

## Research Article

# Sleep disorders among Minia University hospital workers. Minia, Egypt



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### Abstract

**Background:** Sufficient sleep is necessary for optimal human health. Short-term sleep deprivation can negatively affect individuals' alertness, mood, attention and concentration; long-term sleep deprivation is associated with chronic diseases and mortality. **Aim of study:** Measuring sleep quantity, assessing sleep quality and determining risk factors of sleep disturbance among Minia University hospitals' workers. **Subjects and methods:** This study is a cross sectional study conducted for identification of sleep disorders among 311 Minia University hospitals' workers; (104 doctors, 104 nurses and 103 clerks), using a self-administered questionnaire which included demographic characteristics, assessment of sleep, family work conflict (FWC) and emotional exhaustion. **Results:** Sleep score ranged between (0-16) with mean value of  $(3.9 \pm 4.01)$ , (92%) of the studied workers had a little frequency of sleep disturbance and (8%) had a high frequency of sleep disturbance, Sleep score was higher among doctors (6.08) than among nurses (3.7) and Clerks (1.9) with statistically significant difference. FWC score (10-25) with mean  $(16.4 \pm 2.5)$ , Emotional exhaustion score (0-53) with mean  $(17.4 \pm 16.9)$ . Odds ratio for night shift work, high FWC score and high emotional exhaustion score (5.227, 1.450 and 1.083) respectively and all were statistically significant. **Conclusion and recommendations:** Minia University Hospitals' doctors and nurses suffered from high sleep score more than Minia University hospitals' clerks and it can be a source of stress and mental pressure for them and their families. Night shift work had a major effect on sleep disturbance. Hospitals authorities and policymakers can plan and implement measures such as reducing the duration of shift-work schedules and execution of regular time management courses.

**Keywords:** Sleep disturbance; Minia University hospitals' workers; night shift.

### Introduction

Sleep is an important aspect of maintaining the body's circadian rhythm. Inadequate sleep contributes to heart disease, diabetes, depression, falls, accidents, impaired cognition, and a poor quality of life. Until recently, sleep has largely been neglected in the occupational health and industrial/organizational psychology literature <sup>(1)</sup>.

Employed people spend about a third of their time at work and an equally long time asleep. Consequently, both these areas are potentially important for health and

wellbeing, and are likely to influence each other. Furthermore, sleep complaints are an increasingly important problem both in the general and the working populations <sup>(2)</sup>.

The prevalence of sleep complaints in the working population has varied around 16–30% <sup>(3)</sup>, whereas the prevalence of more severe chronic insomnia is about 10% among adults <sup>(4)</sup>.

Several work-related psychosocial factors have been found to be associated with sleep complaints <sup>(5)</sup>.

High job demands and low job control have been associated with poorer sleep due to increased arousal during both daytime and night-time <sup>(4)</sup>.

Research from other disciplines suggests that negative workplace factors, such as low supervisor support, harassment at work, poor ergonomic practices, and job title (i.e., being a staff nurse rather than an assistant nurse manager, clinical nurse specialist, patient care associate, or operations coordinate), are related to deficient sleep <sup>(6)</sup>.

Sleep disturbances are common among night shift workers and may reduce performance, cause increased morbidity, fluctuation in mood, decreased efficacy, increased risk of accidents, and reduced life expectancy <sup>(7)</sup>.

Sleep deprivation and the disturbance of its rhythmicity affect the sleep-wake cycle differently from the circadian cycle causing impacts on work capacity such as tiredness, fatigue, irritability, stress, lack of enthusiasm in daily activities, performance decline, cognitive deficit and demotivation <sup>(8)</sup>.

Although there is intra-individual and temporal variation in sleep, its disorders are associated, less or more intensely, with behavioral and social relations disorders, decreased attention and concentration, delayed response to stimuli, daytime drowsiness and Burnout Syndrome <sup>(9)</sup>.

