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Original Article

Prevalence of poor sleep quality among physicians and nurses in a tertiary health care center

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المخلص

أهداف البحث: العاملون في الرعاية الصحية بمستشفيات الرعاية الثالثية يتعرضون غالبا لظروف يمكن أن تؤثر سلبا على جودة نومهم. ومع ذلك، لم تتم دراسة جودة النوم بين العاملين في الرعاية الصحية الثالثية في المملكة العربية السعودية بشكل جيد. لذلك، هدفنا في هذه الدراسة إلى تقييم جودة النوم بين الأطباء والممرضين في مركز رعاية ثالثية في مدينة جدة وتحديد العوامل المرتبطة بها.

طرق البحث: هذه دراسة كمية تحليلة مقطعية. تم توزيع استبانة إلكترونية على الذات على جميع الأطباء والممرضين العاملين في مستشفى جامعة الملك عبد العزيز. شارك في هذه الدراسة ما مجموعه 395 عاملا في مجال الرعاية الصحية. اشتمل الاستبيان على الخصائص الديموغرافية للمشاركين وقيم مؤشر بيتسبرغ لجودة النوم.

النتائج: كان متوسط عمر العاملين المشاركين في مجال الرعاية الصحية 37.74 ± 10.35 سنة ومؤشر كتلة الجسم 26.32 ± 4.97 كجم / م2. كان غالبية المشاركين من النساء (70.4%) والمغتربين (55.4%). كان معدل سوء نوعية النوم مرتفعا، حيث حصل 70.4٪ من المشاركين على درجة تزيد عن 5 في مؤشر بيتسبرغ لجودة النوم. ارتبطت عدة عوامل بنوعية النوم السيئة بين العاملين في مجال الرعاية الصحية، بما في ذلك كونهم إناثا (علاقة احتمالات معدلة=2,03؛ فاصل ثقة 95٪=3,74-1,11)، والعمل بنظام المناوبات (علاقة احتمالات معدلة=1,87؛ فاصل ثقة 95٪ = 3.45-1.01)، وقلة النشاط البدني (علاقة احتمالات معدلة=2,43؛ فاصل ثقة 95٪ = 5.85-1.01)، والتدخين الحالي (علاقة احتمالات معدلة=4,64؛ فاصل ثقة 95٪ = 12.80-1.68).

الاستنتاجات: يتوافق هذا البحث مع نتائج دراسات أخرى أظهرت شيوع سوء نوعية النوم بين العاملين في مجال الرعاية الصحية. علاوة على ذلك، تم اعتبار كل من كون المشارك امرأة، والعمل بنظام المناوبات، والتدخين، وقلة النشاط البدني عوامل خطر لسوء نوعية النوم.

الكلمات المفتاحية: العاملون في الرعاية الصحية؛ نوعية النوم السيئة؛ مؤشر بيتسبرغ لجودة النوم؛ السعودية؛ مركز الرعاية الصحية الثالثية.

Abstract

Objectives: Sleep quality among tertiary healthcare professionals in KSA has not been well studied. Therefore, in this study, we aimed to assess sleep quality among physicians and nurses in a tertiary care center in Jeddah City and to identify the associated factors.

Methods: In this quantitative, analytical, cross-sectional study, an online, self-administered questionnaire was distributed to all physicians and nurses working at King Abdulaziz University Hospital (KAUH). A total of 395

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healthcare professionals participated in this study. The questionnaire included the participants' demographic characteristics and Pittsburgh Sleep Quality Index (PSQI) values.

Results: The mean age and body mass index of the participating healthcare professionals were 37.74 ± 10.35 years and 26.32 ± 4.97 kg/m^2, respectively. Most participants were women (70.4%) and expatriates (55.4%). The prevalence of poor sleep quality was high: 70.4% of the participants had a PSQI score >5. Several factors, such as female sex (adjusted odds ratio (AOR) = 2.03; 95% confidence interval (CI) = 1.11−3.74), shift work (AOR = 1.87; 95% CI = 1.01−3.45), physical inactivity (AOR = 2.43; 95% CI = 1.01−5.85), and current smoking (AOR = 4.64; 95% CI = 1.68−12.80), were associated with poor sleep quality among healthcare professionals.

