Original Article

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SLEEP ASSESSMENT AND ASSOCIATED FACTORS IN HOSPITAL NURSING WORKERS

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ABSTRACT

Objective: analyze the relationship between sleep quality, excessive daytime sleepiness, and health symptoms among the nursing team working in a hospital.
Method: cross-sectional research, carried out with the nursing team of a public hospital in Brazil, between September 2017 and April 2018. A sociodemographic questionnaire, health symptoms, Sleepiness Scale, and the Pittsburgh Sleep Quality Index were used. Data are presented as absolute and relative frequencies, means, standard deviations, bivariate analysis, and binary logistic regression.
Results: a total of 308 workers participated in the study, and poor sleep quality and absence of daytime sleepiness predominated among them. There was an association between sleepiness, children (p=0.006), and work accidents (p=0.044). Factors associated with poor sleep quality and drowsiness, appetite disorders, feeling of poor digestion, flatulence, weight gain, irritability, headache, feeling of low self-esteem, and mood lability.
Conclusion: appetite disorder was the main factor for poor sleep quality for the nursing team working in a hospital in Brazil. This suggests that it is important to consider sleep quality when examining a worker´s health.

DESCRIPTORS: Nursing team. Shift Work Schedule. Worker's health. Hospitals, Public. Sleep.

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AVALIAÇÃO DO SONO E FATORES ASSOCIADOS EM TRABALHADORES DE ENFERMAGEM HOSPITALAR

RESUMO

Objetivo: analisar a relação entre qualidade do sono, sonolência diurna excessiva e sintomas de saúde entre a equipe de enfermagem que atuava em um hospital.
Método: pesquisa transversal, realizada com a equipe de enfermagem de um hospital público do Brasil, entre setembro de 2017 e abril de 2018. Foram utilizados questionário sociodemográfico, sintomas de saúde, Escala de Sonolência e Índice de Qualidade do Sono de Pittsburgh (PSQI-BR). Os dados são apresentados como frequências absolutas e relativas, médias, desvios padrão, análise bivariada e regressão logística binária.
Resultados: participaram do estudo 308 trabalhadores, predominando entre eles a má qualidade do sono e a ausência de sonolência diurna. Houve associação entre sonolência, crianças (p=0,006) e acidentes de trabalho (p=0,044). Os fatores associados à má qualidade do sono e sonolência foram distúrbios do apetite, sensação de má digestão, flatulência, ganho de peso, irritabilidade, dor de cabeça, sensação de baixa autoestima e labilidade do humor.
Conclusão: o transtorno do apetite foi o principal fator de má qualidade do sono para a equipe de enfermagem que atuava em um hospital no Brasil. Isso sugere que é importante considerar a qualidade do sono ao examinar a saúde do trabalhador.

DESCRITORES: Equipe de Enfermagem. Jornada de trabalho em turnos. Pessoal de Saúde. Hospitais Públicos. Sono.

EVALUACIÓN DEL SUEÑO Y FACTORES ASOCIADOS EN TRABAJADORES DE ENFERMERÍA HOSPITALARIA

RESUMEN

Objetivo: analizar la relación entre la calidad del sueño, la somnolencia diurna excesiva y los síntomas de salud entre el personal de enfermería que trabajaba en un hospital.
Método: investigación transversal, realizada con el equipo de enfermería de un hospital público en Brasil, entre septiembre de 2017 y abril de 2018. Se utilizó un cuestionario sociodemográfico, síntomas de salud, Escala de Somnolencia e Índice de Calidad del Sueño de Pittsburgh (PSQI-BR). Los datos fueron presentados como frecuencias absolutas y relativas, medias, desviaciones estándar, análisis bivariado y regression logística binaria.
Resultados: Participaron del estudio 308 trabajadores, con predominio de pobre calidad del sueño y ausencia de somnolencia diurna entre ellos. Hubo asociación entre somnolencia, hijos (p=0,006) y accidentes de trabajo (p=0,044). Los factores asociados con la mala calidad del sueño y la somnolencia fueron trastornos del apetito, sensación de mala digestión, flatulencia, aumento de peso, irritabilidad, dolor de cabeza, sensación de baja autoestima y labilidad del estado de ánimo.
Conclusión: el trastorno del apetito fue el principal factor de mala calidad del sueño para el equipo de enfermería de un hospital en Brasil. Esto sugiere la importancia de tener en cuenta la calidad del sueño al examinar la salud del trabajador.

