INTEGRATIVE REVIEW ARTICLE

INSTRUMENTS FOR THE EVALUATION OF STRESS IN NURSING STUDENTS
INSTRUMENTOS PARA A AVALIAÇÃO DE ESTRESSE EM ESTUDANTES DE ENFERMAGEM
INSTRUMENTOS PARA LA EVALUACIÓN DE ESTRÉS EN ESTUDIANTES DE ENFERMERÍA

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ABSTRACT

Objective: to identify instruments for the evaluation of stress in nursing undergraduate students. *Method*: this is a bibliographical study, type integrative, with searches of articles in Portuguese, English and Spanish, published between 2007 and 2017, in the LILACS, MEDLINE, BDENF, CINAHL, WEB OF SCIENCE and Scopus databases. The results were presented by means of figures and a table. Results: a sample of 25 articles was analyzed, which identified 13 different instruments, the most used being the Perceived Stress Scale (PSS), the KEZKAK Questionnaire, the Stressful Life Event Scale (SLES), the Stressors in Nursing Students Scale (SINS), the Student Nurse Stress Index (SNSI) and the Nursing Student Stress Assessment Instrument (NSSAI). *Conclusion*: several validated instruments have been obtained, capable of evaluating various sources of stress in nursing students during the period of academic training, especially in clinical practice activities, through specific psychometric instruments, which can assist the managers of the institutions early recognition of potential health problems, making the period of professional training more productive. *Descriptors*: Nursing students; Psychological stress; Inquiries and Questionnaires; Nursing Education; Education; Nursing.

RESUMO

Objetivo: identificar instrumentos para a avaliação do estresse em alunos de graduação em Enfermagem. *Método:* trata-se de um estudo bibliográfico, tipo revisão integrativa, com buscas de artigos nos idiomas português, inglês e espanhol, publicados entre 2007 e 2017, nas bases de dados LILACS, MEDLINE, BDENF, CINAHL, WEB OF SCIENCE e Scopus. Apresentaram-se os resultados por meio de figuras e uma tabela. *Resultados:* analisou-se uma amostra de 25 artigos, que identificou 13 instrumentos distintos, sendo os mais utilizados a Escala de Estresse Percebido (PSS), o Questionário KEZKAK, a Escala de Evento de Vida Estressante (SLES), a Escala de Estressores em Estudantes de Enfermagem (SINS), o Índice de Estresse de Estudante de Enfermagem (SNSI) e o Instrumento para a Avaliação de Estresse de Estudantes de Enfermagem (AEEE). *Conclusão:* obtiveram-se diversos instrumentos validados, capazes de avaliar várias fontes de estresse em estudantes de Enfermagem durante o período da formação acadêmica, sobretudo, nas atividades de prática clínica, por meio de instrumentos psicométricos específicos, os quais podem auxiliar os gestores das instituições acadêmicas no reconhecimento precoce de problemas de saúde potenciais, tornando o período de formação profissional mais produtivo. *Descritores:* Estudantes de Enfermagem; Estresse Psicológico; Inquéritos e Questionários; Educação em Enfermagem; Educação; Enfermagem.

RESUMEN

Objetivo: identificar instrumentos para la evaluación del estrés en alumnos de graduación en Enfermería. *Método:* se trata de un estudio bibliográfico, tipo revisión integrativa con las búsquedas de artículos en portugués, inglés y español, publicados entre 2007 y 2017 en las bases de datos LILACS, MEDLINE, BDENF, CINAHL, Web of Science y Scopus. Se presentaron los resultados por medio de figuras y una tabla. *Resultados:* se analizó una muestra de 25 artículos, que identificó 13 instrumentos distintos, siendo los más utilizados la Escala de estrés percibido (PSS), el Cuestionario KEZKAK, la Escala de Evento de Vida Estresante (SLES), la Escala de Factores de Estrés en los Estudiantes de Enfermería (SINS), el Índice de Estrés de Estudiante de Enfermería (SNSI) y el Instrumento para la Evaluación de Estrés de Estudiantes de Enfermería (AEEE). *Conclusión:* se obtuvieron diversos instrumentos validados, capaces de evaluar varias fuentes de estrés en estudiantes de Enfermería durante el período de la formación académica, sobre todo, en las actividades de práctica clínica, por medio de instrumentos psicométricos específicos, los cuales pueden auxiliar a los gestores de las instituciones académicas en reconocimiento precoz de problemas de salud potenciales, haciendo el período de formación profesional más productivo. *Descritores:* Estudiantes de Enfermería; Stress Psicológico, Encuestas y Questionarios; Educación en Enfermería; Educación; Enfermería.

