Palestinian Medical and Pharmaceutical Journal (PMPJ). 2024; 9(3): 279-292

Prevalence of Sleepiness and Associated Factors Among Healthcare Staff: A Cross-Sectional Study in A University Hospital in Palestine

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Received: (10/10/2023), Accepted: (28/10/2023), Published: (1/9/2024).
DOI: https://doi.org/10.59049/2790-0231.1219

ABSTRACT

Purpose: This study assesses sleep quality by measuring daytime sleepiness and the associated factors among healthcare professionals at a large university hospital. **Method:** The study used a quantitative cross-sectional design, conducted using the Arabic version of the Epworth Sleepiness Scale (ESS), and was done based on the STROBE guidelines. **Results:** Participants aged between 30 to 34 years represent 35.7% and between 25 to 29 years represent 32.1%. Most of the participants (52.0%) worked from 1 to 5 years at this hospital, and 64.7% of them worked from 30 to 40 hours per week. More than half of the participants (56.0%) reported having normal sleep; however, 25.4% reported that they may be excessively sleepy depending on the situation, and 2.8% reported that they are excessively sleepy and should seek medical attention. There was a statistically significant association between sleepiness and gender using multivariate analysis (p-value = 0.032); female staff (mean rank =137.36) reported more sleepiness than males (mean rank =117.67). **Conclusions:** About one-third of participants reported excessive daytime sleepiness, which could show the need for medical attention. Daytime sleepiness could affect the sleep quality and thus the staff's performance. It is essential to seek interventions to improve the work environment for healthcare staff to improve their sleep quality and job performance. Staff may require effective lifestyle changes to improve their sleep quality.

Keywords: Sleepiness, Sleep Quality, Healthcare Professionals, Palestine, Daytime Sleepiness.

INTRODUCTION

A challenge in staying awake when one is expected to be alert is called daytime sleepiness [1]. The desire to sleep when one is typically expected to be alert and awake is also known as excessive daytime sleepiness [2]. Studies have shown that lack of sleep has a negative impact on life satisfaction, quality of life, and well-being, and is linked to a higher incidence of systemic disorders [3-5]. Sleepiness increases the risk of major performance deficits in daily activities, as well as potentially fatal accidents fatal homes, workplaces, or on the road [6].

Insufficient sleep has been associated with untimely death, being overweight [7], diabetes type 2, hypertension, and cardiovascular problems. These health outcomes represent much of the burden of morbidity and mortality [8]. Alteration in sleep patterns is a part of the normal aging process, and studies on the sleep habits of older Americans showed an increase in the time to fall asleep and an increase in sleep fragmentation with age, thus sleep is adequate when there is no daytime sleepiness or dysfunction [9]. About, 1/3 of an individual's life is thought to be spent sleeping on average [10], and one of the most common conditions that individuals experience, among other things, is daytime sleepiness [11]. Feeling excessively sleepy during the day is a widespread issue that affects 4-20% of the population at least three days a week. It can have a negative impact on their quality of life, work performance, and even safety, such as when driving [12]. Studies have shown that excessive sleepiness and sleep disturbances are factors that can affect healthcare workers' performance and compromise patient safety [13].

Sleep problems are a typical complaint among healthcare professionals, and they can

have an impact on both patients and healthy people's quality of life and productivity [14], while many aspects such as socio-demographic and occupational characteristics also affect its occurrence [15, 16]. For example, females, married individuals, and those working night shifts were found to be more vulnerable to sleep disruption [17, 18]. It has also been found that work-related stress caused by heavy workloads or emotionally demanding activities can lead to both a short sleep duration and insomnia [19]. Another study showed that pharmacists who work night shifts may experience high levels of daytime sleepiness, which can negatively impact their ability to concentrate and increase the likelihood of errors [20]. Moreover, researchers found that sleep quality was significantly associated with several factors, including sex, age, exercise habits, work experience, work stress, and hospital type among nurses [21, 22]. Another study in Jordan found that 68% of the nurse participants had poor sleep quality, which was positively associated with increased stress, and depression, and negatively associated with years of experience[23]. However, a study conducted among resident doctors in Palestine found that 37.6% of residents had excessive daytime sleepiness, and nightmares were the only factor negatively associated with sleepiness among other sociodemographic factors [24].

