ORIGINAL

Relationship between stress and quality of life of hospital nurses
Relação entre estresse e qualidade de vida de enfermeiros hospitalares
Relación entre el estrés y la calidad de vida de las enfermeras del hospital

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ABSTRACT
Objective: to assess the extent to which the level of stress interferes with the quality of life of nurses in the inpatient units of a university hospital in Northeastern Brazil. **Method**: this is a cross-sectional study with a quantitative approach, in which 50 nursing assistants participated, whose stress level was assessed according to the Bianchi Stress Scale and WHOQOL-BREF quality of life questionnaire. (Opinion of the Institutional Research Ethics Committee nº 1,437,656 - CAAE: 39124114.1.0000.5208). **Results**: nurses had moderate levels of stress (3.31 ± 0.77; p = 0.717) and a quality of life with a score of 64.82 ± 14.69. Non-intensive care nurses had higher stress scores, especially in the domain "activities related to the proper functioning of the unit" (4.04 ± 1.42; p = 0.011) in the studied group. There was a moderate inverse correlation between work stress and quality of life (r = -0.398; p = 0.004). **Conclusion**: nurses showed a moderate level of stress, with moderate quality of life scores.
Descriptors: Occupational nursing. Workload. Occupational stress. Nurses. Quality of life.

RESUMO
Objetivo: avaliar em que medida o nível de estresse interfere na qualidade de vida dos enfermeiros de unidades de internação de um hospital universitário do Nordeste do Brasil. **Método:** trata-se de um estudo transversal de abordagem quantitativa, em que participaram 50 enfermeiros assistenciais, cujo nível de estresse foi avaliado de acordo com a Escala Bianchi de Estresse, e a qualidade de vida pelo questionário WHOQOL-BREF (parecer do Comitê de Ética em Pesquisa da Instituição nº 1.437.656). **Resultados:** os enfermeiros apresentaram níveis moderados de estresse (3,31±0,77; p=0,717) e uma qualidade de vida com escore de 64,82±14,69. Os enfermeiros não-intensivistas tiveram pontuações mais elevadas de estresse, sobretudo no domínio "atividades relacionadas ao funcionamento adequado da unidade" (4,04±1,42; p=0,011) no grupo estudado. Houve uma correlação inversa e moderada entre estresse no trabalho e qualidade de vida (r=-0,398; p=0,004). **Conclusão:** os enfermeiros apresentaram um nível moderado de estresse, repercutindo em escores moderados de qualidade de vida.
Descritores: Enfermagem do trabalho. Carga de trabalho. Estresse ocupacional. Enfermeiros e enfermeiras. Qualidade de vida.

RESUMÉN
Objetivo: evaluar en qué medida el nivel de estrés interfiere con la calidad de vida de las enfermeras en las unidades de hospitalización de un hospital universitario en el noreste de Brasil. **Método**: este es un estudio transversal con un enfoque cuantitativo, en el que participaron 50 asistentes de enfermería, cuyo nivel de estrés se evaluó de acuerdo con la escala de estrés de Bianchi y el cuestionario de calidad de vida WHOQOL-BREF. (Opinión del Comité de Ética de Investigación Institucional nº 1.437.656 - CAAE: 39124114.1.0000.5208) **Resultados**: las enfermeras tuvieron niveles moderados de estrés (3.31 ± 0.77; p = 0.717) y una calidad de vida con un puntaje de 64.82 ± 14.69. Las enfermeras de cuidados no intensivos tuvieron puntajes de estrés más altos, especialmente en el dominio "actividades relacionadas con el buen funcionamiento de la unidad" (4.04 ± 1.42; p = 0.011) en el grupo estudiado. Hubo una correlación invertida moderada entre el estrés en el trabajo y la calidad de vida (r = -0.398; p = 0.004). **Conclusión**: las enfermeras mostraron un nivel moderado de estrés, con puntajes moderados de calidad de vida.
Descriptores: Enfermería ocupacional. Carga de trabajo. Estrés laboral. Enfermeros y enfermeras. Calidad de vida.

INTRODUCTION

Scientific and technological advances require the worker to learn new abilities and adapt to different types of work. As a result, they can be more competitive in a work market that is also plagued with precarious working conditions, lower benefits from work, and less time for social life. This set of elements ends up favoring the development of work-related diseases, which are often caused by high workloads and by the incorporation of technologies in the productive systems[1].