Conclusions: Our findings are consistent with those from previous studies indicating high prevalence of poor sleep quality among healthcare professionals. Furthermore, female sex, shift work, smoking, and physical inactivity were identified as risk factors for poor sleep quality.

Keywords: Healthcare professionals; KSA; Pittsburgh sleep quality index; Poor sleep quality; Tertiary health care center

Introduction

Poor sleep quality is a contributing factor to increased morbidity and mortality, and can negatively affect quality of life.[1–3] A comprehensive sleep quality evaluation involves consideration of factors such as sleep quality, bedtime, sleep latency, wake-up time, total sleep time, and sleep medication.[4] Sleep disturbances have been associated with several medical and psychological disorders, such as diabetes mellitus, hypertension, coronary artery disease, and depression, and may affect immunity and metabolism.[5–7] Poor sleep quality has an estimated prevalence of 24%–66% in the general population in several countries.[8–11]

Most healthcare professionals have long working hours, and many work on-call and in shifts, both of which have been shown to significantly affect sleep quality.[12] Moreover, the high burnout rate reported among healthcare professionals may result in work-related accidents or incidents, and compromise patient safety and care.[13] In a recent nationwide survey in France, 64.8% of healthcare workers reported poor sleep quality, and the work environment and workplace well-being were confirmed to be associated with poor sleep independently of individual factors including demographic, medical history and behavioral characteristics.[14] In a systematic review and meta-analysis conducted in China, a 39.2% prevalence of poor sleep quality was reported among healthcare professionals, including physicians, nurses, and other medical personnel.[15] In another Chinese study in nurses, the reported pooled prevalence of poor sleep quality was 61.0%.[16] In Riyadh, KSA, a cross-sectional study of 2095 participants in 2017 reported a markedly high prevalence of poor sleep (78.3%).[17] A more recent study in Riyadh has indicated a high prevalence of poor sleep quality (85.9%) among healthcare professionals.[18] Another study has reported similar results in medical residents, 86.3% of whom had poor sleep quality.[19] Risk factors for sleep disturbances have been reported to include female sex, older age, low body mass index (BMI), low socioeconomic status, high caffeine intake, marriage, inactivity, and physical or mental illness.[18,20]

Owing to the importance of sleep quality among healthcare providers, and its effects on patient care and safety, and in view of the scant local data available, we conducted this study. We aimed to evaluate the prevalence of sleep disturbances among healthcare professionals working at a university-based hospital in Jeddah, KSA, and to determine individual risk factors that might increase the prevalence of poor sleep quality.

Materials and Methods

This quantitative, analytical, cross-sectional study was conducted at King Abdulaziz University Hospital (KAUH) in Jeddah, KSA between February 2021 and March 2022. With a simple random sampling method, an online questionnaire and an invitation to participate in the study were distributed to all physicians, nurses, and medical interns of any sex working at the hospital during the study period. The purpose of the study was explained to all participants. Attempts were made to contact participants via email and WhatsApp. A total of 395 participants from KAUH responded, with a response rate of approximately 50%. Non-KAUH healthcare professionals and non-healthcare professionals were excluded.

A self-administered online questionnaire (Google Forms website) was completed in English and used for data collection. Data were recorded in two sections. The first survey section was used to assess demographics and factors potentially affecting sleep quality, including age, sex, nationality, marital status, education level, job profile, monthly income, and weather conditions. Other individual factors included the number of working hours per week, shift work status, exercise frequency, smoking habits, alcohol consumption, coffee intake, and BMI.

