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ASSESSMENT OF STRESS AND SYMPTOMS PRESENTED BY NURSES IN PEDIATRIC INTENSIVE CARE UNITS

AVALIAÇÃO DO ESTRESSE E SINTOMAS APRESENTADOS PELOS ENFERMEIROS DE UNIDADES DE TERAPIA INTENSIVA PEDIÁTRICAS EVALUACIÓN DEL ESTRÉS Y SÍNTOMAS PRESENTADOS POR ENFERMEROS DE UNIDADES DE TERAPIA INTENSIVA PEDIÁTRICAS

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ABSTRACT

Objective: to assess the relationship between stress and symptoms presented by nurses in pediatric ICUs. **Method:** a descriptive exploratory study of quantitative design conducted with nurses working in public pediatric ICUs in the city of Teresina, Piauí, Brazil. A questionnaire was used to collect sociodemographic data and participants were given a scale assessing sources of stress and another one assessing symptoms presented by nurses. Data were analyzed with the SPSS software, version 15.0. This study was approved by a research ethics committee, under protocol no. 0206.0.045.000-10. **Results:** regarding stress scores, 50% of nurses scored between 1.11 and 1.97, indicating moderate stress, and the following sources of stress obtained the highest scores: critical situations (2.49 ± 0.52) and work overload (2.33 ± 0.61). **Conclusion:** there was a significant correlation between higher stress scores and musculoskeletal symptoms and altered sleep and rest. **Descriptors:** Occupational Risks; Stress; Nursing; Intensive Care Units.

RESUMO

Objetivo: avaliar a relação entre o estresse e os sintomas apresentados pelos enfermeiros que atuam em UTI's pediátricas. **Método:** estudo exploratório descritivo, com abordagem quantitativa, realizada em enfermeiros que atuavam em UTI's pediátricas públicas de Teresina/Piauí, Nordeste do Brasil. Os dados foram coletados por meio de um questionário para caracterização do perfil sociodemográfico e pelas Escala de Estressores e Escala de sintomas apresentados pelos enfermeiros. Para a análise dos dados, foi utilizado o programa SPSS, versão 15.0. O estudo teve o projeto de pesquisa aprovado pelo Comitê de Ética em Pesquisa, Protocolo nº. 0206.0.045.000-10. **Resultados:** quanto aos escores de estresse, 50% dos enfermeiros obtiveram escores entre 1,11 e 1,97, classificados com médio estresse, sendo que os domínios com maiores escores foram: situações críticas ($2,49 \pm 0,52$), seguido de sobrecarga de trabalho ($2,33 \pm 0,61$). **Conclusão:** verificou-se correlação significativa entre maiores escores de estresse com sintomas músculo-esqueléticos e alterações de sono e repouso. **Descritores:** Risco Ocupacional; Estresse; Enfermagem; Unidades de Terapia Intensiva.

RESUMEN

Objetivo: evaluar la relación entre el estrés y los síntomas presentados por enfermeros actuantes en UTIs pediátricas. **Método:** estudio exploratorio, descriptivo, con abordaje cuantitativo, realizado con enfermeros actuantes en UTIs pediátricas públicas de Teresina/Piauí, Noreste de Brasil. Datos recolectados mediante cuestionario para caracterización del perfil sociodemográfico, por la Escala de Estresores y la Escala de síntomas presentados por los enfermeros. Para analizar los datos se utilizó el programa SPSS versión 15.0. El estudio obtuvo aprobación del Comité de Ética en Investigación, Protocolo nº 0206.0.045.000-10. **Resultados:** respecto a estrés, 50% de los enfermeros obtuvieron puntajes de entre 1,11 y 1,97, clasificados como estrés intermedio. Los dominios con mayores puntajes de estrés fueron las situaciones críticas ($2,49 \pm 0,52$), seguidas por sobrecarga de trabajo ($2,33 \pm 0,61$). **Conclusión:** se verificó correlación significativa entre puntajes mayores de estrés con síntomas músculo-esqueléticos y alteraciones del sueño y reposo. **Descriptores:** Riesgos Laborales; Agotamiento Profesional; Enfermería; Unidades de Cuidados Intensivos.

