Shift work: overall health state related to sleep in nursing workers*

TRABALHO EM TURNOS: ESTADO GERAL DE SAÚDE RELACIONADO AO SONO EM TRABALHADORES DE ENFERMAGEM

TRABAJO POR TURNOS: ESTADO GENERAL DE SALUD RELACIONADO AL SUEÑO DE TRABAJADORES DE ENFERMERÍA

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ABSTRACT

The objective of this study was to identify the symptoms related to the overall health status associated with shift work in nursing and relate it to the quality of sleep. The study was performed at Hospital da Irmandade da Santa Casa in Poços de Caldas, Minas Gerais State. The participants were 136 nursing professionals, of an average age of 33.1 years, divided into the following categories: nurse (8.1%); nurse technician (80.9%); and nursing aides working the day and night shifts (11%). The health symptoms were identified based on the Overall Health Status Inventory, and quality of sleep was evaluated based on sleep logs. The Chi-Square test showed statistical significance (p=0.021) for the presence of flatulence and abdominal distension during the night shift. Multiple linear regression analysis revealed that subjects working the day shift who experienced symptoms of poor digestion (sometimes or always) and irritability (always) had a poorer quality of sleep.

DESCRIPTORS

Sleep
Shift work
Nursing
Occupational health

RESUMO

O objetivo deste estudo foi identificar os sintomas referentes ao estado geral de saúde associado ao trabalho em turnos de enfermagem e relacioná-los com a qualidade do sono. O estudo foi realizado no Hospital da Irmandade da Santa Casa de Poços de Caldas, Minas Gerais. Participaram 136 profissionais de enfermagem, com média de idade de 33,1 anos, divididos nas seguintes categorias: enfermeiro (8,1%); técnico de enfermagem (80,9%); auxiliar de enfermagem dos turnos diurno e noturno (11%). Os sintomas de saúde foram identificados a partir do Inventário de Estado Geral de Saúde, e a qualidade do sono foi avaliada pelo Diário do Sono. Os dados foram estatisticamente significativos pelo Teste Qui-Quadrado (p=0,021) para a presença do sintoma de flatulência ou distensão abdominal no turno noturno. Constatou-se com a análise de regressão linear múltipla que os sujeitos do turno diurno que apresentaram os sintomas de má digestão (às vezes ou sempre) e irritabilidade (sempre) tiveram pior qualidade de sono noturno.

DESCRITORES

Sono
Trabalho em turnos
Enfermagem
Saúde do trabalhador

RESUMEN

Se objetivó identificar síntomas referentes al estado general de salud asociado al trabajo por turnos de enfermería y relacionarlos con la calidad del sueño. Realizado en Hospital de la Hermandad de Santa Casa de Poços de Caldas-MG. Participaron (n=136) profesionales de enfermería, con media etaria de 33,1 años, divididos en las categorías: enfermero 8,1%, técnico de enfermería 80,9%, auxiliar de enfermería 11,0% de turnos diurno y nocturno. Los síntomas de salud se identificaron mediante Inventario General de Salud y la calidad de sueño se evaluó por Diario del Sueño. Datos estadísticamente significativos según test Chi-Cuadrado (p=0,021) para presencia del síntoma de flatulencia o distensión abdominal en turno nocturno. Mediante análisis de regresión lineal múltiple, los sujetos del turno diurno que presentaban síntomas de mala digestión (eventualmente o siempre) e irritabilidad (siempre), tuvieron peor calidad de sueño nocturno.

DESCRIPTORES

Sueño
Trabajo por turnos
Enfermería
Salud laboral

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INTRODUCTION

In modern society, many factors contribute to the increase in job performance beyond traditional working hours, such as the population's demographic features, rapid technological transformations and globalization, important factors in the expansion of night shift work[1].

The oldest groups of workers working in shifts are distributed in many categories. Among them, health professionals such as doctors, nurses and other workers who provide essential services stand out[2].

