SCIENTIFIC CULTURE
www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 5.1, (2026), pp. 930-941
Open Access. Online & Print

DOI: 10.5281/zenodo.12511074

PREVALENCE OF POOR SLEEP QUALITY AND ASSOCIATED FACTORS AMONG PHYSICIANS IN THE JAZAN REGION, SAUDI ARABIA

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Received: 11/12/2024
Accepted: 25/02/2025

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ABSTRACT

Physicians may experience periods of acute sleep deprivation while on call, in addition to baseline chronic sleep deprivation, which may affect physicians' performance and patients' safety. We can define poor sleep quality according to the natural sleep foundation: if it takes 30 minutes or more to fall asleep, you wake up more than once, or you take 20 minutes or more to get back to sleep, then we call it poor sleep [19]. prevalence of poor sleep quality and associated factors among physicians in the Jazan region**.** This describes the cross-sectional study design applied in Jazan Hospitals. Three hundred eighty-seven participants, including all department specialists, were interviewed using a self-administered questionnaire. 81.1% of participant physicians had poor sleep quality, and approximately 50% reported sleep disturbance and efficiency problems. Additionally, 66.7% of the participants reported experiencing minimal to mild depression, and there was a significant positive correlation between depression and poor sleep quality. The results indicate that sex, age, years of service, number of on-call shifts per month, and monthly income were significantly associated with poor sleep quality. The study found that a significant majority of physicians had poor sleep quality, which is positively correlated with depression. Several factors were associated with poor sleep quality. This study recommends implementing interventions such as psychological awareness, social support, and improving shift schedules to reduce the incidence of depression resulting from poor sleep quality. The goal is to ensure that physicians are well-rested and healthy and can provide top-quality patient care.

KEYWORDS: Acute sleep deprivation, alertness, depression, sleepiness, sleep quality.

critical need for addressing sleep issues among medical professionals.

Moreover, poor sleep quality has significant implications for physicians' mental health. Chronic sleep deprivation is strongly associated with increased levels of stress, anxiety, and depression. The demanding nature of medical practice and the pressures of patient care create a stressful environment exacerbated by lack of sleep. Over time, the cumulative effect of poor sleep can lead to burnout, a condition characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment. Burnout is an increasing concern in the medical community, with studies indicating it affects many physicians. Poor sleep quality is both a contributor to and a symptom of burnout, creating a vicious cycle that can be difficult to break.

The physical health of physicians is also compromised by poor sleep quality. Sleep is a critical period for the body to repair and restore itself, and insufficient sleep has been linked to a range of adverse health outcomes, including cardiovascular disease, obesity, diabetes, and impaired immune function. Physicians who are already at higher risk for these conditions due to the stresses of their profession may find their risk further exacerbated by poor sleep. Notably, sleep disorders such as sleep apnea, which are prevalent among physicians, further contribute to their health risks, highlighting the widespread nature of the problem.

Poor sleep quality among physicians is a matter of personal well-being and a significant public health concern. Given physicians' critical role in society, ensuring that they are well-rested and able to perform at their best is essential for the safety and quality of healthcare delivery. It is imperative to address the factors contributing to poor sleep quality among physicians, such as long working hours, shift work, and workplace culture. These are actionable steps that can be taken to improve the situation and safeguard their and their patients' health.

During these long shifts, their sleep is often limited and fragmented, leading to acute sleep deprivation, which may result in significant changes in cognitive functioning, alteration of mental status in a manner resembling depression or anxiety, and difficulty with short-term memory [4]. Indeed, several studies have found that sleep deprivation significantly affects physician performance and patient safety [5-7]. One study revealed that interns working a traditional schedule of more than 76 hours per week lead to 36% more serious medical errors than those who work an average of 65 hours per week [6].

1. INTRODUCTION

Healthcare providers, especially junior physicians, have long been concerned about acute sleep deprivation brought on by excessive work hours and circadian disruption [1]. Although this type of work necessitates high levels of psychomotor performance, cognitive function, and emotional balance [2], junior physicians are frequently assigned to shifts that are far too long, often lasting between 24 and 30 hours [3].