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INTRODUCTION

The issue of occupational stress among health professionals, especially nurses, has been a theme of contemporary debate and research. Such stress is highly debilitating to workers and strongly interferes in their personal, social, economic and professional lives, hindering productivity and the quality of care provided. Indicated as one of the major causes of temporary disability, absenteeism, early retirement and health risks associated with professional activity, occupational stress also represents a high financial burden on companies and public services.¹

Stress can be defined as an organism's reactions to varied perceived threats; being an adjustment response mediated by individual characteristics and psychological processes. Workplace stress occurs when the adjustment capacity of workers is superseded by events and emotional overload.^{2,3}

Thus, occupational stress is related to the manner in which workers interpret the workplace. Specifically, adjustment refers to an imbalance between people's expectations and the reality of their working conditions; that is, the perceived difference between professional demands and an individual's capacity to meet them.⁴

Furthermore, stress can be understood as a multifactorial condition determined by the interaction between environmental demands and individual characteristics. A source of stress is defined as any stimulus capable of causing organic, mental, psychological or behavioral responses associated with physiological changes, resulting in the hyperfunction of the adrenal gland and the autonomous nervous system.⁵ In other words, stressors disrupt inner homeostasis, inducing adjustment processes and causing strain. In the context of nursing, the main sources of stress are work overload, leadership issues, emotional demands related to caretaking and conflicting functions.⁶

Such high level of continuous stress interferes directly in the quality of life of nurses, frequently causing problems related to social and family interaction, in addition to physical and psychological illness. Some of the most common symptoms include exaggerated reactions, weight loss, irregular sleeping patterns, respiratory problems, anguish, depressed mood and, consequently, extroversion.^{1,7-8} Moreover, nurses can present altered physical and mental health, in addition to problems in the workplace, which include interpersonal conflicts, absenteeism, work accidents and job dissatisfaction.^{2,3,4}

Indicated as a source of stress for patients and family members, the Intensive Care Unit (ICU) stands out in the hospital environment, as it is a high complexity sector with singular working conditions. Surrounded by technological artefacts for maintaining life, ICU professionals are exposed to a work routine full of responsibilities and activities that require technological and scientific mastery, besides concomitant emotional ambiguity. In light of this, the nursing work process in the ICU involves potential risks, among them physical, chemical, biological, mechanical and psychological strain.⁸

In the pediatric ICU, the effect of occupational stress on nurses is accentuated due to the intense emotional load resulting from the patient-family-nurse relationship, a factor that can lead to dysphoric and depressive reactions.¹ Based on this evidence and on the importance of debating issues related to the health of nursing professionals, the following research questions were formulated for the present study: "What stressors are present in pediatric ICUs?" and "What stress symptoms are perceived by nurses working in these sectors?"

Nursing professionals are exposed to a variety of work demands that cause progressive and cumulative strain and compromise the quality of their work and personal lives. Despite the great amount of research on the topic, we highlight the paucity of studies representing nursing professionals in the Brazilian state of Piauí. Thus, the present study attempted to make a contribution to filling this gap.

OBJECTIVE

- To assess the relationship between stress and symptoms presented by nurses working at pediatric ICUs in public hospitals through scales measuring stress sources and symptoms.

METHOD

This was a descriptive exploratory study of quantitative design developed in two pediatric ICUs, with one being an exclusively neonatal ICU. The first was located in a mid-sized children's hospital and the second, in a maternity hospital that is a reference for women and neonate health services. Both belong to the Brazilian Unified Health System (SUS, as per its acronym in Portuguese), located in the city of Teresina, state of Piauí, Brazil. The pediatric ICU had nine beds, one in isolation, while the neonatal unit had 20 beds.

The target population comprised 29 nurses who were working in these units between

September and October 2010 and who agreed to participate in the study. Of these, 21 comprised the study sample. Participants were selected according to the free demand of workflow, as well as to their availability and willingness to participate. Inclusion criteria consisted of: being a nurse and carrying out active nursing functions, having worked at the pediatric ICU for least a month, in addition to accepting and being available to participate in the study.

Data were collected through a three-section structured questionnaire. The first section aimed to establish a sample profile of pediatric ICU nurses and to identify work-related aspects.⁹ The second section consisted of an Analog Visual Scale (AVS) and participants were asked to identify their perceived level of stress. The third section consisted of two Likert scales (a scale of stress sources and a scale of symptoms presented by nurses), in addition to questions about their social habits. The scales were later adapted and given to nurses working in closed and high-complexity units.^{9,10}

The scale assessing sources of stress consisted of 57 items grouped according to semantic similarities in five categories: conflicting functions; work overload; relationship difficulties; personal management and critical situations. The scale of symptoms presented by nurses was subdivided into alterations in the following areas: cardiovascular; digestive system; immunological; sleep and rest; musculoskeletal and menstrual cycle.⁹

In order to analyze stress in the studied population, we selected the mean score obtained on the sources of stress scale for each nurse, who assigned a score to situations (stress sources) between 0 (absence of stress) and 4 (maximum stress). Scores ranged from 1.04 to 2.93 and were distributed into quartiles, classified as low, moderate and high levels of stress.