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INTRODUCTION

It is known that, during the period of academic formation, students, in general, experience different situations, which can be stress-triggering, due to the great academic demand and the responsibilities assumed in this new context. On a personal level, new interpersonal relationships are observed with teachers, colleagues and health professionals.[1]

It is pointed out that Nursing, like other professions that require close contact with people and that can be permeated by emotional involvement, are more likely to develop stress in the training process.[2]

It is understood that, in this context, students find it difficult to organize their time, control their emotions, they may be afraid to express their opinions and the decrease of self-confidence may be present.[3] It is thus caused by all these circumstances of insecurity and anxiety, arising from this process, a situation of risk for the triggering of stress.[2]

Stress is defined, from the point of view of a process, as the association of the individual and his environment, in which the individual has the perception of the stressor as a threatening situation that goes beyond their coping abilities, risk their well-being.[4]

It is understood, through coping behavior, the continuous effort to overcome the imbalance condition, caused by internal and external demands, that plays a fundamental role in the process of stress adjustment.[4]

It has been demonstrated in researches that Nursing students presented perception and presence of stress during the graduation period, being a concern to be observed in relation to the health and academic development impaired during the period of professional training.[5-6]

In this study, in view of the above and considering improving the understanding of stress during Nursing graduation, we aim to contribute to the knowledge of instruments with known psychometric properties, available for the evaluation of stress in Nursing students, taking into account that the stress can be a triggering factor for possible changes in health, which may impair the performance of academic activities, as well as compromise the quality of life and professional activity of future nurses.

OBJECTIVE

• To identify instruments for the evaluation of stress in nursing undergraduate students.

METHOD

This is a bibliographical study, of the type integrative review, which enables a summary of the available evidence on a particular topic, in which the final result is the current knowledge of the subject investigated, guiding the practice through scientific knowledge.[7] There are six stages: identification of the topic with definition of the research question; establishment of the inclusion and exclusion criteria with search in the literature; definition of the information to be extracted from the studies; evaluation of included studies; interpretation of the results and presentation of the review with the synthesis of the data.[7]

The following guiding question was defined: "What are the instruments used for the evaluation of stress in nursing undergraduate students?".

Data was collected in periodicals indexed in the following databases: Latin American and Caribbean Literature in Health Sciences (LILACS); Medical Literature Analyzes and Retrieval online (MEDLINE); Nursing Database (BDENF), through the Virtual Health Library (VHL); Cumulative Index to Nursing and Allied Health Literature (CINAHL); Science Citation Index (WEB OF SCIENCE); Scopus.

The following descriptors in Health Sciences (DeCs) were used: "Nursing Students", "Psychological Stress" and "Inquiries and Questionnaires", for the search of the MEDLINE, LILACS and BDENF databases the boolean "AND" between them in the advanced search refinement process was used.

The MeSH Terms: "Nursing, Student", "Psychological Stress" and "Surveys and Questionnaires" were used, as well as their synonyms, were searched for in the CINAHL, WEB OF SCIENCE, Scopus databases. For the advanced search of each term, the Boolean operator "OR" was chosen. For the crossings, the Boolean operator "AND".

The following were included as inclusion criteria for the selection of the studies: articles obtained in research with primary data, mentioning the instrument for the evaluation of stress in the title or summary, studies with humans, in the Portuguese, English and Spanish languages, published in the period between 2007 and 2017. Dissertations, theses and studies with secondary data, such as reviews, case reports or experiences.

