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Sleep Disorder among Healthcare Workers

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Abstract

Sleep disorders among healthcare workers, often underestimated, significantly impact their physical and mental well-being and professional performance. The current study aims to assess their frequency, consequences, and associated factors. Interns and residents from a Moroccan university hospital participated in an assessment of sleep quality (Pittsburgh Sleep Quality Index-PSQI) and the impact of shifts on their professional and personal lives. Among the 238 surveyed physicians, 62.2% presented a pathological PSQI score (PSQI >5) with an average of 6.68. Prevalent issues included poor daytime function (44%), sleep duration (27.7%), subjective sleep quality (24.4%), sleep latency (23.5%), sleep disturbances (19.3%) and use of sleep medication (15%). While 59.2% experienced impaired professional performance due to poor sleep quality. After shift, 83.7 % felt fatigue, 57.1% headaches, and 35.3% reported diffuse pain. Mood disorders affected 56.3%, and psychological symptoms affected 65.5%. These percentages illustrate the negative impact of stress and fatigue related to shifts on physician's mental health, exacerbated by coffee use (56.3%) and smoking (10.9%). The current study highlights the high prevalence of sleep disorders among healthcare workers and suggests a potential link between sleep health and professional performance among interns and residents in developing countries.

Key words: sleep disorder, work performance, physician mental health, work-related stress.

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Novelty and Significance

What is already known about the topic?

- Sleep disorders are common among healthcare professionals, especially in high-stress environments such as hospitals.
- Irregular working hours, night shifts, and work-related stress have been identified as major contributors to sleep disturbances in this population.
- Previous studies have shown that poor sleep quality negatively impacts both the health and performance of healthcare workers.

What this paper adds?

- This study focuses on the prevalence and impact of sleep disorders among healthcare professionals in a region underrepresented in sleep research.
- It explores the relationship between sleep disorders and professional performance, offering insights into how sleep disturbances affect healthcare delivery.
- The paper highlights the importance of sleep health in healthcare settings, with recommendations for interventions.

Sleep is a complex and fundamental process for a healthy well-being, it is defined by a reduced consciousness which separates two periods of wakefulness (Léger, Ohayon, Beck, & Vecchierini, 2010). In addition to its essential role in several biological functions, including the maintenance of learning and memory functions, it also allows the regulation of metabolism as well as immunity (Ohayon & Sagales, 2010).

Sleep disorders constitute a real health problem that despite their frequency in the general population, they often remain unknown, neglected and therefore undertreated. As clinicians, a lack of sleep can compromise our somatic and mental health and our work performance, it increases the risk of errors and workplace accidents and decreases efficiency (Rabat, 2022) with consequences on the performance of the medical team.

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This has a significant impact on the quality of care provided to patients who have the right to have a healthy doctor, a vigilant, competent, responsible and responsive doctor (Schlafer, Wenzel, & Högl, 2014). The obligation of continuity of care often imposes sustained work rhythms as well as irregular hours (Le Lan & Baubeau, 2004). This issue raises the question of what is the prevalence of sleep disorders among caregivers and how do they affect them? What are the factors associated with these disorders? and how they could be better managed to improve the quality of life and professional performance of caregivers?

The objectives of this study were to evaluate the prevalence of sleep disorders in caregivers, identify the risk factors associated with sleep disorders, and to explore the consequences of sleep disorders on quality-of-life safety at work and the professional performance of caregivers.

Method

Participants

The study included medical residents and interns currently enrolled in the training program at Ibn Rochd University Hospital. An electronic questionnaire was distributed to participants via group emails and social media networks. A total of 238 physicians took part in the survey, with a Mean age of 26.3 years (*SD*= 1.74), and a sex ratio of 0.56, reflecting a higher proportion of female participants. The majority of participants worked in the medical department (64.3%), followed by surgery (21%) and intensive care (14.7%). The participation was voluntary, and respondents were informed about the study's objectives, the confidentiality of their responses, and their right to withdraw without consequence. Participants were informed about the study's purpose and the confidentiality of their responses. All data were anonymized, and consent was implied upon completion of the questionnaire. No financial or non-financial incentives were provided for participation.

Design

This is a cross-sectional descriptive study conducted at Ibn Rochd University Hospital (Casablanca, Morocco), targeting medical residents and interns from various specialties. The study aimed to assess sleep quality, sleep habits, and the impact of poor sleep on daily functioning.

