Level of Stress and Coping Strategies used by Students of the Bachelor of Nursing
Nivel de estrés y estrategias de afrontamiento utilizadas por estudiantes de la licenciatura en Enfermería

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ABSTRACT:
Objective: Determine the relationship between the stress level and the coping strategies used by students of the Bachelor's Degree of Nursing in institutions of higher education of Ciudad Obregón, Sonora.
Methodology: Descriptive and correlational study; the population was comprised by 250 students whose age ranged from 18 and 46 years. Data was collected through a questionnaire of sociodemographic characteristics, the perceived stress level instrument, and the Brief COPE questionnaire.
Results: 74.4% of the sample was comprised by women and 25.6% by men. It was found that both genders had a moderate level of stress (78%), in terms of the coping strategies most frequently used by the students, the emotional active coping was the one found. The correlation analysis was performed using Pearson's chi-square non-parametric test (x²) to probe the existence of relationship between the stress level and coping strategies (p=0.67). Based on the results of x² (p=0.067), an additional analysis was carried out separating the categories of each one of the variables of study; Pearson's test was used to find a significant correlation between low stress level and active emotional coping strategy (p=0.27) and between high stress level and avoidance emotional coping strategy (p=-0.01).
Conclusions: The highest levels of stress are manifested by students who study only theoretical subjects. It is suggested the implementation of interventions related to the adequate management of stress.
RESUMEN:
Objetivo: Determinar la relación entre el nivel de estrés y las estrategias de afrontamiento utilizadas por estudiantes de la Licenciatura en Enfermería en Instituciones de Educación Superior (IES) de Ciudad Obregón, Sonora.

Metodología: Estudio no experimental y correlacional; se empleó un muestreo probabilístico estratificado de 250 estudiantes, con edades entre los 18 y 46 años de edad. Los datos fueron recabados mediante un cuestionario de características sociodemográficas, el instrumento del nivel de estrés percibido y para medir afrontamiento el Brief COPE Inventory.

Resultados: El 74.4% de la muestra fueron mujeres y el 25.6% hombres, ambos géneros exhibieron nivel de estrés moderado (78%), la estrategia de afrontamiento reportada con mayor frecuencia fue afrontamiento activo emocional. Se empleó la prueba no paramétrica chi-cuadrada de Pearson ($\chi^2$) para probar la existencia de asociación entre el nivel de estrés y las estrategias de afrontamiento ($p = 0.67$). Con base a los resultados de $\chi^2$ ($p=0.67$) se realizó un análisis adicional separando las categorías de cada una de las variables de estudio, se utilizó la prueba de Pearson con la cual se encontró correlación significativa entre el nivel de estrés bajo y la estrategia afrontamiento activo emocional, ($p=0.27$) y entre nivel de estrés alto y estrategia de afrontamiento emocional por evitación ($p=-.01$).

Conclusiones: Los niveles más altos de estrés lo manifiestan estudiantes que cursan solo materias teóricas. Se sugiere la implementación de intervenciones relacionadas al manejo adecuado del estrés.

Palabras claves: estrés, estrategias de afrontamiento, estudiantes del área de la salud (DeCS, BIREME).

Keywords: Stress, coping strategies, students of the health area (DeCS, BIREME).

INTRODUCTION

Stress is an important disorder present in a person’s learning period, with increasing rates in 21st century societies. Research on stress and human disease is complicated by the fact that stress is only one condition that contributes to most disease status.

It has been shown that nursing students in clinical practice express considerable perceived stress due to direct dealings with human life (1).

From a physiological point of view, “stress” is any situation that puts the body on alert. “These are situations of subjective discomfort, accompanied by emotional disturbances that generally interfere with social activity and appear during the period of adaptation to a significant biographical change or a stressful life event” (2).

Around the world “one in four individuals experience some serious stress problem and in cities. Currently, it is estimated that 50 percent of people have some mental health problem of this nature” (3).

In order to contextualize, worldwide stress is considered as a public health problem, because it affects the entire population, without distinction. The World Health Organization (WHO), according to Gutiérrez, mentions that at the beginning of this century, stress-related diseases will have surpassed infectious diseases and it was estimated that in 2010, in Latin America and the Caribbean there will be more than 88 million people with affective disorders triggered by stress (4).