The second survey section involved a secure online link for participants to complete the self-reported 19-item Pittsburgh Sleep Quality Index (PSQI) questionnaire to assess sleep quality.[4] The PSQI has been demonstrated to be valid via evaluations of internal consistency, concurrent validity with polysomnography and clinical interviews, known-groups validity, and factorial validity in several Afro-Asian samples. The internal consistency of this index is adequate, as indicated by a Cronbach alpha value of 0.67 in the study sample.[21–25] In this study, sleep quality was assessed over a 1-month period with the PSQI questionnaire, which comprises seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep

disturbances, use of sleep medications, and daytime dysfunction. The score for each component is calculated and summed to yield a global PSQI score. A total score ≥5 indicates poor sleep quality.[4]

Data were analyzed in SPSS software (version 23.0). Descriptive statistical measures were used to present the sociodemographic characteristics of the study participants. A binary logistic regression model was used to determine the factors associated with poor sleep quality among healthcare professionals. The dichotomized sleep quality variable, on the basis of a PSQI cutoff score ≥5, was the dependent variable. A list of independent variables was selected from the study variables, according to statistical considerations, theoretical justifications, and previous scientific reports of factors associated with sleep quality. Nationality, highest academic qualification, exercise frequency, and smoking status were selected, on the basis of a p-value <0.25. Age, sex,[26] weekly working hours,[27] shift work,[28] BMI,[29] and coffee intake frequency[30] were selected as covariates, according to recent reports of their association with sleep quality. Ordinal regression models were used to determine factors associated with various aspects of sleep quality, according to the PSQI component scores. Ordinal regression models were implemented with the PLUM procedure in SPSS software. Seven PSQI component-based ordinal models were first assessed for model fit measures, goodness of fit, and the assumption of proportional odds. Only three PSQI component scores—component 3, sleep duration; component 4, sleep efficiency; and component 6, use of sleep medication—satisfied these conditions (Supplement file I). Therefore, ordinal regression models for these three PSQI component scores are presented. Descriptive statistics of participant characteristics are presented as mean, standard deviation (SD), range, and percentage. Binary logistic regression outcomes are presented as adjusted odds ratios (AOR) and 95% confidence intervals. In the binary logistic regression, the adjusted odds ratio is the change in the likelihood of the dependent variable occurring per unit change in the concerned independent variable, when all other independent variables are constant. In ordinal regression, the full odds ratio is the proportional change in the likelihood of moving from one category to a higher category (of the dependent variable) per unit change in the independent variable, when all other independent variables are constant. A p-value of 0.05 was considered to indicate significant relationships.

This study was approved by the Unit of Biomedical Ethics of KAUH. All participants provided written informed consent to participate in the study and were assured of confidentiality.

Results

The prevalence of poor sleep quality was very high: 70.4% of participants scored >5 on the PSQI. The mean age, BMI, and PSQI score were 37.74 ± 10.35 years, 26.32 ± 4.97 kg/m^2, and 7.88 ± 3.60, respectively. Most participants were women (70.4%) and expatriates (55.4%). Most study participants were married (68.4%) and had a university education or higher (77.5%). Nurses comprised 50.4% of the study sample. Most healthcare professionals indicated a monthly

Table 1: Socio-demographic characteristics of the participating health professionals.