Sleep, a fundamental biological necessity, is often compromised in the modern world, particularly among professionals with demanding schedules. Physicians face unique challenges that make them particularly vulnerable to poor sleep quality. Their work, characterized by long hours, night shifts, on-call duties, and high-stakes decision-making, often leads to chronic sleep deprivation and sleep disturbances. The consequences of poor sleep among physicians extend beyond personal health, affecting their cognitive performance, mood, and, ultimately, patient care quality.

The prevalence of poor sleep quality among physicians is alarmingly high, with numerous studies across different specialties and regions reporting significant issues with sleep duration, sleep efficiency, and sleep-related disorders. For instance, research consistently shows that physicians frequently obtain less than the recommended 7-9 hours of sleep per night, with some studies reporting that a substantial percentage of physicians sleep fewer than 6 hours per night. This chronic sleep deprivation is often compounded by irregular sleep patterns due to shift work and the unpredictable demands of on-call duties. Such patterns disrupt the body's natural circadian rhythm, impairing sleep quality and leading to adverse outcomes.

One of the most immediate consequences of poor sleep quality among physicians is the impact on cognitive function. Sleep is essential for mental processes such as attention, memory consolidation, and executive function. Sleep deprivation impairs these cognitive functions, leading to slower reaction times, decreased vigilance, impaired judgment, and increased likelihood of errors. In the medical field, where split-second decisions and precise actions are often required, these impairments can have serious, even life-threatening, consequences. Studies have shown that physicians who are sleep-deprived are more prone to making medical errors, including diagnostic errors, medication errors, and procedural errors. The correlation between sleep deprivation and increased risk of mistakes underscores the

This study aimed to predict the prevalence of poor sleep quality and assess its relationship with depression on general health among physicians in the Jazan region.

1.3. Specific Objectives:

- assessed the sleep quality and determine the predictors of poor sleep among physicians in the Jazan region, Saudi Arabia.
- assessed the association between sleep quality and departments.

2. LITERATURE REVIEW

Upon reviewing the literature, I found that many studies have been done worldwide on the healthy lifestyle of undergraduate students. This cross-sectional comparative study was conducted at King Abdul-Aziz University Hospital (KAUH) in Jeddah, Kingdom of Saudi Arabia. Over 87% of respondents slept 5 hours or less while on-call. Among all participants, the percentage of clinicians' alert after the call was significantly reduced compared to before. The total POMS scores of several groups after the call for Groups 1 and 2 were considerably worse than their scores before the call. At the same time, there was no significant difference between the POMS scores before and after the call for Group 3 [13].

This cross-sectional study, conducted on male and female Saudi Commission residents working in public healthcare facilities in the Aseer region, Saudi Arabia, revealed a stark reality. Before the COVID-19 outbreak, 85.1% of residents reported poor sleep quality. However, during the pandemic, this percentage surged to 92.5%, highlighting the profound impact of the crisis on the sleep patterns of healthcare professionals [14].

A cross-sectional study, assessing the sleep quality of 334 junior physicians in Pakistan using PSQI, brought to light a significant finding. It revealed that 36.8% of the participants were classified as 'poor sleepers,' with poor sleep quality being notably associated with the female gender. This association underscores the need for genderspecific interventions to improve sleep quality in healthcare settings [15]. A cross-sectional study conducted at King Abdulaziz University Hospital (KAUH) in Jeddah, Saudi Arabia, examined sleep patterns among physicians. Over 87% of respondents reported sleeping 5 hours or less while working an on-call shift. Alertness levels significantly decreased post-call compared to pre-call, as measured by the Profile of Mood States (POMS) questionnaire [13]. A cross-sectional study at a major tertiary hospital in Japan assessed sleep quality among resident

Given the demanding nature of their profession, physicians are particularly susceptible to poor sleep quality. Long and irregular work hours, the high-stress environment, and the weight of patient care create a perfect storm for sleep disturbances. This issue is exacerbated by the increasing prevalence of sleep disorders among the general population, which may also affect physicians. The rapid expansion of the Saudi Arabian healthcare system has placed immense pressure on physicians. This heightened workload and other factors have contributed to a significant prevalence of poor sleep quality among Saudi physicians. The consequences of this issue are far-reaching, impacting both the physicians' well-being and patient care.