Student's t-test was conducted to analyze the differences among the three resulting levels of stress presented by nurses, with the purpose of identifying possible characteristics that can influence stress scores.

Data were collected on the premises of Intensive Care Units, preferentially in administration or support rooms. It took an average of 30 minutes for each participant.

The study abided by the norms set forth by Resolution 196/96 of the Brazilian Ministry of Health regarding research with human subjects and was approved by the research ethics committee of the Federal University of Piauí, approval protocol no. 0206.0.045.000-10. Prior to the study, subjects were informed on the nature of their participation, being guaranteed anonymity and presented with the research objectives.

Participants signed two copies of a free and informed consent form, one of which remained with the research subject, whereas the other was filed by the researcher. This was a minimum-risk study and participants were not paid for their involvement. Any information that could expose their identities was kept confidential throughout the entire process.

After data collection, the gathered information was typed and charted using the SPSS software (Statistical Product and Service Solutions), version 15.0, a data processing and statistical analysis tool.

RESULTS

In terms of the sample profile, most participants were women (95.2%), married (52.4%), between the ages of 41 and 50 (42.9%) and 31 and 40 (28.6%).

Regarding time since graduation, 42.9% had graduated from nursing school 10 years or more before the study. Most participants had been working in the ICU for less than a year (38%). Nurses with graduate degrees presented greater mean time since graduation and time working in the ICU than those without graduate degrees.

Most professionals reported working a 30-hour weekly workload (66.7%) and the overwhelming majority (95.2%) reported holding parallel jobs at other institutions, most of them public.

It is important to highlight the fact that 90.5% of nurses held graduate degrees, but only 10.5% had specialized in ICU care.

The variables related to work and profession are presented below:

Table 1. Intensive Care Unit nurses, by variables related to work and profession. Teresina (PI), 2010.

Variables	n	%
Received ICU training?		
Yes	2	9.5
No	19	90.5
Do you frequently have to make an effort to go to work?		
Yes	4	19
No	17	81
Are you satisfied with your work?		
Yes	17	81
No	4	19
Does your workday seem to never end?		
Yes	4	19
No	17	81
Do you feel like changing profession?		
Yes	6	28.6
No	15	71.4

Regarding self-perceived stress rated on a visual analog scale, nurses scored their job between 3 and 7, little to very consuming, respectively, with a mean score of 5.09, corresponding to moderately stressful.

As described above, the mean score obtained on the sources of stress scale was used for data analysis in the studied population. Therefore, 25% of the nurses presented a mean score equal or lower than 1.11, which corresponds to low levels of stress; 25% obtained means equal or greater

than 1.97, corresponding to high levels of stress, and most (55%) presented mean scores between 1.11 and 1.97, or moderate levels of stress.

Student’s t-test, used to identify differences among the three groups of stress levels, did not reveal any statistically significant differences between stress levels and other variables. This finding indicates that the study sample possessed homogenous characteristics.

Table 2. Descriptive measures by domain of stress source among Intensive Care Unit nurses. Teresina, Piauí, Brazil, 2010.

Domains	Mean	Standard deviation	Minimum value	Maximum value
Conflicting functions	2.08	0.68	1.0	3.13
Work overload	2.33	0.61	0.82	3.0
Relationship difficulties	1.78	0.82	0.70	3.20
Personal management	2.31	0.78	0.80	3.60
Critical situations	2.50	0.52	1.24	3.10

Table 2 presents the descriptive measures of stress according to source of stress domain. Critical situations obtained the highest mean (2.50), which is made up of items regarding different situations such as caring for critical patients, the singularities of such units and, furthermore, self-perceived professional competence. The next highest mean was presented by work overload (2.33). Items reported as causing maximum stress were as

follows: pay level (42.9%), constant noise within the units (38.1%) and dealing with terminal patients (38.1%).