Characteristics	Range; mean ± SD /frequency (percentage)
PSQI score	7.88 ± 3.60
Sleep quality[a]	
Poor sleep quality	278 (70.4)
Good sleep quality	117 (29.6)
Age (years)	23−70; 37.74 ± 10.35
BMI (kg/m^2)	26.32 ± 4.97
Sex	
Male	117 (29.6)
Female	278 (70.4)
Nationality	
Saudi	176 (44.6)
Expatriate	219 (55.4)
Relationship status	
Single	106 (26.8)
Married	270 (68.4)
Widow, widower, divorced, or separated	19 (4.8)
Highest academic qualification	
Diploma	89 (22.5)
University degree	141 (35.7)
Post-graduation and PhD	165 (41.8)
Job profile	
Intern	18 (4.6)
Nurse	199 (50.4)
Physician	152 (38.5)
Other	26 (6.5)
Monthly income (In Saudi Riyal)	
≤5000	80 (20.3)
>5000−10,000	138 (34.9)
>10,000−20,000	71 (18.0)
>20,000	106 (26.8)
Do you have children?	
No	144 (36.5)
Yes	251 (63.5)
Weekly working hours	
<40 h	65 (16.4)
40−59 h	285 (72.2)
>60 h	45 (11.4)
Do you work in shifts?	
No	190 (48.1)
Yes	205 (51.9)
Exercise frequency	
Daily or nearly daily	34 (8.6)
Two or three times per week	96 (24.3)
Once per week	100 (25.3)
Never or less than once per week (inactive)	165 (41.8)
Smoking habit	
Non-smoker (never)	325 (82.3)
Ex-smoker	28 (7.1)
Smoker	42 (10.6)
Alcohol use	
No	382 (96.7)
Yes	13 (3.3)
Coffee intake	
No coffee	95 (24.1)
Three or fewer cups per day	249 (63.0)
More than three cups per day	51 (12.9)

[a] On the basis of a cut-off score of 5 of the PSQI; PSQI: Pittsburgh Sleep Quality Index; SD: standard deviation; BMI; body mass index.

Table 2: Predictors of poor sleep quality in health professionals.

Predictors	*p*-value	AOR (95% CI of AOR)
Sex		
Male		1
Female	0.022	2.032 (1.106−3.736)
Nationality		
Saudi		1
Expatriate	0.293	0.675 (0.324−1.405)
Highest academic qualification		
Post-graduation and PhD		1
University degree	0.943	1.024 (0.527−1.992)
Diploma	0.127	0.542 (0.247−1.190)
Weekly working hours		
<40 h		1
40−59 h	0.120	0.560 (0.269−1.163)
>60 h	0.956	1.028 (0.384−2.755)
Do you work in shifts?		
No		1
Yes	0.046	1.866 (1.010−3.447)
Exercise frequency		
Daily or nearly daily		1
Two or three times per week	0.363	1.519 (0.617−3.736)
Once per week	0.506	1.357 (0.552−3.337)
Never or less than once per week (inactive)	0.047	2.433 (1.012−5.851)
Smoking habit		
Non-smoker (never)		1
Ex-smoker	0.057	2.913 (0.969−8.762)
Current smoker	0.003	4.636 (1.680−12.796)
Coffee intake		
No coffee intake		1
Three or fewer cups per day	0.176	0.672 (0.377−1.196)
More than three cups per day	0.183	0.568 (0.247−1.307)
Age	0.818	1.003 (0.978−1.029)
BMI	0.781	1.007 (0.957−1.060)

CI: confidence interval; AOR: adjusted odds ratio; BMI: body mass index.

income of >5000 Saudi Riyal (79.7%). Most participants had children (63.5%), worked >40 h per week (83.6%), and worked in shifts (51.9%). Regarding physical activity, 67.1% of participants reported being either inactive or exercising once per week. The lifetime smoking prevalence was 17.7%, and 75.9% of participants reported drinking coffee daily (Table 1).

Table 2 summarizes the results of the binary logistic regression analysis conducted to determine the factors associated with poor sleep quality among participants. The binary logistic regression with ten independent variables (Table 2) revealed a significant relationship with sleep quality (χ^2 = 38.366, [16, n = 395], p = 0.001) and explained 13.2% (Nagelkerke R^2) of the variance in categorizing the participants with poor sleep quality. Among participants, female sex (adjusted odds ratio [AOR], 2.03; 95% confidence interval [CI], 1.11−3.74), shift work (AOR, 1.87; 95% CI, 1.01−3.45), physical inactivity (AOR, 2.43; 95% CI, 1.01−5.85), and current smoking (AOR, 4.64; 95% CI, 1.68−12.80) were associated with poor sleep quality (Table 2).