It should be taken into account that nursing students, due to the characteristics of the profession “are in contact with suffering, pain, disability, and even death”, as well as the interrelation with other professionals, so they are are exposed to a greater number of stressors that other groups of students. Zryewsky and Davis (5) described the main
sources of stress in nursing students and found that the academic and clinical areas generated 78.4% of stressful events; the social area, 8%; and the personal area, 13.6%.

Betancourt, Hernández, Suárez and Arguello (6) showed that 39% of medical and biological science students have a very high level of stress, 43% projects a moderate to slightly high level with a tendency to increase in a more demanding situation, and 18% indicate a moderate to low level of stress. It could be said that more than 50% may present a major depression or a major problem caused by the stress experienced.

Martín (7) stated that stress indexes in university populations are high, in general, reaching higher levels in the first years of the career than in the last years and in the periods immediately prior to exams. We should bear in mind that continuous exposure to stressful situations can cause, on the one hand, psychophysiological disorders (e.g., amenorrhea, back pain, sexual dysfunction, gastrointestinal disorders, etc.) and mental disorders (e.g., anxiety, depression, post-traumatic stress disorder, etc.) and, on the other hand, although stress does not directly cause disease, it can impair the normal functioning of the organism.

It is estimated that in Mexico between 30 and 40% of people suffer from stress: “We are the second country in the world with the highest incidence rate of this problem, only after China”, revealed Alfredo Whley Sánchez, a physician assigned to the outpatient clinic of the Ramón de la Fuente Múñiz National Institute of Psychiatry (INPRF)(8).

Currently, there is a lack of local studies on university stress, especially in nursing students who have among their academic responsibilities the care of real people in their clinical practices, which makes them prone to present high levels of stress. It is important for the institutions to know the coping strategies used by the students in order to make appropriate nursing interventions that contribute to the integral development of the students.

**OBJECTIVES**

Determine the relationship between the level of stress and the coping strategies used by students of the Bachelor's Degree in Nursing in Institutions of Higher Education (IES) of Ciudad Obregón, Sonora.

Describe the sociodemographic characteristics of students of the Bachelor’s Degree in Nursing from Higher Education Institutions (HEI) of Cd. Obregón, Sonora.

- Determine the stress level of IES Bachelor Science in Nursing students.
- Determine the coping strategies used by Bachelor’s Nursing student.
- Relate the coping strategies used by students of Bachelor's Degree in Nursing from different Higher Education Institutions (HEI) according to the level of perceived stress.
METHODOLOGY

Study design

The study design was of the correlational type with a quantitative and cross-sectional approach. Its objective was to measure the degree of relationship between two or more concepts or variables. We sought to associate the relationship between the level of stress and coping strategies.

Population, Sampling and Sample

Nursing students from different institutions of higher education in Ciudad Obregón, Sonora, were considered. The total population for the present study was 750 nursing students; UNISON (234 students), Escuela Iberoamericana (146 students), and the Institute for the Formation and Training of Professionals in Nursing (IFCPE –by its acronym in Spanish, 335 students). Using the finite population formula, a sample of n=250 students was estimated and the stratified probability sampling method was used to select them. The sample was stratified first by university and then by semester.

Inclusion criteria: Nursing students from different Higher Education Institutions in Cd. Obregón, Sonora.

Exclusion criteria: Those students who suffer from an illness that could alter the results of the study, such as anxiety, depression, or who are undergoing medical, psychological, or psychiatric treatments, or have been undergoing these treatments for less than 6 months.

Elimination criteria. Students who left the evaluation instruments unresolved; students who did not wish to participate in the study.

Data collection procedure

For the collection of information, authorization was requested from the Research Ethics Committee (CIE) of the Nursing Department of the Universidad de Sonora, Hermosillo Campus. Once the IRB resolution was obtained, it was proceeded to visit the various institutions of higher education to request verbal permission and through official letters in order to apply the evaluation instruments to the student community. Information was requested from them about the number of students and the number of students per group, to later obtain the number of instruments to be applied per HEI and per group.

Data collection was carried out by the principal researchers through visits to the HEI (UNISON, IFCPE, IBEROAMERICANA) in order to unify criteria and avoid biases during data collection. For the collection of information, three instruments were applied, the first one to know sociodemographic data of the students designed by those responsible of the research; the second instrument was the one that determined the level of stress; and the last instrument was used in order to measure the variable of coping strategies. At the end of the application of the instruments,
acknowledgement was given to the participants because of their participation in the study.

