

Evening work, sleep quality and illness of nursing workers

Trabalho noturno, qualidade do sono e adoecimento de trabalhadores de enfermagem
Trabajo nocturno, calidad del sueño y enfermedades de trabajadores de enfermería

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Abstract

Objective: To analyze factors associated with sleep quality and illness in nursing workers who work in the night shift.

Methods: Cross-sectional and correlational study carried out in a teaching hospital with a representative sample of nursing workers who work at night. For data collection, we used a socio-occupational questionnaire, the Work-Related Damage Assessment Scale and the Pittsburgh Sleep Quality Index. For data analysis, we used the Chi-square test and Spearman correlation, with significance level of 5%.

Results: A total of 139 workers participated in the study, with a predominance of physical illness and poor sleep quality. An association was identified between sleep quality, gender and physical damage variables. Physical illness was associated with gender, physical activity, work accidents and work leave. There was a statistical difference between psychological illness and the variables gender, health treatment, use of medication and physical activity. Sleep quality correlated with physical and psychological damage.

Conclusion: The identified factors are useful for planning health actions in order to promote the health of nursing workers who work the night shift.

Resumo

Objetivo: Analisar fatores associados à qualidade do sono e adoecimento em trabalhadores de enfermagem que atuam no turno noturno.

Métodos: Estudo transversal e correlacional realizado em hospital de ensino com uma amostra representativa de trabalhadores de enfermagem com atuação no noturno. Para coleta de dados utilizou-se um questionário sociolaboral, a Escala de Avaliação de Danos Relacionados ao Trabalho e o Índice de Qualidade do Sono de *Pittsburgh*. Utilizaram-se, para análise dos dados, teste Qui-Quadrado e correlação de *Spearman*, com níveis de significância de 5%.

Resultados: Participaram 139 trabalhadores, com predomínio de adoecimento físico e com qualidade do sono ruim. Identificou-se associação entre qualidade do sono e as variáveis sexo e danos físicos. Adoecimento físico associou-se ao sexo, prática de atividade física, acidente de trabalho e afastamento do trabalho. Houve diferença estatística entre adoecimento psicológico e as variáveis sexo, tratamento de saúde, uso de medicação e prática de atividade física. Qualidade do sono correlacionou-se a danos físicos e psicológicos.

Conclusão: Os fatores identificados são úteis para planejar ações em saúde a fim de promover a saúde dos trabalhadores de enfermagem que atuam no turno noturno.

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Resumen

Objetivo: Analizar los factores asociados a la calidad del sueño y enfermedades de trabajadores de enfermería que actúan en el turno nocturno.

Métodos: Estudio transversal y correlacional realizado en un hospital universitario con una muestra representativa de trabajadores de enfermería en turno nocturno. Para la recolección de datos, se utilizó un cuestionario sociolaboral, la escala de Evaluación de Daños Relacionados con el Trabajo y el Índice de Calidad del Sueño de *Pittsburgh*. Para el análisis de los datos, se utilizó prueba χ^2 de Pearson y correlación de *Spearman*, con nivel de significación de 5 %.

Resultados: Participaron 139 trabajadores, con predominio de enfermedades físicas y sueño de mala calidad. Se identificó una relación entre calidad del sueño y variables sexo y daños físicos. Las enfermedades físicas se relacionaron con el sexo, la práctica de actividad física, accidentes laborales y ausencia al trabajo. Se observaron diferencias estadísticas entre enfermedades psicológicas y las variables sexo, tratamiento de salud, uso de medicación y práctica de actividad física. La calidad del sueño se correlacionó con daños físicos y psicológicos.

Conclusión: Los factores identificados son útiles para planificar acciones en salud a fin de promover la salud de los trabajadores de enfermería del turno nocturno.

Introduction

Health workers, especially nurses, are exposed to elements related to the work process that contribute to a complex work environment. These elements may include working in shifts, particularly the night shift, which is considered a predictor of endocrine and metabolic changes, such as increased body mass index,⁽¹⁾ increased risk of coronary disease,⁽²⁾ prevalence of Burnout syndrome, poor sleep quality and changes in sleep duration,⁽³⁻⁵⁾ which suggests workers' illness.

Working the night shift may make it impossible to properly replace lost hours of sleep, as it is an essential need for body relaxation and physical restoration. Thus, working this shift, having reduced time for sleep recovery and poor sleep quality can be aspects that contribute to negative repercussions on the physical, emotional and psychosocial health of nursing workers.^(6,7)

National and international studies have identified an association between night work and poor sleep quality in nursing workers.⁽⁸⁻¹⁰⁾ Sleep quality influences the performance of several physiological processes, such as the immune system, body metabolism, hormonal balance, mental and emotional health, which may imply fatigue, physical and mental imbalance⁽⁷⁾ and damage to health.