Short sleep duration was common among the participants: 17.5% reported fewer than 5 h of sleep, and 25.6% reported a sleep duration of 5−6 h. Older age was associated with shorter sleep duration ($p < 0.001$). Saudi participants reported shorter sleep durations, at half that of expatriates ($p = 0.012$). Those not working shifts reported longer sleep durations than shift workers ($p = 0.003$), and those who exercised daily or near daily reported longer sleep durations than physically inactive participants ($p = 0.011$). Similarly, participants with once-weekly exercise reported longer sleep durations than physically inactive participants ($p = 0.028$). Participants with no smoking history reported longer sleep durations than current smokers ($p = 0.051$, Table 3).

Poor sleep efficiency was common among participants: 23.8.5% reported a sleep efficiency below 65%, and 20.5% had a sleep efficiency of 65−74%. Male participants reported a higher sleep efficiency than female participants ($p = 0.002$). Participants not working in shifts reported a higher sleep efficiency than shift workers ($p = 0.023$). Those with no smoking history reported higher sleep efficiency than current smokers ($p < 0.001$), and those reporting no coffee intake (OR = 2.191, p = 0.035) or those consuming three or fewer cups per day (OR = 1.948, p = 0.041) reported a higher sleep efficiency than those consuming more than three cups per day (Table 4).

The self-reported rate of use of sleep medication was lower than those of the other sleep parameters, but the reported level was substantial: 3.5% reported use three or more times per week, and 8.6% reported use at least once per week. Male participants reported using less sleep-associated medication than female participants ($p = 0.040$). Participants with university degrees reported using more sleep medication than participants whose highest qualification was a diploma ($p = 0.013$). Participants who regularly exercised reported using less sleep medication than physically inactive participants ($p = 0.003$). Similarly, participants who reported once-weekly exercise activity reported using less sleep medication than physically inactive participants ($p = 0.028$). Participants with no history of smoking reported using less sleep medication than current smokers ($p = 0.010$, Table 5).

Discussion

In this study, we aimed to determine the prevalence of sleep disturbances among healthcare providers at a tertiary hospital center, and to identify specific factors associated with sleep quality. According to the PSQI questionnaire, 70.4% of the participants experienced sleep disturbances (mean score, 7.88 ± 3.60). Moreover, female sex, shift work, and exercise and smoking habits were predictors of poor sleep quality.

Our results were consistent with findings from prior studies reporting a high prevalence of poor sleep quality among healthcare professionals. In two Turkish studies, 72.4%[31] and 83.3%[32] of physicians had poor sleep quality, and physicians who worked night shifts were more prone to poor sleep quality than physicians who worked only

Table 3: Ordinal regression predictors of the PSQI component score-3 (sleep duration) in health professionals.

Predictors	P-value	OR	95% Confidence interval (CI) Lower	Upper
Sex				
Male	0.482	0.839	0.515	1.367
Female		1.000		
Nationality				
Saudi	0.012	2.142	1.186	3.869
Expatriate		1.000		
Highest academic qualification				
Post-graduation and PhD	0.532	1.231	0.642	2.358
University degree	0.079	1.627	0.945	2.802
Diploma		1.000		
Weekly working hours				
<40 hours	0.823	0.920	0.442	1.916
40-59 hours	0.265	0.704	0.380	1.305
>60 hours		1.000		
Do you work in shifts?				
No	0.003	0.464	0.281	0.765
Yes		1.000		
Exercise frequency				
Daily or nearly daily	0.011	0.389	0.188	0.808
Two or three times/ week	0.782	1.071	0.661	1.735
Once a week	0.028	0.586	0.363	0.945
Never or less than once a week (inactive)		1.000		
Smoking habit				
Non-smoker (Never)	0.051	0.507	0.256	1.002
Ex-smoker	0.774	0.870	0.338	2.244
Current Smoker		1.000		
Coffee				
No coffee intake	0.112	1.731	0.881	3.402
≤3 cups per day	0.749	1.101	0.612	1.980
>3 cups per day		1.000		
Age	0.001	1.035	1.014	1.057
BMI	0.096	1.036	0.994	1.079

OR: full model odds ratio; BMI: body mass Index

daytime shifts. The results were consistent with our findings, in which a higher PSQI score was significantly correlated with shift work. This finding might be explained by the effects of shift work on circadian rhythms.[1,2,4] In contrast, employees who did not work shifts were more likely to have consolidated sleep and a greater total sleep duration per day.