**Instruments and measurements**

For the collection of sociodemographic data, an instrument was prepared that contained the necessary data for the execution of the research, in which the following questions were requested: Institution to which the student belongs, age, sex, semester, occupation, and number of children.

To assess the level of academic stress, the Perceived Stress Scale (PSS-14), which is a self-report that assesses the level of perceived stress during the last month, consists of 14 items with a five-point scale response format (0 = never, 4 = very often). The total score of the PSS is obtained by inverting the scores of items 4, 5, 6, 7, 9, 10 and 13 (as follows: 0=4, 1=3, 2=2, 3=1 and 4=0) and then adding the 14 items. The direct score obtained indicates that a higher score corresponds to a higher level of perceived stress(9).

To identify the coping strategies used by the students of the different educational institutions, the Brief COPE Inventory questionnaire (Carver's brief version, COPE-28) was used, which contains 28 Likert-type items with four response alternatives whose rating ranges from 1 (I have not been doing this at all) to 4 (I have been doing this a lot). This scale focuses on evaluating the coping strategies that people use in the presence of stress. The 28 items are grouped 2 by 2 resulting in 14 coping strategies contained in two dimensions, one called active coping and the other called passive coping. All items are positive.

The higher the score in each coping mode, the greater the use of that strategy. The 14 subscales will be grouped into 3 categories of coping by adding the items into higher scores indicating greater intensity of strategy use. The items were factored into: problem-focused as active coping, planning, supportive instrumental, and religiosity ($\alpha = 0.80$); emotional active coping in the form of ventilation, positive reframing, humor, acceptance, and emotional support ($\alpha = 0.81$), and emotional avoidance coping in the form of self-distraction, denial, behavioral disengagement, self-blame, and substance use ($\alpha = 0.88$)(10).

**Ethical and legal considerations**

Prior to the application of the instruments, the research protocol was approved by the Research Ethics Committee of the Nursing Department of the Universidad de Sonora, with registration CEI-ENFERMERIA-E-77/2018.

The study complied with the ethical aspects that guarantee respect for the dignity and protection of the rights and well-being of the students. In the development of this study, the Regulations of the General Health Act(11) on Health Research were considered, requesting verbal and written informed consent from the study subjects to guarantee voluntary and free participation. The study was classified as safe research (article 17). The principles of the convention on human rights and biomedicine, known as the Oviedo Convention(12), were also followed.
Prior to signing the informed consent form, the participants were informed of the benefit of their collaboration, both for themselves and for other nursing students and professionals. It was explained to them that the information they would provide would be handled confidentially and only for the purposes of the research. In addition, extreme care was taken in the management of the instruments, which were kept under lock and key, and when appropriate, the information was incinerated out of respect for the research units.

**Statistical data analysis**

Data were analyzed using SPSS statistical software, version 23; descriptive statistics were used for the analysis of sociodemographic variables and non-parametric statistics for the correlation of variables, using the Chi-square test ($X^2$) and Pearson's correlation.

**RESULTS**

The total sample size was 250 students; 32.8% of whom studied at the Universidad de Sonora (UNISON), 46.8% at the Institute for the Formation and Training of Professionals in Nursing (IFCPE) and the remaining 20.4% at the Ibero-American School of Nursing (IBERO).

In the Bachelor's Degree in Nursing, women represent almost 3 quarters of the total number of students (74.4%), while men represent only the remaining quarter (25.6%). The average age of the participants was 21.76 years (SD= ±3.58). The majority of the students were young, 62.8% was between 18 and 21 years old, 25.2% was between 22 and 25 years old, and 12% was distributed between 26 and 46 years of age; 18 years being the minimum age and 46 years the maximum age.

91.6% of the students were single; 6.8% was married; and only 1.6% was separated or divorced; 86.8% of the students did not have children. Regarding work activity, 68.8% of the students do not work, while 31.2% do work.

The majority of students are in their second and fourth semesters, both with 31.2%, while 18.8% are in their sixth semester, and the remaining 18.8% are in their eighth semester.

