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# Factors related to musculoskeletal pain of nurses in the hospital setting: cross-sectional study

*Fatores relacionados à dor musculoesquelética de enfermeiros no âmbito hospitalar: estudo transversal*

*Factores relacionados con el dolor musculoesquelético de enfermeros en el ámbito hospitalario: estudio transversal*

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## ABSTRACT

**Objective:** To analyze the relationship between musculoskeletal pain and sociodemographic and labor variables of nurses in the hospital setting.

**Method:** Cross-sectional, descriptive research, carried out from December/2019 to March/2020, with 83 nurses from a philanthropic hospital. Sociodemographic, labor, pain-related characteristics were assessed and analyzed with descriptive and inferential statistics.

**Results:** 75.9% had pain, tingling and numbness in the last year. Most affected regions: neck, upper back, and shoulders; 36% rated their pain as moderate and 14.6% severe; Nurses who work 8 hours a day, 40/44 hours a week and work at night, assessed their pain with greater intensity; there was a correlation between pain intensity and daily working hours ($p = 0.046$) and work shift ($p = 0.029$).

**Conclusion:** Nurses feel musculoskeletal pain in several anatomical regions and its intensity is related to the training time and acting in nursing, shift and weekly workload.

**Keywords:** Occupational health. Pain. Nurses. Hospitals. Hospital care. Patient safety.

## RESUMO

**Objetivo:** Analisar a relação entre dor musculoesquelética e variáveis sociodemográficas e laborais de enfermeiros no âmbito hospitalar.

**Método:** Pesquisa transversal, descritiva, realizada de dezembro/2019 a março/2020 com 83 enfermeiros de um hospital. Avaliadas características sociodemográficas e laborais relacionadas com a dor e analisadas com estatística descritiva e inferencial.

**Resultados:**75,9% apresentaram dor, formigamento e dormência no último ano. Regiões mais acometidas: pescoço, parte superior das costas e ombros; 36% avaliaram sua dor como moderada e 14,6%, intensa; verificada diferença estatística significativa entre intensidade da dor e jornada diária ($p = 0,046$) e turno de trabalho ($p = 0,029$).

**Conclusão:** Enfermeiros sentem dor musculoesquelética em diversas regiões anatômicas e a intensidade da mesma está relacionada com o tempo de formação e atuação na enfermagem, turno e carga horária semanal de trabalho.

**Palavras-chave:** Saúde do trabalhador. Dor. Enfermeiras e enfermeiros. Hospitais. Assistência hospitalar. Segurança do paciente.

## RESUMEN

**Objetivo:** Analizar la relación entre el dolor musculoesquelético y las variables sociodemográficas y laborales del enfermero en el ámbito hospitalario.

**Método:** Investigación descriptiva transversal, realizada de diciembre/2019 a marzo/2020, con 83 enfermeros de un hospital filantrópico. Las características sociodemográficas, laborales y relacionadas con el dolor fueron evaluadas y analizadas con estadística descriptiva e inferencial.

**Resultados:** El 75,9% presentó dolor, hormigueo y entumecimiento en el último año. Regiones más afectadas: cuello, espalda alta y hombros; El 36% calificó su dolor como moderado y el 14,6% severo; Las enfermeras que trabajan 8 horas al día, 40/44 horas a la semana y trabajan de noche, valoraron su dolor con mayor intensidad; hubo correlación entre la intensidad del dolor y la jornada laboral diaria ($p = 0,046$) y el turno de trabajo ($p = 0,029$).

**Conclusión:** Los enfermeros experimentan dolor musculoesquelético en varias regiones anatómicas y su intensidad está relacionada con el tiempo transcurrido desde la formación y actuación en enfermería turno y la carga de trabajo semanal.

**Palabras clave:** Salud laboral. Dolor. Enfermeras y enfermeros. Hospitales. Atención hospitalaria. Seguridad del paciente.

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## INTRODUCTION

Occupational health seeks to understand the relationship between work and health/disease processes. In this sense, institutional, human and clinical factors, such as the requirement for greater productivity, precariousness and intensification of work, staff shortages, weaknesses in relationships, increased hospitalizations, length of stay and mortality, are predictors of labor illness[1]. In the meantime, musculoskeletal pain is an important problem in the health of workers in different age groups and degrees of functional incapacity, translated by absenteeism, permanent leaves, high costs of treatment and indemnities[2].