The articles were searched in March 2017. A validated instrument was used to select the articles, [8] which allowed the analysis of the

main aspects of the instruments for the evaluation of stress in Nursing students.

For the analysis of the data and the subsequent synthesis of the articles that met the inclusion criteria, a figure was created with basic data of the articles selected, including: title; author; year of publication; goals; methodological design; instrument for stress assessment; main results and level of evidence.

The evidence is classified into six levels: the first includes results from the meta-analysis of multiple controlled and randomized clinical trials; in the second, the evidence resulting from individual studies with experimental design; in the third, the results of quasi-experimental studies; in the fourth, evidence from descriptive or qualitative studies; in the fifth, the case or experience reports; in the sixth, the evidence based on expert opinions.[9]

A flow chart, a table and a figure for the presentation of the results were constructed from the data collection figure, which were also complemented in a descriptive way, allowing a synthesis of each study included in the integrative review, emphasizing the tools available for the evaluation of stress in Nursing students and thus achieving the objective of the methodology and the possibility of applicability to practice.

RESULTS

A total of 260 articles were analyzed. It was used as a strategy for selection, reading the titles and abstracts of the total sample, taking into account the inclusion and exclusion criteria. The final sample of 25 articles was composed. It is illustrated, in figure 1, the strategy of search and refinement.
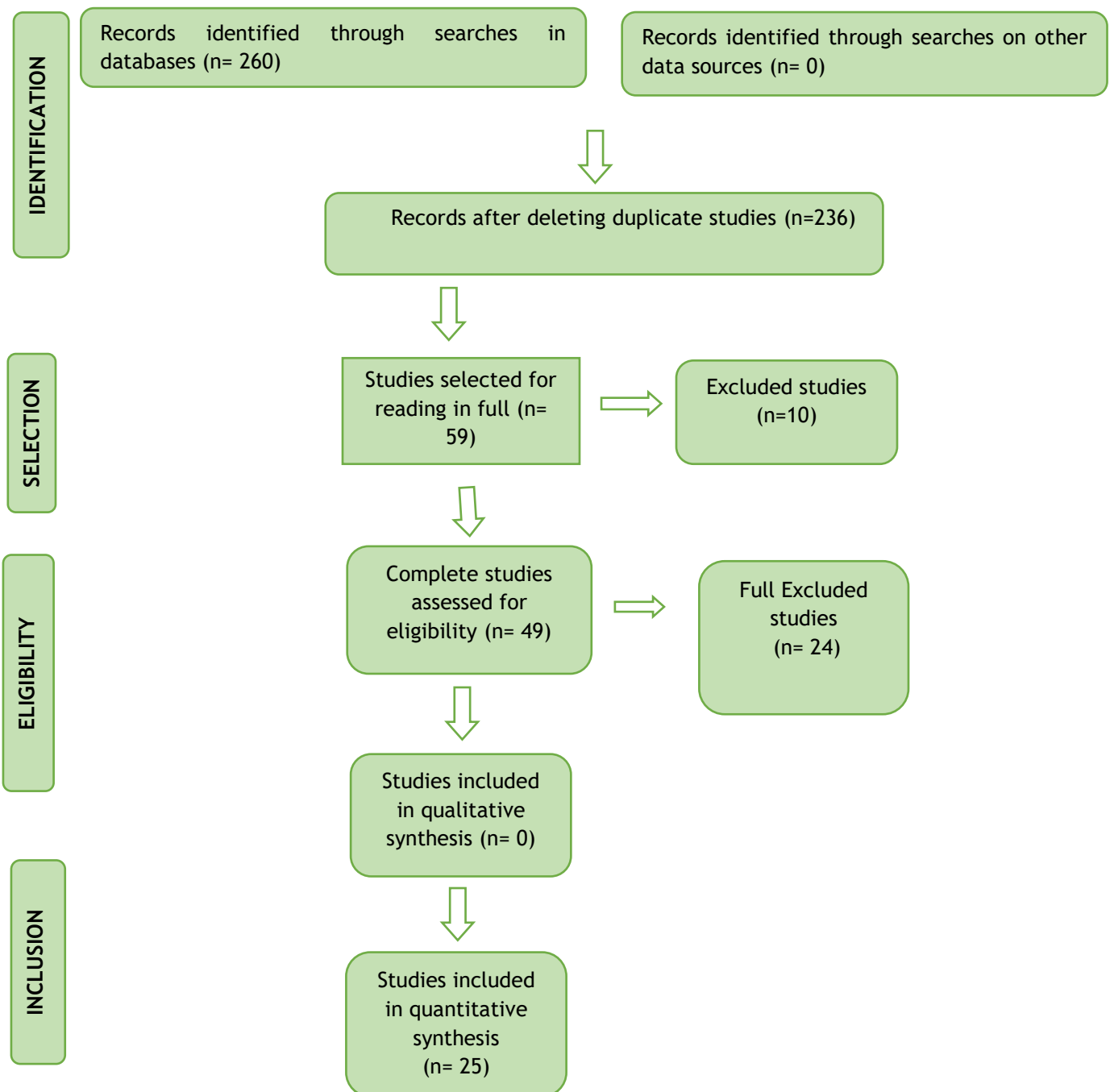