**Variables of study**

Table 1 shows that 21.2% of the students showed low stress level, 78% showed moderate stress level, and 0.8% showed high stress level.

<table>
<thead>
<tr>
<th>Variable / HEI</th>
<th>UNISON</th>
<th>IFCPE</th>
<th>IBERO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>15</td>
<td>6</td>
<td>32</td>
</tr>
<tr>
<td>Medium</td>
<td>65</td>
<td>26</td>
<td>85</td>
</tr>
<tr>
<td>High</td>
<td>2</td>
<td>0.8</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>32.8</td>
<td>117</td>
</tr>
</tbody>
</table>

Source: Perceived Stress Scale (PSS-14), 2001. n=250
Table 2 shows the coping strategies most commonly used by students of the Bachelor's Degree in Nursing from different higher education institutions to cope with stress. It was found that they mostly use emotional active coping (60.4%), which includes actions such as emotional discharge, humor, acceptance, seeking emotional support, and positive reformulation. In second place, it was found problem-focused coping (37.2%), which includes active coping, planning, support with some instrument, and religion. Only 2.4% use emotional avoidance coping, which is characterized by self-distraction, denial, renunciation, self-blame, and substance abuse.

Table 2. Coping strategies used by Bachelor of Science in Nursing students by educational institution, Cd. Obregón, Sonora, 2018.

<table>
<thead>
<tr>
<th>Variable / HEI</th>
<th>UNISON</th>
<th>IFCPE</th>
<th>IBERO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td><strong>Coping Strategies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem-focused coping</td>
<td>27</td>
<td>10.8</td>
<td>44</td>
</tr>
<tr>
<td>Active emotional coping</td>
<td>53</td>
<td>21.2</td>
<td>70</td>
</tr>
<tr>
<td>Avoidance emotional coping</td>
<td>2</td>
<td>0.8</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>32.8</td>
<td>124</td>
</tr>
</tbody>
</table>

Source: Brief COPE Inventory Questionnaire, COPE-28, 1997. n=250

Table 3 shows the analysis between stress level and coping strategies. It can be seen that the percentage of low and moderate stress level is associated with emotional active coping.

Table 3. Stress level and coping strategies of students of the Bachelor's Degree in Nursing, Cd. Obregón, Sonora, 2018.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Problem-focused coping f</th>
<th>Active emotional coping f</th>
<th>Avoidance emotional coping f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>14</td>
<td>39</td>
<td>0</td>
</tr>
<tr>
<td>Medium</td>
<td>77</td>
<td>112</td>
<td>6</td>
</tr>
<tr>
<td>High</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>93</td>
<td>151</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Questionnaire Brief COPE Inventory, COPE 1997; Perceived Stress Scale, 2001. n=250

**Correlational analysis**

By using Pearson's non-parametric chi-square test ($x^2$), no statistically significant association was found between the stress level variable and coping strategies (Table 4).
Based on the results of $x^2$ ($p=0.067$) an additional analysis was performed separating the categories of each of the variables of study, the Pearson test was used in order to confirm previous results, by obtaining values greater than ($p=0.5$); although the research hypothesis was rejected, a significant correlation between low stress level and the strategy used in terms of active emotional coping ($p=0.02$) was evidenced, as well as a negative correlation between high stress level and avoidance emotional coping ($p=-0.01$).

Table 5. Pearson’s correlation test for the variables stress level and coping strategies.

<table>
<thead>
<tr>
<th>Stress Level</th>
<th>Problem-focused coping</th>
<th>Active coping</th>
<th>Avoidance coping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>$r$ = -0.116</td>
<td>$p$ = 0.068</td>
<td>$r$ = 0.140</td>
</tr>
<tr>
<td>Medium</td>
<td>$r$ = 0.089</td>
<td>$p$ = 0.160</td>
<td>$r$ = -0.114</td>
</tr>
<tr>
<td>High</td>
<td>$r$ = 0.117</td>
<td>$p$ = 0.065</td>
<td>$r$ = -0.111</td>
</tr>
</tbody>
</table>

DISCUSSION

The sample consisted of 250 university students, 32.8% (82 students) of whom studied nursing at the Universidad de Sonora (UNISON), 46.8% (117 students) at the Institute for the Formation and Training of Professionals in Nursing (IFCPE), and 20.4% (51 students) at the Universidad Iberoamericana (IBERO).