Conceptualized as a consequence of injuries to the musculoskeletal system[3], in nursing, musculoskeletal pain results from requirements for the performance of care and from the physical exhaustion resulting from professional activity[4] and affects mainly the cervical, thoracic and low back[5]. Nursing care demands manual activities that require physical strength and dexterity, which favor the occurrence of work-related musculoskeletal disorders (WRMD) and repetitive strain injuries (RSI), with different degrees of disability[6].

Worldwide, nursing has about 28 million professionals[7]. In Brazil, the profession is represented by about 2.2 million professionals, of which more than 558 thousand nurses, and most of them work in the hospital network[8]. In this sense, studies on the physical and psychological health of these workers are relevant, since occupational diseases impact the different scopes (personal, family, social and labor) of the individual's life, interfere with patient care and safety and have repercussions on the health care network.

The psychological tension experienced by nursing, combined with the physical effort of work, contributes to illness[3]. The vulnerability of nursing to musculoskeletal disorders is related to working conditions, which involve fast pace, undersized staff, fragmentation of tasks, inadequate postures, excessive physical force and long workhours, determining factors of musculoskeletal disorders that evolve into labor limitations[5].

In a study with 27 nurses and 83 nursing technicians/assistants in a public hospital, an association was found between musculoskeletal diseases and reduced work ability[3]. It is highlighted the need for support and risk control measures to prevent illness and promote the health of nursing professionals, as well as the importance of educational actions and interventions with these workers based on evidence on work ability, stress and musculoskeletal disorders[4].

The identification of musculoskeletal disorders linked to working conditions in nursing supports managers and employees in the search for solutions in order to reduce the occurrence of these diseases[9]. Among the strategies that can be used, the ergonomic analysis of the labor environment, the availability of technological resources that reduce physical effort and harmful postures, the dimensioning of adequate staff to care demand, the continued education of the worker to adhere preventive measures are explained, the guarantee of labor rights and investment in research related to the theme[9].

These considerations, together with the authors' position, demonstrate the relevance of this research, to the extent that musculoskeletal pain can be prevented or treated early and, thus, preserve the health of nursing workers, as well as the quality of care provided by these professionals and the hospital organization as a whole. Thus, the objective of this study is to analyze the relationship between musculoskeletal pain and sociodemographic and labor variables of nurses in the hospital setting.

## METHOD

The construction and reporting of this study were in accordance with the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE), recommended for observational studies.

This is an exploratory, cross-sectional, and analytical study, developed in a philanthropic hospital, with 208 beds, a macro-regional health reference for 125 municipalities in the northwest region of the state of Rio Grande do Sul. The target population of the study comprised 90 nurses.

It was not performed sample size calculation, since all nurses at the institution were eligible and were invited to participate in the research. However, from the total of 90 eligible professionals, 83 (92.2%) agreed to participate in the study. This quantity makes it possible to infer that such data have a confidence level of 95% and a sampling error of 3%, which demonstrates the reproducibility of the data collected.

Regarding the eligibility criteria, being a nurse and acting in the institution were considered as inclusion criteria. Five nurses who were on vacation and on sick leave or maternity leave and two who refused to participate were excluded during the data collection period.

It was used a sociodemographic, clinical, and labor questionnaire, prepared by the researchers, which includes the variables gender, age, marital status, children, training time, postgraduate courses, position, time in the profession, work shift, workload, work unit, health status, physical activity, leisure time, health problems, medication use, smoking, drinking alcohol and absence from work.

The Nordic Musculoskeletal Questionnaire (NMQ) adapted for the Brazilian culture[10] includes 36 multiple and binary

questions regarding problems such as pain, tingling/numbness in the last 12 months and in the last seven days, preventing to perform normal activities and if consulted a healthcare professional, physician or physical therapist, because of this condition, in the last 12 months, in nine anatomical regions: neck, shoulders, upper back, elbows, wrists/hands, lower back, hips/thighs, knees, ankles/feet[10].