Sleep disruption is closely linked to our sense of well-being, health, emotional awareness, motivation, efficiency, memory, and cognitive skills, as well as human engagement [3]. Shift workers frequently have insufficient sleep, which has serious negative effects on their health and wellness [25, 26]. Since healthcare workers work sporadically or intermittently, with shift schedules over 7 days per week and 24 hours a day, especially when working night shifts, there are more chances for mistakes and errors and workplace injuries [17], more sleepiness and exhaustion from having trouble falling asleep, more stress, anxiety, and depression, and more health issues [27]. Sleepiness caused by night shift work has been found to have a negative impact on the health and well-being of healthcare workers [4]. For instance, studies have shown that nurses who work on different shifts experience a decline in sleep quality [28]. Night shifts have longer hours than day shifts and require exposure to light at night, which may reduce the time available for sleep between shifts [4]. Previous studies have shown that shift work, including night shifts, can disrupt the sleep-wake cycle, leading to poor sleep quality and/or increased daytime sleepiness [29-31].

Moreover, poor sleep, stress, and psychological health concerns have been shown to influence healthcare professionals' abilities to think critically and make clinical judgments, increasing the likelihood that they would make mistakes that endanger patients [32]. Several studies have examined daytime sleepiness in Palestine [24, 33-37]. For instance, a study among Palestinian adults in the Gaza Strip found a high prevalence of excessive daytime sleepiness (43.6%) and poor sleep quality (52.8%) [37]. Another study conducted among Palestinian undergraduates reported that daytime sleepiness was common and more than half of them take a daytime nap at least once per week [33]. However, to our knowledge, no studies have been conducted to assess the prevalence of daytime sleepiness among Palestinian healthcare professionals.

Aim

This study aims to examine the prevalence of daytime sleepiness among healthcare staff and the association between their demographic characteristics and reported sleepiness prevalence in a university hospital in Palestine. This study also aims to assess the association between the demographic characteristics of staff and their reported daytime sleepiness prevalence.

The results of this study can help identify the extent of the problem of daytime sleepiness among healthcare staff, which can have negative impacts on their quality of life, work performance, and even safety, such as when driving. Moreover, it can help identify the demographic and work characteristics that are associated with higher levels of daytime sleepiness, which can help in developing targeted interventions to address this issue. For instance, managers may restructure the scheduling system, redistribute night shifts better among the staff, and conduct activities

to relieve working stress. Finally, it also can help raise awareness about the importance of sleep hygiene and the need for healthcare staff to take care of their health and well-being.

METHODS

Study Design

This was a cross-sectional study design, which used the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guide for reporting cross-sectional studies [38]. STROBE guidelines are used in observational studies to help the researcher present the study conducted in a high-quality manner and equip the reader with the necessary information for a thorough evaluation of the research [38]. The checklist used in this guideline functions as a unified framework for presenting observational research in a standardized and rigorous way [39]. The studies by Zabin, et al. [40] and Simonetti, et al. [41] are examples of the studies that used this guideline.

Settings and population

The study was conducted at the only accredited academic medical center in Palestine, An-Najah National University Hospital (NNUH). A university hospital consists of more than 110 inpatient beds and is accredited by Joint Commission International (JCI) [40, 42]. The study population consisted of all healthcare workers regardless of their profession. These healthcare workers included physicians, nurses, technicians, pharmacists, and ancillary services. Staff with work experience of less than six months, volunteers, and part-time staff were excluded because they did not have sufficient experience or exposure to the working conditions at NNUH.