Shift work is a way to organize work that involves many teams working sequentially around the clock[3]. It is organized in such a way to cover different periods of the day, in a fixed format or as a rotational system. Employees work mornings, afternoons, evenings and nights in a continuous fashion to cover the 24 hours of the day; in other words, the work is performed in a continuous format[4].

The health sector provides workers around the clock to provide care for individuals and their families at all hours of the day and night[5].

In Brazilian nursing practice, the weekly working hours vary between 30 and 40 hours, with the most common working week composed of 36 hours. Regarding daily hours, there are many options: 12-hour shifts, which may be day or night shifts followed by a 36- hour rest; 6-hour shifts, 8-hour shifts, or even four days of 6-hour shifts and one 12-hour shift. Shifts are arranged according to each hospital institution's policies[6].

Nursing work is a collective occupation that works congruently with other health professionals. The health care process involves different types of workers whose specific purpose is to provide health services to individuals, considered to be a right by all individuals involved[7].

The hospital is an institution where services are performed without interruption so that nursing activities are not delayed and do not compromise patients and families. The institution's purpose is to assist, treat and heal individuals suffering from a wide variety of pathologies. It is an environment in which workers may be constantly exposed to many health risks, including work accidents, injuries and illness[8].

The sleep/wake cycle is one of the most important biological rhythms in humans. It is time-dependent as a result of internal structures that naturally ensure a basic cyclical pattern of 24 hours[9-10]. It is influenced by numerous nervous system structures under endogenous control and environmental influences, such as working hours, social factors, leisure and other activities[11].

The unbalanced biological cycles of shift workers can extensively damage workers' health, resulting in a wide presentation of symptoms such as sleep disturbances, gastrointestinal disorders, cardiovascular disorders, reduction in performance, exhaustion, irritation, excessive fatigue during the day, psychic disorders, and altered social and family relations[10,12-13].

Regarding nursing researches, shift work stands out as a stress factor that can have a negative impact on the health of these individuals[14-16].

There are many variables that might improve or worsen an individual's tolerance for shift work. These variables are related to both work and life conditions such as: schedule times and hours, individuals' characteristics and their relation to working, environment tolerance, psychosocial factors and economic, political and social conditions of the country. Interconnection among these variables might determine work tolerance, which is different for each worker and will greatly influence their health, quality of life and ability to adjust[17].

Regarding nursing researches, shift work stands out as a stress factor that can have a negative impact on the health of these individuals.

Inability to adjust to the routine hours of the nursing team is a subject that currently requires more investigation, since we are now aware of the body's innate biological clock and the factors that can alter it, especially in terms of alteration in sleep routines.

In face of this problem involving shifts workers, and knowing the reality experienced by these nursing professionals working 12-hour shifts, it is highly important to propose effective measures aimed at developing a healthcare program for nursing workers.

The main objective of this study was to identify the symptoms regarding the general health condition of nursing workers and relate them to the quality of their sleep.

METHOD

Type of study

This is a quantitative, cross-sectional and descriptive research with a representative sample of nursing professionals from a philanthropic private hospital institution.

Subjects

Within a population of 200 nursing professionals, the sample was composed of 136 (n=136) nursing workers from the day and night shifts who worked three consecutive days, on different units in the institution. Individuals were divided into the following professional categories: nurse (n=11), nursing technician (n=110) and nurses' aides (n=15), from the Hospital da Irmandade da Santa Casa in Poços de Caldas, Minas Gerais, Brazil. Working hours for

the day shift workers were from 7 a.m. to 7 p.m., while the night shift workers worked from 7p.m. to 7a.m. of the next day.

Selection criteria of the sample

Nursing professionals working in the Adult Intensive Care Unit, Pediatric and Neonatal Intensive Care Unit, Surgery Center, Material and Sterilization Center, Hemodialysis, General Surgery, Internal Medicine, Maternity, Pediatrics, Nursery, and Emergency from the day and night shifts (12 hours) were invited to take part in this study. Professionals from both genders participated in the study and must have worked in the hospital for more than one month.