The Analog Scale for Pain Assessment (EVA) is numbered from 0 to 10, where 0 represents "no pain" and 10, "maximum pain". For the classification of pain levels, the following scores were used: no pain, 0; mild pain, from 1 to 4; moderate pain, from 5 to 6; and severe pain, from 7 to 10[11].

Data collection took place from December 2019 to March 2020. For operationalization, nurses from all shifts and units of the institution were contacted personally, invited to participate, and clarified about the objectives and stages of the research. The data were initially collected by the main author of the research, using printed forms and, sequentially, due to the Covid-19 pandemic, the respective instruments were sent online to the participants through Google Forms.

The data were entered in the Excel® software by two independent typists, being later compared to control possible typing errors, in order to reduce biases. The returns obtained online were checked and incomplete data were excluded.

Data were transferred to the Statistical Package for Social Science (SPSS) software, version 22.0, and analyzed using descriptive and inferential statistics. Descriptive statistics were used to characterize the sociodemographic, labor and clinical variables of the participants. Qualitative variables were described by means of relative and absolute frequency and quantitative variables by measures of central tendency and dispersion. In the assessment of the pain intensity variable, it was used the median with the quartiles, dividing the ordered set of data into four equal parts (each part represents 1/4 of the participants). Thus, Q1 = first quartile = lower quartile = is the value referring to the 25% of the ordered sample; the median refers to the value up to which 50% of the ordered sample is found; and Q3 = third quartile (designated as Q3/4) = upper quartile = value referring to the 75% of the ordered sample or value from which 25% of the highest values are found.

Association and/or correlation tests were used for categorical variables, according to asymmetry of distribution by the Shapiro-Wilk normality test and the Mann-Whitney U and Kruskal Wallis tests, with p values $< 0.05$ being considered significant. When using the Kruskal Wallis test, the post-hoc Dunn-Bonferroni test was performed, a multiple comparison test used after the application of non-parametric tests with three or more factors.

All ethical precepts were observed according to the guidelines and regulatory standards for research involving human beings and complementary[12]. After authorization from the local hospital for data collection, the study was submitted to the Research Ethics Committee of the University under CAAE No. 18791319.7.0000.5350 and approved under Opinion No. 3.657.852.

## RESULTS

83 nurses participated in the research. Table 1 presents sociodemographic and labor characteristics of the participants. It was observed that the sample is predominantly female (84.3%), young, with the highest percentage aged between 31 and 40 years (51.8%), married (54.2%) and with children (56.6 %).

Regarding training time, the highest percentage is for more than five years (61.4%). Still, most nurses claim to have taken postgraduate courses, a necessary subsidy to have expertise in each area of acting. Regarding labor characteristics, it is evident that 41% have been nurse for more than 10 years, 66.3% work during the day, 63.9% work 6 hours a day and most (81.9%) work 36 hours per week. Practically 60% of them refer not to occupy a leadership position.

Sequentially, Table 2 shows the results regarding the way the participants assess their health conditions. It is observed that most of them (74.7%) assess their health status as good; however, more than half say their leisure time is not enough and 38.6% practice physical activity. When asked about the diagnosis of a health problem, the majority reported not presenting and not having taken leave from work; more than 60% claim not to make continuous use of medicines, but 47% make occasional use of analgesics, anxiolytics, sedatives, and antidepressants. Allied to this, it is noteworthy that a high percentage refers to the consumption of alcoholic beverages "sometimes".

In continuity, Figure 1 shows the results regarding the occurrence of musculoskeletal disorders. It shows that majority of nurses had pain, tingling and/or numbness in the last 12 months and that more than half claimed to have had any of these symptoms in the last seven days prior to data collection.

Sequentially, Table 3 describes the results referring to musculoskeletal pain by anatomical region reported by the participants. It is observed that regarding the occurrence of pain, in the last 12 months, the most affected regions were neck (38.6%), upper back (37.3%) and shoulders (34.9%). Some professionals, however, in lower percentages, reported pain in the lower back, wrists/hands and ankles/feet.