Sleep deprivation in physicians can lead to impaired cognitive function, increasing the risk of medical errors and compromising patient safety. Moreover, the physical and mental health of physicians is adversely affected by chronic sleep insufficiency, increasing the risk of burnout, depression, and other medical conditions. Addressing the issue of poor sleep quality among Saudi physicians requires a comprehensive approach. Implementing work-hour restrictions, optimizing shift work, and creating supportive work environments are essential. Educational programs on sleep hygiene and the importance of sleep for healthcare professionals can also improve sleep quality. Additionally, providing access to sleep specialists and establishing sleep clinics can offer specialized care for physicians with severe sleep disorders.

Numerous researchers have investigated how long on-call shifts affect productivity and cognitive function. [3,8-10]. Few researchers have examined these impacts, even though working long shifts may cause poor mood and decreased alertness. These can impair cognitive functioning and physician performance and harm patients' and doctors' safety [11,12]. This study will address the research gap by examining how poor sleep quality could affect physicians and its associations with depression related to it in Jazan, Saudi Arabia.

1.1. Study Rationale

Job requirements affect physicians who work long shifts under the influence of severe sleep deprivation and a state of mood and vigilance. This practice is considered one of the practices that affect mood and increase the rates of medical errors. Because there is no previous study in this regard in our region, it is essential to conduct a study in the Jazan region.

1.2. General Objectives

used the PSQI and ESS to assess sleep quality and daytime sleepiness among gynecologists. It reported that 75% of participants had poor sleep quality, with significant associations between inadequate sleep and errors in clinical judgment during surgeries [26]. A multi-center study in the UK examined the effects of sleep deprivation on mental health among psychiatrists. The study utilized the General Health Questionnaire (GHQ) and found that poor sleep quality was significantly correlated with higher scores on anxiety and depression scales [27]. A cross-sectional study in Turkey assessed the sleep quality of physicians in primary care settings using the PSQI. Over 70% of the respondents had poor sleep quality, significantly associated with increased work-related stress and burnout [28]. This study in China investigated sleep patterns among ICU physicians using actigraphy and the PSQI. It was found that physicians working night shifts slept significantly less and had worse sleep quality, correlated with higher rates of selfreported medical errors [29]. A cross-sectional study conducted in Nigeria used the ESS to assess daytime sleepiness among resident physicians. It revealed that 63% of residents had excessive daytime sleepiness, strongly associated with decreased clinical performance [30].

This longitudinal study in Spain followed a cohort of internal medicine physicians over a year, assessing sleep quality and cognitive function using the PSQI and neuropsychological tests. The study found persistent poor sleep quality among participants, leading to significant declines in cognitive function, particularly in tasks involving attention and executive function [31]. A cross-sectional study in Italy used the PSQI to evaluate sleep quality among radiologists. The study reported that 69% of participants had poor sleep quality, with a significant correlation between inadequate sleep and reduced accuracy in diagnostic imaging interpretations [32].

This study in South Africa assessed shift work's impact on emergency physicians' sleep quality using subjective (PSQI) and objective (actigraphy) measures. The results indicated that shift work was associated with significantly worse sleep quality and increased rates of self-reported medical errors [33]. A cohort study in Germany examined the effects of sleep deprivation on surgical performance among orthopedic surgeons. The study used actigraphy to measure sleep duration and found that surgeons who slept less than 5 hours had significantly higher error rates during procedures [34]. This cross-sectional study in Malaysia used the ESS and PSQI to assess sleep quality and daytime sleepiness among general practitioners. It found that 72% of participants had physicians using the Pittsburgh Sleep Quality Index (PSQI). It found that 70% of residents had poor sleep quality, which was correlated with increased selfreported errors during shifts [17].

A cohort study in the United States investigated the impact of night shifts on sleep and cognitive function among attending physicians. The study utilized actigraphy to measure sleep duration, revealing that participants averaged only 4 hours per night during shifts. Cognitive assessments showed a significant decline in reaction times and memory retention post-shift [18]. This cross-sectional study at a Brazilian university hospital used the Epworth Sleepiness Scale (ESS) to measure daytime sleepiness among surgeons. Results indicated that 65% of surgeons experienced moderate to severe daytime sleepiness, which was associated with a higher incidence of self-reported surgical errors [19].