Material

Three questionnaires were used: one for identifying individual and sociodemographic characteristics, one for data related to the participants' general health, and another to evaluate the sleep/wake cycle (sleep diary).

Procedures

Data collection was performed throughout August and September of 2009. At first, the researcher asked subjects to fill out the questionnaire regarding individual and sociodemographic characteristics, and then subjects answered questions about their health symptoms after they started working in shifts. After they had completed these two questionnaires, subjects immediately turned them in to the researcher.

In order to investigate sleep patterns, one other questionnaire was presented to the subjects, which was the sleep diary. Instructions about how to fill it out were provided. Information in the sleep diary was entered on a daily basis after sleeping, until it had been filled out for a period of 15 consecutive days. Subjects then turned them in to the researcher on the proposed deadline.

Ethical aspects

Prior to data collection, the research proposal was forwarded to the Research and Ethics Committee (REC) of the Faculty of Medical Sciences School at University of Campinas – UNICAMP, which approved the study under protocol No 686/2008.

All professionals who took part in the study signed a consent form agreeing to participate, based on Resolution 196/96 of the National Health Council complying with recommendations for researches with human beings.

Data treatment

The Chi-Square test was used to evaluate health symptoms in shift workers. A Multiple Linear Regressions analysis was used to identify the variables influencing the quality of sleep. The Kruskal-Wallis test was used in the comparison of health symptoms and sleep quality. The Mann-Whitney test was used in the comparison of the quality of night and day sleep with shift work. The significance level adopted was 5% (p-value<= 0.05).

RESULTS

The average age of the subjects was 33.1 years. There was predominance of females (82.4% female versus 17.6% male).

Regarding health data, there were many symptoms reported by nursing professionals from the day and night shifts.

According to Table 1, day shift professionals reported symptoms of flatulence or abdominal bloating: a total of 23.8% recorded (seldom) and 8.3% recorded (always) for this symptom. In comparison with the night shift workers, the Chi-Square test revealed a statistically significant difference (p=0.021).

Other health symptoms were reported by nursing professionals: gastrointestinal alterations (appetite disorders, indigestion, burning or heartburn), weight gain, irritation, insomnia, headaches, concentration difficulties, feelings of depression or unhappiness, loss of self-esteem, and lack of a sense of humor.

Table 1 – Distribution in percentages of the main symptoms reported by nursing professionals according to their work shift – Poços de Caldas, MG, 2009

Symptoms	Day shift			Night shift			P value
	n	% (seldom)	% (always)	n	% (seldom)	% (always)	
Appetite disorder	44	34.5 (n=29)	17.9 (n=15)	31	30.8 (n=16)	28.8 (n=15)	0.321
Indigestion	34	35.7 (n=30)	4.8 (n=4)	26	38.5 (n=20)	11.5 (n=6)	0.273
Heartburn or stomach burning	32	31.0 (n=26)	7.1 (n=6)	24	26.9 (n=14)	19.2 (n=10)	0.104
Flatulence or abdominal bloating*	27	23.8 (n=20)	8.3 (n=7)	26	25.0 (n=13)	25.0 (n=13)	0.021
Weight gain	42	33.3 (n=28)	16.7 (n=14)	24	19.2 (n=10)	26.9 (n=14)	0.134
Irritation	57	47.6 (n=40)	20.2 (n=17)	34	42.3 (n=22)	23.1 (n=12)	0.827
Insomnia	40	25.0 (n=21)	22.6 (n=19)	31	38.5 (n=20)	21.2 (n=11)	0.231
Headaches	50	40.5 (n=34)	19.0(n=16)	36	48.1(n=25)	21.2 (n=11)	0.515
Concentration difficulties	38	39.3 (n=33)	6.0 (n=6)	26	40.4 (n=21)	9.6 (n=5)	0.693
Feelings of depression and unhappiness	31	27.4 (n=23)	9.5 (n=8)	21	25.0 (n=13)	15.4 (n=8)	0.586
Loss of self-esteem	33	32.1 (n=27)	7.1 (n=6)	21	30.8 (n=16)	9.6 (n=5)	0.874
Lack of sense of humor	36	34.5 (n=29)	8.3 (n=7)	27	34.6 (n=18)	17.3 (n=9)	0.260

*Chi-Square test: significance level (p<=0.05).