Damage to health can be classified into physical, defined as body pain and biological disorders; psychological, such as negative feelings and life in general; and social, such as isolation and difficulty in family and social relationships.⁽¹¹⁾ These situations can increase the risk of illness, work accidents and absenteeism, as these adversities resulting from

work organization impact the health-disease relationship, which is called biopsychosocial factors.⁽¹²⁾

In view of the advances in research related to worker health, which point to the growing illness related to work activity in nursing workers,⁽¹³⁾ it is questioned: what factors are associated with sleep quality and illness in nursing workers who work in the night shift? The aim of this study was to analyze factors associated with sleep quality and illness in nursing workers who work in the night shift.

Methods

Quantitative, cross-sectional and correlational study. It was carried out in a public teaching hospital, general, at a tertiary level, which attends 100% through the Unified Health System. Located in the state of Rio Grande do Sul, the institution offers a total of 403 hospitalization beds and the work process occurs daily and during the night shift (from 7 am to 1 pm; from 1 pm to 7 pm and from 7 pm to 7 am). Regarding the work system, there are workers governed by the Brazilian Hospital Services Company, with regular working hours: eight hours a day and/or special working hours: 12 consecutive hours for 36 hours rest, totaling 36 hours a week,⁽¹⁴⁾ and workers governed by the Single Legal Regime, with flexible working hours, totaling 30 hours a week.

Data collection took place individually and at the workplace, from September 2017 to April 2018, with a period of five days for the return of completed instruments. The settings were: medical clinic, tocogynecological unit, nephrology, pediat-

ric inpatient unit, adult and pediatric intensive care unit, adult and pediatric emergency room, operating room, anesthetic recovery room, obstetric center and treatment center for children with cancer.

During data collection, the nursing population consisted of a total of 960 workers (333 nurses, 500 nursing technicians and 127 nursing assistants), who worked in the day and night shifts. The inclusion criteria were: being a nurse, nursing technician or nursing assistant, working in direct assistance to users. The exclusion criteria were: being on leave of any kind during the period of data collection.

A stratified type sample calculation was carried out by professional category (nurse, nursing technician and nursing assistant), using a 95% confidence level, a sampling error of 5%. The application of these parameters produced a minimum sample size of 277 nursing workers. After that, the proportion of each professional category in the population was verified (35% nurses, 52% nursing technicians and 13% nursing assistants). Considering the turnover in work shifts, this variable cannot be considered for sample calculation purposes. Thus, for this study, we decided to only evaluate the data referring to workers who, in the period of data collection, were working in the night shift.

As data collection instrument, a socio-occupational questionnaire was used to characterize the participants (age, gender, children, marital status, position in the institution, work shift, another job, working time in the unit, post-graduation, training to work in the sector, work accidents, work and remuneration satisfaction, option for the work shift, health treatment, use of medication, work leave due to illness, physical activity, leisure-time).

The validated Work-Related Damage Assessment Scale (WRDAS) was used to assess the damage caused by work. The results are interpreted based on the general averages of the factors (physical, psychological and social damage), being classified into four levels: bearable (below 1.9); critical (between 2.0 and 3.0); severe (between 3.1 and 4.0) and the presence of occupational diseases (above 4.1). The bearable assessment is the most positive, producing pleasure at work; the critical state indicates a limit situation, indicating suffering at work

and signaling a state of alert; the severe level is considered a producer of suffering and an indicator of high risk of illness, while the highest level represents the presence of occupational diseases. At a critical level it already means illness, therefore, this classification was grouped into non-illness (bearable) and illness (critical, severe and the presence of occupational diseases).⁽¹¹⁾

To measure sleep quality, we used the Pittsburgh Sleep Quality Index, a version validated in Brazilian Portuguese (PSQI-BR). Its overall score can vary from 0 to 21 points, being characterized as good sleep quality (≤ 4), poor sleep quality (5-10) and sleep disorder (≥ 11).⁽¹⁵⁾ We opted for categorize the variable in sleep quality as “good” (≤ 5) and “poor” (> 5 points), as previously identified.⁽¹⁶⁾

Double entry data was conducted in the Excel for Windows/7 (Microsoft Office 2007) and statistically analyzed using Predictive Analytics Software, from SPSS, version 18.0. Categorical variables are described as absolute (N) and relative (%) frequency and quantitative variables by mean and standard deviation. The Chi-Square test was used for associations among the categorical variables, considering a significance level of 5% ($p < 0.05$), in cases of finding the global association, the adjusted residuals were calculated. For correlation analysis, we used the Spearman's correlation.

