Original Article

Stress and sleep quality among registered nurses who use sleeping pills*

Estresse e qualidade do sono entre enfermeiros que utilizam medicamentos para dormir

Estrés y calidad del sueño de enfermeros que utilizan medicamentos para dormir

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ABSTRACT

Objective: To describe the stress level and the use of sleeping pills among registered nurses and to examine the relationships among stress, sleep quality, and the use of sleeping pills. **Methods:** This cross-sectional descriptive comparative study used a sample of 203 registered nurses from a major hospital in Campinas, São Paulo, Brazil. Data were collected with the Bianchi Stress Scale-Revised and the Pittsburgh Sleep Quality Index. **Results:** A great number of the sample of registered nurses (17.7%) used sleeping pills. Among those, 48.6 had higher level of alertness and stress (p = .016) and a great number of them (n =36) had worse sleep quality score. **Conclusion:** Registered nurses who used sleeping pills also had higher levels of stress and worse sleep quality.

Keywords: Stress; Sleep disorders; Nurses; Shift work; Anti-anxiety agents

RESUMO

Objetivos: Identificar os níveis de estresse, analisar a utilização de medicamentos para dormir e correlacionar níveis de estresse, qualidade do sono e uso de medicamentos. **Métodos:** Estudo quantitativo, transversal, descritivo e comparativo, realizado com 203 enfermeiros de uma instituição hospitalar da cidade de Campinas, São Paulo, Brasil. Foi utilizado um questionário de identificação, Escala Bianchi de Stress modificada (EBSm) e o Índice de Qualidade do Sono de Pittsburgh. **Resultados:** Dentre 203 enfermeiros, 17,7% utilizavam medicamentos para dormir. Dos enfermeiros que utilizaram medicamentos para dormir 48,6% demonstraram estado de alerta e alto nível de estresse (p = 0, 016) e apresentaram na sua totalidade (n=36) uma qualidade de sono ruim. **Conclusão:** Os enfermeiros que utilizaram medicamentos para dormir apresentaram níveis de estresse mais elevados e prejuízos que comprometem a qualidade do sono.

Descritores: Estresse; Transtornos do sono; Enfermagem; Trabalho em turnos; Ansiolíticos; Uso de medicamentos; Transtornos relacionados ao uso de substâncias

RESUMEN

Objetivos: Identificar los niveles de estrés, analizar la utilización de medicamentos para dormir y correlacionar niveles de estrés, calidad del sueño y el uso de medicamentos. **Métodos:** Estudio cuantitativo, transversal, descriptivo y comparativo, realizado con 203 enfermeros de una institución hospitalaria de la ciudad de Campinas, Sao Paulo - Brasil. Fue utilizado un cuestionario de identificación, Escala Bianchi de Stress modificada (EBSm) y el Índice de Calidad del Sueño de Pittsburgh. **Resultados:** De 203 enfermeros, el 17,7% utilizaba medicamentos para dormir. De los enfermeros que utilizaron medicamentos para dormir el 48,6% demostró estado de alerta y alto nivel de estrés (p = 0, 016) y presentaron en su totalidad (n=36) una calidad de sueño malo. **Conclusión:** Los enfermeros que utilizaron medicamentos para dormir presentaron niveles de estrés más elevados y perjuicios que comprometen la calidad del sueño.

Descriptores: Estrés; Trastornos del sueño; Enfermería; Trabajo por turnos; Agentes ansiolíticos

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INTRODUCTION

Interest in search conditions of life and work and its consequences to the health of nursing workers occur of the concern with the influence and conditions of hospital environment.

Nurses perform a job with a high degree of difficulty and responsibility. Their accelerated rhythms, and excessive work shifts are important factors that may develop an occupational stress[1-2].

Labor activities that adopt work in turns impose to its intense workers repercussions to the health and damage in the social life. This system of organization of the work makes with that the human rhythms are modified, with direct consequences in the organic systems and the cycle vigil-sleep[3-5].

Studies suggest that the excess of physical effort and high demand of work is indicating of risks for sleep disorders[5].

This condition is considered one of the most triggering factors to insomnia[6]. Work shifts not only lead to sleep disorders but also to an increase on daily drowsiness and a decrease of the alert status of individuals. The effects on the changes of sleep-wake cycle may cause damages on workers' quality of life[7-8].