The final model of the multiple linear regressions is demonstrated in Table 2, and the variables are: shift, indigestion and irritation, with 17.4% of variance related to the differences in the quality of the night sleep.

Table 2 – The final multiple linear regression model selected by the stepwise process for the study on the quality of night sleep in nursing professionals – Poços de Caldas, MG, 2009.

Variable	Coefficient	P value
Constant	5.64	<0.000
Shift	0.71	0.014
Indigestion 1	1.29	0.023
Indigestion 2	0.75	0.184
Irritation 1	1.15	0.004
Irritation 2	1.08	0.003

Shift (1=day 0=night) Indigestion (no: indigestion 1=1indigestion 2=0; seldom: indigestion 1=0 indigestion 2=1; always: indigestion 1=0 indigestion 2=0) Irritation (no: irritation 1=1 irritation 2=0; seldom: irritation 1=0 irritation 2=1; always: irritation 1=0 irritation 2=0) R^2 of the model = 0.1742

According to the data presented, subjects from the day shift who experienced indigestion (seldom or always) and irritation (always) demonstrated a poorer quality of night sleep.

Data in Table 3 demonstrate statistically significant results through the Kruskal-Wallis test for the symptoms of: indigestion (0.023), irritation (0.002), insomnia (0.001), headache (0.005), and concentration difficulties (0.002). Professionals from both the night and day shifts who reported these symptoms (always) had an average quality of night sleep worse than those who mentioned these symptoms (seldom).

Table 3 – Comparison of the night quality of sleep with the main health symptoms in nursing professionals – Poços de Caldas, MG, 2009

Symptoms	Night Sleep Quality					
	n	Averages (seldom)	SD	Averages (always)	SD	P value
Appetite disorder	75	7.0 (n=30)	1.55	6.7 (n=0)	1.90	0.358
Indigestion*	60	6.7 (n=50)	1.62	5.9 (n=10)	2.22	0.023
Heartburn or stomach burning	55	6.8 (n=39)	1.55	6.2 (n=16)	2.42	0.146
Flatulence or abdominal bloating	53	6.8 (n=33)	1.61	6.8 (n=20)	2.01	0.577
Weight gain	66	7.0 (n=38)	1.44	6.3 (n=28)	1.98	0.090
Irritation*	90	7.2 (n=61)	1.53	6.0 (n=29)	1.79	0.002
Insomnia*	71	6.9 (n=41)	1.50	6.1 (n=30)	1.83	0.001
Headaches*	85	7.1 (n=58)	1.62	6.3 (n=27)	1.85	0.005
Concentration difficulties*	64	6.7 (n=54)	1.59	6.3 (n=10)	2.37	0.002
Feelings of depression and unhappiness	52	6.9 (n=36)	1.81	6.2 (n=16)	2.00	0.123
Loss of self-esteem	54	6.8 (n=43)	1.74	6.1 (n=11)	1.77	0.075
Lack of a sense of humor	63	6.4 (n=47)	1.61	7.1 (n=16)	1.64	0.006

*Kruskal-Wallis test: significance level (p<= 0.05).

Regarding the sleep pattern characteristics of the nursing workers, figure 1 demonstrates the average values for night and day sleep quality among work shifts. There were statistically significant differences (p=0.046) as calculated by the Mann-Whitney test regarding night sleep quality. On the other hand, there was no statistically significant difference (p=0.238) through the Mann-Whitney Test for day sleep quality.