Figure 1. Flowchart of the search of articles. Campinas (SP), Brazil, 2017.

Between the articles selected, 84% were recorded in English, 12% in Spanish and only 4% in Portuguese. It is pointed out that eight studies originated in the European continent, in Spain, Turkey, Albania, Sweden, Czech Republic and England; nine studies were Asian, from China, Jordan and Taiwan; seven were from the American continent, Brazil, Peru, Chile and the United States. It was identified that the three Brazilian studies were carried out in Paraíba, Rio Grande do Sul and Ceará. It is noteworthy that only one study was done in Oceania, Australia.

Nurse Education Today concentrated seven studies (28%), the Latin American Journal of Nursing and the International Journal of Mental Health Nursing had two studies each (16%), and the 14 journals were diversified (56%).

It can be seen, according to table 1, that the cross-sectional/descriptive studies prevailed, followed by cross-sectional and cross-correlational studies. The Perceived Stress Scale (PSS) was present in six studies,[10-5] followed by the KEZKAK Questionnaire, in four studies.[16-9]

Table 1. Distribution of studies according to the outline, the stress assessment instrument, the time of publication and the level of evidence. Campinas (SP), Brazil, 2017.

Variables		n	%
Study outline	Cross-sectional and Descriptive	8	32.0
	Cross-sectional	7	28.0
	Cross-Sectional and Correlational	4	16.0
	Prospective Cohort	2	8.0
	Longitudinal Description	1	4.0
	Non-Experimental Longitudinal	1	4.0
	Correlational Longitudinal	1	4.0
	Quasi-experimental	1	4.0
Stress Assessment Tool	PSS	6	24.0
	KEZKAK	4	16.0
	SLES	2	8.0
	SINS	2	8.0
	SNSI	2	8.0
	NSSAI	2	8.0
	Others	7	28.0
Year of publication	2014-2017	10	40.0
	2011-2013	6	24.0
	2007-2010	9	36.0
Level of evidence	Level 4	24	96.0
	Level 3	1	4.0

The Stressful Life Events Scale (SLES) was used in two studies,[20-1] as well as the Stressors in Nursing Students Scale (SINS),[22-3] Student Nurse Stress Index (SNSI)[24-5] and the Nursing Students Stress Assessment Instrument - NSSAI.[26-7]

For each of the seven remaining studies, a different type of instrument for assessing stress was recorded: Academic Stress Inventory (ASI),[28] Inventory of Stress Symptoms for Lipp adults - ISSL,[29] Questionnaire Clinical Stress Questionnaire (CSQ),[30] Stress in Nurse Education Questionnaire (SINE),[31] Student Stress Survey (SSS),[32] Acculturative Stress Scale for International Students (Acculturative Stress Scale for International Students - ASSIS)[33] and Student Life Stress Inventory (SSI)).[34]

The greatest percentage of publications was concentrated in the period between 2014 and 2017, and the year that stood out was 2015, with six studies; between the years 2011 and 2013, the distribution was egalitarian - two studies in each year; from 2007 to 2010, only the year 2008 included

three studies; two articles were found in each remaining year.