Occupational stress is a possible risk factor for insomnia and for changes on sleep pattern. The existing relation between occupational stress and sleep disorders associated with a high secretion of cortisol from the activation of the axis hypothalamus-pituitary gland and adrenal cortex, and it is responsible for the induction of sleep disorders and consequently to an occupational stress[9-10].

Psychological pressure and work stress may be correlated to nurses' sleep damages[11-13], as well as a poor adaptation from the nurses to work environment[8,14].

The existing relation between nurses' stress levels and organizational characteristics of work, reaching as a result a relation between difficult to sleep and the use of medications to sleep, with the stress related to work. Several studies[15-19] had pointed to the indiscriminated use of medications to sleep by the society, which is associated with the facilities to get those medicines.

However, the bibliographical searches relatively to stress, sleep and the use of medications to sleep for the nurses had revealed scarce.

The nursing personnel shiftworkers nor always possess satisfactory conditions of work therefore they execute exhausting working hours. The easiness of the profession in getting and using medications to sleep becomes a concern.

To consider to the nurses a compatible work with a good quality of life, well-being and personal satisfaction, is a great challenge. The development, the promotion and implantation of health politics in the workstations are responsibilities of the Institutions for the development of the worker health[2,20].

The search for the cause of the high levels of stress, presence of stressors[21] and sleep disorders must be prioritized.

The aims of this study were to verify the stress level and the sleep quality, analyze the medicine use to sleep and correlate the stress levels and sleep quality in individuals who uses medications to sleep.

METHODS

In a School University Hospital (UNICAMP-Campinas-SP), Brazil with about 403 beds, 203 Registered Nurses (RN) participated on this study. Out of 203 RN, 9.4% worked on Emergency Room (ER), 9.4% on Surgical Center (SC), 2.9% on Sterilization and Material Center (SMC), 18.2% on Intensive Care Unit (ICU), 12.3% on Surgery and Emergency Infirmary of Trauma and Psychiatric (SEITP) 19.7% on Medical-Surgery Infirmary-1 (MSI-1), 23.6% Medical-Surgery Infirmary-2 (MSI-2) and 4.4% on Transplant and Bone Marrow Department (TBMD).

Data were obtained through a social-demographic identification chart and two questionnaires applied to RNs on their workplace, from May to July 2007.

Self-administered questionnaires were distributed for 242 subjects whom 203 answered them anonymously. This was a quantitative, cross-sectional, descriptive and comparative study.

In Brazil, RN's work is composed of six days of six hour shift schemes for morning and afternoon shifts with seven monthly off-times. The morning shift is from 07:00 to 13:00, the afternoon shift is from 13:00 to 19:00, both of them with 15-minute break. The night shift is composed of 12 hour shift schemes with three monthly off-times of 36 hours each. The night shift is from 19:00 to 07:00, with one-hour break. Supervisor nurses have a different shift scheme, from 07:00 to 17:00, with one-hour break and eight monthly off-times[22].

Social-demographic RN's data were the following: gender, age group, marital status, work shift and medications to sleep (Table 1). The subjects of this study used the following medications to sleep (anti-anxiety agents): midazolam, clonazepam, bromazepam, alprazolam, cloxazolam, lorazepam e diazepam (benzodiazepines).

A Brazilian questionnaire, the Bianch Stress Scale[23] was modified (BSSm) and it contains 63 questions that permits both identification and classification of RN's stress which are: minor score or equal 2 shows a low stress level, from 2.1 to 3 shows a medium stress level, from 3.1 to 4 shows alerts to a high stress level and more

than or equal 4 shows a high stress level. The validated questionnaire applied to RNs has been used on many national researches[23-25].

The Pittsburg Sleep Quality Index [26] (PSQI) evaluates the characteristics of sleep pattern and quantifies the sleep quality. On this questionnaire the score varies from zero (0) to 20, less and equal 5.0 score (≤5.0) shows a good sleep quality and more than 5.0 score (>5.0) shows a poor sleep quality[26-27]. This type of standard and evaluation of sleep was used on the literature by several authors[11-14, 26-27].

Consistent analysis used on this study showed Cronbach's alpha of 0.955 for BSSm and 0.883 for PSQI, conforming the liability of the questionnaires.

SAS program[28] was used for descriptive analysis of measures of the collected results and the sample profile also used it according to the variables on this study.

Frequency tables were made for the categorical variables (gender, age group, marital status, work shift and medications to sleep), with absolute frequency variables (N), percentage (%), descriptive statistics, with medium descriptors and standard deviation (SD) for continuous variables (age group). Chi-Square Test and Fisher Exact Test were used in order to compare categorical variables among stress groups, sleep-wake cycle and use of medications to sleep.