Table 3 demonstrates the symptoms reported by participants according to the domains of the scale of symptoms, namely: cardiovascular alterations, digestive system alterations, immunological alterations, sleep and rest alterations, musculoskeletal alterations and menstrual cycle alterations.

Table 3. Descriptive measures by domains of the scale of symptoms among Intensive Care Unit nurses. Teresina, Piauí, Brazil, 2010.

Domains	Mean	Standard deviation	Minimum value	Maximum value
Cardiovascular alterations	0.66	0.50	0	1.56
Digestive system alterations	0.53	0.48	0	1.67
Immunological alterations	0.32	0.37	0	1.20
Sleep and rest alterations	1	0.99	0	3.75
Musculoskeletal alterations	1.69	1.10	0.50	4.0
Menstrual cycle alterations	1.14	0.20	2.80	0.65

Among the symptoms presented by professionals in this study, musculoskeletal alterations presented the highest mean (1.69 ± 1.10), followed by those related to menstrual cycle alterations (1.14 ± 0.65).

Regarding the scale of symptoms, the most commonly reported symptoms were: cramps or muscle spasms (14.3%); muscle pain (14.3%); pain in the back of the head or cervical region (14.3%); lumbar pain (14.3%), pertaining to the musculoskeletal domain; difficulties falling asleep (9.5%), from the sleep and rest alterations domain; lack of appetite (4.8%) and nausea and vomiting (4.8%) belonging to the digestive system alterations domain; pain or discomfort before menstruation (4.8%); pain during menstruation (4.8%) and irregular cycles (4.8%), of the menstrual cycle alterations domain.

Belonging to the cardiovascular symptoms domain, high blood pressure was reported by 14.3% of participants as a high-intensity symptom. In turn, the immunological alterations domain presented symptoms of moderate intensity, among which infectious diseases in general and coughing stand out, both with 9.5%.

Each individual differs in terms of characteristics and competences and regarding their different job functions and work units, factors which condition each person's response in the face of stress. Regarding social habits, the present results found that most nurses made regular use of alcohol (76.2%), none were smokers (100%) and 81% took drugs to induce sleep.

DISCUSSION

The results described above indicate that the studied group consisted primarily of economically active and married women. This finding is compatible with 2006 indicators, which displayed that approximately 90% of nurses are women.¹¹ Difficulties in the family-workplace interface are especially common among women. Family activities can act either as a support system or as a source of strain for managing stress when associated with the development of multiple activities and managing a double shift between family and professional life.¹²

Regarding age, 71.5% of the sample was between the ages of 31 and 50, data similar to those identified in a previous study.¹⁰ In the present research, stress and age were not significantly correlated; however, statistically significant and inverted correlations (negative) between stress and age have been found.¹³

By relating work and profession, the present study found that participants were susceptible to stress, seeing that 90.5% had not received any specific ICU training. Coupled with the absence of graduate studies in the field, this situation indicates the need for specific professional development, as training allows professionals to become familiar with the ICU routine and environment and leads to enhanced team integration, strengthening professional confidence.

Furthermore, holding a graduate degree was a variable associated both with time since graduation and time at ICU, which can contribute towards professional confidence and adjusting to the work environment and process.¹⁴⁻⁵

The weekly workload of the analyzed subjects tended to exceed 30 hours. Excessive work, represented by a high hourly workload, in association with other jobs and double or triple shifts are all elements that can favor the presence of psychological risk factors in health workers, and in this specific case, nurses.¹⁶

The demand created by increased work hours and accumulated tasks and responsibilities can lead to lack of enthusiasm, dissatisfaction and consequent emotional exhaustion. Thus, holding two jobs can be seen as a negative factor, in that doubled or tripled work activities lead to increased vulnerability to stress.

Furthermore, 81% of participants did not have to make an effort to go to work, were satisfied with their job and did not feel that their day never ended; in addition, 71.4% did not express a desire to change professions. Comparatively, nurses who reported having to make an effort to carry out their job perceived the day as never ending. On the other hand, those who did not have to make an effort displayed higher levels of satisfaction.

It is believed that having to make an effort to go to work impacts job satisfaction. Among the possible causes for such effort, special emphasis goes to involvement with other professional or personal activities. When work is adjusted to the physical and psychological conditions of workers and occupational risks are minimized, it becomes easier for workers to meet objectives and gain personal accomplishment from their jobs, thus increasing personal satisfaction and self-esteem.⁴

Our analyses found a correlation between descriptive measures and relative mean scores on the Visual Analog Scale regarding self-perceived stress. On this scale, most nurses

classified their profession as causing moderate strain. Such values point to the perception of occupational stress as a threat, influencing their personal and professional lives, in that the effort demanded to deal with stress was greater than participants' existing capacity to cope with it.