Furthermore, women have been reported to have poorer sleep quality than men, in terms of burnout scores,[33,34] in agreement with our results. Ali et al. have reported poor sleep quality in 77.4% of physicians, particularly female and/or junior physicians.[35] Moreover, in a multicenter study including six hospitals in China, almost 60% of physicians had poor sleep quality, which was more pronounced among women.[36] Regarding the prevalence of poor sleep quality among nurses, who comprised most of our participants, studies conducted in Turkey and China have reported values of 61.9%[37] and 72.1%,[38] respectively. In general, female sex was strongly associated with poor sleep quality. Although a definitive explanation remains to be determined, this relationship may be a result of physiological factors affecting women, including hormonal changes during the menstrual cycle, menopause, pregnancy, and the postpartum period, which affect circadian rhythms, thereby causing sleep disturbances and exacerbating poor sleep quality.[39] Men were less likely than women to report medication use to improve sleep quality.

Physical activity was significantly correlated with sleep quality in this study. Respondents who were inactive or who exercised less than once per week complained of poor sleep quality (AOR, 2.43; $p < 0.5$). These results might have been associated with factors specific to the study setting and

Table 4: Ordinal regression predictors of the PSQI component score-4 (Sleep efficiency) in health professionals.

Predictors	P-value	OR	95% Confidence interval (CI) Lower	Upper
Sex				
Male	0.002	0.432	0.254	0.734
Female		1.000		
Nationality				
Saudi	0.849	1.062	0.573	1.966
Expatriate		1.000		
Highest academic qualification				
Post-graduation and PhD	0.051	1.964	0.997	3.869
University degree	0.105	1.593	0.907	2.796
Diploma		1.000		
Weekly working hours				
<40 hours	0.082	1.956	0.918	4.165
40-59 hours	0.398	0.757	0.397	1.444
>60 hours		1.000		
Do you work in shifts?				
No	0.023	0.543	0.321	0.919
Yes		1.000		
Exercise frequency				
Daily or nearly daily	0.169	0.576	0.262	1.265
Two or three times/ week	0.383	1.249	0.758	2.057
Once a week	0.691	1.105	0.676	1.806
Never or less than once a week (inactive)		1.000		
Smoking habit				
Non-smoker (Never)	0.001	0.312	0.153	0.639
Ex-smoker	0.244	0.557	0.208	1.490
Current Smoker		1.000		
Coffee				
No coffee intake	0.035	2.191	1.059	4.535
≤3 cups per day	0.041	1.948	1.029	3.687
>3 cups per day		1.000		
Age	0.671	1.005	0.984	1.026
BMI	0.063	1.041	0.998	1.086

OR: full model odds ratio; BMI: body mass Index

population.[40] The average BMI among participants was 26.32 ± 4.97 kg/m^2, a value within the healthy range; moreover, sleep quality and BMI were not related in this study. However, an association between obesity and sleep disorders has been reported by Rahe et al.,[40] in a study in which 34.7% of participants had poor sleep quality (PSQI score >5). Moreover, poor sleep quality has been significantly associated with general obesity and body fat mass in another study.[41] Our results did not show such a relationship, possibly because of the examination of small sample of healthcare professionals from a single tertiary hospital. Furthermore, the self-reported nature of the study might have led to a response bias. However, this study adds value, because few studies have been conducted on the association between poor sleep quality and BMI, particularly among healthcare professionals.