**Table 1** – Sociodemographic and labor characterization of nurses (n = 83) working in a general hospital, Rio Grande do Sul. Brazil, 2019/2020

| Variables | | n | % |
|---|---|---|---|
| Gender | Female | 70 | 84.3 |
| | Male | 13 | 15.7 |
| Age | 18 to 30 years | 27 | 32.5 |
| | 31 to 40 years | 43 | 51.8 |
| | 41 to 50 years | 13 | 15.7 |
| Marital status | With partner | 45 | 54.2 |
| | No partner | 38 | 45.8 |
| Children | Yes | 47 | 56.6 |
| | No | 36 | 43.4 |
| How many | One | 27 | 32.5 |
| | Two | 18 | 21.7 |
| | Three | 2 | 2.4 |
| Training time | Less than 5 years | 32 | 38.6 |
| | 6 to 10 years | 26 | 31.3 |
| | More than 10 years | 25 | 30.1 |
| Post-graduate | Yes | 66 | 79.5 |
| | No | 17 | 20.5 |
| Holds a leadership position | Yes | 34 | 41.0 |
| | No | 49 | 59.0 |
| Time acting in nursing | Less than 3 years | 17 | 20.5 |
| | 3 to 10 years | 32 | 38.5 |
| | More than 10 years | 34 | 41.0 |
| Daily working hours | 12 hours | 14 | 16.9 |
| | 6 hours | 53 | 63.9 |
| | 8 hours | 16 | 19.3 |
| Work shift | Day | 55 | 66.3 |
| | Night | 16 | 19.3 |
| | Mixed/ switch days off* | 12 | 14.5 |
| Weekly workload | 30 hours | 3 | 3.6 |
| | 36 hours | 68 | 81.9 |
| | 40/44 hours | 12 | 14.5 |
| Total | | 83 | 100.0 |

Source: Elaborated by the authors.
* Mixed/ Switch days off: professionals who replace days off and work in different shifts (morning, afternoon or night).

**Table 2** – Life habits and health of nurses (n = 83) acting in a general hospital. Rio Grande do Sul, Brazil, 2019/2020

| Characteristic | | n | % |
|---|---|---|---|
| How nurse rate their health | Good | 62 | 74.7 |
| | Excellent | 7 | 8.4 |
| | Regular/poor | 14 | 16.9 |
| Practice of physical activity | Yes | 32 | 38.6 |
| | Sometimes | 27 | 32.5 |
| | No | 24 | 28.9 |
| Leisure time | Sufficient | 29 | 34.9 |
| | Little sufficient | 48 | 57.8 |
| | Insufficient | 6 | 7.2 |
| Has health problem | No | 57 | 68.7 |
| | Yes | 26 | 31.3 |
| Uses continuous medication | No | 55 | 66.3 |
| | Yes, with medical prescription | 26 | 31.3 |
| | Yes, on its own | 2 | 2.4 |
| Smoke | No | 80 | 96.4 |
| | Yes | 2 | 2.4 |
| | Sometimes | 1 | 1.2 |
| Drinks alcoholic beverage | Sometimes | 48 | 57.8 |
| | No | 30 | 36.1 |
| | Yes | 5 | 6.0 |
| Left work due to health problems | No | 72 | 86.7 |
| | Yes | 11 | 13.3 |
| Uses medications | Analgesic/sedative | 20 | 24.1 |
| | antidepressant/ anxiolytic | 19 | 22.9 |
| | Relaxant | 5 | 6.0 |

Source: Elaborated by the authors.