A multi-center study across European hospitals examined sleep disorders in physicians using polysomnography. The study found that 58% of the participants had sleep apnea or other sleep-related breathing disorders, significantly affecting their daytime alertness and cognitive performance [20]. This longitudinal study in Australia followed a group of emergency medicine physicians over six months to assess sleep patterns and work performance. The PSQI revealed that 80% had poor sleep quality, and work performance, particularly in decision-making tasks, declined over time [21]. A cross-sectional study in Canada evaluated sleep quality among pediatricians using the Insomnia Severity Index (ISI). Approximately 60% of the pediatricians reported moderate to severe insomnia, which was significantly correlated with increased levels of burnout and depressive symptoms [22].

This study in a French hospital used subjective (PSQI) and objective (actigraphy) measures to assess sleep among anesthesiologists. It found that those working night shifts had significantly worse sleep quality and shorter sleep durations than their dayshift counterparts [23]. A cross-sectional survey in India examined sleep disturbances among junior doctors. The study used the Athens Insomnia Scale and found that 68% of participants reported significant sleep disturbances strongly associated with self-reported fatigue and decreased patient care quality [24]. In a cohort study conducted in South Korea, researchers used the Berlin Questionnaire to assess the prevalence of sleep apnea among cardiologists. The study found that 42% had moderate to severe sleep apnea, associated with increased daytime sleepiness and impaired cognitive function [25]. This cross-sectional study in Egypt

Hospital, 76 participants from King Fahad Central Hospital, 106 participants from Price Mohammed bin Nasser Hospital, and 47 participants from samitah general hospital. In this study, 225 participants were male, representing 58.1%, and 162 were female, representing 41.2%. From this number, 18 consultants, 104 general practitioners, 155 residents, 71 Specialists, and 39 interns.

3.4. Inclusion and Exclusion Criteria

"Participants must not have any diagnosed physical or mental problems and should be residents in all departments. The physician overseeing the study must be MBBS certified. Exclusion criteria include individuals unwilling to participate in the research and other health care workers."

3.5. Sample size

The Ministry of Health in Saudi Arabia's statistical data indicates that exactly 2790 doctors, including Saudi and non-Saudi doctors, work in the Jazan region in private and government health sectors. The estimated sample size will be 338. The research power will be fixed at 80%, and the confidence interval (CI) will be 95%.

N = Z 2 PQ/d 2. where N = Minimum sample size. Z = Standard deviation score at 95% = 1.96. Q = Complimentary probability (1 – P) =1 – 0.72 = 0.28. d = Error margin = 5%. Substituting, N = (1.96) 2 × 0.72 × 0.28/(0.05) 2 = 338 With the addition of a 10% non-response rate, the sample size will be 372.

3.6. Data collection method

After considering all ethical considerations, the administration of 5 hospitals distributed a self-administered, previously validated questionnaire. Doctors of the selected hospitals in the Jazan region could collect the data through an online questionnaire.

3.7. Sampling technique

This cross-sectional study was conducted among doctors in Jazan Hospital, Saudi Arabia. The hospital was selected randomly from the 13 general hospitals of the region using a lottery method. All physicians in these departments were included because the number and duration of on-call shifts are like those of entry-level physicians in medicine, surgery, pediatrics, obstetrics, etc... Because the duration of on-call shifts during weekends and national holidays is generally shorter, participants were not assessed during these shifts, and the questionnaire will be online. All participants gave consent, and confidentiality will be maintained to the greatest extent possible. After obtaining ethical approval from

poor sleep quality, with significant associations between poor sleep, reduced patient care quality, and increased burnout [35].

3. METHODOLOGY

3.1. Study Area

The Jazan region where this study was conducted. One of Saudi Arabia's thirteen regions is the Jazan region. It is situated alongside Yemen on the Red Sea coast of Saudi Arabia's southwest. With a population of1.5 million, research was conducted using a cross-sectional approach and involved the distribution of an online, self-administered questionnaire that had been validated previously. The questionnaire was disseminated to different departments, including internship, general practitioner, resident, specialist, and consultant roles, at five randomly selected hospitals in the Jazan region of Saudi Arabia. King Fahad Central Hospital, Prince Mohammed bin Nasser Hospital, Jazan General Hospital, Abu Arish General Hospital, and Samitah Gerald Hospital. Data collection occurred between December 2023 and the end of August 2024.ion of almost 1.5 million, this area is densely populated. According to the last MOH record, there are around 1083 residents in the Jazan region.

