









## Comparison of stress in freshman and senior nursing students

Comparação do estresse em universitários de enfermagem ingressantes e concluintes do curso  
Comparación del estrés en universitarios de enfermería de primer año y egresos de la carrera

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### ABSTRACT

**Objective:** To compare stress levels in freshman and senior nursing students. **Method:** A cross-sectional study was carried out in a public federal university of the state of Bahia, with students who answered questionnaires about sociodemographic variables, academic life, and a scale for assessing stress in nursing students. Chi-square and Fisher's exact tests were applied to analyze the relationship between variables. To assess proportional trends between ordinal variables and groups, a chi-square test for linear trend was applied. The significance level was 5%. **Results:** One hundred and fifty-four students participated in the study. There was a tendency to higher stress levels among students in the last year compared to those in the first year, in four out of six domains: Performance of Practical Activities ( $p=0.00$ ), Professional Communication ( $p=0.00$ ), Environment ( $p=0.00$ ) and Professional Education ( $p=0.00$ ). **Conclusion:** High levels of stress were observed in students taking the last year. There is a need for broader research that includes other years of the course, an institutional reflection on stress factors and the adoption of an institutional policy that favors a better confrontation of stress factors.

### DESCRIPTORS

Students, Nursing; Stress, Psychological; Risk Factors.

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## INTRODUCTION

Stress is considered to be a predisposing, triggering or adjunct factor of several diseases<sup>(1-3)</sup>. The presence of this phenomenon has been pointed out in many life sciences courses<sup>(4-6)</sup>, especially in nursing undergraduate courses, in which students experience potentially stressful situations throughout the academic education process, inside and outside classrooms<sup>(7)</sup>.

Some studies have shown that academic life is a period when students are faced with different factors that can trigger stressful situations and harm their health and quality of life<sup>(1,7-8)</sup>, since they have to manage their social and personal lives, as well as academic demands and preparation to their careers<sup>(7)</sup>. In addition, the transition from academic education to the labor market requires a decision on where and when to start a professional career and take on financial responsibilities<sup>(9)</sup>.

Freshman university students can be exposed to different levels of stress when compared to senior students. Those who enter university seem to experience stressful situations regarding their adaptation to a new environment and their new condition, with new school obligations, academic education responsibilities, task organization needs, and the adaptation to new assessments and criteria, among others<sup>(7)</sup>. Although senior students are also exposed to similar factors, they may face a wider range of stressful situations since they are more concerned with their future market insertion, in actual practice, and are exposed to conflicts with other professionals and to competition with classmates<sup>(9)</sup>. Last year students reported stressful situations that caused physical wear such as anxiety, fear and insecurity in the development of their graduation thesis, the heavy practice workload, the performance of practical activities, concerns with market insertion, difficulties in interpersonal relationships with classmates and finding a balance between study time and family life<sup>(10-11)</sup>.

In view of the above, prevention and reduction of stress in nursing students are relevant throughout academic education, with a necessary assessment of stress levels and main academic stress factors, at different stages of academic education. However, after a search in the literature, few comparative studies that addressed the stress levels of freshman and senior students were found.

Therefore, the objective of this study was to compare stress levels in freshman and senior nursing students.

## METHOD

### STUDY TYPE

A cross-sectional study was carried out in the nursing undergraduate course of a public university in Salvador, Bahia, Brazil.

### DATA COLLECTION

During the data collection period, 187 freshman and senior students were enrolled in the course, 106 in the first year and 81 in the last year. One hundred and fifty-four of them accepted to participate in the study and met the

inclusion criteria, which considered a minimum age of 18, and both men and women. Students who were taking the second or third years of the course were excluded. Therefore, the sample was made up of 91 first-year students and 63 last-year students.

All students were approached in the classroom, at a previously scheduled time, when the researchers introduced themselves and explained the study objectives and procedures.

Three instruments were used for data collection, which were answered by students in the classroom, with an average duration of 30 minutes. The instrument for sociodemographic data included closed-ended and semi-structured questions on variables such as age (in years), gender, self-declared race/color, marital status, monthly family income, and monthly personal expenses. The form related to academic life variables had closed-ended questions about the current year, secondary school background, forms of entry in university, term workload, number of days and shifts at school and extra classroom activities.