According to Lazarus and Folkman's Cognitive Appraisal Theory, how individuals react to stress depends on their interpretation of a given situation and their coping mechanisms. Since stress is a psychological process, it cannot not be defined by the situation or by the response *per se*, but how individuals perceive the experienced situation, considering both the individual and their environment.⁶

Individual characteristics and working conditions are important variables to consider when analyzing stress. When comparing stress scores and variables such as personal, work and professional information and social habits, nurses who wished to change professions presented higher mean levels of stress in comparison to those who did not express wanting to change professions. Furthermore, nurses who did not have to make an effort to go to work and those who were satisfied with their jobs presented lower mean levels of stress.

Our analysis demonstrated that general life conditions, work relationships, work processes and control over such processes displayed a very dynamic interaction with job satisfaction. Excessive workload, interference of work in one's personal life, lack of authority and necessary influence for conducting one's job are determinant factors leading to dissatisfaction. Stress stands out as one of the main consequences of dissatisfaction, negatively influencing worker health.¹⁷

Varying with the time, intensity and quality of stress sources, reactions to stress are physiological responses caused by the perception of adverse and threatening situations of the somatic system. Thus, despite the similarity of activities, the identification of stress varies according to the field of work and its singularities. It also depends on the individual assessment of each professional.

The main sources of stress indicated by the present study regarded pay level, constant noise level in the unit and dealing with terminal patients. This finding is similar to that of another study conducted on occupational stress in the nursing workplace, whose main sources of stress were work overload, leadership issues, emotional

demands of caretaking and conflicting functions.⁷

Insufficient pay is directly associated with stress, indicated as a demotivating factor towards quality of life in the workplace, even though other studies have pointed out that improved working conditions are more significant than increased pay. Thus, when compared to other issues such as work overload, pay level is not only a determining factor, but it also contributes to job satisfaction.¹⁸⁻⁹

The presence of constant noise, a reality present 24 hours a day can lead to physiological and psychological alterations, expressed by altered mood, agitation, sleep disorders, increased blood flow to the brain, altered intellectual functions and stress. Professionals exposed to this condition tend to speak more loudly, gesticulate more and carry out their activities at a quicker pace, characteristics which contribute to reduced concentration levels and increased memory errors.²⁰

Regarding the manifestation of stress, the present results demonstrated that musculoskeletal symptoms were the most prevalent, such as cramps, spasms and muscle pain in general.

Stress can cause musculoskeletal disorders by a chain of physiological reactions. Traditionally, such factors are related to carrying weight, inappropriate body postures and repetitive tasks. More recently, other sources of stress have been added to the list of risk factors for musculoskeletal ailments, such as mental sources, psychosocial factors, work organization, inadequate furniture, work posts and equipment and lack of training and staff.²¹⁻²

There was no significant correlation between the domains of the scale of stressors and symptoms presented by nurses. Notwithstanding, there was a statistically significant correlation between musculoskeletal and sleep disorders and participants with high levels of stress.

Stress is a constant challenge to nurses, influencing their personal health and the quality of care provided to patients. It is important to highlight that nursing care in high-complexity sectors requires an ability for dealing with complicated situations and managing work processes quickly and with precision, requirements not generally demanded in other hospital units, in that high-complexity workers deal with numerous health risk factors on a daily basis.²³

CONCLUSION

Considering the objectives of the present research, this study demonstrated that most subjects presented moderate levels of stress. The most prevalent sources of stress were low pay levels, constant noise within the units, dealing with terminal patients and work overload. Such stress sources are in alignment with the specificities of the studied sector. Regarding symptoms, the most common were musculoskeletal and sleep alterations.

Limits of this study include the scarcity of publications related to the research question in the state of Piauí, Brazil. Furthermore, we did not evaluate the characteristics of each unit, such as the number of procedures conducted, working conditions and other factors that directly influence the work process of pediatric ICU nurses.

The data from this study did not allow for any conclusive results; however, it provided insight into pediatric ICU work processes and allowed for reflections on the multiple aspects that compose this practice. Such information can also serve as the basis for institutions interested in developing human resource policies and professional training.

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