This study collected data from five hospitals (King Fahad Central Hospital, Prince Mohammed bin Nasser Hospital, Jazan General Hospital, Abu Arish General Hospital, and Samitah Gerald Hospital). To select five hospitals from a pool of 13, we employed a lottery method: we wrote the names of the hospitals on separate pieces of paper and drew five randomly.

3.2. Study design

The study was conducted using a cross-sectional and involved the distribution of an online, self-administered questionnaire that had been validated previously. The questionnaire was disseminated to different departments, including internship, general practitioner, resident, specialist, and consultant roles, at five randomly selected hospitals in the Jazan region of Saudi Arabia. King Fahad Central Hospital, Prince Mohammed bin Nasser Hospital, Jazan General Hospital, Abu Arish General Hospital, and Saminah Gerald Hospital. Data collection occurred between December 2023 and the end of August 2024.

3.3. Study participants

Doctors at different levels (internship, general practitioner, resident, specialist, and consultant) at Jazan region hospitals. As per the data obtained from the questionnaire, it was found that the number of participants (70 participants from Abu Arish General Hospital, 88 participants from Jazan General

All data analyzed using the Statistical Package for the Social Sciences (SPSS) software package, version 27. For descriptive statistical measurements, frequency and percentage were used. Sleep quality is the dependent variable, and various risk factors are the study's independent variables. Chi-squared was used to assess the statistical significance of associations. In addition, logistic regression analysis was used to predict the factors associated with poor sleep quality. Spearman correlation test was used to determine the relationship between depression and poor sleep quality. A P value less than 0.05 considered an indicator of statistical significance.

3.10. Ethical consideration

We obtained all necessary official approvals, such as those from the ethical committee with Approval Number: 23139 that issued in 28/12/2023. All participants asked to agree to participate before starting the questionnaire, and they can decline to participate in the study or leave the study early. To all respondents, the researcher will describe the goal. This pre-measurement training is a crucial component. All participants' privacy and confidentiality will be respected. For the use of the questionnaire, all permissions we obtained after contacting the primary authors for using PSQI and the PHQ-9 are public domain and free to use.

4. **RESULTS**

A total of 387 participants took part in the survey. Response rates were 58.1% male and 41.9% female. The majority of participants were Saudis, and most were under the age of 36. Most participants (65.6%) resided in the cities, and 59.7% were married. 83.7% were not smokers, while 72.4% did not exercise regularly. In addition, only 55(14.2%) participants reported having psychological issues, and they were excluded from the sample, and 23.8% used medication for a medical condition. Table 1 provides a detailed description of the sociodemographic characteristics of the study participants. Furthermore, Table 3 provides their work-related characteristics. Over half of the study participants reported working over 41 hours per week and having more than five oncall monthly shifts.

the IRB, hospital administrators sent the doctors an electronic questionnaire.

3.8. Questionnaire

A comprehensive self-administered questionnaire comprising four sections forms the backbone of our study. The first section delves into Sociodemographic characteristics and work-related factors, including a wide range of variables such as sex, age, nationality, marital status, place of residence, monthly income, job title, hospital, department, number of working hours per week, years of service, number of on-call shifts per month, and medical history.

The second section is the Pittsburgh Sleep Quality Index PSQI, which evaluates sleep quality. PSQI is widely used and recognized for assessing sleep quality for several reasons. The PSQI gathers information directly from individuals about their sleep experiences. It has undergone extensive validation and reliability testing. The PSQI has been used in various clinical studies and is commonly employed by healthcare professionals to assess sleep disturbances and guide interventions. PSQI evaluates multiple dimensions of sleep, including sleep duration, sleep latency, sleep disturbances, sleep efficiency, use of sleep medication, and daytime dysfunction. To calculate the score of the questionnaire, each question is assigned a score from 0 (very good) to 3 (very bad). Scores for all domains are summed up to yield a global PSQI score ranging from 0 to 18. Higher scores indicate worse sleep quality. If the total score obtained is five or more significant, it suggests poor sleep quality. Moreover, if it is less than 5, it is considered good sleep quality.