Sample size and sampling procedure

The study used a convenience sampling method. This non-probability sampling method is easier, cheaper, and more convenient for the researcher to access the participants, and useful to get an idea about a phenomenon.[43]. The hospital's population consisted of approximately 500 staff members. The sample size was calculated using the Raosoft® sample size calculator[44]; which is a commonly used tool to calculate the sample size, with a 5% margin of error, 95% confidence level, and 50% response distribution. Studies have found a variation in the prevalence of daytime sleepiness. Some studies showed a low prevalence of daytime sleepiness [45, 46] and others were moderate to high [33, 34]. Moreover, according to a recent systematic review and meta-analysis study, the prevalence of excessive daytime sleepiness (EDS) was estimated to be between 10.3% and 100% using the Epworth Sleepiness Scale (ESS) [47]. For this, we chose to set the response distribution between these variations to 50% to increase the sample size and thus increase the power of our study. These intervals are often used in this type of study sampling because they provide a good balance between accuracy and confidence. The sample size calculated was 240 after adding 10% as a drop rate.

Data collection

The study used a survey from two sections, the first section contained demographic data for the participant staff including their gender, age, working experience in the hospital, total working hours per week, and their positions in the hospital. All of these characteristics were categorical variables

The second section contained the Arabic version of the Epworth Sleepiness Scale (ESS). This scale was used to assess the daytime sleepiness of the participants. This version was translated by Ahmed, A. E et.al. [48]. It has a good level of internal consistency, as measured by Cronbach's alpha = 0.89. It consists of eight situations in which participants were asked to rate the chance of dozing in each different situation. The scale was 0 (no chance of dozing), 1 (slight chance of dozing), 2 (moderate chance of dozing), and 3 (high chance of dozing); the score ranged from 0 (minimum score–normal sleep) to 24 (maximum score–very sleepy). Final scores were grouped into four categories, from 0-7 (unlikely that participant is abnormally sleepy); 8-9 (participant may have an average amount of daytime sleepiness); 10-15 (participant may be excessively sleepy depending on the situation. and may want to consider seeking medical attention); 16-24 (participant are excessively sleepy and should

consider seeking medical attention). Previous studies have indicated that scoring above 10 is considered abnormal [13, 49].

The data was collected between July 20, 2022, and August 5, 2022. The researcher used a SurveyMonkey® account to distribute the survey to the staff members of the hospital through the quality department using their work emails. The survey sent contained an overview of the study goals and the time needed to fill out the survey with a small introduction. The introduction contained information on the confidentiality and privacy of the data and participants, as well as information on voluntary participation and the right to withdraw at any time. All data gathered from the survey was then downloaded and stored on an external hard drive to be analyzed.

Statistical analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 27. Basic demographic data were summarized using descriptive statistics. The Shapiro-Wilk test was used to test for data normality. The data was found to be not normally distributed (Sig. <0.001). S-W test was one of the most used tests of normality in the studies and has the greatest ability to detect nonnormality [50]. Therefore, non-parametric tests of Man-Whitney and Kruskal-Wallis were used to examine the associations with the categorical variables which were provided as Mean Rank and interquartile range. Multiple linear regression was used to examine the predictors of daytime sleepiness. The total score of ESS was the only continuous variable, and the rest of the study variables were considered categorical. P-values of less than 0.05 are considered statistically significant in all statistical tests.

Ethical consideration and consent to participate

This study was approved by the Institutional Review Board (IRB) of the *Arab American University (AAUP)* under the reference number [2023/A/51/N]. Filling out the survey was considered approval to participate in the study. This was mentioned on the cover page of the survey sent to the staff. Participation was anonymous and voluntary; the participants had the right to withdraw from the study at any time. All data gathered was used for research purposes only and was kept anonymous and confidential.