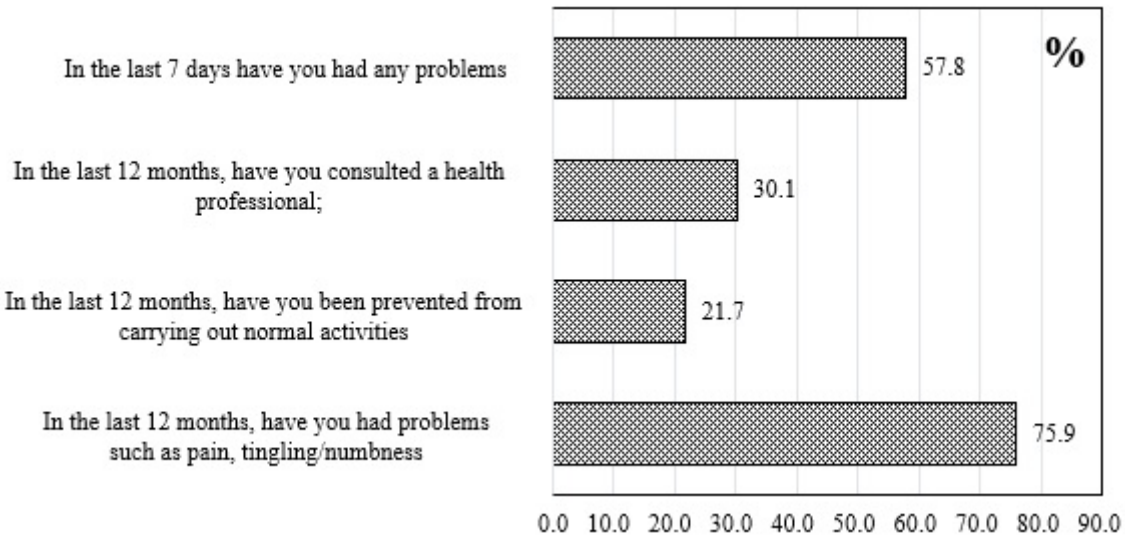


**Figure 1** – Frequency of musculoskeletal disorders in the different periods reported by nurses (n = 83) who work in a general hospital. Rio Grande do Sul, Brazil, 2019/2020
Source: Elaborated by the authors.

**Table 3** – Frequency of musculoskeletal disorders by anatomical region reported by nurses (n = 83) acting in a general hospital. Rio Grande do Sul, Brazil, 2019/2020

| Musculoskeletal Symptoms | PPT | PCNA | CHP | PR |
|---|---|---|---|---|
| Body division | n(%) | n(%) | n(%) | n(%) |
| Neck | 32(38.6) | 2(2.4) | 9(10.8) | 21(25.3) |
| Shoulders | 29(34.9) | 3(3.6) | 6(7.2) | 16(19.3) |
| Upper Back | 31(37.3) | 4(4.8) | 5(6.0) | 22(26.5) |
| Elbows | 4(4.8) | 1(1.2) | - | 1(1.2) |
| Wrists or hands | 21(25.3) | 6(7.2) | 7(8.4) | 10(12.0) |
| Lower back | 21(25.3) | 5(6.0) | 6(7.2) | 12(14.5) |
| Hips/thighs | 10(12.0) | 3(3.6) | 4(4.8) | 2(2.4) |
| Knees | 8(9.6) | 1(1.2) | 5(6.0) | 4(4.8) |
| Ankles/feet | 20(24.1) | 3(3.6) | 4(4.8) | 10(12.0) |

Source: Elaborated by the authors.
PPT = in the last 12 months, had problems such as pain and tingling/numbness. PCNA= in the last 12 months, has been prevented from carrying out normal activities. CHP= in the last 12 months, consulted a health professional. PR = in the last seven days, had any problems such as pain and tingling/numbness.

When asked about limitations to perform normal daily activities in the last year, nurses reported that pain in wrists and hands and in the lower back were the most limiting. Regarding the answers related to the consultation with a health professional in the same period, most were motivated by the occurrence of musculoskeletal disorders in the neck, wrists and hands, followed by the shoulders and lower back. As for musculoskeletal pain in the last seven days prior to data collection, the highest percentages were pain in the upper back (26.5%), neck (25.3%) and shoulders (19.3%), followed by lower back, wrists and hands and ankles and feet, in a lower percentage.

As for pain intensity, practically half of them (49.4%) reported mild pain. However, in addition to reporting pain in more than one anatomical region, 36% of the participants rated their pain as moderate and 14.6% as severe.