The fourth section is the patients' health questionnaire PHQ-9 for diagnosing depression. PHS-9 consists of 9 components ranging from 0 (very good) to 3 (very bad), with a total score ranging from 0 to 27. Scores can be classified as follows: 0-4 points indicate Minimal depression, 5-9 points indicate Mild depression, 10-14 points indicate Moderate depression, 15-19 points indicate moderately severe depression, and 20-27 points indicate severe depression.

3.9. Statistical analysis

Table1: Sociodemographic Distribution

Characteristics	Frequency	(%)
Gender		
Male	225	(58.1%)
Female	162	(41.9%)
Age		
25-30	157	(40.6%)
31-36	109	(28.2%)
36-40	54	(14.0%)
>40	67	(17.3%)

Nationality		
Saudi	295	(76.2%)
Non-Saudi	92	(23.8%)
Material status		
Single	143	(37.0%)
Married	231	(59.7%)
Divorced	13	(3.4%)
Place of residence		
City	254	(65.6%)
Village	133	(34.4%)
Smoking		
Yes	63	(16.3%)
No	324	(83.7%)
Do you Exercise regularly?		
Yes	107	(27.6%)
No	280	(72.4%)
Monthly income		
<10000	67	(17.3%)
10000-15000	42	(10.9%)
15000-20000	167 81	(43.2%)
20000-25000	30	(20.9%)
>25000		(7.8%)

Table 2: Sociodemographic characteristics associated with poor sleep quality.

Characteristics	Frequency (%)	p-value
Gender		0.365
Male	225 (58.1%)	
Female	162 (41.9%)	
Age		0.066
25-30	157 (40.6%)	
31-36	109 (28.2%)	
36-40	54 (14.0%)	
>40	67 (17.3%)	
Nationality		0.102
Saudi	295 (76.2%)	
Non-Saudi	92 (23.8%)	
Material status Single		**0.036**
Married	143 (37.0%)	
Divorced	231 (59.7%)	
Widow	13 (3.4%)	
	0 (0%)	
Place of residence		0.398
City	254 (65.6%)	
Village	133 (34.4%)	
Smoking		0.56
Yes	63 (16.3%)	
No	324 (83.7%)	
Do you Exercise regularly?		0.731
Yes No	107 (27.6%)	
	280 (72.4%)	
Monthly income		0.368
<10000	67 (17.3%)	
10000-15000	42 (10.9%)	
15000-20000	167 (43.2%)	
20000-25000	81 (20.9%)	
>25000	30 (7.8%)	

of five, indicating poor sleep quality. Among the study participants, 81.1% (314) were identified as having poor sleep quality based on their scores.

The participant's total scores on the PSQI ranged from 1 to 16, with a mean score of 7.77 ± 3.11. This average score exceeds the recommended cut-off point

Table 3: Work-related characteristics associated with poor sleep quality.

Characteristics	Frequency (%)	P-value
Job title		0.536
Consultant	18 (4.7%)	

General practitioners Internships Residents Specialist	104 (26.9%) 39 (10.1%) 155 (40.1%) 71 (18.3%)	
Hospital/Workplace		0.789
Abu Arish General Hospital	70 (18.1%)	
Jazan General Hospital	88 (22.7%)	
Kings Fahad Central Hospital	76 (19.6%)	
Prince Mohammed Bin Nasser Hospital	106 (27.4%)	
Samitah general Hospital	47 (12.1%)	
Department/Job Role		0.340
Surgical	95(24.5%)	
Internal medicine	212 (54.8%)	
Pediatric	41(10.6%)	
Preventive medicine	21 (5.4%)	
Radiology	18(4.7%)	
Number of Working Hours per Week		**0.014**
<20	36 (9.3%)	
20-40	108 (27.9%)	
41-60	200 (51.7%)	
>60	43 (11.1%)	
Years of service		**0.004**
<5 years	222(57.4%)	
5-10 years	100(25.8%)	
>10 years	65(16.8%)	
Number of On-call Shifts per Month		**0.001**
0	93(24.0%)	
1-5	98(25.3%)	
6-10	127(32.8%)	
11-20	27(7.0%)	
>20	42(10.9%)	

presented in Table 4. The results reveal that most participants reported experiencing minimal to mild depression compared to the other categories.