RESULTS

Participant characteristics

The study was conducted on 500 staff members, the returned surveys were 252. As shown in Table 1 male participants were 55.2% of the sample, while females were 44.8% of the sample. The majority of participants were from nursing positions (48.8%). Physicians represented 10.7% of the participants. The three types of physicians - consultants, specialists, and residents- who participated were grouped into one category called "Medical". The "Support services" category represents 12.3% of the participants and includes food services, facilities, and quality officers. Other clinical positions such as the infection control team, pharmacists, physiotherapists, nutritionists, ophthalmologists, and technicians represented 17.5% of the participants and were grouped into a separate category. Participants were aged between 30 to 34 years (35.7%) and between 25 to 29 years (32.1%). Moreover, most of the participants worked from 1 to 5 years (52%) and 6 to 10 years (43.7%) in the current hospital. 68.3% of them worked 1 to 5 years in the current unit. Also, the majority of them worked from 30 to 40 hours per week (64.7%). Participants who worked in the profession from 6 to 10 years were the majority (40.9%), and those who worked from 1 to 5 years were 93 (36.9%).

Table (1): Participant Characteristics.

Variable	Categories	Number (N)	Percentage (%)
Gender	Male	139	55.2 %
	Female	113	44.8 %
Age	Less than 25 years	30	11.9 %
	25 - 29	81	32.1 %

Variable	Categories	Number (N)	Percentage (%)
	30 - 34	90	35.7 %
	35 - 39	31	12.3 %
	40 and above	20	7.9 %
Experience in Profession	Less than 1 year	2	0.8 %
	1 to 5 years	93	36.9 %
	6 to 10 years	103	40.9 %
	11 or more years	54	21.4 %
Experience in the current hospital	Less than 1 year	9	3.6 %
	1 to 5 years	131	52.0 %
	6 to 10 years	110	43.7 %
	11 or more years	2	0.8 %
Experience in the current unit	Less than 1 year	17	6.7%
	1 to 5 years	172	68.3%
	6 to 10 years	63	25.0%
Total working hours per week	Less than 30 hours per week	15	6.0 %
	30 to 40 hours per week	163	64.7 %
	More than 40 hours per week	74	29.4 %
Primary unit or work area in this hospital	Multiple Units, No specific unit	33	13.1%
	Surgical Services	17	6.7%
	Support Services	8	3.2%
	Medical/ Surgical Units	31	12.3%
	Clinical Services	32	12.7%
	Patient Care Units	107	42.5%
	Administration/Management	5	2.0%
	Other	19	7.5%
Position in this hospital	Nursing	123	48.8 %
	Supervisor, Senior Leader, Manager, Clinical Leader	32	12.7 %
	Medical (Physicians)	27	10.7 %
	• Specialist • Consultant • Resident	6 11 10	22% 40% 37%
	Support	26	12.3 %
	Other Clinical Position • Dietitian • Pharmacist • Physiotherapist • Infection Control • Technician • Social Worker	44 2 12 4 4 20 2	17.5 % 4.5% 27.2% 9% 9% 45.4% 4.5%
Total Respondents		**252**	**100 %**

Prevalence of daytime sleepiness

The results for sleepiness using the ESS can be seen in Table 2**.** Most of the participants (56.0%) showed unlikely that they were abnormally sleepy. However, many participants (25.4%) showed that they may be excessively sleepy depending on the situation, and they might seek medical attention.

Participants who scored an average amount of daytime sleepiness were 40 (15.9%). Only 2.8% of participants showed that they were excessively sleepy and should seek medical attention. Those who scored for a high chance of dozing mentioned that they may doze while lying down to rest in the afternoon when circumstances permit (11.1%), 7.5% of them mentioned that they may doze while sitting as a passenger in a car for an hour without a break, and 7.5% mentioned that they may get dozing while sitting quietly after lunch as seen in Table 3.

Table (2): Daytime Sleepiness Scores.

Category	Score Interpretation	Frequency	Percent
0 - 7	It is unlikely that you are abnormally sleepy	141	56.0%
8 - 9	You have an average amount of daytime sleepiness	40	15.9%
10 - 15	You may be excessively sleepy depending on the situation. You may want to consider seeking medical attention.	64	25.4%
16 - 24	You are excessively sleepy and should consider seeking medical attention	7	2.8%
Total		**252**	**100%**

Table (3): Daytime Chances of Dozing.