DESCRIPTORES: Grupo de enfermería. Horario de trabajo por turnos. Personal de salud. Hospitales públicos. Sueño.

INTRODUCTION

The work performed in hospitals involves a large number of nursing professionals, who work in different shifts, perform a multiplicity of unhealthy activities, are exposed to body fluids inherent to the task[1], and live with ergonomic inadequacies, suggesting musculoskeletal discomfort[2] and damage to workers' health.

Shift work is a factor that can change sleep patterns. Shift work is a factor that can affect sleep quality. Some consequences are sleep deprivation, poor sleep quality, and daytime sleepiness[3]. Nurses working on the night shift were significantly associated with gastrointestinal changes, loss of appetite, heartburn, nausea, and weight gain when compared to those on the day shift[4]. These signs and symptoms may arise from sleep disturbances.

Poor sleep quality can decrease the professional performance of nurses[5], reduce alertness and cognitive performance, increase the chances of headache[6], cause changes in hunger[7], and be related to symptoms of depression[8], anxiety[9] and worse general health[10]. The relationship between depression and anxiety occurs through the corticolimbic circuit, related to difficulties in reactivity and affective regulation, which seems to be affected by poor sleep quality[9].

Drowsiness is a consequence of poor sleep quality. Symptoms of insomnia or drowsiness may include difficulty concentrating, lack of energy and headaches, suggest an imbalance between professional and personal life, and work-related errors and accidents[11]. Poor sleep quality also interferes with body mass index through hormonal and biochemical changes, such as variations in leptin, ghrelin, and cortisol levels or increased insulin resistance[7]. These data is in line with American research which identified that nurses with higher body mass index have poor sleep quality ($p=0.0032$)[12].

There are studies on signs and symptoms that result from poor sleep quality in different countries. In Jordan, poor sleep quality of nurses working in hospitals was positively associated with increased stress and depression[13]. In Spain, the lack of sleep impaired the ability of emergency nurses to process and understand the emotions[14].

Thus, studies on sleep quality for the health of the nursing team are relevant[15.] They were identified in the national literature[16] and international[17], especially when they go beyond the objective of identifying the prevalence of poor sleep quality among the nursing team. It is necessary to identify the relationship of this variable with other factors that can have negative consequences on the health of the worker.

Considering this, this study aimed to analyze the relationship between sleep quality, excessive daytime sleepiness, and health symptoms among the nursing team working in a hospital.

METHOD

A cross-sectional study was carried out in a public teaching hospital, which has 403 inpatient beds. The population of nursing professionals at the time of data collection was 960 people (333 nurses, 500 nursing technicians, and 127 nursing assistants). The eligibility criteria were to provide direct assistance to users, excluding those on leave of any kind during the period of data collection. The sample was of the probabilistic type, stratified by professional category (95% confidence level, 5% sampling error). The minimum sample size was 277 nursing workers and, from that, a minimum representative sample was defined as 97 nurses (35% of the total population), 144 nursing technicians (52%), and 36 nursing assistants (13%).

Data collection took place from September 2017 to April 2018 in the adult and children's Emergency Room; medical and surgical inpatient units; adult and child intensive care units; and surgical center unit (surgical center and post-anesthetic recovery). Nursing work in these places is organized in shifts (morning – 7 am to 1 pm; afternoon – 1 pm to 7 pm, and evening – 7 pm to 7 am).

The team that assisted in data collection was trained in face-to-face meetings with the research coordinator and received the collector's manual with project data and questionnaires. The team participants were two professional volunteers working at the institution, three undergraduate students, one graduate student, and a scientific initiation scholarship.