The average PHQ-9 index score of the respondents was 8.12 ± 6.01, which indicates that most participants were classified as having mild depression. The PHQ-9 scores and classifications of the participants are

Table 4: Participants' scores of the PHQ-9 questionnaire.

Scores	Minimal depression (0-4 points)	Mild depression (5-9 points)	Moderate depression (10-14 points)	Moderately severe depression (15-19 points)	Severe depression (20-27 points)
N(%)	121 (31.3 %)	137 (35.4%)	74 (19.1%)	38 (9.8%)	17 (4.4%)

Table 4 presents the results of the logistic regression analysis. Results revealed that sex, age, years of service, number of on-call shifts per month, and monthly income were significant factors associated with poor sleep quality. According to the results, male individuals were more likely to experience poor sleep quality than female individuals (B = 1.13, OR=3.09, p = 0.002). Participants between the ages of 25 and 30 were 7.8 times more likely to have poor sleep than those older (B = 2.05, OR=7.81, p = 0.003). Moreover, the results showed that individuals with less than five years of service were less likely to have poor sleep quality (B =-2.52, OR=0.08, p = 0.002). Similarly, participants with less than five on-call shifts were less likely to experience sleep disturbances than those with more than five. Additionally, the study indicated that individuals with a 10000-15000 monthly income were more likely to have poor sleep quality than those with a higher income (B = 1.73, OR=5.69, p = 0.043).

Tables 2 and 3 show the associations of sleep quality with different demographic and work-related factors. There was no significant association between poor sleep quality and gender, age, living place, or income. However, poor sleep quality was significantly associated with material status (p=0.036). Furthermore, the results revealed a significant association between poor sleep quality and work-related factors, including years of service (p=0.014), number of working hours per week (p=0.004), and number of on-call shifts per month (p=0.001).

The Spearman correlation test was conducted to investigate the correlation between depression status and sleep quality of participants. The results showed a significant correlation between the two variables (r = 0.45, p<0.001), indicating a moderate positive linear relationship. This suggests that individuals who experience poor sleep quality are more likely to exhibit symptoms of depression.

likely to have poor quality of sleep, respectively. However, the result is not statistically significant.

Furthermore, the study found that individuals who had psychological issues and used medication for a medical condition were 1.29 and 1.25 times more

Table 5: Logistic regression analysis of factors associated with poor sleep quality.

Variables	B	Odds ratio (OR)	P value	Confidence interval
Sex:				(-0.148-0.057)
Male	1.131	3.098	**.072**	
Female	1			
Age				(-0.072-0.33)
25-30	2.056 .821	7.811	**.003**	
31-36	1.823	2.273	.212	
36-40	1	6.190	.012	
>40				
Material status	-			(-0.158-0.047)
Single	19.844	.000	.998	
Married	-	0	.998	
Divorced	21.079			
	1			
Smoking				(-0.188-0.015)
Yes	.841	2.318	.104	
No	1			
Years of service	-			(0.063-0.263)
<5 years	2.524	.080	**.002**	
5-10 years	-	.322	.150	
>10 years	1.132			
Number of On-call Shifts per Month				(0.094-0.291)
0	-2.368	.094	**.003**	
1-5	-1.881 -.519	.152	**.020**	
6-10	-1.302	.595	.529	
11-20	1	.272	.183	
>20				
Monthly Income (SAR)				(-0.147-0.057)
<10000	1.021	2.776	.132	
10000-15000	1.739	5.691	**.043**	
15000-20000	.375	1.454	.529	
20000-25000	.720	2.055	.255	
>25000	1			

per week and had more than five on-call monthly shifts.

The study found that most (81.1%) participants had poor sleep quality, while only a small minority (18.9%) reported good sleep quality. These results are consistent with a similar study conducted in Jordan among resident physicians, where most (90%) residents experienced poor sleep quality [22]. Among the PSQI domains, approximately 50% of the participants reported sleep disturbance and efficiency problems.

The results showed that most of the participants reported experiencing minimal to mild depression. These findings indicate that a significant number of doctors might be experiencing mild depressive symptoms, which could be due to various factors such as stress, anxiety, or other psychological issues. Furthermore, the study has found a indicates that the prevalence of poor sleep quality among physicians could be a contributing factor to their mental health issues.