Current evidence shows that stress levels are related with structural questions, inherent to the professional exercise within social structures (recognition, valorization, autonomy, empowering, burden) and relationships, in a context of rigid hierarchies, added to the inherent demands of the professional. The effects of excessive and continuous stress are not limited to health impairment. The can, in addition to triggering the development of numerous diseases, prejudice the quality of life and productivity. Therefore, there is a large interest over the causes and methods of stress reduction.

The performance of workers is seen as intimately tied to the level of satisfaction they find in the work environment. This means that the reaching of organizational objectives is somewhat related to the interests of individuals. In this context, strategies to improve the quality of life at work seek, on one hand, to improve the satisfaction and wellbeing of the worker, while, on the other, improving the attention provided to the patient[1]. High stress levels lead to a lower quality of life, due to lack of motivation, irritation, impatience, and unhappiness in the work environment, all of which change the way individuals interact in the many fields of their lives[1-2].

In the context of nursing, professional activities nearly always take place amid risks and adverse conditions, which can directly influence physical and mental health, leading to stress and impairing work. The exposure to pathogens, sharp objects, the risk of contracting diseases, and the violence that can come from any source have a negative impact on the health of the nursing professional[2-3].

Stress at work, in the context of this research and according to the instrument selected, is seen as a subjective phenomenon, based on individual perception. The workplace and activities carried out by the nurse are sources of multiple stressors[4]. The quality of life, on the other hand, is defined by the World Health Organization (WHO) as an"[...] individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns"[5]. This construct, thus described, indicates the subjectivity ingrained in the cultural, social, and environmental contexts and can be related to professional stress.

Quality of life and its uncountable facets, including stress, are often associated and experienced in the daily working life of the nurse. Considering these contemporary and complementary themes, the need and relevance of this study becomes clear, as it seeks to contribute for a critical reflection about the stress levels that nurses face in their work environment and their quality of life. As a result, the objective of this study is to examine to what extent stress levels interfere in the quality of life of the nurses from the hospitalization units of a university hospital.

METHOD

This is an exploratory, cross-sectional, quantitative study, carried out in two intensive care units from four clinical-surgical wards from a university hospital in the Northeast of Brazil, from June to August 2017.

A sample by convenience, made up by 50 hospital nurses, included all nurses who worked in the units selected for the study, excluding those on leave, on vacation, and residents. After the professionals were addressed and received an explanation about the objectives of the research, they were invited to participate, signing the Free and Informed Consent Form. They were invited during work hours, in a moment of their choosing, as not to hinder their working routines.

The instrument used for data collection was a questionnaire made up by three parts. In the first, elaborated by the authors, sociodemographic data was collected (sex, age, number of children, marital status, religion, place of origin), as well as data on their education and professional activities (specializations, time in the service, number of formal jobs, years of formal education, sector in which they work, workload). In the second part, the validated instrument Bianchi Stress Questionnaire (BSQ) was used. The BSQ aims to measure the levels of stress the nurse attributes to the activities they perform in their daily professional lives in the hospital[6]. It includes 51 items in a Likert scale that varies from 1 to 7, with 1 indicating little stress; 4 indicating medium stress; and 7 indicating high stress. The items are grouped in six domains, which are: relationships with other units and supervisors (A); adequate function of the unit (B); personnel management (C); nursing care provided to the patient (D); management of activities (E); work conditions (F). The scores of the items that make up each domain are summed up, and the result is divided by the number of items. Then, the mean score of each domain is found. For the analysis of the mean score of the nurse, the following standardized score was considered for the stress levels regarding each item and domain: 3.0 or lower — low stress levels; from, 3.1 to 5.9 — medium stress levels; equal or above 6.0 — high stress levels[4].

The third and last part was made up by WHOQOL-BREF, a questionnaire to assess the quality of life. The WHOQOL-BREF is made up by 26 questions (questions 1 and 2 being about general quality of life). Its answers are in a Likert scale (1 to 5; the higher the score, the better the quality of life)[5]. In addition to these two questions, the instrument counts on 24 facets, which make up four domains that seek to evaluate the aspects: physical, psychological, social relations, and environment.

To analyze the data, the software SPSS (Statistical Package for the Social Sciences), version 20.0, was used, with data inserted double input to be validated.

The sample was characterized using descriptive statistics tools. The scores were converted to values of up to 100 points, and the quality of life is directly proportional to the scores found. The stress scores and the quality of life of the nurses are presented by means and standard deviations. The Kolmogorov-Smirnov test showed a normal distribution for the main outcomes of the study. The means of nurses who work with intensive care and those who do not were compared using Student's t test. In the evaluation of the correlation between quality of life and stress, Pearson's correlation coefficient was calculated, and the reliability in the use of the questionnaires was evaluated using Cronbach's α. All tests considered a significance level of 5%.