We invited 350 professionals individually and in the workplace. The ethical precepts that govern research with human beings were presented to the professionals. After their consent, the questionnaires were handed out and a return date was agreed upon. There were 10 refusals and 32 questionnaires were not returned after the 5th attempt to collect the instruments. A questionnaire was used for socio-occupational characterization (professional category, work shift, working time in the unit, age, gender, children, partner, physical activity, leisure activity), and a questionnaire on self-reported health symptoms in the last week (appetite disturbance, feeling of poor digestion, heartburn, weight gain, irritability, insomnia, headaches, difficulty concentrating, feeling depressed or unhappy, feeling low in self-esteem, and mood lability (involuntary emotional swings).

To assess excessive daytime sleepiness, we used the Epworth Sleepiness Scale (ESS), versão traduzida e adaptada para o português do Brasil. The 8 ESE-BR items had a total reliability coefficient of 0.83. In this study, the value of Cronbach's alpha was 0.82. The analysis of the Epworth Sleepiness Scale was based on the sum of the response values, which can vary from 0 to 24 points. If the value is ≤10, the absence of excessive daytime sleepiness is considered, a score of 11 to 15 suggests excessive sleepiness and if the value is ≥16, severe sleepiness is considered[18]. The variable was dichotomized into the absence of excessive daytime sleepiness (≤10) and the presence of excessive daytime sleepiness (>10), according to a previous study[19].

The Pittsburgh Sleep Quality Index (PSQI) was used, translated, and validated into Brazilian Portuguese[20], which assesses sleep quality over 1 month. It has 19 questions, the higher the score, the worse the sleep quality. A global score of 5 indicates that the person has great difficulties in at least two components or moderate problems in three or more components. We chose to categorize the variable as "good" (less than or equal to 5) and "bad" (greater than 5) sleep quality, as already used in the scientific literature[21]. The internal consistency of the Brazilian version was 0.73, and in this study was 0.72.

Data were double-entered into Excel for Windows/7 (Microsoft Office 2007) and statistically analyzed using PSS (Predictive Analytics Software, SPSS INc., Chicago, USA), version 18.0 for Windows. Data normality was assessed using the Kolmogorov-Smirnov test (n>50).

Categorical variables were analyzed using absolute (n) and relative (%) frequency, and quantitative variables, as they follow the normal distribution, are presented with measures of position (mean) and dispersion (standard deviation). Internal consistency analysis was performed using Cronbach's alpha coefficient and association tests Chi-Square or Fisher's exact test. In all analyses, a significance level of 5% ($p<0.05$) was used.

To verify the associated factors between the variables, binary logistic regression was used (by the Enter method) to identify the adjusted association between the variable poor sleep quality (dependent variable) and the other variables. The association measure used was Odds Ratio (OR) and their respective confidence intervals (95%CI). Logistic regression models were run with the variables, which were removed from the models as p was greater than 25%. Multicollinearity was verified using the variance inflation factor (VIF), and a VIF < 5 for each variable was acceptable.

The fit quality was verified using the Hosmer-Lemeshow test. For the binary regression, the variables that obtained p<0.25 in the bivariate analysis were included in the adjusted model 1; and in adjusted model 2, p<0.15 with statistical significance (p<0.05).

We respected the ethical issues involving research with human beings such as anonymity and the voluntary nature of participation. Research carried out with human beings was approved by the Research Ethics Committee and complies with Resolution 466/12.

RESULTS

The percentage of responses was 88% (n=308 participants), with a predominance of females (86.4%, n=266), mean age of 40.84 years old (SD±9.12), a minimum of 23 and a maximum of 69 years old; and a mean working time of 8.07 years (SD± 8.10). Professionals with technical level totaled 67.53% (n=208) and higher level 32.47% (n=100). Worked on the day shift were 54.9% (n=169) and 45.1% (n=139) were on the night shift.

There was a predominance of professionals with a partner (77.9%, n=240), children (72.7%, n=224) who did not practice physical activity (51%, n=157), and who had free time for leisure activities or more times a week (91.9%, n=283).

There was a prevalence of poor sleep quality among the participants (57.1%, n=176), followed by the presence of disorder (27.6%, n=85) and good sleep quality (15.3%, n=47). When dichotomized, we observed that 84.7% (n=261) had poor sleep quality, and when associating with sociodemographic variables, no significant association was identified (p>0.05).