#	Situation	Chance of Dozing							
		No chance of dozing		Slight chance of dozing		Moderate chance of dozing		High chance of dozing	
		Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)
1	Sitting and reading	96	38.1%	111	44.0%	40	15.9%	5	2.0%
2	Watching TV	88	34.9%	115	45.6%	42	16.7%	7	2.8%
3	Sitting inactive in a public place (e.g., a theater or a meeting)	121	48.0%	86	34.1%	38	15.1%	7	2.8%
4	As a passenger in a car for an hour without a break	56	22.2%	100	39.7%	77	30.6%	19	7.5%
5	Lying down to rest in the afternoon when circumstances permit	38	15.1%	83	32.9%	103	40.9%	28	11.1 %
6	Sitting and talking to someone	195	77.4%	49	19.4%	6	2.4%	2	0.8%
7	Sitting quietly after lunch	57	22.6%	88	34.9%	88	34.9%	19	7.5%
8	In a car, while stopped for a few minutes in traffic	175	69.4%	55	21.8%	19	7.5%	3	1.2%

Factors associated with sleepiness

Mann-Whitney and Kruskal-Wallis tests were used to find the association with demographic characteristics (See Table 4). It was found that gender had a statistically significant association with the total score of sleepiness (P-value= 0.032); female staff (Mean Rank =137.36) reported more sleepiness than males (Mean Rank =117.67). It was also found that the primary unit or work area in this hospital had a significant association with the total score of sleepiness (P-value= 0.034); participants working in Patient Care Units reported sleepiness more than other participants (Mean Rank =143.71).

Table (4): Factors associated with daytime sleepiness.

Variable	Category	N (%)	Mean Rank	Median [Q1–Q3]	P-value
Gender	Male	139	117.67	7.00 [4.00–9.00]	**0.032***
	Female	113	137.36	7.00 [4.00–11.00]	
Age	Less than 25	30	132.23	7.50 [3.75–11.00]	0.378
	25 - 29	81	123.13	7.00 [4.00–10.00]	
	30 - 34	90	135.73	7.00 [5.00–10.25]	
	35 - 39	31	106.90	5.00 [2.00–10.00]	
	40 and above	20	120.38	7.00 [5.25–8.00]	
Position in this hospital	Nursing	123	136.77	7.00 [5.00–10.00]	0.158
	Supervisor, Senior Leader, Manager, Clinical Leader	32	127.78	7.50 [3.25–10.75]	
	Medical	27	123.57	7.00 [5.00–9.00]	
	Support	26	106.85	5.00 [2.00–10.25]	
	Other Clinical Position	44	110.26	6.00 [3.00–10.00]	
Primary unit or work area in this hospital	Multiple Units, No specific unit	33	99.21	5.00 [2.00–8.00]	**0.034***
	Surgical Services	17	110.94	6.00 [4.50–8.50]	
	Support Services	8	124.88	7.50 [5.50–8.00]	
	Medical/ Surgical Units	31	134.10	7.00 [6.00–9.00]	
	Clinical Services	32	113.53	6.00 [4.00–10.00]	
	Patient Care Units	107	143.71	8.00 [5.00–11.00]	
	Administration/Management	5	126.90	7.00 [4.00–9.50]	
	Other	19	100.89	5.00 [2.00–11.00]	
Total working hours per week	Less than 30 hours per week	15	126.53	7.00 [2.00–13.00]	0.223
	30 to 40 hours per week	163	132.01	7.00 [4.00–11.00]	
	More than 40 hours per week	74	114.36	6.00 [4.00–9.00]	
Experience in current profession	Less than 1 year	2	206.25	11.50 [9.00–0]	0.276
	1 to 5 years	93	131.72	7.00 [4.00–10.00]	
	6 to 10 years	103	119.48	7.00 [4.00–10.00]	
	11 or more years	54	127.94	7.00 [4.00–9.25]	
Experience in hospital	Less than 1 year	9	106.33	4.00 [1.00–11.00]	0.440
	1 to 5 years	131	121.22	7.00 [4.00–10.00]	
	6 to 10 years	110	134.14	7.00 [5.00–11.00]	
	11 or more years	2	143.00	8.00 [5.00–0]	
Experience in the current unit	Less than 1 year	17	114.71	6.00 [1.50–11.50]	0.674
	1 to 5 years	172	125.76	7.00 [4.00–10.00]	
	6 to 10 years	63	131.70	7.00 [5.00–10.00]	