### Aim of the study

1. Measuring sleep quantity among Minia University hospitals' workers
2. Assessing sleep quality among Minia University hospitals' workers
3. Determining risk factors of sleep disturbance among Minia University hospitals' workers

### Subjects and methods

**Study design:** A cross-sectional study was performed among Minia University hospitals' workers during period from January 2020 to September 2021. **Sample size:** The sample size was determined using

the dichotomous outcome formula (Cochran, 1977), The sample size was calculated according to this formula:  $n = p(1 - p)(ze)^2$ , where  $n$  = sample size,  $z = 1.96$  at 95% confidence interval.,  $p$  = expected prevalence and  $e = 5\%$  the margin of error. Accordingly, the minimum sample size needed was 311 hospital workers.

**Data collection:** Socio-demographic data: Data were collected from participants after explaining the nature of the study and taking a verbal informed consent from them. The study collected detailed information on socio-demographic characteristics, including age, gender, education, marital status, and responsibility for children and other dependents, work hours and work years. **Sleep score:** The Jenkins Sleep questionnaire include 4 items which assess the sleep quality: the difficulties of falling asleep, difficulties staying asleep, waking up to early and feeling tired after the usual amount of sleep (Jenkins CD et al., 1988).

The response for each item was rated on 6 point scale (0=not at all, 1=1 to 3 days, 2= 4 to 7 days, 3=8 to 14 days, 4= 5 to 21 days and 5= 22 to 28 days). The score of 11 is a cut-off. A score <11 considered a little sleep disturbance and >11 considered a high frequency of sleep disturbances.

The FWC was measured by using the FWCs developed by Haslam et al., 2010 which is a short 5-items measure assessing FWC. FWC score (range 7–35) with higher scores indicating higher levels of conflict.

A subscale of the Maslach Emotional exhaustion Inventory, General survey (MBI-GS), was used to assess emotional exhaustion (Maslach, C. et al., 1996). The scale comprised 9 items. The total score (range 0-54). The score 27 or over is considered high and below 27 is considered low emotional exhaustion.

**Ethical consideration:** Approval of the Ethical Committee of Faculty of Medicine was obtained.

**Data analysis:** Data collected were reviewed and coded. These numerical codes were fed to the computer where

statistical analysis was done using the Statistic Package for Social Science Version 22 (SPSS 22).

### Results

As shown in table (1) there were 311 hospital workers; 144 (46.3%) of them were males and 167 were females (53.7%). Their age ranged from 24 years to 59 years. 240 (77.2%) lived in urban areas. 200 (64.3%) were married and 195 (62.7%) have children. Most of them (84.6%) had education university and above. About 48% did not perform physical activity while 34.1% performed little activity and 16.4% performed moderate activity.

The mean duration of sleeping at night was  $6.6 \pm 0.9$ . Table (2) showed that 33.4% were

nurses, 33.1% were Clerks and 33.4% were doctors. Their occupation duration ranged between 1 – 37 years with mean value of  $12.1 \pm 8.7$  years. Duration of work/week ranged between 28-120 hours with mean value of  $47.4 \pm 14.1$  hours. About 42% of them worked at night shifts with mean duration of  $16.8 \pm 5.9$  hours and 41.2% of them performed additional work. Table (3) found that Sleep score was higher among doctors (6.08) than among nurses (3.7) and Clerks (1.9) with statistically significant difference. There was high sleep score among doctors (17.3%) than nurses (5.8%) and clerks (1%) with statistical significant difference. Table (4) showed that there were higher odds ratio for night shift work, high FWC score and high emotional exhaustion score (5.227, 1.450 and 1.083) respectively and all were statistically significant.