Regarding drowsiness, a predominance of the absence of drowsiness was identified (58.8%, n=181). An association was identified between workers with drowsiness who had children (p=0.006), between workers without drowsiness and children, and between workers with drowsiness and involvement in a work accident (p=0.044).

Poor sleep quality and drowsiness were associated with appetite disorders, feeling of poor digestion, flatulence or abdominal distension, weight gain, irritability, headache, feeling of low self-esteem, and mood lability (p<0.05). Insomnia and feelings of depression or unhappiness were associated with poor sleep quality (p<0.05) (Table 1).

Table 1 – Association between sleep quality, sleepiness, and health symptoms of nursing workers at a public hospital in Brazil. Santa Maria, RS, Brazil, 2017-2018. (n=308)

Health symptoms	GQS*	BQS‡	p†	ND	WS**	p†
	n(%)	n(%)		n(%)	n(%)	
Appetite disorders						
One or more times	6(12.8)	124(47.5)	<0.001	62(34.3)	68(53.5)	0.001
None	41(87.2)	137(52.5)		119(65.7)	59(46.5)	
Feeling of Bad Digestion						
One or more times	14(29.8)	144(55.2)	0.001	71(39.2)	87(68.5)	<0.001
None	33(70.2)	117(44.8)		110(60.8)	40(31.5)	
Heartburn						
One or more times	14(29.8)	111(42.5)	0.102	66(36.5)	59(46.5)	0.079
None	33(70.2)	150(57.5)		115 (63.5)	68(53.5)	
Flatulence or bloating						
One or more times	17(36.2)	163(62.5)	0.001	97(53.6)	83(65.4)	0.039
None	30(63.8)	98(37.5)		84(46.4)	44(34.6)	

Table 1 – Cont.

Health symptoms	GQS*	BQS‡	p†	ND	WS**	p†
	n(%)	n(%)		n(%)	n(%)	
Weight gain						
One or more times	22(46.8)	177(67.8)	0.006	107(59.1)	92(72.4)	0.016
None	25(53.2)	84(32.2)		74(40.9)	35(27.6)	
Irritability						
One or more times	29(61.7)	199(76.2)	0.036	119(65.7)	109(85.8)	<0.001
None	18(38.3)	62(23.8)		62(34.3)	18(14.2)	
Insomnia						
One or more times	10(21.3)	147(56.3)	<0.001	98 (54.1)	59(46.5)	0.184
None	37(78.7)	114(43.7)		83 (45.9)	68(53.5)	
Headaches						
One or more times	21(44.7)	178(68.2)	0.002	106(58.6)	93(73.2)	0.008
None	26(55.3)	83(31.8)		75(41.4)	34(26.8)	
Difficulty concentrating						
One or more times	20(42.6)	175(67)	0.001	99 (54.7)	96(75.6)	<0.001
None	27(57.4)	86(33)		82 (45.3)	31(24.4)	
Feelings of depression or unhappiness						
One or more times	10(21.3)	131(50.2)	<0.001	76(42)	65(51.2)	0.111
None	37(78.7)	130(49.8)		105(58)	62(48.8)	
Feeling of low self-esteem						
One or more times	10(21.3)	142(54.4)	<0.001	78(43.1)	74(58.3)	0.009
None	37(78.7)	119(45.6)		103(56.9)	53 (41.7)	
Mood lability						
One or more times	16(34)	164(62.8)	<0.001	90(49.7)	90(70.9)	<0.001
None	31(66)	97(37.2)		91(50.3)	37(29.1)	

p† chi-square test; * Good Quality of Sleep; ‡ Bad Quality of Sleep; §No drowsiness ** With Drowsiness

Crude binary logistic regression analyzes showed a significant relationship between poor sleep quality and excessive daytime sleepiness, appetite disorders, feeling of poor digestion, heartburn, flatulence, weight gain, irritability, insomnia, headache, difficulty concentrating, depression, decreased self-esteem, and mood lability. Table 2 shows the crude odds ratio and adjusted by the logistic regression model of the variable sleep quality, excessive daytime sleepiness, and health symptoms.