RESULTS

For the age group, 15.3% of the subjects showed to be less than 30 years of age, 32% from 30 to 39, 41.9% from 40 to 49 and 10.8% over 50 years old. For the gender, there has been a prevalence of female gender (88.2%), which corroborates to Health Minister Statistical Data[29] (92.2% of nurses in Brazil are females), as well as the other national studies performed with RN[23-25]. Regarding to marital status it was found that 50.2% of nurses were with partners.

For the work shift, this sample is composed by 25.6% of morning and afternoon shift nurses respectively, 40.4% in night shifts and 8.4% working from 07:00 to 17:00.

For the use of medications to sleep, 17.7% of the RN confirmed that they took them and 82.3% did not take medications that induce the sleep.

Table 2 shows that 48.6% of RNs, that used medications to sleep, have alert and high level of stress, compared to 24.7% of RNs that did not use medications to sleep and Chi-Square Test showed statistical significant values (p= 0.016).

Table 3 shows that there has been a statistical significant difference (Fisher Exact Test; p< 0.0001) when comparing RN's sleep quality to the use of medications to sleep. Subjects who used medications to sleep showed (N= 36) a poor sleep quality, 100% of the subjects, compared to the ones who did not use medication to sleep, that showed a good sleep quality (N= 90), 54% of the subjects.

Table 1 - Background of subjects from a school university hospital - may to july 2007

Variable	n 203	%
Departments		
SC	19	9.4
SMC	6	2.9
SEITP	25	12.3
MSI-1	40	19.7
MSII-2	48	23.6
ER	19	9.4
TBMD	9	4.4
ICU	37	18.2
Age group		
Less than 30 yr	31	15.3
30 - 39	65	32.0
40 - 49	85	41.9
Gender		
More or equal 50 yr	22	10.8
Female	179	88.2
Male	24	11.8
Marital status		
With partner	102	50.2
Without partner	101	49.8
Work shift		
Morning	52	25.6
Afternoon	52	25.6
Night	82	40.4
07:00 to 17:00	17	8.4
Use of medications to sleep		
Yes	36	17.7
No	167	82.3

Table 2 - Comparison of nurses BSSm stress levels to the use of medications to sleep from a school university hospital - may to july 2007

Levels of Stress	RNs that used medications to sleep (%)	RNs that did not use medications to sleep (%)	P-value[1)]
low level of stress	17.1	20.4	
medium level of stress	34.3	55.0	0.016
alert and high level of stress	48.6	24.7	

[1)] Chi-Square Test; P<0.05

Table 4 - Comparison of PSQI questionnaire to the use of medications to sleep from a school university hospital - may to july 2007

Use of medications to sleep	Good Sleep Quality n (%)	Poor Sleep Quality n (%)	P-value[1)]
Yes	0 (0)	36 (100)	< 0.0001
No	90 (54)	77 (46)	

[1)] Fisher Exact Test; P <0.05.

Table 3 - Comparison of sleep quality that RNs between the use medications to sleep from a school university hospital - may to july 2007

Variable	Subjective sleep quality		Latency of sleeping		Sleeping time duration		Sleeping disturbances		Drowsiness and disturbances during the day		P-value[1)]
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Use of sleeping pills											<0.0001
Yes	2.08	0.69	2.11	0.89	1.58	1.05	2.03	0.70	2.14	0.80	
No	0.99	0.75		0.95	0.79	0.82	1.27	0.64	1.25	0.82	
Work shift											0.0008
Morning					1.33	0.94					
Afternoon					0.67	0.76					
Night					0.79	0.90					
07:00 to 17:00					1.12	0.99					
Gender											0.0402
Male									1.75	0.90	
Female									1.36	0.87	

[1)] Chi-square Test; P<0.05.

Table 4 shows that there has been a statistical significant difference (p< 0.0001) when comparing data with subjective sleep quality of RNs to the use of medications to sleep through Chi-Square Test.

RNs that used medications to sleep referred a poor sleep quality while the nurses who did not use them referred a good sleep quality. Results showed that there has been a significant difference through Chi-Square Test (p< 0.0001) to latency of sleeping when compared to the use of medications to sleep. Nurses who used medications to sleep showed a mean of 31 to 60 minutes on delay to start sleeping (mean, 2.11, SD, 0.89) and the ones who did not use them showed 16 to 30 minutes delay to start sleeping (mean,1.08, SD, 0.95).