Table 4 presents the sociodemographic and labor characteristics according to the assessment of pain intensity reported by nurses. It is observed that graduated nurses who work in nursing for more than 10 years, who work 40 to 44 hours per week, and those who work at night rated their pain as more intense. There was a statistical difference between pain intensity and daily shift ($p = 0.046$) and work shift ($p = 0.029$). In the evaluation of the p-values of the two-by-two comparisons, there was a statistical difference in the variable "daily working hours", between the 6-hour and 8-hour shifts ($p=0.016$); and, in the "work shift" category, there was a difference between the day shift with the Mixed/switch days off ($p=0.021$) and also, with the night shift and the Mixed/switch days off ($p=0.016$).

## DISCUSSION

The characteristics of nurses' work in the hospital setting favor exposure to several risks that contribute to physical and psychological illness and have repercussions on the personal, professional, and organizational levels. This statement emerges from reflections based on the results of the present study, which demonstrate that nurses acting in a general hospital experience moderate to high intensity musculoskeletal pain in different anatomical regions. And, that the intensity of musculoskeletal pain is related to the working day and shift, and to the training time and acting in nursing.

The nurse experience situations such as difficulties in teamwork, lack of autonomy and inadequate staffing, which result in the fragmentation of care and require constant flexibility and reorganization. The scenario can then be one of pain, fear and uncertainty, which contributes to tension, stress and musculoskeletal pain in the professional.

Less autonomy and opportunity to participate in important decisions, lack of control over time, need to adjust unexpected tasks, increased institutional pressure, flexible working hours and organizational commitment are common organizational characteristics in hospital institutions[13]. Adjustments or compensations that qualify labor conditions inherent to institutional characteristics depend on political and economic contexts and on the level of competitiveness of the health sector in each country[13].

The musculoskeletal pain reported by the participants of this study in certain anatomical regions and associated with some sociodemographic and labor characteristics suggests that its occurrence is due to physical effort, lack of adequate conditioning and incorrect positioning. This pain is an alert indicator for both nurses and hospital managers, as it can become chronic and, gradually, make professional practice unfeasible, with damage to personal health, care safety and organization.

In this sense, the fact that most nurses claim to have presented musculoskeletal pain, tingling and/or numbness in the last year and that a lower percentage have experienced some of these symptoms in the last seven days prior to data collection is worthy of attention and suggests change in pain typology from acute to chronic. Acute pain is conceptualized as a physiological warning sign and has a limited duration, ceasing with the resolution of the noxious process; chronic pain, in turn, is like a disease that persists after healing of the initial injury, whose causal nexus may not be identified, which does not invalidate its existence and diagnosis[14]. Nurses need to pay attention to risk factors for musculoskeletal injuries associated with the practice of nursing care[15].

It is highlighted the multinational task force established by the International Association for the Study of Pain (IASP) to update the definition of pain as an "unpleasant sensory and emotional experience associated with, or similar to that associated with, an actual or potential tissue injury"[14]. Pain constitute an individual sensitive experience, influenced by biological, psychological and social factors and which,

**Table 4** – Assessment of pain intensity of nurses (n = 83) acting in a general hospital related to sociodemographic and labor characteristics. Rio Grande do Sul, Brazil, 2019/2020

| Characteristics | | Assessment of pain intensity | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | n | LI | UI | $Q_1$ | Md | $Q_3$ | p-value |
| Gender | Female | 70 | 0 | 8 | 2 | 5 | 6 | *0.194 |
| | Male | 13 | 0 | 7 | 0 | 3 | 5.5 | |
| Age | 18 to 30 years | 27 | 0 | 7 | 0 | 4 | 5 | #0.447 |
| | 31 to 40 years | 43 | 0 | 8 | 3 | 5 | 6 | |
| | 41 to 50 years | 13 | 0 | 8 | 0.5 | 3 | 6.5 | |
| Marital status | With partner | 45 | 0 | 8 | 5 | 4 | 6 | *0.817 |
| | No partner | 38 | 0 | 7 | 2 | 5 | 6 | |
| Holds leadership position | Yes | 34 | 0 | 8 | 3 | 4.5 | 6 | *0.918 |
| | No | 49 | 0 | 8 | 0.5 | 5 | 6 | |
| Daily working hours | 12 hours | 14 | 0 | 7 | 2.25 | 5.5 | 6 | #0.046 |
| | 6 hours | 53 | 0 | 8 | 0.5 | 4 | 5 | |
| | 8 hours | 16 | 0 | 8 | 3.5 | 5.5 | 6 | |
| Time acting in nursing | Less than 3 years | 17 | 0 | 7 | 1.5 | 4 | 5 | #0.632 |
| | 3 to 10 years | 32 | 0 | 8 | 2 | 4 | 6 | |
| | More than 10 years | 34 | 0 | 8 | 1 | 5 | 6.25 | |

