressors and protective factors[14,24], investigated the relationship between students and stressful situations[15-17,19,26-27], determined burnout levels and their relationship with stress[18,23,27], examined knowledge about mental health services and counseling[20], and compared stress between graduate and undergraduate students and the general population[21-22,25,29].

The results showed that postgraduate students have high stress levels[13,18,20,22,25]. The related symptoms negatively affect the student's relationship with the course[14,23,26], causing emotional problems that affect academic performance and well-being[18-20,22,24,27,29]. Irregular sleep, lack of physical activity and negative mood were identified as stress predictors[16]. The large content load in a limited amount of time, insecurities, little time for family and friends, the relationship with the advisor, building the thesis/dissertation and financial worries were all factors related to the student's mental suffering[28]. Stress was related to exhaustion and depressive symptoms[18,20,22,27,29].

They also pointed out that students often adopt coping strategies to deal with the stressful situations of everyday academic life, including the adoption of risky behaviors, such as the use of alcohol and other drugs[15,17,21,25].

However, despite contributing to the triggering of stress symptoms, some participants stated that the master's degree was an escape strategy and a search for support[17].

Discussion

According to the findings, an overview of stress levels among postgraduate students was established, as well as an assessment of related factors and contexts. There is a similarity between the symptomatic profiles and stressful contexts among postgraduate students from different teaching areas. However, there are particularities that require more specific analysis of the types of programs and training within each professional field[13,30].

It should be noted that perceptions of postgraduate teaching may vary according to the training area and its modalities (*lato sensu* or *stricto sensu*). For master's students in nursing, despite the course presenting stressful moments, the prospect of considering leaving care to start teaching was a support strategy to deal with the exhausting work in hospitals. In this way, these students considered postgraduate study as an opportunity to escape the care environment[17].

For these professionals, even if they didn't clearly know what their ideal occupation would be (nurse, researcher or teacher), the possibility of participating in important reflections on professional issues was also one of the most positive aspects of the master's degree[17]. Postgraduate education for nurses can not only represent an escape from more stressful roles, but also open up ways of legitimizing their intellectual work and professional recognition that they didn't find in nursing care[31].

Among postgraduate nursing students, the aspects identified as having the greatest potential for stress were related to the programs' routines, including: frustrated expectations, exhaustion, course workload, requirements to write scientific papers to the expected standard, meeting the academic demands of the program and paying tuition or course fees[14,23]. Another study also showed that significant predictors of the intention to drop out of doctoral programs in nursing were influenced by stress factors in the postgraduate program and by supportive relationships. In a direct relationship, the accentuation of stress factors involving the doctoral program leads to a greater intention to drop out; in a protective capacity, family and friend support acts to reduce this risk[26,32].

Although the preparation of their research/dissertations was not identified as a source of stress by nursing master's students[23], doctoral students in the medical sciences indicated the thesis as the main source of stress, mainly related to supervision and guidance for writing the thesis. In this sense, studies have shown that a good relationship with the supervisor and their effective assessment, together with constructive feedback, can be important guidelines for improving students' mental health[24,33].

In other areas, stress may be more pronounced in clinical programs than in those mostly focused on research. Among postgraduate dental students, for example, clinical residents had higher perceived stress levels compared to students in non-clinical and doctoral programs. Similarly, the difficulties in reconciling the time available for leisure activities was considered the most relevant stressor among the three groups[18].

However, the other stressful contexts alternate due to the different demands of each program. Whereas for clinical residents, inattention to their personal lives and the lack of an adequate team in the clinics are more relevant situations, for postgraduate students

in non-clinical programs, difficulties with curricular requirements and insecurity about their professional future are more notable. Among doctoral students, concerns about financial and professional issues and neglect of personal life were highlighted[18].

In medicine, stress-related symptoms were higher in the group of master's and doctoral students when compared to undergraduates and residents. Among a variety of factors related to this situation, the following can be highlighted: interpersonal relationships and relationships with teachers/supervisors, financial difficulties, the heavy demand for course content, the constant need for publications and uncertainty about the availability of work after completing their studies[13]. In addition, in other teaching areas, aspects related to studying were also considered distressing, such as: retaining diverse content in a short period of time; doubts about the performance and planning of their studies, professional uncertainty, interpersonal demands and reduced time for family and friends[19,21-22].

Other contexts may also be correlated with stress among postgraduate students. Among postgraduate psychology students, sleep patterns, physical activity and negative affectivity were significantly correlated with stress, with a 24% prediction of variance in stress scores[16]. In addition, increased interpersonal contact and social support were significantly correlated with decreased psychological stress, which suggests that postgraduates should be encouraged to actively seek and maintain social support[15,34].

Sources of distress can also vary significantly in relation to the years of the course. First-year postgraduate students express greater concerns about assessment tasks, whereas more advanced students worry notably about carrying out clinical procedures and interactions with senior physicians[22].

The consensus on the age of these students being a protective or risk factor cannot be affirmed in all areas of postgraduate study. Whereas in the research with postgraduate dental students[18], older age emerged as a protective factor against stress and psychological exhaustion, symptoms of anxiety and stress among postgraduate medical students were higher in students aged ≥30 years[22].

When compared to undergraduate students, there is a certain similarity between the stress symptom profiles of undergraduates and postgraduates. However, coping with stressors is different in these two groups. Postgraduate students may experience a drop in well-being and academic performance as a result of stress[20,27-29], but they are more likely to use active coping strategies focused on the problem, which may be a favorable approach in these contexts[25]. However, it was also found that this group has a greater tendency to use some kind of psychoactive substance (alcohol or other drugs) to deal with their stressors[24-25,35].

As this is an integrative review study, some limitations can be pointed out, such as methodological weaknesses and insufficient data in some studies' results, as well as the low EL of the productions included, in other words, as they are cross-sectional studies, it is not possible to establish a cause and effect relationship between psychological stress and the factors identified. Despite the limitations, the aim was to carefully follow the stages for developing this type of study.

The results of this review contribute to the identification of the main factors related to psychological stress among postgraduate students, as well as their impact on mental health and the student's relationship with the course. The findings are important for planning and implementing support strategies during professional training.

Conclusion

The results obtained in the review indicated a wide range of factors related to psychological stress among postgraduates, mainly: difficulty in reconciling time with leisure activities and the program's demands, inattention to one's personal life, curricular demands, insecurity about their professional future, financial problems linked to the costs of self-financing their research and reduced time for family and friends.

In addition, it should be noted that imbalances in the relationship with supervisors was an important stressor for postgraduates, given that when this relationship is stressful and full of demands and requirements, it can contribute to illness and declines in the positive development of studies.

It should be noted that the difference in perceptions between the modalities of the postgraduate programs within the multiple areas analyzed suggests that support measures are not restricted to a homogeneous panorama and must be adapted to the stages of the professional's training within the particular contexts that surround them.

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