The sociodemographic profile of the students reflects that the majority of nursing students belongs to the female gender (74.4%); only 25.6% was male, and average age was that of 21.76 years (SD=± 3.58). These data are similar to the data provided by the National Institute of Statistics and Geography (INEGI by its acronym in Spanish) and its National Survey of Occupation and Employment (ENOE by its acronym in Spanish) performed on the second quarter of 2015; in Mexico, nurses over 15 years of age amount 475,295, 85% of which are women and 15% men (13).

The set of characteristics that make up the profile of the students shows a young population, a study by De Valle & col. (14) similar to the results obtained since their study established that the average age was 20 years (SD= 4.3); with a predominance of the female gender (73%) as it is characteristic of the nursing career.
The data obtained in this research show that both the male and female genders represented a moderate stress level of 78% (195 students). Similar data yields the research performed by Rivas Acuña et al.\(^{(15)}\) called Frequency and Intensity of Stress in Nursing Degree Students of the DACS (División Academica de Ciencias de la Salud), the frequency and intensity of academic stress in the students of the UJAT-DACS (Universidad Juarez Autonoma de Tabasco - División Academica de Ciencias de la Salud) Nursing Degree in general was not frequent with 46%, but with a moderate intensity in 55%.

Regarding the coping strategies variable, the Nursing students of the different HEI in order to confront stress they most frequently use the active emotional coping, 60.4%; 37.2%, problem-focused coping, and only 2.4% use avoidance emotional coping.

According to several studies, those who use coping strategies focused on the problem and more functional emotional strategies, adapt better, and can have greater success in academics, work, etc.\(^{(16)}\) by coping more actively with events.

Moreano\(^{(17)}\), similar to Torrejón\(^{(18)}\), in a sample of 145 students, found a greater preference for the use of problem-focused styles, such as striving and succeeding. In a study with 123 psychology students\(^{(19)}\), they found that the most frequently used coping strategies were positive reinterpretation and the search for social support; and the most used coping styles were mixed and basically focused on the problem and on emotion. Similar results were obtained by Chau\(^{(20)}\), who found that the most frequently used coping style was problem-focused, followed by emotion and, in last place, avoidance.

For nursing students there are many stressors. Zryewskyj and Davis\(^{(5)}\) described the main sources of stress for nursing students; they found that academic and clinical areas generated 78.4% of stressful events.

This study showed that those who are not in clinical practice experience a higher level of stress with 31.2% and students who are in professional practice with 18.2%.

Many researchers have studied the stress and stressful situations of nursing students during their clinical internships, highlighting the initial period of this internship as the most stressful with respect to other periods.

When studying the relationship between the level of stress and coping strategies, no significant difference was found, obtaining a p value of 0.67. This indicates that there is no relationship between them, so the hypothesis of the study is rejected. This result agrees with a study called stress and coping techniques in university students in Quito\(^{(17)}\) where the result obtained was p=0.1272, which indicates that it is a value greater than the significance level.

Evidence of significant correlation was found between low stress level and emotional active coping strategy (p=0.27) and between high stress level and avoidance emotional coping strategy (p= -.01).

Stress and stressful situations of nursing students during their clinical internships have been studied, highlighting the initial period of these internships as the most stressful compared to other periods\(^{(1,3,5)}\).
CONCLUSIONS

The sociodemographic characteristics of the study population were: gender, predominantly female; average age, 21.76 years; single; without children; most of the study population did not work.

Of the total sample, the majority showed moderate levels of stress; those who reported higher levels of stress were female students, single, without children, were not working, were enrolled in the first semesters of the university, and those who are not yet enrolled in any clinical practice. As previously mentioned, the highest levels of stress were reported by students in the first year and it is implied that students in higher grades have developed skills to counteract stressful situations.

In terms of coping strategies, students showed a greater tendency towards emotional active coping, which refers to active steps to try to change situations or lessen their effects. Secondly, problem-focused coping, which involves the management of internal or environmental demands that pose a threat and decompensate the relationship between the person and his or her environment. Finally, avoidance emotional coping where the university student uses strategies focused on avoidance, distraction, distancing from the stressful event, or turning to another activity to avoid thinking about the problem.

In the population studied, no significant association was found between the variables stress level and coping strategies.

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