This research was elaborated and based on the ethical precepts in Resolution No. 466/12 and was only started after being appreciated and approved by the Research Ethics Committee from the institution (opinion n°. 1.437.656 – CAAE: 39124114.1.0000.5208).

RESULTS

The sample was mostly made up by women (47/94%), above 30 years old (27/54%), who lived in the capital (33/66%), were married or had partners (21/42%), had no children (30/60%), and were Catholic (35/70%).

25 (50%) participants were nurses from ICUs while 25 (50%) were from clinical or surgical wards. Only 12 (24%) worked in the night shift, and most had a workload of 36 hours (38/76%), in a distribution that was proportional to the scale and to the distribution of the nursing personnel in the hospital and can represent the population studied. The difference between dependent variables (stress and quality of life) according to shifts was not considered for this study.

76% of nurses work on 36-hour shifts in the hospital, while 54% have different shifts. 82% have worked in their wards for less than five years. The high percentage of professionals working for five years or less reflects the changes in management that have taken place in the last few years, through public selection processes to replace workers from hired companies and temporary contracts — all current workers were hired in government selection processes.

Table 1, which shows the results of the stress, as related to the work of the nurses, per domain, shows high reliability in the application of the scale (α>0.7) for most items, and moderate for the "management of activities" (α=0.662) and "work conditions for the performance of the activities of the nurse" (α=0.455).

The means of all domains showed a medium level of stress (3.31±0.77), and the general stress level was found to be medium (30/60%) for all nurses interviewed. The domains with the highest scores regarding stress were "nursing care provided to the patient", (3.58±1.05), "activities related to the

adequate function of the unit" (3.52±1.47) and "relationships with other units and supervisors" (3.48±1.32) (Tables 1 e 2).

The scores of quality of life for all nurses in the sample showed similar values across domains, with high reliability on their categories, except "environment" (α = 0.65) (Table 3).

Table 4 shows that, when the stress was evaluated comparing groups of nurses, the domain "activities related with the adequate function of the unit" had a higher result among those who do not work in intensive care (p=0,01). It stands out that in the domain "nursing care provided to the patient" (3.83±1.26 vs. 3.32±0.73; p=0.09), intensive care nurses had higher stress levels when compared to nurses from other wards (Table 5). In the other domains of stress and quality of life, the best means were in the group of nurses who did not work with intensive care (Table 4).

As the associations between stress and quality of life are evaluated, it should be mentioned that the scores showed by the scales are directly proportional to concepts and that, in the hypothesis tested, negative associations show that the higher the stress, the worse the quality of life (lower scores).

Stress had a moderate and inverse association with quality of life (r=-0.398; p=0.004) and with the "physical" (r=-0.331; p=0.019), "psychological" (r=-0.331; p=0.019) and "environment" (r=-0.371; p=0.008) domains. General quality of life, on the other hand, had relations with the following domains of stress: "relationships with other units and supervisors (r=-0.347; p=0.014), "management of activities" (r=-0.358; p=0.011), and "work conditions for the performance of nursing activities" (r=-0.511; p<0.01) (Table 5).

The potential associations between the domains of quality of life and the domains of the stress questionnaire were verified. Regarding the physical domain of QoL, there was an inverse and moderate association with "work conditions for the development of nursing activities" (r=-0.466; p=0.001) and "activities relate to the adequate function of the unit" (r=-0.286; p=0.044). The "psychological" domain had significant associations with the domains "relationships with other units and supervisors" (r=-0.348; p=0.013), "management of activities" (r=-0.376; p=0.007), and "work conditions for the development of nursing activities" (r=-0.426; p=0.002). The stress domains showed no association with "social relations". Finally, the "environment" domain showed significant associations with the subscales "relationships with other units and supervisors" (r=-0.325; p=0.021), "management of activities" (r=-0.352; p=0.012), and "work conditions for the development of nursing activities" (r=-0.476; p=0.000) (Table 5).

DISCUSSION

The nurses were characterized according to sociodemographic variables, stress, and quality of life. Currently, although men are increasingly present in the field of nursing, their presence is still minor than that of women. However, their participation is

extremely important, especially considering the   submitted[1].
physical requirements to which nursing workers are

Table 1 - Results of the assessment of stress as related to the work of nurses, by domains from the Bianchi Questionnaire. Recife-PE, 2017.