Adjusted analyzes showed that nursing professionals with appetite disorders one or more times a week were three times more likely to have poor sleep quality (OR=3.09; CI=1.18-8.11); those with flatulence were once more likely to have poor sleep quality (OR=1.88; CI=0.93-3.80); with insomnia, twice (OR=2.98; CI=1.35-6.54); with headache, once (OR=1.90; CI=0.95-3.80); and those with a feeling of decreased self-esteem were twice as likely to have poor sleep quality (OR=2.45; CI=1.10-5.47).

Table 2 – Crude and adjusted associations between sleep quality, sleepiness, and self-reported health symptoms of nursing workers at a public hospital in Brazil. Santa Maria, RS, Brazil, 2017-2018. (n=308)

	Gross association OR (IC)	p	†RBLAjus 1*	p	‡RBLAjust 2**	p
Drowsiness						
With	2.03 (1.02-4.02)	0.043				
Without	1.00					
Appetite disorders						
One or more times	6.18 (2.54-15.07)	<0.001	2.77 (0.97-7.85)	0.056	3.09 (1.18-8.11)	0.021
None	1.00		1.00		1.00	
Feeling of Bad Digestion						
One or more times	2.90 (1.48-5.67)	0.002				
None	1.00					
Heartburn						
One or more times	1.74 (0.89.41)	0.104	0.55 (0.222-1.36)	0.197		
None	1.00		1.00			
Flatulence						
One or more times	2.93 (1.53-5.60)	0.001	1.97 (0.91-4.27)	0.085	1.88 (0.93-3.80)	0.078
None	1.00		1.00		1.00	
Weight gain						
One or more times	2.39 (1.27-4.49)	0.007				
None	1.00					
Irritability						
One or more times	1.99 (1.04-3.83)	0.039				
None	1.00					
Insomnia						
One or more times	4.77 (2.27-10.00)	<0.001	3.28 (1.43-7.52)	0.005	2.98 (1.36-6.55)	0.006
None	1.00		1.00		1.00	
Headache						
One or more times	2.65 (1.41-4.99)	0.002	2.07 (0.95-4.48)	0.064	1.90 (0.95-9.80)	0.067
None	1.00		1.00		1.00	
Difficulty concentrating						
One or more times	2.74 (1.46-5.17)	0.002				

Table 2 – Cont.

	Gross association OR (IC)	p	†RBLAjus 1*	p	‡RBLAjust 2**	p
None	1.00					
Feeling of depression						
One or more times	3.73 (1.78-7.81)	<0.001				
None	1.00					
Feeling of low self-esteem						
One or more times	4.41 (2.10-9.25)	<0.001	1.84 (0.71-4.81)	0.208	2,45 (1.10-5.47)	0.028
None	1.00		1.00		1	
Mood lability						
One or more times	3.28 (1.70-6.30)	<0.001				
None	1.00					

†RBLAjus 1 (p<0.25): Adjusted logistic binary regression 1: sleep quality+appetite and feeling of poor digestion+heartburn+flatulence+insomnia+headache+decreased self-esteem. *Hosmer and Lemeshow test =0.788 ‡RBLAjust 2 (p<0.15): Adjusted logistic binary regression 2. Model: sleep quality+appetite+flatulence+insomnia+headache+decreased self-esteem. **Hosmer and Lemeshow test=0.254.

DISCUSSION

The results showed that appetite disturbance was the main factor for poor sleep quality for the nursing team working in a hospital in Brazil, followed by insomnia, feeling of decreased self-esteem, and headaches.

There was a predominance of poor sleep quality and an absence of excessive daytime sleepiness, which converges with data from national studies[19,22]. A higher percentage of professionals with a partner and children was identified, data similar to the previous research[19].

Although no significant relationship was identified between better sleep quality and the practice of physical activity (p>0.05), we must consider that physical activity is an aspect that can improve sleep quality and vice versa[23]. A study suggests that an active and healthy lifestyle reduces the risk of insomnia in people with chronic musculoskeletal pain[24], while sedentary behaviors contribute to greater chances of developing sleep problems[25]. On the other hand, lower exercise frequency was associated with poor sleep quality[17].