Analyzing sleep latency, it was observed that the subjects that used medications to sleep referred one or two days a week when they took more than 30 minutes to start sleeping.

For sleeping time duration, the mean values from background variables, showed that there has been a significant difference through Chi-Square Test (p< 0.005) when it was compared the RN's sleeping time duration to nurses with work shift and the use of medications to sleep variables.

Nurses from morning shifts and the ones working from 07:00 to 17:00, slept a mean of 6 to 7 hours per night (mean, 1.12, SD, 0.99) while the nurses from both afternoon and night shifts slept more than 7 hours per night, with a significant statistical difference according to Chi-Square Test (p= 0.008).

According to Chi-Square Test (p<0.0001), nurses who used medications to sleep showed a mean of 6 to 7 hours of sleeping per night (mean, 1.58, SD, 1.05) and when it was compared to nurses who did not use medications to sleep, data had shown that they sleep more than 7 hours per night (mean, 0.79, SD, 0.82) and it was concluded that there has a been a significant statistical difference.

Nurses who used medications to sleep showed sleeping disturbances from one to two times a week (mean, 2.03, SD, 0.70), while the nurses who did not use medications to sleep, they showed sleeping disturbances of less than once a week (mean, 1.27, SD, 0.64 ; Chi-Square Test; p<0.0001).

It was found a significant statistical difference (Chi-Square Test; p=0.0402) when it was compared both drowsiness and disturbances during the day and to the gender variable. Male subjects showed more sleeping disturbance during the day (mean, 1.75, SD, 0.90) than the female ones (mean, 1.36, SD, 0.87).

Nurses who used medications to sleep showed drowsiness during the day from one to two times a week and also (mean, 2.14, SD, 0.80), they became upset and showed a moderate lack of enthusiasm to perform daily activities.

Nurses who did not use medications to sleep showed sleeping disturbances less than once a week and they became upset and showed a mild lack of enthusiasm to perform daily activities (mean, 1.25, SD, 0.82). Chi-square Test results ($p<0.0001$) showed that there has been significant statistical difference.

DISCUSSION

The average of subjects age was of 39,6 years. Other studies[23-25] had shown that the age group of nurses was constituted predominantly of adults, from 31 to 40 years old, this study showed difference for the age group of the nurses (from 40 to 49 years old).

In this present study there hasn't been significant statistical difference when age with the PSQI score was correlated, demonstrating that the age did not intervene with the sleep quality of the individuals that used medications to sleep (Table 4). On this study medications to sleep usage obtained significant correlation among several variables, leading to the worsen of the sleep quality of subjects and it was correlated to high levels of stress, 48.6% of RNs that used medications to sleep showed, alerts and high levels of stress (Table 2).

Authors[11] analyzed the association with stress and sleep quality and observed that work stress was correlated to the damage to nurses' sleep.

For the sleep quality, 100% of RNs that used medications to sleep showed a poor sleep quality (Table 3).

For the subjective sleep quality of nurses, it was found that the subjects who used medications to sleep referred a poor sleep quality, while the ones that did not use medications to sleep referred a good sleep quality (Table 4).

The latency of nurses' sleep was harmed due to the use of medications to sleep, with an average from 31 to 60 minutes of delay to start sleeping, when compared to the nurses that did not use medications to sleep, who showed an average from 16 to 30 minutes of delay to start sleeping (Table 4).

The results had shown that it had significant difference for the Test of Qui-square ($p< 0, 005$) when comparing the sleep time duration of the nurses with the variable shift work. Nurse from morning shifts and the ones working from 07:00 to 17:00, slept a mean of 6 to 7 hours per night, whereas the nurses of the afternoon shifts and the night shifts slept a mean of more than 7 hours of sleep per night (Table 4).

These results can demonstrate understood that the morning shifts and the ones working from 07:00 to 17:00 favored the presence of which had poor sleep when waking up early of the subjects, that is, with sleep deficit.

The damages of sleep in night shift are pointed in studies[30-31]. However in this research, we got given significant of damage of sleep and drowsiness during the day for the individuals of morning shifts.

One of hypotheses to be considered is the influence of the nap during the night shift for the nurses for the preservation of sleep[32], as well, as a possible adaptation of chronotype of these individuals for the shift work[3].

Authors[33] points that, for still unknown reasons, the workers of morning shifts submitted the work overload that execute its labor activities it has more than two years followed are susceptible to an increase of the drowsiness during the day.