Stress levels were assessed by means of the scale Assessment of Stress in Nursing Students (ASNS) validated by Costa and Polak in 2009<sup>(12)</sup>, which has 30 items grouped into six domains and in a Likert-type format, with four levels of answers, from 0 to 3: 0 (applied when the student did not experience stress at the situation depicted in the item), 1 (when stress level is regarded as low by the student in the presented situation), 2 (when the situation presents a moderate stress level) and 3 (when the student perceives a high stress level in the situation). The instrument gives scores to each domain, which are obtained by the sum of all scores given to each item. The domain with the highest score is considered predominant and corresponds to the highest stress intensity. The domain with the highest score is considered prevalent and with greater stress intensity. Domain 1 – Performance of Practical Activities, is related to the instrumental knowledge of students for the performance of procedures and feelings involved in the provision of care; Domain 2 – Professional Communication, depicts the difficulties experienced by students in the communication and interaction with professionals and the conflicting situations that arise; Domain 3 – Time Management, concerns the difficulties faced by students in reconciling personal life and the demands of the school program; Domain 4 – Environment, refers to the difficulties of having access to internships and university, in addition to the distress caused by the means of transport; Domain 5 – Professional Education, is related to students' concern with the knowledge gained during academic education and its impact on their professional lives; and Domain 6 - Theoretical Activity, depicts the difficulties encountered by students with the course program and its methodology<sup>(12)</sup>.

### DATA ANALYSIS AND PROCESSING

Data were analyzed in STATA version 12.0. Descriptive analyses were carried out with the use of absolute (n) and relative (%) frequency distribution, univariate and bivariate, means and standard deviation values. To assess the importance of the association between variables of interest,

chi-square and Fischer's exact tests were applied. To assess proportional trends between ordinal variables and groups, a chi-square test for linear trend was applied. The significance level adopted was 5%. Internal consistency of answers to the ASNS was assessed by Cronbach's alpha coefficient so as to evaluate the correlation strength between answers, considering: values between 0.70 and 0.90 as presenting good internal consistency, below 0.70 as poor internal consistency, and over 0.90 as high consistency.

## ETHICAL ASPECTS

The study was approved by the Research Ethics Committee of the School of Nursing of the University of Bahia, under protocol number 356.038 of 2013, and complied with the ethical precepts of Resolution 466/12, of the National Health Council. Those who accepted to participate in the study signed a Free and Informed Consent Form.

## RESULTS

Out of the 154 students, 91 (59.1%) were in the first year, and 63 (40.9%) in the last year. There was a prevalence of women in the last year (83 – 91.2%) and in the first year (55 – 87.3%), and these were the independent variables.

The average age was 22.4 years, with a prevalence of the age group 20-24 years, for both the first (45 – 49.5%) and the last year (36 – 57.1%). There were no students aged 18 or 19 years in the last year, but 39 (42.8%) were in the first year. In addition, the greatest proportion of students aged over 25 were in the last year. Age and course year were dependent variables.

Most students stated they were black, both in the first (72– 79.2%) and in the last year (49 – 77.8%), and these were independent variables.

There was a predominance of single individuals with no partner, with 44 (48.3%) in the first year and 21 (33.3%) in the last year. As for single individuals with a partner, they were in greater number in the last year (45 – 49.5% against 34 – 53.9%). These variables were dependent.

The most frequent range of monthly family income for the first and last years was 3 to 5 minimum wages (30 – 32.9% and 24 – 38.1%), followed by nine or more (22 – 24.1% and 15 – 23.8%), and groups were homogeneous. For first-year students, personal expenses were more often below the minimum wage (52 – 57.1% against 25 – 39.7%), and for last-year students, they reached one to two minimum wages (26 – 26.8% versus 27 – 42.8%), with a small difference between groups.

A higher percentage of first-year students (89 – 97.8%) attended the course five to six days when compared to last-year students (33 – 52.4%), and these were dependent variables. Extra classroom activities prevailed for first-year students (87 – 95.6%) and last-year students (58 – 92.1%) and both groups were homogeneous with regard to this

variable. A workload of 400 hours or more per term was observed both in the first (89 – 97.8%) and in the last year (32 – 50.8%). However, a greater proportion of last-year students had a workload under 400 hours compared to first-year students (2 – 2.2% against 31 – 49.2%), and there was a statistically significant relationship between this variable and the year being attended.