**Table (1):** Socio-demographic data of the studied Minia University hospitals' workers, January 2020-September 2021

Variables		No.= 311
Sex	Male	144 (46.3%)
	Female	167 (53.7%)
Age (years)	Range	24-59
	Mean $\pm$ SD	$35.6 \pm 9.2$
	Median [IQR]	33[13]
Age distribution	20-30	129 (41.5%)
	31-40	95 (30.5%)
	41-50	55 (17.7%)
	>50	32 (10.3%)
Marital status	Single	97 (31.2%)
	Married	200 (64.3%)
	Divorced/widow	14 (4.5%)
Number of children	0	116 (37.3%)
	1-2	99 (31.8%)
	3-4	85 (27.3%)
	>4	11 (3.5%)
Residence	Urban	240 (77.2%)
	Rural	71 (22.8%)
Education	Below university	48 (15.4%)
	University and above	263 (84.6%)
Physical activity	No	150 (48.2%)
	Little Once - twice/week	106 (34.1%)
	Moderate 3/week	51 (16.4%)
	Intensive daily	4 (1.3%)
Duration of sleeping at night (hours)	Mean $\pm$ SD	$6.6 \pm 0.9$
	Range	5-10
	Median [IQR]	6[2]
Total		311 (100%)

**Table (2):** The occupational characteristics of the studied Minia University hospitals' workers, January 2020-September 2021

Variables		No.= 311
Occupation	Doctor	104 (33.4%)
	Nurse	104 (33.4%)
	Clerk	103 (33.1%)
Occupation duration (years)	Range	1-37
	Mean $\pm$ SD	12.1 $\pm$ 8.7
	Median [IQR]	10 [13]
Duration of work/week (hours)	Range	28-120
	Mean $\pm$ SD	47.4 $\pm$ 14.1
	Median [IQR]	48[14]
Night shift	Yes	130 (41.8%)
	No	181 (58.2%)
Number of night shifts/week	1 shift/week	42 (13.5%)
	2 shift/week	44 (14.1%)
	3 shift/week	30 (9.6%)
	4 shift/week	14 (4.5%)
Duration of night shift (hours\shift)	Range	12-24
	Mean $\pm$ SD	16.8 $\pm$ 5.9
	Median [IQR]	12[12]
Additional work	Yes	128 (41.2%)
	No	183 (58.8%)
<b>Total</b>		<b>311 (100%)</b>

**Table (3):** Comparison of sleep score in relation to occupation among Minia University hospitals' workers, January 2020-September 2021

Score		Doctor No. 104	Nurse No.= 104	Clerk No.= 103	P-value
Sleep score	Mean $\pm$ SD Median[IQR]	6.08 $\pm$ 4.2 6[5]	3.7 $\pm$ 3.7 3[4]	1.9 $\pm$ 2.7 0[4]	0.0001*
Sleep disturbance	Low High	86 (82.7%) 18 (17.3%)	98 (94.2%) 6(5.8%)	102 (99%) 1(1%)	0.0001*

P-value &lt;0.05: Significant

Kruskal Wallis test and Chi-square test

**Table (4):** Predictors of sleep disturbance among Minia University hospitals' workers, January 2020-September 2021

Risk factors		OR (95% CI)	P value
Age		1.160 (0.974-1.380)	0.095
Gender	Female (ref.) Male	1.061 (0.316-3.560)	0.923
BMI		1.028 (0.914-1.157)	0.640
Night shift	No (ref.) Yes	5.227 (1.011-27.029)	0.049*
Working hours		1.032 (0.992-1.073)	0.118
Working years		0.852 (0.714-1.017)	0.077
Additional work	No (ref.) Yes	1.361 (0.349-5.301)	0.657
Residence	Urban (ref.) Rural	1.104 (0.329-3.706)	0.872
FWC score		1.450 (1.222-1.720)	0.0001*
WFC score		1.144 (0.788-1.661)	0.481
Emotional exhaustion score		1.083 (1.037-1.131)	0.0001*

Odds ratios with its 95% confidence intervals are calculated by using the logistic regression models.