**Table 4** – Cont.

| Characteristics | | Assessment of pain intensity | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | n | LI | UI | $Q_1$ | Md | $Q_3$ | p-value |
| Work shift | Day | 55 | 0 | 8 | 2 | 5 | 6 | #0.029 |
| | Night | 16 | 0 | 8 | 3 | 6 | 6 | |
| | Mixed/switch days off | 12 | 0 | 6 | 0 | 1.5 | 4.75 | |
| Weekly workload | 30/36 hours | 71 | 0 | 8 | 1 | 4 | 6 | *0.163 |
| | 40/44 hours | 12 | 0 | 8 | 3.5 | 5 | 6.75 | |
| Training time | Less than 5 years | 32 | 0 | 7 | 2 | 4 | 5 | #0.353 |
| | 6 to 10 years | 26 | 0 | 8 | 1.5 | 4.5 | 6 | |
| | More than 10 years | 25 | 0 | 8 | 1 | 5 | 6.5 | |
| Unit | Critical Units | 44 | 0 | 8 | 0.25 | 4 | 6 | #0.747 |
| | Care Units | 15 | 0 | 7 | 3 | 5 | 6 | |
| | Management and Administrative | 24 | 0 | 8 | 1 | 5 | 6 | |
| Post-graduate | Yes | 66 | 0 | 8 | 1.17 | 5 | 6 | *0.349 |
| | No | 17 | 0 | 7 | 1 | 4 | 5 | |

Source: Elaborated by the authors.
*Mann-Whitney U test, significant for $p < 0.05$. # Kruskal Wallis test, significant for $p < 0.05$.
LI= Lower limit; UI= Upper limit; Q1= first quartile; Md= Median; Q3 =third quartile. Mixed/switch days off: professionals who replace days off and work in different shifts (morning, afternoon or night);

although in general, plays an adaptive role, it can affect the individual's well-being and professional life[14].

The results of this investigation lead us to reflections on how much pain can interfere in the daily lives of these professionals, especially given the fact that most of them assess their health status as good, claim not to have a diagnosis of health problems and continue in their professional practice, even with pain. This leads us to think about the way they develop their labor activities, which factors trigger pain and what makes them prone to errors and damage in care. Pain has a negative impact on the life and health of the individual and his family, and the pain process, when chronic, has repercussions on sleep, activity, cognition, mood, relationships and personal and professional performance[3].

The fact that the anatomical regions most affected by musculoskeletal pain are neck, shoulders and upper back is in line with research conducted with 260 nurses from a Portuguese hospital, in which most participants had musculoskeletal pain in at least one body segment, and the most affected regions were the low back, cervical and dorsal spine[15]. Similar results were evidenced in a research with 211 nursing professionals from a Brazilian teaching hospital, in which the majority had pain in one or more anatomical regions, and the low back and neck regions were most affected[16]. Outcomes that denote that, characteristics of the nurse's work in the hospital setting contribute to the physical illness of the professional.

Acting as a nurse in the hospital setting makes it possible to affirm that the undersized staff, absenteeism and presenteeism are aspects that imply work overload and can clearly contribute to physical and psychological illness. Physical overload, repetitive movements, long hours, work rhythm and organization, deadlines, productivity, physical environment and lack of control of occupational risks culminate in the physical and mental illness of the worker[17]. Nursing work requires a high physical and mental load, which contributes to the occurrence of musculoskeletal disorders[4].

Undersized staff, professionals turnover, absenteeism, increased hospitalization rates, length of stay, severity of the patients' clinical condition[1] and non-use of devices and technologies that favor the practice of care[15] are factors that interfere in the nursing workload, with consequent illness of the professional.