Instruments and Measures

Sociodemographic Data. Using a questionnaire data were collected on demographic information of participants, including age, sex, professional specialty, and year of training. Participants were also asked whether they were currently being treated for a chronic physical condition (e.g., diabetes, cardiovascular or respiratory disease) using a yes/no question, referred to in the analysis as "Followed for Organic Disease".

Sleep Habits. Using a questionnaire participants provided information about their sleep habits, including bedtime, wake-up time, time taken to fall asleep, and any difficulty falling asleep. This section also assessed the impact of sleep quality on daytime functioning, particularly in terms of fatigue and concentration difficulties.

Pittsburgh Sleep Quality Index (CMI; Pendleton *et alii*, 2004). (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). PSQI is a self-rated questionnaire composed of 19 items classified into 7 components: subjective sleep quality, sleep onset latency (time

taken for the transition from full wakefulness to sleep), sleep duration, habitual sleep efficiency (ie, the percentage of time in bed that one is asleep), sleep disturbances, use of sleeping medication, and daytime dysfunction during the past month. Each component is weighted from 0 to 3, generating one global score ranging from 0 to 21. Poor sleep quality is indicated by total score of 5 or greater, while good sleep quality is indicated by a score of less than 5. It would give a diagnostic sensitivity of 89.6% and a specificity of 86.5% (kappa= 0.75, p <.001) to distinguish good and bad sleepers (Costa *et alii*, 2021).

Data Analysis

Descriptive statistics were used to summarize sociodemographic characteristics, sleep habits, and PSQI scores. The prevalence of poor sleep quality (PSQI >5) was calculated. Chi-square tests were used to explore associations between sociodemographic factors (e.g., gender, specialty, year of training) and sleep quality. Multivariate analysis was employed to examine the relationship between sleep habits, work-related factors, and sleep disturbances.

RESULTS

Table 1 shows sociodemographic data, and repors of quality of sleep of the partipants, along with the results of PSQI application The study revealed that 62.2% of healthcare workers experienced sleep disorders, with the highest prevalence among surgical specialists (72%), followed by intensive care specialists (65%) and medical specialists (58%). The average global PSQI score was 6.68 (*SD*= 3.1), indicating poor sleep quality. While many participants rated their sleep as average, objective measures showed moderate to severe sleep disturbances, with high levels of daytime dysfunction, sleep latency, and disturbances.

Table 1. Sociodemographic data of the sample and results of the PSQI application (*N*= 238)

Variables		*n* (%)	Quality of Sleep *n* (%)					*p*
			Very good	Good	Average	Poor	Very poor	
Age range	25-27 years	157 (66%)	4 (2.5%)	34 (21.8%)	83(53.2%)	34 (21.8%)	7 (4.5%)	
	Other	81 (44%)						
Gender	Female	153 (64%)	4 (2.6%)	34 (22.2%)	76 (49.7%)	32 (20.9%)	7 (4.6%)	.77
	Male	85 (35.7%)	2 (2.4%)	18 (21.2%)	49 (57.6%)	13 (15.3%)	3 (3.5%)	
Marital Status	Married	22 (9%)	0	4 (18.2%)	15 (68.2%)	2 (9.1%)	1 (4.5%)	.59
	Single	216 (91%)	6 (2.8%)	48 (22.2%)	110 (50.9%)	4 (19.9%)	9 (4.2%)	
Specialty	Medicine	154 (64.3%)	10 (6.5%)	39 (25.5%)	68 (44.4%)	32 (20.9%)	4 2.6%)	.023
	Surgery	50 (21%)	1 (2%)	9 (18%)	33 (66%)	7 (14%)	0	
	Intensive Care	35 (14.7%)	0	1 (2.9%)	24 (68.6%)	6 (17.1%)	4 (11.4%)	
Psychiatric History	No	209 (87.8%)	6 (2.9%)	48 (23%)	115 (55%)	36 (17.2%)	4 (1.9%)	<.001
	Yes	29 (12.2%)	0	4 (13.8%)	10 (34.5%)	9 (31%)	6 (20.7%)	
Currently treated for an organic disease	No	204 (85.7%)	6 (3%)	48 (23.6%)	108 (53.2%)	33 (16.3%)	8 (3.9%)	.73
	Yes	34 (14.3%)	0	4 (11.8%)	16 (47.1%)	12 (35.3%)	2 (5.9%)	
PSQI scores	Subjective sleep quality			1.03 ± 0.77				
	Sleep latency			1.34 ± 1.01				
	Sleep duration			1.13 ± 0.92				
	Sleep efficiency			0.21 ± 0.54				
	Sleep disturbance			1.13 ± 0.57				
	Medication intake			0.45 ± 0.89				
	Feeling out of shape during the day			1.39 ± 0.85				
	PSQI Total			6.68 ± 3.1				

A significant association was found between sleep quality and specialty (χ^2= 7.30, p= .026). A significant association was also found between sleep quality and psychiatric history (χ^2= 15.49, p <.001).