## Discussion

As regard demographic data of the studied sample, the current study included 311 hospital workers; 144 (46.3%) of them were males and 167 were females (53.7%). Their age ranged from 24 years to 59 years with mean age of  $35.6 \pm 9.2$ . Also, 240 (77.2%) lives in urban areas. 200 (64.3%) were married and 195 (62.7%) have children. Most of them (84.6%) have education university and above.

This can be supported by a study done among Iranian Emergency Medical Technicians<sup>(10)</sup> where most participants were males (97%) and married (69%). The mean age of the participants was  $31 \pm 6$  years. Most of them (56%) had a family with at least two members. Most of them were holders of associate degrees (45%) and bachelor degrees (33%).

Also, a study done among 85 nurses who worked in all general and special inpatient units at Minia University Hospital<sup>(11)</sup> found that 42 (49.4%) were <25 years old, 53 were females (62.4%), 49 (57.6%) of them were married. The discrepancy in demographic data in different studies may

be due to using a random technique in collecting sample.

In this study, we found that 33.4% were nurses, 33.1% were Clerks and 33.4% were doctors. Their occupation duration ranged between 1 – 37 years with mean value of  $12.1 \pm 8.7$  years. Duration of work/week ranged between 28-120 hours with mean value of  $47.4 \pm 14.1$  hours. 41.8% of them work at night shifts with mean duration of  $16.8 \pm 5.9$  hours and 41.2% of them perform additional work with mean duration of  $28.1 \pm 10.1$  hours.

Our results were supported by another study done among Iranian Emergency Medical Technicians<sup>(10)</sup> where the duration of shift work reported was 24/48 (24 hours on site and 48 hours off) or 48/24 (48 hours on site and 24 hours off) or a combination of both. The majority of the participants (68%) reported variable shift-work schedule; 24/48 (24-hour on site and 48-hour off) and 48/24 (48-hour on site and 24-hour off), and most of them (63.5%) reported "shift exchange restriction." "Overtime working" was reported by 92% of the respondents of the questionnaire. In order to meet their family expenditure,

38.5% of the participants reported working in rural bases in addition to urban bases.

Among our studied population; 61.1% had troubles in falling asleep, 19% wake up several times per night but did not have trouble falling asleep again in 1-3 days last month, 31.2% wake up one or more times per night and had troubles in falling asleep again in 1-3 days last month and 19.3% wake up after usual amount of sleep feeling tired or worn out in 1-3 days last month.

Our findings were similar to that reported in Handbook of counseling women <sup>(12)</sup> in which among the participants of the study 63% had sleep troubles, however, our result was inconsistent with a study done among employees of the City of Helsinki <sup>(13)</sup> that reported the prevalence of sleep complaints was 24% among women and 20% among men aged 40–60 years.

In this study we found that mean duration of sleeping at night was  $6.6 \pm 0.9$ , this supported by a study done among healthcare workers in tertiary hospital in China <sup>(14)</sup> in which reported that most participants (46.7%) reported sleep duration of approximately 6 hours/ day regardless of department.

In this study higher odds ratios for having sleep problems were night shift work, high FWC score and high emotional exhaustion score (5.227, 1.450 and 1.083) respectively. Our results were consistent with another study among healthcare workers in tertiary hospital in China <sup>(14)</sup> which reported that night-shift work predicted a greater risk of sleep problems (OR=1.43, 95% CI=1.21 to 1.69). Our results were inconsistent with a study done among women working in aged care services in Japan <sup>(15)</sup> in which authors reported that work family conflict predicted a greater risk of sleep problems (OR=1.99, 95% CI=1.34–2.93).

### Conclusion

Minia University Hospitals' doctors and nurses suffered from high sleep score more than Minia University hospitals' clerks and it can be a source of stress and mental pressure for them and their families. Night shift work, emotional exhaustion and

family family conflict had a major effect on sleep disturbance.

### Recommendations

1. Hospitals authorities and policymakers should plan and implement measures such as reducing the duration of shift-work schedules, execution of regular time management courses and decrease in shift-change restriction.
2. Modification of the work schedule and job redesign with continuous assessment of the new one.

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