Internal consistency of the ASNS domains was estimated by Cronbach's alpha, with 0.76 for domain 1 (Performance of Practical Activities), 0.80 for domain 2 (Professional Communication), 0.68 for domain 3 (Time Management), 0.75 for domain 4 (Environment), 0.79 for domain 5 (Professional Education) and 0.59 for domain 6 (Theoretical Activity). The correlation between the items of domains 1, 2, 4 and 5 was good, with an alpha over 0.70; in domain 2, the correlation between items was stronger (alpha = 0.80). For domains 3 and 6, the correlation between items was lower (alpha < 0.70).

As for stress levels, data from Table 1 shows a tendency to higher levels of stress in last-year students when compared to those in the first year, in four out of the six domains: Performance of Practical Activities, Professional Communication, Environment, and Professional Education.

In domain 1, Performance of Practical Activities, there was a greater tendency to higher stress levels in last-year students when compared to those in the first year ( $p=0.00$ ). Low stress levels prevailed in first-year students (71 – 78.0%) and, although these levels also prevailed in last-year students (26 – 41.3%), higher frequencies of moderate and high/very high stress levels were observed in last-year students.

In domain 2, Professional Communication, a tendency to higher stress levels was also observed in students who were at the final stage of the course ( $p=0.00$ ). There was a higher prevalence of low stress levels in first-year students, whereas for last-year students there was a higher prevalence of high and very high levels of stress.

In domain 3, Time Management, there was no tendency to higher stress levels in either group. It was seen that more than half of first- and last-year students had low stress level scores, followed by moderate levels.

In domain 4, Environment, a tendency to higher stress levels in last-year students was observed ( $p=0.00$ ). Low stress levels prevailed in first-year students and high and very high levels in last-year students.

In domain 5, Professional Education, a greater tendency to higher stress levels was observed in students who were at the final stage of the course ( $p=0.00$ ). Low levels of stress prevailed in the first-year and high/very high levels in last-year students.

In domain 6, Theoretical Activity, low and moderate levels of stress prevailed for both first-year and last-year students. However, a greater proportion of low stress levels was found in the last year ( $p=0.06$ ).

**Table 1** – Classification of stress levels of first- and last-year nursing students according to the ASNS domains – Salvador, BA, Brazil, 2017.

Domains	Stress intensity rank						p(a) value
	1st year			Last year			
	Low n (%)	Moderate n (%)	High/Very high n (%)	Low n (%)	Moderate n (%)	High/Very high n (%)	
<b>Performance of Practical Activities</b> Items: 4, 5, 7, 9, 12, 21	71 (78.0)	11 (12.1)	9 (9.9)	26 (41.3)	24 (38.1)	13 (20.6)	0.00
<b>Professional Communication</b> Items: 6, 8, 16, 20	74 (81.3)	7 (7.7)	10 (11.0)	20 (31.7)	17 (27.0)	26 (41.2)	0.00
<b>Time Management</b> Items: 3, 18, 23, 26, 30	53 (58.2)	26 (28.6)	12 (13.2)	35 (55.6)	19 (30.2)	9 (14.3)	0.80
<b>Environment</b> Items: 11, 22, 24, 29	64 (70.3)	20 (22.0)	7 (7.7)	23 (36.5)	15 (23.8)	25 (39.6)	0.00
<b>Professional Education</b> Items: 1, 15, 17, 19, 25, 27	65 (71.4)	8 (8.8)	18 (19.8)	15 (23.8)	7 (11.1)	41 (65.1)	0.00
<b>Practical Activities</b> Items: 2, 10, 13, 14, 28	42 (46.1)	37 (40.7)	12 (13.2)	41 (65.1)	16 (25.4)	6 (9.5)	0.06

(a) Linear trend test.

Note: (n=154).

## DISCUSSION

Our study focused on stress levels in a young population mostly made up of women, since nursing courses are still attended mainly by them, even with the insertion of men in this profession<sup>(7,13-14)</sup>.

A study on sociodemographic characteristics of nursing students found a profile that is predominantly young, in the age group of 20–24 years, which is similar to this study<sup>(15)</sup>. The identification of a greater proportion of older students in the last year can be explained by the course time elapsed, since it lasts five years.

University students were mostly single, but a significant proportion of last-year students had a partner, which can be explained by the fact that older people tend to strengthen bonds and consolidate more serious relationships, start a family, among other important changes that coincide with the transition between the last academic terms to professional life<sup>(9)</sup>.