No significant associations were found between sleep quality and age, gender, marital status, or whether participants reported being treated for an organic disease (χ^2= 0.12, p= .73).

The variable "Currently trated for organic disease" referred to participants who self-reported currently receiving medical treatment for chronic physical health conditions (e.g., asthma, diabetes), as assessed via a closed-ended item in the sociodemographic questionnaire.

Table 2 shows results about sleep habits, sleep-related issues, substance use and alteration in professional performance among participants. Regarding sleep habits, 74% of physicians who experienced night-time or early morning awakenings had sleep disorders, and 84% of those with a sleep onset latency greater than 30 minutes exhibited a sleep disorder. Additionally, 90% of physicians with sleep disorders reported difficulty falling asleep one to three times a week, and 82% of those sleeping less than six hours experienced sleep disorders. Among those with respiratory disturbances during sleep, 90% had a PSQI score above 5.

Table 2. Sleep habits, sleep-related issues, substance use and alteration in professional performance among healthcare workers (N= 238).

Variables				Frequency (%)
Sleep habits	Bedtime		Before 11 PM	36 (15.1)
			Between 11 PM and Midnight	99 (41.6)
			After Midnight	103 (43.3)
	Wake-up time		Before 6 AM	63 (26.5)
			Between 6 AM and 8 AM	93 (39.1)
			After 8 AM	82 (34.5)
	Sleep latency (time to fall asleep)		Less than 15 minutes	79 (33.2)
			Between 16 and 30 minutes	96 (40.3)
			Between 31 and 60 minutes	61 (25.6)
			More than 60 minutes	2 (0.8)
	Difficulty falling asleep by specialty		Medicine	168 (70.6)
			Surgery	162 (68)
			Intensive Care	156 (65.6)
	Frequency of medication use		Less than once a week	21 (8.82)
			Not in the last month	181 (76.05)
			Three or more times a week	14 (5.88)
			Once or twice a week	22 (9.24)
Impact during the day	Problem with enthusiasm during social activities		No problems	47 (19.75)
			Only a very small problem	80 (33.61)
			Somewhat of a problem	83 (34.87)
			A very big problem	28 (11.76)
	Difficulty staying awake during daily activities		Less than once a week	69 (28.99)
			Not in the last month	95 (39.92)
			Three times or more per week	16 (6.72)
			Once or twice a week	58 (24.37)
	Alteration in professional performance		Altered decision-making abilities	47 (19.7)
			Slowed reaction time	95 (39.9)
			Concentration issues	126 (52.9)
			Decision-making errors	36 (15.1)
			Accidents	27 (11.3)
	Consumption of toxic substances and stimulant products	Before on-call	Coffee or Tea	134 (56.34)
			Tobacco	26 (10.92)
			Cannabis	3 (1.26)
			Hypnotic medication	3 (1.26)
			Energy drinks	19 (7.98)
		During on-call	Coffee or Tea	112 (47.06)
			Tobacco	27 (11.34)
			Cannabis	3 (1.26)
			Hypnotic medication	2 (0.84)
			Energy drinks	25 (10.50)
		After on-call	Coffee or Tea	52 (21.84)
			Tobacco	9 (3.78)
			Cannabis	3 (1.26)
			Hypnotic medication	6 (2.52)
			Energy drinks	5 (2.10)

When evaluating subjective sleep quality, 52.1% considered their sleep quality average, while 21.8% rated it as good. The majority of physicians taking medication to fall asleep (91.2%) suffered from sleep disorders. Regarding daytime functioning, 34.9% of participants reported a moderate impact on their motivation, while 39.9% did not report difficulties staying awake while driving, walking, or engaging in social activities.

A statistically significant association was found between sleep disorders and specialty (χ^2= 7.30, p= .026), nocturnal or early morning awakenings (χ^2= 4.67, p= .031), sleep onset latency (χ^2= 11.57, p <.001), difficulty falling asleep (χ^2= 8.89, p= .003), sleep duration (χ^2= 14.71, p <.001), respiratory disorders (χ^2= 5.14, p= .023), and medication use (χ^2= 17.53, p <.001).