A strong correlation was observed between smoking and sleep disturbance. As in previous studies,[42,43] current smokers had higher PSQI scores in our study. In contrast, healthcare professionals with no smoking history had better sleep quality and were less likely to use sleep medication. Poor sleep quality among smokers has been reported to be associated with various sleep quality dimensions. First, smokers may awaken because of a physiological craving for more nicotine while sleeping, which might result in inso mnia. Second, nicotine use near bedtime may disrupt sleep

Table 5: Ordinal regression predictors of the PSQI component score-6 (Sleep medication use) in health professionals.

3Predictors	P-value	OR	95% Confidence interval (CI) Lower	Upper
Sex				
Male	0.040	0.540	0.300	0.972
Female		1.000		
Nationality				
Saudi	0.479	1.278	0.648	2.520
Expatriate		1.000		
Highest academic qualification				
Post-graduation and PhD	0.280	1.529	0.707	3.304
University degree	0.013	2.269	1.191	4.323
Diploma		1.000		
Weekly working hours				
<40 hours	0.637	1.232	0.517	2.935
40-59 hours	0.745	1.130	0.541	2.360
>60 hours		1.000		
Do you work in shifts?				
No	0.197	0.682	0.381	1.220
Yes		1.000		
Exercise frequency				
Daily or nearly daily	0.003	0.150	0.043	0.523
Two or three times/ week	0.384	0.787	0.458	1.351
Once a week	0.028	0.536	0.308	0.934
Never or less than once a week (inactive)		1.000		
Smoking habit				
Non-smoker (Never)	0.010	0.360	0.165	0.787
Ex-smoker	0.355	0.606	0.209	1.754
Current Smoker		1.000		
Coffee				
No coffee intake	0.160	1.803	0.792	4.108
≤3 cups per day	0.313	1.453	0.703	3.003
>3 cups per day		1.000		
Age	0.692	0.995	0.971	1.020
BMI	0.197	1.031	0.984	1.080

OR: full model odds ratio; BMI: body mass Index

latency, because nicotine is a stimulant.[44] Additionally, nicotine decreases sleep quality by causing circadian clock disturbances,[45] and increases the risk of snoring and obstructive sleep apnea.[46]

This study has several limitations. First, it included healthcare professionals working at only one tertiary health center in Jeddah. Second, the study was conducted during the COVID-19 pandemic, thus potentially affecting the results. Finally, questionnaires were used, with no objective measures of sleep patterns such as actigraphy or polysomnography.

Conclusions

Poor sleep quality was common among healthcare professionals in this study, and might have negative consequences during working hours and on overall quality of life. Factors including sleep disturbance, shift work, physical inactivity, active smoking, and female sex were associated with poor sleep quality. Regular physical exercise and avoidance of smoking had positive effects on sleep quality. Future research should include more healthcare centers to achieve broader representation. Other factors with potentially important roles in sleep quality should also be investigated, such as burnout levels, workload (work conditions), medical specialties, family issues, and diet. Additionally, investigations of the consequences of poor sleep quality for healthcare professionals in the workplace, and studies of physicians and nurses with poor sleep quality, are recommended to address the multiple issues that may arise because of sleep disturbances.

The strengths of our study are that it confirmed the frequency of poor sleep quality among healthcare workers and

also identified modifiable risk factors that may improve the sleep quality of this critical population.

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Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

Formal ethical approval (REF #485-20) was obtained from the Ethical Committee at KAUH, Jeddah, KSA (Approval date: 14 September 2020).

Author contributions

RS, FH, SW: conceived and designed the study. LG, LS, RG, NJ, MB, LW: conducted research, provided research materials, and collected and organized data. MM: analyzed and interpreted data. LG, LS, RG, NJ, MB, LW, GB: wrote the initial draft of the article. RS, FH, SW: wrote the final draft of the article and provided logistic support. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jtumed.2024.03.003.

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