The ethical aspects of research with human beings from the National Health Council were respected,⁽¹⁷⁾ the research was approved by the Research Ethics Committee protocol 2237779.

Results

A total of 139 nursing workers who worked in the night shift during the data collection participated in the study (41 nurses, 76 nursing technicians, 22 nursing assistants). The average age of the participants was 42.6 years old ($SD \pm 9.47$) (minimum, 23; maximum, 69 years old) and the average working time in the unit was 9.7 years ($SD \pm 8.12$) (minimum 5; maximum 38 years).

There was a predominance of women 86.3% ($n=120$), having a partner 82.7% ($n=115$), children

79.9% (n=111) and postgraduates 58.3% (n=81). Related to health, 29.5% (n=41) underwent health treatment, 40.3% (n=53) used medication, 50.4% (n=70) practiced physical activity one or more times a week and 93.5% (n=130) had leisure time.

Regarding job characteristics, 19.4% (n=27) had another job, 70.5% (n=98) received training to work in the sector, 95% (n=122) and 87.8% (n=129) were satisfied with work and remuneration, respectively. A percentage of 35.3% (n=49) suffered accidents and 18% (n=25) were on work leave due to illness in the last six months prior to data collection. Most workers, 92.8% (n=129), chose to work in the night shift.

When assessing work-related damage, it was found that the average physical damage was 2.19 (SD±1.18), which classified it as critical. The average psychological damage was 1.11 (SD±1.15) and social damage 1.27 (SD±1.10), classifying them as bearable.

The percentage of workers showing physical, psychological and social damage related to work is shown (Table 1), according to the classification.

Table 1. Classification of work-related damage

Classification	Physical damage n(%)	Psychological damage n(%)	Social damage n(%)
Bearable	60(43.2)	107(77.0)	101(72.7)
Critical	45(32.4)	18(12.9)	32(23.0)
Severe	26(18.7)	11(7.9)	4(2.9)
Occupational diseases	8(5.8)	3(2.2)	2(1.4)

When dichotomizing the classification of damage in illness and non-illness, 56.9% (n=79) were identified in physical illness, 23% (n=32) in psychological illness and 27.3% (n=38) in social illness. Regarding sleep, there was a predominance of poor sleep quality (80.6%, n=112). (Table 2) shows the association between physical, psychological and social illness/non-illness and sleep quality.

There was a significant association between physical illness and poor sleep quality (p<0.001). In the association between socio-occupational variables and sleep quality, a statistical significance difference was found between poor sleep quality and the female gender variable (p=0.046). When associating socio-occupational variables and illness/non-illness,

Table 2. Association between physical, psychological and social illness/non-illness and sleep quality

Variable	Sleep quality		p-value*
	Good n(%)	Poor n(%)	
Non-physical illness	22(81.5)	38(34)	<0.001*
Physical illness	5(18.5)	74(66)	
Non-psychological illness	24(88.9)	83(74.1)	0.101
Psychological illness	3(11.1)	29(25.9)	
Non-social illness	20(74.1)	81(72.3)	0.854
Social illness	7(25.9)	31(27.7)	

*Chi-square test; *Significant association p<0,05

a significant association was found between physical illness and the female gender variables (p=0.001), not practicing physical activity (p=0.020), work accidents (p=0.027) and work leave (p=0.002). A significant association was identified between psychological illness and the variables female gender (p=0.005), health treatment (p=0.014), use of medication (p=0.004) and not practicing physical activity (p=0.039). Table 3 shows the correlation among study variables.

Table 3. Correlation matrix of age, working time, physical, psychological and social damage and sleep quality

Variable	Age	Working time	Physical damage	Psychological damage	Social damage
Age					
Working time	0.634*				
Physical damage	-0.008	0.049			
Psychological damage	0.159	0.161	0.421*		
Social damage	-0.052	0.012	0.322*	0.479*	
Global PSQI	-0.076	0.008	0.440*	0.238*	0.099

*Spearman's Correlation Coefficient; *Significant correlation p<0,01

A direct correlation was identified between age and working time (r=0.634); physical and psychological damage (r=0.421); physical and social damage (r=0.322); psychological and social damage (r=0.479); Global PSQI and physical damage (r=0.440) and between global PSQI and psychological damage (r=0.238).

Discussion

The limitations refer to the type of cross-sectional study, which limits the possibility of establishing causal relationships. Considering that, the analysis of the study occurred with nursing workers who worked in the night shift, it is necessary to deepen

the investigation with this population, through participatory researches, and, in future investigations, to include other workers who work this shift in order to compare possible similarities or divergences about related factors. Another limitation refers to selection bias, as this study disregarded workers on any kind of leave.