** Significance level (p< 0.05).*

Predictors of daytime sleepiness

Multiple linear regression was done to check the associated factors, and we found that there is a statistically significant association between gender and the total score of sleepiness (p-value= 0.027, VIF= 1.009). However, the linear regression showed no statistically significant association between the primary unit or work area in this hospital and the total score of sleepiness (p-value= 0.092, VIF= 1.009) (see Table 5).

Table (5): Predictors of daytime sleepiness.

Predictor					95.0% Confidence Interval		
	b	**B**	**t**	**p-value**	**Lower Bound**	**Upper Bound**	**VIF**
Constant	4.394		4.628	**< 0.001**	2.524	6.264	
Gender	1.144	0.139	2.222	**0.027***	0.130	2.158	1.009
Primary unit or work area in this hospital	0.214	0.106	1.692	0.092	-0.035	0.464	1.009

R = .183; R Square = .033; adjusted R Square = .026, F = 4.297, df = 2, p = 0.015

**Significance level p< 0.05*

DISCUSSION

This research sought to analyze and describe the prevalence of daytime sleepiness and its association with demographic characteristics among healthcare professionals at a university hospital in Palestine. The author halted the survey link after two weeks, as the predetermined sample size of the completed surveys had been met.

This study found that healthcare staff experienced daytime sleepiness during the day while sitting quietly after lunch, while sitting as a passenger in a car for an hour without a break, and while lying down to rest in the afternoon when circumstances permit. The results showed that about half of the participants reported they were unlikely to have abnormal sleep. However, about one-third of them reported daytime sleepiness. Specifically, 25.4% reported that they may have had excessive sleep depending on the situation, and 2.8% reported excessive sleep and should seek medical attention. These results indicate that the staff experienced a high level of daytime sleepiness, which is similar to what was found in a quantitative correlational study that showed that nurses reported high levels of sleepiness and chronic fatigue that impeded full functioning both at work and at home [51]. Another study showed similar results among healthcare staff, which found that among resident doctors, more than one-third reported being excessively sleepy during the day, while over two-thirds reported having poor sleep quality [52]. This could signal those drastic changes to working conditions are required to improve sleep quality for healthcare staff.

The study results show that almost one-third of healthcare staff experienced excessive daytime sleepiness and may want to seek medical attention depending on the situation. While sleep deprivation and problems such as sleep apnea and insomnia are the most common causes of excessive sleepiness, daytime sleepiness can be caused by depression and other psychological problems, certain drugs, and physical illnesses affecting the brain and body [53]. Many studies have discovered that excessive daytime sleepiness may have significant negative health effects. It has been found that excessive daytime sleepiness was linked to an increased risk of stroke and coronary heart disease (CHD). However, other important aspects of sleep, like insomnia, and snoring, must be taken into consideration [54]. A cross-sectional study in Tehran shows a high prevalence of poor sleep quality in a group of non-complaining, healthy staff can be an early indicator of underlying medical or mental health difficulties [55].

The multivariate analysis in this study found that daytime sleepiness is associated with only one demographic characteristic, which is gender. Female staff reported more daytime sleepiness than males. This result is congruent with a study that showed sleep quality was associated with the gender of the adult population [56]. Other studies have supported the philosophy that women are more likely than men to suffer from poor sleep quality [57-62]. Similarly in other studies, poor sleep quality and stress were found to be predicted by the female sex [32, 56, 63]. However, this result is not congruent with other studies. For instance, a study by Alami et al. [24] showed no significant association between the demographic characteristics of the healthy participants and the total score of sleepiness using ESS. Another study by Korkmaz et al. [64] showed no statistically significant association between gender and sleep quality using the Pittsburgh Sleep Quality Index (PSQI). The discrepancies in these results between the studies may be due to participant variances in social or environmental conditions. However, it is worth reflecting on the necessity to enforce gender-specific methods for the treatment of poor sleep quality. For instance, women who work shifts may experience menstrual cycle irregularities, and they may also be at risk for reduced fertility or even pregnancy-harming conditions, including gestational diabetes and hypertension [65]. This might create a need for healthcare managers to improve the scheduling system for female staff.