Stress was exclusively assessed in 28% of the selected studies. In the studies that evaluated, besides stress, other variables, 32% were on coping, 12% on anxiety and 12% on personality. In the other studies (16%), different variables were analyzed, such as patterns of adaptation to stress, clinical competence, depression, self-control, psychosocial aspects, sense, coherence, anxiety, alcohol consumption, self-reflection, spiritual health and behaviors health promotion.

The instruments were applied in different graduation stages: 36% in clinical practice activities, 24% in all graduation years, 12% in the 1st, 2nd and 3rd years and 8% in the 1st year. It was verified in the other studies (20%) that the instruments were applied in the following graduation years: 2nd and 3rd years, 1st and 4th years, 2nd to 5th years, 2nd year and before clinical practice, corresponding to 4% for each of these studies.

The characteristics of the main instruments used in the studies contained in this review are shown in Figure 2.

Instrument	Form of presentation	Item Description
Perceived Stress Scale (PSS)	Likert scale with 29 items grouped into six factors.	Patient care (eight items), relationship with teachers and nursing staff (six items), assignments and workload (five items), peers and everyday life (four items), lack of professional knowledge / skills clinical environment (three items).
KEZKAK Questionaire	Likert scale with 41 items grouped into nine factors.	Factors: lack of competence; contact with suffering; relationship with teachers and colleagues; impotence and insecurity; lack of control in the relationship with the patient; patients seeking closer relationships; emotional involvement; relationship with the patient and work overload.
Stressful Life Event Scale (SLES)	Likert scale with 57 potentially stressful events.	Individuals report whether they have been exposed in the last two years to the events and the importance that the events had for them.
Stressors in Nursing Students Scale (SINS)	Likert scale with 43 items grouped into four categories.	Categories: education, clinical work, trust and finances.
Stressors in Nursing Students Scale (SNSI)	Likert scale with 22 items with a four factor structure	Factors: academic load (seven items), clinical concerns (seven items), interface concerns (seven items), personal problems (four items).
Nursing Student Stress Assessment Instrument (NSSAI)	Likert scale with 30 items grouped into six domains.	Domains: Carrying our practical activities (Five items), Professional Communication (five items), Time Management (five items), Environment (five items), Vocational Training (six items), Theoretical Activity (five items).

Figure 2. Presentation forms and evaluated characteristics of the six main instruments used in the reviewed articles. Campinas (SP), Brazil, 2017.

DISCUSSION

Results in this review were obtained, that presented the contributions of different instruments for the evaluation of stress in Nursing students, noting a greater concentration of studies in more developed regions, such as Europe[16,18-21,25,30-1] and to Asia.[10-5, 22-3,32] For this reason, a little explored scientific production on the stress of this population in the other regions is presented,[17,24,28,33-4] including Brazil.[26-7,29]

It was generally found that research using the Perceived Stress Scale (PSS)[10-5] showed that the greatest stressors faced by the students were the burden of activities and work, stressors of relationships with colleagues and everyday life , those related to patient care[10-3] and relationships with teachers and the nursing team.[13] A lack of professional knowledge and skills was also indicated.[15]

It was revealed in studies that implemented self-reflection during clinical practice that there was a reduction of stress during this period.[11-2] It has been demonstrated within the relationship between stress and spiritual health that students who had better spiritual health had a weaker depression tendency, were less affected by stress in clinical practice and more likely to engage in promotion behaviors of health.[14]