The purpose of this study is to provide information on the factors associated with sleep quality and illness in nursing workers who work the night shift to contribute to the development of interventions, built along with managers, maximizing workers health with positive repercussions in care.

From the data analysis, an average age of 42.6 years old was identified, a data similar to that found in a national study conducted with this population.⁽⁸⁾ Age was correlated with the working time in the unit, that is, the greater the age, the longer the working time, which suggests greater exposure of the worker to the work context. About that, a study points out that body pain and biological disorders reported by nursing professionals, which may be due to forced or adopted postures for a long time, contribute to the development of several musculoskeletal problems,⁽¹³⁾ which signals the risk of damage to health.

Most workers had a partner and children, data similar to investigations carried out with nursing workers.^(18,19) There was an association of women and physical ($p=0,001$), psychological illness ($p=0,005$) and poor sleep quality ($p=0.046$). The hegemony of the female gender can imply physical and mental overload due to the domestic and family attributions that are still prevalent for them. This personal overload can influence work activities, the quality of care provided, decision making and high rates of disorders and stress among workers.⁽²⁰⁾

When investigating the damage to health in this group of workers, a critical assessment for physical damage was identified, which indicates suffering at work and signals an alert state. The work context interferes with the health-disease relationship, causing the physical and mental illness of the worker.⁽¹²⁾

Regarding sleep assessment, a predominance of poor sleep quality was identified, a fact that converges with a European study showing that nursing

workers who work at night had worse sleep quality than those who worked the day shift.⁽⁹⁾

Added to this is the identification of workers with poor sleep quality associated with physical illness ($p<0.001$). It shows that sleep deprivation affects physical and mental aspects, cognitive and emotional functions, it can depress the immune system and cause metabolic disorders.⁽⁷⁾ In addition, it increases the secretion of cortisol, a hormone that contributes to gastrointestinal disorders, body weight, behavioral disorder, hypertension and osteoporosis,⁽²¹⁾ situations that may be related to impaired health of the night shift worker.

This data is confirmed by the correlation between sleep quality, physical and psychological damage, suggesting that the worse the sleep quality, the more pain in the body, biological disorders and bad mood. A study carried out in Germany with nursing workers identified that physical changes such as tachycardia, circulatory problems and constant back pain were correlated with a worse sleep quality.⁽¹⁰⁾ In addition, sleep compromised in its quantity/quality favors fatigue, defined by the feeling of weariness, tiredness and lack of energy,⁽⁶⁾ which can contribute to health damage.

Nursing work requires a high degree of attention, concentration, dexterity, and responsibility that, added to the night shift, long hours and the poor sleep quality, can have an impact on health. Data analysis showed an association among psychological illness, health treatment ($p=0.014$) and medication use ($p=0.004$). A study conducted with a total of 502 nursing workers from a hospital that investigated the factors associated with Burnout syndrome, according to the work shift, showed that those who worked the night shift were dissatisfied with sleep and had greater chances of high emotional exhaustion.⁽²²⁾

Exhaustion can favor physical illness, which showed a significant difference with work accidents ($p=0.027$) and work leave ($p=0.002$), that is, people with body pain and biological disorders associated with work accidents and/or sick leave were identified. The health of workers who work the night shift needs to be (re) planned through institutional actions that sensitize them to take care of themselves.

Among the actions, the encouragement to practice physical activity is mentioned, which was associated with non-physical illness ($p=0.020$) and non-psychological illness ($p=0.039$) in this study, which reinforces the understanding of the benefits of this practice for health. Research data⁽²³⁾ carried out with a total of 235 nursing workers and physicians working in different shifts identified the practice of daily physical exercise as a protective factor, with improvements in physical conditioning, in family and social relationships and in minimizing negative feelings.

Thus, there is a need for actions to improve work contexts and promote the health of nursing workers,⁽²⁴⁾ and must consider the particularities related to the night shift. Finally, when reflecting on the nursing work process and the health of workers, it is essential to pay attention to the evaluation of work-related damages, especially physical ones, and sleep quality, since they obtained the most negative results in the group of investigated workers.

Conclusion

This study identified a predominance of poor sleep quality in nursing workers working the night shift, who were physically ill. The factors associated with worse sleep quality were gender and physical damage; associated with physical illness, the variables gender, practice of physical activity, work accident and work leave; and associated with psychological illness the variables gender, health treatment, use of medication and practice of physical activity. Offering spaces for workers to inform themselves and discuss the factors that may compromise their health, aiming at providing them with tools to take care of themselves, may have an impact on care.

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Collaborations

Cattani AN, da Silva RM, Beck CLC, Miranda FMA, Dalmolin GL and Camponogara S contributed to the study design, data analysis and interpretation, article preparation, critical review of the content and final approval of the version to be published.

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