Furthermore, 75.06% of physicians experiencing work-related stress suffered from sleep disorders, and 59.2% admitted to making professional errors due to fatigue or sleep disturbances. In terms of consumption habits during shifts, 56.3% drank coffee or tea before their shift, and 11.3% used tobacco. (see Table 2)

Discussion

Our study revealed a high prevalence of sleep disorders among healthcare workers, affecting 62.2% of participants. This finding is consistent with several previous studies (Philibert, 2005; Azzez, Abdulah, Piro, & Alhakem, 2019), but it also highlights the unique context of healthcare workers in Morocco, a region that has been underrepresented in sleep disorder research. A meta-analysis by Pappa *et alii* (2020) reported an overall prevalence of sleep disorders among physicians at 38.9%. However, our study showed a significantly higher percentage of sleep disorders among surgical residents (72%) compared to medical and intensive care specialists (58% and 65%, respectively). This discrepancy may be explained by the intense workload and stress levels commonly experienced in surgical specialties, a finding consistent with previous studies (Philibert, 2005). These findings also align with Banfi *et alii* (2019), who observed similar trends in surgical residents under increased workload conditions.

In terms of the relationship between specialty and sleep quality, we found a significant association with surgical specialists exhibiting the highest rates of sleep disturbances. This finding confirms the impact of work-related stress and long working hours on sleep quality in certain medical specialties, as previously discussed in the literature. However, unlike some studies, our findings showed no significant association between sleep quality and psychiatric history nor did we observe a link between sleep disorders and organic disease. These findings differ from previous research, which suggested that mental health and chronic physical health conditions could exacerbate sleep difficulties (Siddiqui *et alii*, 2016). The lack of significant association in our study may be due to the fact that workplace stress and long shifts may have a greater impact on sleep quality than personal medical conditions.

Work-related stress was a major contributing factor to poor sleep quality in our study, with 75.06% of physicians experiencing work-related stress reporting sleep disturbances. This finding is consistent with other studies that have linked stress to sleep deprivation among healthcare workers. In addition, 59.2% of participants admitted to making professional errors due to fatigue or sleep disturbances, highlighting the adverse impact of sleep disorders on professional performance.

Regarding sleep habits, we observed that 74% of physicians who experienced night-time or early morning awakenings had sleep disorders, and 84% of those with a

sleep onset latency greater than 30 minutes exhibited a sleep disorder. These findings reinforce the importance of addressing sleep onset latency and sleep duration as modifiable factors in improving sleep quality, as suggested by Siddiqui *et alii* (2016). Additionally, 90% of physicians with sleep disorders reported difficulty falling asleep one to three times a week, and 82% of those sleeping less than six hours experienced sleep disorders. These findings are in line with other studies that have emphasized the relationship between sleep duration and sleep quality in healthcare workers.

In contrast to previous studies, our research found a strong correlation between medication use and poor sleep quality with 91.2% of those using sleep medications reporting sleep disturbances. This suggests that self-medication may be prevalent among healthcare professionals, who often turn to sleep aids to cope with fatigue caused by irregular working hours. This is consistent with findings by Montgomery *et alii* (2011), who reported high rates of self-medication in healthcare workers.

Interestingly, our study found that 56.3% of physicians drank coffee or tea before their shifts, and 11.3% used tobacco. Both habits were associated with higher rates of sleep disturbances, highlighting the role of lifestyle factors in sleep quality. This finding is consistent with Alaska *et alii* (2022), who identified caffeine consumption as a factor contributing to poor sleep in healthcare workers.

Overall, the findings of our study underline the significant role of workplace stress, irregular hours, and poor sleep habits in contributing to sleep disorders among healthcare workers. Interventions such as stress management programs, improved work schedule design, and promotion of good sleep hygiene could help mitigate the negative effects of irregular work hours on sleep quality. This aligns with the recommendations of Besson *et alii* (2021), who emphasized the importance of addressing workplace stress in healthcare settings to improve the well-being and professional performance of healthcare workers.

However, it is important to note that the relatively small sample size of 238 physicians limits the generalizability of our findings. The study was conducted at a single institution in Morocco, and its results may not be directly applicable to healthcare professionals in other countries or regions with different work environments or cultural contexts. Future studies with larger, more diverse samples are needed to better understand the global prevalence of sleep disorders among healthcare workers and to refine strategies for their management.

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