The KEZKAK Questionnaire was used in research carried out in universities in Spain.[16-9] A worrying finding was that one of the studies showed that 100% of students in the 2nd and 3rd years presented moderate level of stress, with anxiety being the symptom derived from the most frequent stress, followed by the manifestations of tension and insomnia.[17]

The main sources of stress were the lack of knowledge, understanding, ability, impotence and uncertainty in the face of a certain clinical situation and the risk of causing harm to the patient,[16,18-9] which were aggravated by the relationship with patients, emotional involvement and lack of control,[18] as well as the receipt of contradictory orders from teachers, which were preponderant factors in the appearance of stress.[19]

Higher levels of stress were observed in female students from the 1st to 3rd years of age than in men during clinical practice, and stress was more related to emotional situations. Stress was associated in men with lack of knowledge in uncontrolled clinical situations.[19] As stressors, in the relationship with the patients, the contact with the suffering and the relations with the work colleagues were obtained.[18]

The level of stress was reduced as students advanced from 1st to 3rd years, and 1st graders had a perception of stress related to fear of causing harm to the patient or to

themselves, but, on the other hand, did not feel stress because of relationships with other students, health professionals, teachers or patients.[16] It can be noted that the sources of stress identified in the studies with the KEZKAK Questionnaire were similar to the sources identified by the Perceived Stress Scale.[10,13,15]

The Stressful Life Event Scale (SLES) was applied, as well as the KEZKAK Questionnaire, also, in Spanish universities.[20-1] It was concluded that the students had higher scores than the men, and the older students obtained higher levels of stress. High neuroticism was associated with a high level of stress.[21] The result is compared to the study with students from the 1st to 3rd years old, who used KEZKAK.[19]

The Stressors in Nursing Students Scale (SINS) was administered in two studies that occurred in Asia for different purposes.[22-3] The stressors of the original scale from English to Chinese were translated in one of the studies, and the psychometric structure of stress in this population was explored. The following stress-related factors were identified: clinical, financial, trust and education. It was demonstrated that the original structure of the instrument in English was confirmed in this student population.[22]

In the other study, the students from the beginning of the course until the end of the first year and the relation between personality, stress, Burnout and psychological morbidity were evaluated, showing that students had increased stress levels during this period, as well as higher levels of morbidity and psychological burnout at the end of the first year, [23] corroborating the research that used the KEZAKAK.[16]

The Student Nurse Stress Index (SNSI) was used to compare stress in different areas of curricular activities in two studies.[25-6]

The stress and anxiety state of the academics assigned to a home-based hospital program with a perception of academic load and anxiety less than the group assigned to other clinical allocations were shown, with reductions in stress levels over time in both groups.[25]

It is pointed out that mental health students perceived less demands on their academic routines than students in other areas, identifying stressors as evaluations, fear of failure and financial problems, the latter being a source of stress not yet mentioned; [25] the fear of failure may occur due to other stressors already reported, as

revealed in the studies that applied the KEZKAK.[16, 18-9]

The instrument for the Nursing Student Stress Assessment Instrument (NSSAI) was used in two surveys carried out in Brazil in public universities. It was recorded that, in one of the studies, the stress predictors and the coping strategies of the students of all undergraduate years were evaluated.[26] In the other study, we verified exclusively the stress of the students from their insertion in the practical activities, identifying the presence of stress in all the semesters, with emphasis in the field of professional training. It is emphasized that the scores of the domain of the accomplishment of the practical activities were higher in the students of the 6th period.[27]

In a third study conducted in Brazil, students from the 3rd to the 10th grades at a public university, the Lipp Adult Stress Symptom Inventory (LASSI), in which 49.7% of the students presented with stress symptoms, 42.4% of these were in the resistance phase, with the largest number of students distributed in the 8th and 9th periods, and the psychological symptoms were the most reported in 50.7% of the cases.[28]