The prevalence of self-declared black individuals is explained by the fact that the study was carried out in Bahia, a region that is characterized by its African origins, and Salvador is the city with the largest black population out of Africa<sup>(16)</sup>.

The prevalent income was three to five times the minimum wage, and personal expenses were below the minimum wage. A study with nursing students found a similar monthly income, pointing to the fact that, as the course is full-time, with more than one shift filled in with academic activities<sup>(14)</sup>, it reduces the chances of students being able to work and increasing their income<sup>(14,17)</sup>.

As for the workload, although it exceeded 400 hours for both groups, it is worth mentioning that last-year students had an internship workload that was significantly higher than first-year students: practical activities in the place of study accounted for 323 hours in the first year and 918 hours in the last year. It was also observed that the number of days and shifts attended by last-year students was lower than for those who were in the first year, since they went directly to

the health institutions where they carried out their practical activities.

This study confirms other findings which showed that stress can be found in the beginning of professional education, as students face challenging situations which interfere in the learning process and in their health conditions<sup>(12,17)</sup>. In this study, a tendency to higher levels of stress was observed in last-year students when compared to first-year students in four out of the six domains of the scale, namely Performance of Practical Activities, Professional Communication, Environment, and Professional Education.

As for the Performance of Practical Activities, the highest level of stress was observed in last-year students, possibly because they are more exposed to activities in the clinical field, since the workload of practical activities is lower for first-year students in the institution's current program. Another reason can be related to the fact that more complex practical skills are required, as well as a greater responsibility with the progress made throughout the course. These findings show that, even with students' previous experience, stress levels in this group remained high. Unlike our findings, another study showed that stress levels for Performance of Practical Activities were higher in the sixth term, compared to the seventh and ninth terms, suggesting that progress in the course reduces insecurity in direct patient care<sup>(18)</sup>.

In Professional Communication, low stress levels also prevailed for first-year students, whereas there was a tendency to higher levels in last-year students. This can be associated with last-year students remaining longer in practice, and therefore interacting more regularly with the health staff, and being more sensitive to the webs of relationships around them due to their previous experience and to the demands of the coordination training process of nursing care. Communication and relationship with colleagues and the health staff can result in high levels of stress in nursing students, since they are generally young and possibly less experienced with human contact, finding greater difficulty in dealing with care issues alongside health professionals. In addition, competitiveness in the search for knowledge



and individual differences with course colleagues can be reasons for conflicts in a health care context<sup>(13)</sup>. High and very high levels of stress found in this domain for nearly half of last-year students highlight the importance of the training process in the development of positive strategies to face the stress that is inherent to the relationship with the care staff.

In domain 3, Time Management, more than half of first- and last-year students had low levels of stress, with no tendency to higher levels in either group, which suggests that there is possibly a balance between time spent with relatives, social interaction, leisure, rest, and academic activity demands. A study that assessed stress levels in students from all terms of a nursing undergraduate course, using the same stress scale, found a predominance of low stress levels (60.4%), which confirms the findings of our study<sup>(19)</sup>.

In domain 4, Environment, the prevalence of low stress levels in the first year and the tendency to higher levels in the last year showed that senior students were more exposed to stressful factors, such as distance between the university and practice locations and their homes, as well as the need for public transport to get to health institutions. Stressful situations are caused by reduced urban mobility, with time wasted in traffic jams. Another study confirmed these findings, as this domain was considered to be of greater stress for students who had practical classes in suburbs far away from the university and who used public transport<sup>(20)</sup>.

With regard to domain 5, Professional Education, the prevalence of low stress levels in the first year and the tendency to higher levels in senior students can be explained by the fact that senior students are going through a stage in which there is greater concern with their future insertion in the labor market, a greater appreciation of theoretical and practical knowledge assimilation for professional practice, anticipation of experiencing situations that are close to the actual role of nurses, among other reasons. Other studies also found low stress levels related to Professional Education in early terms; however, stress levels increase as students progress through the course as their concern with course completion and their future work as actual nurses increase as well<sup>(19)</sup>.

In domain 6, Theoretical Activity, the highest stress level found in freshman students can be associated with the fact that they feel insecure with tests, with meeting academic obligations, in addition to having a greater difficulty in

assimilating theoretical content as the result of their little practical experience in the field. Most last-year students had few stressful situations in this domain, which can be associated with an increased workload in practical activities to the detriment of tests and theoretical activities. Another study found that the level of difficulty related to the program content and the learning methodology were perceived as a minor source of stress the more advanced in the course the students were<sup>(19)</sup>.