On the other hand, the access and use of technologies reduce physical effort and inappropriate postures in care and are associated with adherence to preventive measures by workers[18]. Also, the regular practice of physical exercises is beneficial to health, as well as muscle stretching exercises reduce the level of pain and positively interfere with work activities and daily life[19].

Another result worthy of reflections, discussions and actions concerns the analysis of the report of pain measurement by nurses, classified as moderate and intense, which totals more than 50% of the participants. This result, together with the percentage of nurses (47%) who reported the use of analgesics, anxiolytics, sedatives and antidepressants, alerts to how much pain can favor iatrogenic events, compromise care, team and patient safety and institutional image, even to the point of gradually making professional performance unfeasible. Fragile labor conditions and the work intensification lead to the professional becoming ill, with repercussions on the quality of patient care[1].

Self-medication is a common practice among nurses, especially regarding the use of analgesics and non-steroidal anti-inflammatory drugs to treat headache and muscle pain, and is linked to pharmacological knowledge and to the handling and easy access to medications[20]. However, there are risks no less important than drug interactions, such as delayed diagnosis and adequate treatment, fatigue, and poor working conditions, with repercussions on the safety of professionals and care.

Still in relation to the assessment of pain by research participants, it can be stated that it differs from individual to individual, as it is a subjective vital sign, influenced by physiological, psychological, and social issues. In addition, nurses with greater daily workload and/or weekly working hours, trained and acting in nursing for more than 10 years, and those acting at night rated their pain as more intense. The greatest risk of illness of nursing professionals is among those who work long hours, with work overload and lack of time for self-care[18].

This result can be justified by the fact that longer working hours and longer professional activities imply greater exposure to the risks inherent in the work environment, less time for family and social life and reduced rest time and recovery of the organism. Also, due to working at night, a shift in which there is usually an undersized staff, especially the number of nurses, which requires taking on roles beyond care, concomitant with the management of the nursing team and, sometimes, the supervision and coordination of hotel services, cleaning, administration, among others.

The precariousness and intensification of work can cause adverse effects on occupational safety and health[1]. Work overload, time pressure and demand for greater effort culminate in unsafe work practices, with repercussions on individual safety and on an organization's work environment[1].

The analysis of the results of this research, combined with the position of several authors, worldwide, show that the work of nurses in the hospital environment can induce suffering and physical and psychological illness. Given this reality, much can be done, both by nurses and managers, in order to change this condition. However, for this to occur, it is necessary to diagnose these situations, promote knowledge, take attitudes, and implement actions aimed at health promotion, as well as the prevention of occupational diseases and the maintenance of a safe and adequate work environment, with a view to excellence in care.

## CONCLUSION

Nurses who act in a general hospital feel musculoskeletal pain in different anatomical regions, and the intensity of this pain is related to the work shift, the daily working hours and the weekly workload, the training time and acting in nursing. Research participants need a greater contribution of knowledge about occupational health, environmental conditions, and health damage, combined with institutional actions to promote health and prevent damage (often irreversible, with negative repercussions on patient safety and the institution as a whole).

The results of this study can support reflections, discussions and attitudes, in order to be used as indicators of actions and interventions with emphasis on the mobilization of strategies by managers of health institutions. Strategies are pointed out that range from work organization, which includes analysis of physical conditions, staff adequacy, quantitatively and qualitatively, management of the daily and weekly workload, the implementation of labor gymnastics and pre-established breaks in the working day and availability and use of technologies that favor nursing care with quality and safety.

Among the limitations of this investigation, the fact that it was carried out in only one hospital makes it impossible to generalize the results. It is suggested to be conducted new studies aimed at expanding knowledge about ergonomics and institutional measures that contribute positively to working conditions and the quality of life of professionals; development of scientific, technological, and sociological skills; and therapies that enable nurses to self-care, perceive their health condition and the identification of risk factors in the labor environment, with a view to better coping.

The results of this investigation are equally important for highlighting the relevant role of nurses, expanding the political and dialogic relationship and enabling greater recognition and appreciation of this professional category.

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