The Brazilian studies revealed, in general, as sources of stress, the lack of knowledge / skills in practical activities, [26-27] which have also been reported in other studies.[19-20,22-3] It is possible to relate the academic formation, indicated in the studies that used the NSSAI, the preparation of reports and the final works, besides the concern inherent to the future professional life, evidencing higher levels of stress in the students of the last periods of the graduation, [26-7] with potential for the appearance of psychological symptoms.[28]

In addition to stress, alcohol consumption among second-year students was evaluated in the Academic Stress Inventory (ASI).[29] Academic overload was pointed out as the most prevalent stressor, which corroborates the results of the studies used the Perceived Stress Scale.[10,13] Data are considered to be of concern regarding alcohol consumption, since almost half of the students (48%) consumed from one to two glasses per day.[29]

In the Clinical Stress Questionnaire (CSQ), stress levels were analyzed in 2nd year students, in their first experience in the operating room, and coping mechanisms.[30] Contrary data was observed in relation to the other studies evaluated: the students had mostly low levels of clinical stress, used a self-confident and optimistic approach to

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stress coping, and those who had never been in a room have used a submissive approach.[30]

In another study carried out in five countries (Albania, Brunei, Czech Republic, Malta and Wales), the Nursing Education Stress Questionnaire (NESQ) was applied. The variation of levels and sources of stress was recorded. It was found that Wales had the lowest average stress score and the highest Brunei score. The students in Brunei and Malta were distinguished by the academic elements of the course. It should be noted that for students from the Czech Republic, Wales and Albania, there was no significant difference in the perception of stress between the academic and clinical elements of the course.[31]

In the survey with students of the 1st year of a military college in Jordan, the Student Stress Survey (SSS) was used, which presented a particularity: all subjects were women. There is an important aspect in this study, which refers to changes in eating and sleep habits:[32] only one study revealed insomnia as the third symptom derived from stress, [17] and sources of work overload and change in the living environment showed similar results to studies using the Perceived Stress Scale (PSS)).[10,13]

The Stress Acculturation Scale for International Students (SASIS) was investigated, stress in Chinese students from 1st to 3rd years in Australia. It is pointed out that the students had a moderate level of stress, and the students of the 3rd year had the highest average, followed by the students of the 1st and 2nd years.[33] It can be noticed that second-year students, in another study, also had a low level of stress, although the applied instrument was different and foreign students were not evaluated.[30] It is understood that in the study that applied the KEZKAK questionnaire, there was a different result for the students of the 2nd year, who had a moderate level of stress, and the students of the 3rd year had similar results to this one.[17]

The human resources used in learning, stressors and academic performance were analyzed, through the Student Life Stress Inventory (SLSI).[34] High levels of personal and academic stressors were evidenced, but they were not significant predictors for academic performance.[34] Similar results of overload of academic activities were identified in studies that used other instruments.[19,21, 25] Men perceived less stress in relation to women, a result that was also demonstrated in the studies that applied the KEZKAK Questionnaire[19,21] and in the research of a

military college, in which all the students were women. It is pointed out that the most frequent stressors were pressures involving deadlines and ability to deliver reports and competition in notes; work and relationships were also indicated, as were concern and anxiety about testing, and similar data were identified in the Brazilian studies.[26-7]

CONCLUSION

The results that allowed the identification of a variety of instruments for the evaluation of stress in Nursing students were obtained, which can be administered during the whole graduation period, and in this study, the instruments were administered with greater emphasis during clinical practice activities.

The most commonly reported sources of stress are the overload of academic activities, relationships with colleagues, professionals, patients and teachers, and the lack of knowledge or skills in practical activities.

It should be noted, among the gaps in the research topic, the small number of studies carried out in Brazil, which suggests that the characteristics of the vocational training process may be different in Brazilian institutions.

It is recognized that, although stress may be inherent in undergraduate studies, it is important that early identification of the different sources of stress in the training environment by managers and educators is important so that many health problems can be recognized or minimized, and the be more productive and less stressful for academics, through the implementation of educational programs that may contribute to health promotion.

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