Domains	Mean	Standard deviation	α
General stress	3.31	0.77	0.72
A - Relationships with other units and supervisors	3.48	1.32	0.84
B - Activities related with the adequate function of the unit	3.52	1.47	0.82
C - Activities related with personnel management	3.05	1.26	0.78
D - Nursing care provided to the patient	3.58	1.05	0.86
E - Management of activities	3.16	1.01	0.66
F - Work conditions for the development of nursing activities	3.09	1.02	0.45

α: Cronbach's alpha

Table 2 - Distribution of hospital nurses evaluated according to levels of work-related stress, per domain. Recife-PE, 2017.

Domains	Stress levels		
	Low N(%)	Medium N(%)	High N(%)
General stress	20(40)	30(60)	-----
A - Relationships with other units and supervisors	20(40)	30(60)	-----
B - Activities related with the adequate function of the unit	19(38)	28(56)	3(6)
C - Activities related with personnel management	23(46)	25(50)	2(4)
D - Nursing care provided to the patient	16(32)	32(64)	2(4)
E - Management of activities	24(48)	26(52)	-----
F - Work conditions for the development of nursing activities	25(50)	25(50)	-----

Table 3 - Quality of life scores of the nurses evaluated, per domain. Recife-PE, 2017.

Domain	Mean	Standard deviation	α
Physical	66.6	15.2	0.83
Psychological	64.7	13.7	0.79
Social relations	69.7	13.9	0.81
Environment	58.4	14.7	0.65

α: Cronbach's alpha

Table 4 - Stress and quality of life of intensive care nurses and those from clinical-surgical wards. Recife-PE, 2017.

Variables	Intensive care nurses (md±dp)	Clinical-surgical ward nurses (md±dp)	p*
Work-related stress	3.29±0.84	3.32±0.72	0.91
A - Relationships with other units and supervisors	3.48±1.35	3.48±1.31	1
B - Activities related with the adequate function of the unit	3.0±1.36	4.04±1.42	0.01
C - Activities related with personnel management	3.0±1.41	3.09±1.13	0.79
D - Nursing care provided to the patient	3.83±1.26	3.32±0.73	0.09
E - Management of activities	3.29±1.12	3.02±0.89	0.34
F - Work conditions for the development of nursing activities	3.18±0.94	2.99±1.11	0.51
General quality of life	65.57±14.69	64.07±7.14	0.65
Physical	66.0±17.74	67.17±12.41	0.79
Psychological	62.83±15.45	66.5±11.69	0.35
Social relations	73.33±16.84	66.0±8.97	0.06
Environment	60.12±17.67	56.62±11.28	0.41

md±sd: mean ± standard deviation; *: Student's t test

Table 5 - Correlations between work-related stress and quality of life. Recife-PE, 2017.

| Domains - Stress | Domains - Quality of life (WHOQOL - BREF) | | | | | | | | | |
| | General | | Physical | | Psychological | | Social relations | | Environment | |
	r	P	r	p	r	p	r	p	r	p
General	-0.398	0.004	-0.331	0.019	-0.331	0.019	-0.232	0.105	-0.371	0.008
Domain A	-0.347	0.014	-0.232	0.104	-0.348	0.013	-0.203	0.157	-0.325	0.021
Domain B	-0.189	0.188	-0.286	0.044	0.065	0.656	-0.160	0.267	-0.204	0.156
Domain C	-0.175	0.225	-0.086	0.551	-0.238	0.096	-0.031	0.832	-0.205	0.154
Domain D	-0.005	0.973	-0.014	0.925	-0.055	0.703	-0.056	0.697	0.103	0.475
Domain E	-0.358	0.011	-0.207	0.149	-0.376	0.007	-0.211	0.141	-0.352	0.012
Domain F	-0.511	<0.01	-0.466	0.001	-0.426	0.002	-0.254	0.075	-0.476	0.000

r: Pearson's correlation

Although there have been changes in the hospital's nursing personnel over the years, the mean age of professionals in the study was above 30 years old. This can have an inverse relation with the levels of stress, that is, the higher the age, the lower the perception of stress. The perception of stress, therefore, takes place in the relation between life stories and experiences (person) and work organization (environment). The lower the age, the higher the stress regarding issues that involve the process of work, health institutions, and interpersonal relations in the work environment, in addition to its associated psychological symptoms, despite the fact that physical symptoms are more prevalent in nurses who have been working for longer[6-9]. It can also be said that younger nurses follow the footsteps of the older ones, and this is relevant for their decision to remain or not in the profession. That is, the stress and the conditions of older nurses tend to discourage beginners[10-11].