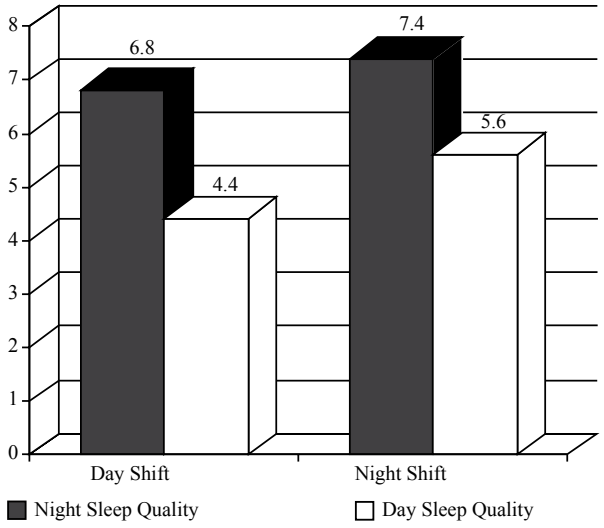

Figure 1 – Quality scores for day and night sleep according to work shifts

DISCUSSION

Regarding the average age demonstrated in this study, subjects were all young adults (average of 33.1 years) working within their full productive capacity. In a study performed in nurses from a hospital unit working different shifts (6 hours for the morning and afternoon shifts and 12 hours for the night shift), similar results were presented regarding the average age, which was 33.8 years[18].

Of the subjects in the study, there was a predominance of females (82.4%). These findings may be related to the origin of nursing as a profession, which has always been connected to care giving. In a research to evaluate levels of stress and its correlation to the chronotype, in the nursing team studied 81.6% of the subjects were females[16].

In general, health symptoms reported by nursing professionals from the day and night shifts and the gastrointestinal alterations reported by the night shift workers are complaints that have been repeated in other researches, as in the study with nurses from the General Hospital of the Medical School of Ribeirão Preto – SP, which demonstrated that 42.8% presented with appetite disorders, 50% with weight gain, 44.8% with headaches, and 34.4% with

irritation[14]. In another research performed with the nursing team of the University Hospital of São Paulo, where the objective was to evaluate the effects of shift work on the health and social life of a nursing team, the researchers concluded that their health was altered, as evidenced by neuro-psychological, cardiovascular and gastrointestinal complaints[19].

Due to the low explanatory level of the R2 model=0.1742(17.4%), only factors that are combined can be considered indicative of a worse quality of night sleep for the day shift group.

Quality of sleep analysis demonstrated that subjects from the night shift group had better quality of night sleep compared to the day shift group. These findings might be related to the long working hours (12h), and to the hospital routine in which most nursing procedures are performed during the day. A study performed with nursing professionals working fixed shifts of 12 hours, followed by 36 resting hours, demonstrated that the perception of night sleep quality of the night shift group individuals on resting days was higher than the day sleep quality in night shift workers who worked days[20]. In another research performed with nurses working the day and night shifts in the General Hospital of the Medical School of Ribeirão Preto –SP, it was demonstrated through polysomnography that day sleep quality was worse when compared to night sleep quality, demonstrating an elevated number of awakenings and micro-awakenings that influenced day sleep quality[14].

Health aspects described in this study demonstrate that, in this population, health alterations were present partially due to the long working hours. There were study limitations, mainly regarding the shifts consisting of a 12-hour working day versus a 36-hour off period. . Studies must be developed to evaluate the impact in terms of reduced working hours in order to affirm the distress on the study participants who took part in this investigation.

CONCLUSION

Data on the general health condition of the workers in this study demonstrated alterations in the physical and psychological health of nursing professionals due to shift work, whether they work day or night shifts.

Health symptoms analysis regarding flatulence and/or abdominal bloating demonstrated significant statistically results for the night shift subjects.

Factors indicating a worse night sleep quality for the day shift group were indigestion and irritation.

Learning about this reality demonstrated coherent perceptions, especially regarding long working hours, that favor an increase in knowledge production regarding this theme and the provision of resources to develop effective strategies to improve the health and working conditions for nursing professionals, through preventive actions in relation to sleep health and hygiene. However, other studies may suggest innovations regarding the health aspects of nursing professionals who perform their activities in shifts.

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