Among the factors that affect sleep quality, insomnia is mentioned, which in this study increased the chance of having poor sleep quality by two times. It suggests an implication for the health of the worker and health care. The conflict in the structure of rhythms, caused by the work performed in alternative shifts, has direct implications for the wake/sleep cycle and the organic systems, as the individual is forced to change their sleep and eating schedules[16].

There was a significant relationship between poor subjective sleep quality, excessive daytime sleepiness, and variables related to weight gain, feeling of poor digestion, flatulence, and appetite disorders. Appetite disorders increased the chances of having poor sleep quality by three times. In this regard, research identified that individuals who gained weight equal to or greater than 5 kg reported poor sleep quality (p=0.002) and excessive daytime sleepiness more often (p=0.041)[26] which converges

with our findings. In Norway, data confirmed the existence of a significant relationship between poor sleep quality and the variables of uncontrolled eating and emotional eating[15].

Sleep alterations can affect the health of the nursing worker and have repercussions on signs and symptoms such as headache, which in this study was related to poor sleep quality and drowsiness. These data converge with the result of Chinese research that identified that health workers with sleep problems were more likely to report headaches (OR=2.64, 95% CI=2.27 to 3.03), which suggests that this is one of the risk factors for poor sleep quality[6].

Other symptoms were significantly related to poor sleep quality, such as feelings of low self-esteem, irritability, insomnia, difficulty concentrating, and mood lability. There is evidence that people who suffer from stress have difficulty falling asleep and often wake up during sleep. Even more, the increase in the level of anxiety and stress negatively affects the quality of sleep and leads to psychological problems. Sleep and stress are factors that can negatively affect each other, and prolonged exposure to high levels of stress can lead to insomnia[27], which can impair concentration and imply a risk to safety in health care.

Healthy sleep repairs adaptive processing, functional brain activity, and the integrity of medial prefrontal cortex-amygdala connections and improves the ability to regulate individuals' emotions and well-being, being essential for our mood and mental health; sleep disorders restrict daily well-being and social functioning and influence the evolution of affective disorders such as depression[28]. Studies developed in China have identified a greater association of sleep disorders with depression than with anxiety[10], and that symptoms of depression increase the chance of having poor sleep quality by three times[8].

The feeling of decreased self-esteem increases the chance of having poor sleep quality by twice. In India, a study showed that health professionals with low self-esteem were twice as likely to experience high stress, with Odds Ratio (OR)=2.84 (1.36–5.92)[29]. Spanish research carried out with nurses identified that low scores for sleep problems correlated with high scores for stress management, suggesting that individuals with good sleep quality had better stress management, which points to the relevance of sleep quality for the health of the nursing staff[15].

We must consider that sleep alterations can impair health care. In this study, there was an association between the occurrence of an accident at work and drowsiness, which converges with a study carried out in England, where adverse safety outcomes were strongly associated with high sleepiness scores[30].

Therefore, interventions are urgently needed to improve the quality of actions that promote workers' sleep hygiene. It is important to consider sleep quality when examining worker health.

The limitations of this study are related to the cross-sectional design, which limits the possibility of concluding the causal relationships between sleep quality and excessive daytime sleepiness and self-reported symptoms by nursing professionals. Therefore, we should not generalize the findings. In particular, this study was based on the subjective assessment of sleep without the consequent objective analysis.

CONCLUSION

There was an association between sleep quality, excessive daytime sleepiness, and health symptoms, and appetite disorder was the main factor for poor sleep quality for the nursing team working in a hospital in Brazil.

Identifying the factors that can contribute to a better quality of sleep favors the construction of knowledge in nursing and health, and points to the need for better awareness and understanding of sleep behaviors by nursing professionals who work in the health area in hospital institutions. Studies

should be developed to explore other variables, as well as conducting intervention research aimed at improving workers' health.

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CONFLICT OF INTEREST

There is no conflict of interest.

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