The results, regarding to sleeping time duration, showed who the nurses that used medications to sleep, sleep a mean from 6 to 7 hours per night, while the ones who did not use them sleep, a mean of more than 7 hours per night (Table 4).

Nurses' who used medications to sleep had presented characteristics of primary disorder of sleep, such as, drowsiness during the day, delay to start the sleeping and constantly awake up during the night, as he was emphasized by Monti [34]. The author analyzed the use of benzodiazepines for the treatment of primary insomnia, alerting that the adverse effect during the administration of this medications include the drowsiness and the fatigue during the first hours of the morning.

The drowsiness during the day caused by the privation of sleep in nursing workers represents serious implications for own health, as well, as compromises the care to the patient[35].

Studies suggest that there is a correlation between decrease and increase of daily sleeping hours with the increase of the risk to develop cardiovascular diseases[36] and the decrease of sleeping hours be able to cause driving accidents after the work[37].

It was observed that the nurses who used medications to sleep showed moderate sleep disturbances from once to twice a week, while the ones who did not use them showed moderate sleep disturbances of less than once a week.

The use of medications to sleep for the treatment of primary insomnia may lead to side effects that include drowsiness and fatigue on the first hours of the morning[34].

Authors[38] identified in a study performed with 895 nurses that 66.6% of the sample reported drowsiness at

least once a week, while driving home after work shift, so daily drowsiness represents a great risk for professional health, leading to serious consequences such as driving.

The subjects who used medications to sleep had presented variation in the quality, latency, time duration and the disturbances of sleep, daily drowsiness and lack of enthusiasm to perform daily activities. These individuals had presented alert and high level of stress, demonstrating that further than damages of sleep, the levels of stress had been higher.

It was observed on this study, characteristics of primary sleep disturbance on the subjects who used medications to sleep such as daily drowsiness, difficulty to start the sleeping and constant awake during the night, are harmful sleep-wake cycle changes. Indiscriminate use of medications to sleep might be ineffective to the treatment of sleep disturbances. Several studies[16-19] point out that indiscriminate use of medications to sleep by society is associated with the real availability in order to obtain such medications.

Nurses, who used medications to sleep, should be followed up by Occupational Health Department of the Institution in order to diagnose the sleep disturbances correctly and also to improve drowsiness treatment, suit medication therapy as well as proposing sleep hygiene measures, relaxing, and other therapies that favor the health reestablishment of these professionals.

Development, promotion and implantation of health polices in the work sites is one of the responsibilities regarding to Institutions in order to improve workers' health[20,39].

Researches that identify causes of high stress levels, presences of stressors[28] and sleep disturbances should be priorized.

CONCLUSION

The inquiry carried through with the analysis of sleep and stress, in individuals that used medicines to sleep, demonstrated various negative repercussions for the worker.

The nurses sleep quality of the morning shift was related stress, and the increase in the levels of stress resulted in damage of sleep quality for these subjects. The morning shift also presented a lower mean of sleep hours per night when compared with the afternoon and the night shifts. We should consider that the morning shift propitiates a waking up early, having as consequence the sleep deficit.

The application of measures of hygiene of sleep in subjects that present alteration of the circadian sleep-wake would improve the damages for the sleep lack.

The found mean values for the sleep score had been compatible with the poor sleep quality. Healthful habits of sleep must be prioritized in hospital Institutions aiming at an improvement of the quality of life of its workers.

This investigation was performed analyzing stress and sleep, which confirmed the effects of stress over sleeping, with negative repercussions to the workers who used medications to sleep. On the other hand, changes of sleep-wake cycle of the subjects that used medications to sleep, may suggest that the indiscriminate use of medications to sleep is an inefficacy therapy for the treatment of sleep disturbances.

The damage to the health caused for the use of medications to sleep already is known in literature. However, in this study, was revealed and became an extremely preoccupying result. RNs that used medications to sleep showed, in their totality (100%), a poor sleep quality compared to the ones that did not use medications to sleep, whose 54% of them showed a good sleep quality.

Subjects who used medications to sleep had presented alterations in the quality, the latency, the duration and the disturbances of sleep, drowsiness during the day and a mild lack of enthusiasm to perform daily activities. It was seen that nurses who used medications to sleep showed higher stress levels as well as damages that intensely compromise the sleep quality.

Therefore, these data could in one another stage of studies be complemented with more detailed inquiries on sleep and the use of medications to sleep, as well as, its correlation with the higher levels of stress of this population.

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