5. DISCUSSION

Acute sleep deprivation among healthcare providers, especially junior physicians, is due to long work hours and circadian disruption. Such sleep deprivation can significantly affect physician performance and patient safety. This study aims to examine how poor sleep quality affects physicians and its association with depression in Jazan, Saudi Arabia. The purpose is to assess doctors' sleep quality and determine the factors associated with poor sleep quality.

The study was conducted with 387 participants, 58.1% males and 41.9% females. The majority of the participants were Saudis and were under the age of 36. Most participants resided in the cities and were married. The majority of the participants were not smokers but did not exercise regularly. A small percentage of participants reported having psychological issues, while around a quarter used medication for a medical condition. Over half of the study participants reported working over 41 hours

In this study, we observed a higher nonresponse rate with the self-administered questionnaires than with other surveys we conducted. We have identified several challenges, such as difficulty coordinating with hospital administrations and encountering technical issues with the questionnaire links or forms. These insights will help us implement strategies to improve data collection in future studies, such as refining the questionnaire design and considering alternative data collection methods to address nonresponse issues and technical challenges.

7. CONCLUSION

This study aimed to assess the quality of sleep among physicians in Jazan and identify potential risk factors. The results revealed that a significant majority of the participants, around 81%, had poor sleep quality. Furthermore, the study found that many physicians experience mild depressive symptoms, and there is a positive correlation between poor sleep quality and depression. In addition, it was found that several factors, such as age, sex, monthly income, years of service, and number of on-call shifts per month, were associated with poor sleep quality. Based on these findings, we recommend implementing more interventions to improve sleep quality among physicians. These interventions should include psychological awareness and social support during their careers. Additionally, we recommend focusing on the quality and quantity of sleep hours in physicians' shift schedules to reduce the incidence of depression resulting from poor sleep quality. This ensures that physicians are well-rested and healthy and can provide top-quality patient care.

8. RECOMMENDATIONS

To effectively tackle the issue of poor sleep quality and its connection to depression, especially among physicians in Jazan, healthcare organizations represented by the Ministry of Health must focus on sleep health education, educate work-life balance, provide mental health support, cultivate supportive, healthy work environments, and implement sleep-friendly policies. Policymakers must thoroughly review labor laws, ensure fair compensation, and actively support healthcare workers. We need more research addressing this issue in the health care provider and the community in the area by including more risks not included in previous studies.

this study found no association between poor sleep quality and gender among physicians, a result that may contradict previous literature. This discrepancy could be explained by a hidden confounding factor that affects sleep quality differently across genders. In the Jazan region, Mohamed Salih Mahfouz et al. estimated the prevalence of khat chewing at 33.2%. Furthermore, a study by Mehmet Yilmaz et al. conducted in Ethiopia among individuals with neurosis indicates that khat chewers are 1.58 times more likely to experience poor sleep quality [44]. Therefore, the regional habit of khat chewing may alter the analytical assessment of sleep quality in this population."

The chi-square test results indicate a significant association between poor sleep quality and material status, years of service, working hours per week, and on-call monthly

shifts. The logistic regression analysis investigated factors that could influence poor sleep quality. The results revealed that several factors were significantly associated with poor sleep quality. These factors included sex, age, years of service, number of on-call shifts per month, and monthly income. According to the findings, males were three times more likely to have poor sleep quality than females. This finding was consistent with a previous study conducted among medical workers in China, which also demonstrated that male workers were associated with poor sleep quality [23].

Furthermore, the study showed that participants between the ages of 25 and 30 were at a higher risk of poor sleep quality. Contrarily, individuals with less than five years of service and less than five on-call shifts per month were less likely to experience poor sleep quality. Additionally, the study found that individuals with a lower monthly income were more likely to have poor sleep quality than those with a higher income. Moreover, the study found that individuals who smoked, had psychological issues, and used medication for a medical condition were more likely to have poor sleep quality. However, this result was not statistically significant. Overall, this study highlights various factors contributing to poor sleep quality, which could help develop interventions to improve sleep quality among physicians.

6. LIMITATION OF THIS STUDY

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