The results of this study showed that it is a challenge for educational institutions to help nursing students face stressful factors related to administrative requirements, nursing work processes, and factors related to the performance of leadership and care activities that put them before ethical conflicts with people in critical health conditions, in precarious settings. It is necessary to give an opportunity to set up a dialog with nursing students about stressful factors found during the training process and help them to adopt strategies to deal with it that reduce stress and enhance academic performance.

Limitations of this study include the reduced number of studies on the topic that compare freshman and senior students, as well as its cross-sectional design and the use of convenience sampling, which does not allow for establishing a cause and effect relationship. In addition, the study was carried out in only one public university in the state of Bahia.

Therefore, this suggests a need for further research on other course years, as well as for an institutional policy that ensures the control of stressful factors in the process of students' education.

The authors also suggest broadening the sample so as to assess the stress levels of nursing students in all terms and from private schools, in different regions of the country, so the results can be compared to those of other sociodemographic, academic and behavior characteristics. Other studies can include university students from different areas of knowledge.

## CONCLUSION

There was a prevalence of higher stress levels among students in the last year compared to those in the first year, in four out of six ASNS domains: Performance of Practical Activities, Professional Communication, Environment, and Professional Education.

## RESUMO

**Objetivo:** Comparar o nível de estresse de universitários de enfermagem ingressantes e concluintes do curso. **Método:** Estudo transversal, desenvolvido em uma universidade pública federal, do estado da Bahia, com estudantes que responderam a questionários sobre variáveis sociodemográficas, vida acadêmica e a escala para Avaliação de Estresse em Estudantes de Enfermagem. Para avaliar as relações entre as variáveis empregaram-se os testes do Qui-quadrado de Pearson e Exato de Fisher. Para verificar tendências proporcionais entre variáveis do tipo ordinal e os grupos utilizou-se do Teste Qui-Quadrado de Tendência Linear. O nível de significância estatística foi de 5%. **Resultados:** Participaram 154 estudantes. Houve tendência a maior nível de estresse em estudantes do último ano comparados aos do primeiro, em quatro dos seis domínios: Realização das atividades práticas ( $p=0,00$ ), Comunicação profissional ( $p=0,00$ ), Ambiente ( $p=0,00$ ) e Formação profissional ( $p=0,00$ ). **Conclusão:** Constatou-se níveis elevados de estresse no último ano. Ressalta-se a necessidade de ampliação da investigação para outros anos do curso, a reflexão institucional sobre os fatores estressores e a adoção de uma política institucional que propicie melhor enfrentamento dos estressores.

## DESCRITORES

Estudantes de Enfermagem; Estresse Psicológico; Fatores de Risco.

## RESUMEN

**Objetivo:** Comparar el nivel de estrés de universitarios de enfermería de primer año y egresos de la carrera. **Método:** Estudio transversal, desarrollado en una universidad pública federal, del Estado de Bahía, con estudiantes que respondieron a cuestionarios acerca de variables sociodemográficas, vida académica y la escala para la Evaluación de Estrés en Estudiantes de Enfermería. Para valorar las relaciones entre las variables, se emplearon las pruebas de Chi cuadrado de Pearson y Exacta de Fisher. A fin de verificar tendencias proporcionales entre variables del tipo ordinal y los grupos, se utilizó la Prueba Chi cuadrado de Tendencia Lineal. El nivel de significación estadística fue del 5%. **Resultados:** Participaron 154 estudiantes. Hubo tendencia a un mayor nivel de estrés en estudiantes del último año comparados con los del primero, en cuatro de los seis dominios: Realización de las actividades prácticas ( $p=0,00$ ), Comunicación profesional ( $p=0,00$ ), Ambiente ( $p=0,00$ ) y Formación profesional ( $p=0,00$ ). **Conclusión:** Se constataron niveles elevados de estrés en el último año. Se subraya la necesidad de ampliación de la investigación a otros años de la carrera, la reflexión institucional acerca de los factores de estrés y la adopción de una política institucional que facilite un mejor enfrentamiento de dichos factores.

## DESCRIPTORES

Estudiantes de Enfermería; Estrés Psicológico; Factores de Riesgo.

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