In literature, some data suggest that the time of education and the time working in the unit are important variables for the perception of stress in some activities carried out in the hospital work environment, including those related to the adequate function of the unit, personnel management, direct patient care, and coordination of activities. This leads to the reflection that workers develop, throughout their years in the profession, coping mechanisms to deal with the stressful situations that emerge from interpersonal relations and from their interaction with the organization of their work[8].

Considering the number of children, most people in the sample have no children and half of them are single. Marriage or marital coexistence often include responsibilities for domestic chores and for the education/creation of children, which lead to an excessive burden, frustration, and to a consequently higher level of stress. Furthermore, nurses who work on duty have less free time, which makes their social lives more difficult, especially regarding interactions with their family and leisure, both of which could be simple strategies to minimize the stress[12-13].

When it comes to occupational stress, the "care provided to the patient" who is hospitalized, especially in intensive care, is considered to be highly stressful. However, the response from the nurses interviewed regarding the elaboration of activities that make up this domain seems to disagree with this assumption, since their score indicated medium levels of stress. Another study showed that the nurses have higher levels of stress when the care provided does not achieve its goals, such as in unsuccessful cardiopulmonary reanimation[14].

The domain "activities related to the adequate function of the unit" showed a mean score and high reliability in nurses who did not work in intensive care. This can be partly explained by the fact that the ICU has a better supply of materials and a better physical structure for the performance of their activities, while nursing wards frequently lack supplies and have to wait a long time for them to arrive, since the priority is always given to the intensive care, considering there are only serious cases in that unit. Unpredictable situations in the field end up compromising the process that must be carried out. Sometimes, when professionals need more attention and focus due to preoccupations with other bureaucratic activities related to the function and management of the unit, they make mistakes, [15].

Considering the analysis of quality of life, as correlated to stress levels, the stress was found to affect the "physical" domain moderately in these professionals. This inverse relation can be noted in symptoms about which the professionals normally complain, such as: headaches, abdominal discomfort, tiredness, drowsiness, depending on medications or caffeinated products, posture problems, sleep alterations[12]. Furthermore, the profession demands much physical effort, especially in intensive care, which leads to changes in the general state of the organism, compromising the quality of life in association with the presence of psychological symptoms[7,15]. A large study with 5012 nurses who worked in Chinese hospitals found that the prevalence of problems sleeping was high, showing that occupational stress is a risk factor, as it includes intense psychological demands, coupled with low participation in management decision processes and little institutional support[9].

The quality of life of nursing professionals has been shown to be moderate or low, and these workers should seek strategies to deal with the

occupation and moral stress of the profession, within the work environment or out of it[15]. These strategies can be promoted by managers, to improve the satisfaction of the professional and increase productivity, diminishing turnover[16-18]. Social support is an ally of the professionals in coping with stress[19].

The moderate stress-related alterations in the "psychological" domains can be attributed to changes in the mental state of the professional, who is often brought to psychic suffering by long work journeys, accelerated production, repressive and authoritative pressure, lack or scarcity of pauses to rest, fragmentation of tasks, lack of valorization of the work provided, irritability, direct contact with the pain and suffering of patients and relatives[13]. The lack of supplies for work also generates stress, which, in turn, can impact in the domain of quality of life.

There is evidence that allows inferring that the activities included in this field, that is, control, supervision, training, and evaluation of the nursing team are elements of the actions of the nurse that generate stress[4,19-20]. It is well known that good personal relations are challenges for personnel management, which leads to reflections on the autonomy and the decision making powers of the nurse. This field has a direct relation with the making of decisions in higher hierarchical levels and with relations of power due to which the nurse is constantly required to deal with the needs for personnel in the sector and provide adequate working conditions, not to mention their position in management to discuss and suggest improvements in the ward they work[20]. Similarly, better professional relations increase engagement and satisfaction, minimizing the levels of stress of the professional activity[16].

This study presented, as its limitations, the high turnover in the sectors under study, owing to the entrance of new nurses. As a result, most were not in accordance with the inclusion criteria of the sample. Furthermore, the study was carried out in a single hospital. Additionally, there was no influence of other jobs or socio-family factors in the perception of stress.

CONCLUSION

There was a significant negative correlation between stress and the quality of life of nurses who perform their activities, both in Intensive Care Units and in other hospital wards. The nursing professionals showed a moderate level of stress, whose consequence was a moderately positive perception of their quality of life.

The discussion about the health of the nursing worker must be constant, serving as a warning for workers and for the organs that guide the category, to improve working conditions and guarantee work rights that can protect the integral exercise of the art of caring, with no prejudice to any of the dimensions of health of the caregiver.

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