Moreover, in the univariate analysis, the study showed an association between the primary unit or work area in this hospital and sleepiness; Participants who are working in Patient Care Units reported higher daytime sleepiness than other staff. This is similar to the result of a study by Alami YZ et al. which showed no significant association between the working department and sleepiness among resident doctors [24]. This may be because these units have higher patient turnover rates, several patient escorts, and repeated procedures of operations which may increase the level of tension and produce a tense work atmosphere, which as a result, may significantly affect the performance of the healthcare professionals and the quality of their sleep [32].

Limitations

To the best of our knowledge, this study is the first to assess the level of daytime sleepiness among healthcare workers in a university hospital in Palestine. However, this study has a few limitations. First, the study design was cross-sectional and the sample was convenient, correlational associations are the only identifiable results. The study was also conducted in one hospital and can't be generalizable to other hospitals. Second, the reasons for daytime sleepiness were not discussed in this study. Third, this study did not examine the possible co-factors that may affect daytime sleepiness like insomnia, snoring, apnea, etc. because this study was intended to be the baseline for future studies. Fourth, the study did not examine the possible association with other work, health, and sociodemographic characteristics like weight, presence of illnesses, smoking, marital status, work stress, and other work conditions. Therefore, further studies are encouraged to include clinical characteristics and examine the causes of excessive daytime sleepiness among healthcare staff and the effect on their job performance.

CONCLUSION

This study indicated that the majority of the healthcare participants did not appear to be unusually sleepy, however, almost one-third of them reported excessive daytime sleepiness which may require medical attention. This was more common among females. Daytime sleepiness among healthcare staff requires health promotion actions. Therefore, hospital administrators and staff should consider implementing intervention programs to improve the work environment. This will have an impact on sleep quality, health conditions, and job performance. These interventions could include but are not limited to, decreasing work-related stress, implementing relaxation techniques and yoga sessions from time to time, encouraging staff to avoid drowsy medicines and decreasing the number of night shifts per week, addressing underlying disorders if excessive daytime sleepiness is due to sleep apnea or insomnia,

and providing psychological consultation for the staff to help alleviate their stressors.

ABBREVIATIONS

NNUH, An-Najah National University Hospital; ESS, Epworth Sleepiness Scale; STROBE, Strengthening the Reporting of Observational Studies in Epidemiology; JCI, Joint Commission International; PSQI, CHD, Coronary Heart Disease; Pittsburgh sleep quality index; IRB, Institutional Review Board; SPSS: Statistical Software Package for the Social Sciences; Q1– Q3, Interquartile range;

DECLARATIONS

Confidentiality

We confirmed that the data gathered was exclusively utilized for clinical research. All information provided by the participants was kept confidential and utilized solely for this study. The information was kept private so no one could have access, but only the researcher, and it was held in a locked cabinet.

Consent for publication

Not applicable.

Availability of data and materials

All data are stored in an external hard drive and locked in a safe location and may be obtained from the corresponding author.

Conflicts of Interest

The author declares that he has no competing interests.

Authors' contributions

LMZ designed the study, reviewed the literature, performed data collection and data analysis, and wrote the draft manuscript. He also coordinated the data, critically reviewed the manuscript to improve intellectual content, and reviewed the final manuscript.

FUNDING

This study is not supported by any funding.

ACKNOWLEDGMENTS

The author would like to extend his sincere thanks to the Clinical Research Center at An-Najah National University Hospital. Mr. Maher Battat, and Mr. Saif Hasan for their help and support. He also would like to thank An-Najah National University Hospital for providing the opportunity to conduct this study. *"This article was previously posted to the advance preprint server on July 7, 2023"*.

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