

Poor Sleep Quality and Associated Factors among Healthcare Workers in a Tertiary Care Hospital in North Kerala: A Cross-sectional Study

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ABSTRACT

Background and Objectives: Sleep is a vital determinant of physical and mental well-being, particularly among healthcare workers who are exposed to demanding work schedules, shift duties, and occupational stress. Poor sleep quality adversely affects health, job performance, and patient safety. The present study aimed to estimate the prevalence of poor sleep quality and identify its associated factors among healthcare workers in a tertiary care hospital in Wayanad, Kerala. **Methodology:** A hospital-based cross-sectional study was conducted among 204 healthcare workers employed at a tertiary care teaching hospital in Wayanad, Kerala. Participants were selected using stratified random sampling. Data were collected using a structured questionnaire comprising sociodemographic details, occupational characteristics, lifestyle factors, and the Pittsburgh Sleep Quality Index (PSQI). A global PSQI score >5 was considered indicative of poor sleep quality. Data were analysed using appropriate jamovi 2.3.28.0. Associations between sleep quality and independent variables were assessed using the Chi-square test and multivariable logistic regression. A $P < 0.05$ was considered statistically significant. **Results:** A total of 204 healthcare workers were included in the study, with females constituting 57.4% of the participants. The prevalence of poor sleep quality was 48.5%. Poor sleep quality was significantly associated with smartphone use after 9 PM, working more than 10 h/day, hypertension, and high caffeine consumption ($P < 0.05$). On multivariable logistic regression, smartphone use after 9 PM (adjusted odds ratio [AOR] 2.31, 95% confidence interval [CI] 1.29–4.12) and hypertension (AOR 1.94, 95% CI 1.05–3.60) remained independent predictors of poor sleep quality. **Conclusion:** Poor sleep quality affected a substantial proportion of healthcare workers, underscoring its importance as an occupational health issue. Alcohol consumption emerged as the only significant correlate of poor sleep quality, suggesting that behavioral factors may have a greater influence than demographic or workplace characteristics in this setting. Incorporating sleep health assessment into occupational health programs and promoting healthy lifestyle practices may improve healthcare workers' well-being and work performance.

Keywords: Healthcare workers, Poor sleep quality, Pittsburgh sleep quality index

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INTRODUCTION

Sleep is an integral part of human physiology; it could be refreshing and healing. Therefore, disorders of sleep may result in significant derangement in human functionality. The need for getting sufficient sleep cannot be overemphasized. Lack of sufficient sleep has been associated with significant weight gain, cardiovascular diseases such as hypertension, and neurologic disorders such as Alzheimer's disease and stroke.^[1,2] The objectives of this study were to estimate the prevalence of poor sleep quality among healthcare workers and to determine the association between poor sleep quality and lifestyle factors. Understanding the burden of poor sleep quality and the influence of modifiable lifestyle behaviors is essential for developing targeted interventions that promote the health, well-being, and work performance of healthcare professionals.

According to Centers for Disease Control and Prevention, good sleep quality is characterized by the ability to fall asleep quickly, sleep through the night with few awakenings, and wake up feeling well-rested.^[17] Sleep quality is a broad concept that includes several measures such as sleep latency, sleep efficiency, sleep disturbances, sleep duration, and use of sleeping medication, among others.^[10] Poor sleep quality is considered one of the most striking public health problems, with rates increasing in both developing and modern societies.^[3,4] The global burden of poor sleep quality has gained increasing recognition, with studies linking it to impaired cognitive performance, decreased productivity, and mental health disorders such as depression

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and anxiety.^[20,21] Sleep disturbances also impose a considerable economic cost due to increased healthcare utilization and reduced workplace efficiency.^[22]

Poor sleep quality and excessive daytime sleepiness are highly prevalent among doctors, especially those who are lower in the hierarchy.^[11] These factors lead to medical errors and poor patient care. Shift work systems have been recognized as significant contributors to the heightened risk of overweight and obesity in healthcare professionals.^[12,13] Considering the demanding nature of healthcare professions, understanding sleep quality and its associated factors among healthcare professionals is crucial to ensure their well-being and optimal performance. Therefore,

this study aims to assess sleep quality and identify the factors associated with it among healthcare professionals in a tertiary care setting, providing evidence for targeted interventions to promote their health and work efficiency.

Emerging evidence also suggests that poor sleep quality among healthcare professionals is associated with burnout, emotional exhaustion, and reduced empathy toward patients, ultimately compromising the quality of care delivered.^[25] Sleep deprivation impairs attention, decision-making, and psychomotor performance, which are critical in medical practice where errors can have severe consequences.^[26] Moreover, lifestyle factors such as caffeine consumption, irregular eating habits, and increased use of digital devices have been shown to exacerbate sleep disturbances among professionals working in high-stress environments.^[27,28]

Rationale

Sleep plays a key role in maintaining both physical and mental health. However, in today's fast-paced lifestyle, poor sleep quality has become increasingly common, especially among healthcare workers. This study is highly relevant as it aims to explore the link between sleep quality and various health conditions, including obesity, diabetes, hypertension, and cardiac disorders. The study hopes to highlight the need for better sleep awareness and habits. The findings are expected to reveal key factors that contribute to poor sleep and how they increase the risk of medical comorbidities. This can help in early identification and prevention strategies. Ultimately, the study will provide valuable insights for the medical community and help improve patient care and the overall well-being of healthcare workers.

METHODOLOGY

Study Design

This was a cross-sectional study.

Study Setting

This was a tertiary care hospital in Wayanad.

Study Period/Duration

The study period was 4 months.

Study Participants

Selection process

Healthcare workers will be identified from the hospital in various departments and will be selected by stratified random sampling.

Inclusion criteria

1. Health care workers in the age group of about 30–65 years of age
2. Health care workers who are willing to participate in the study are chosen.

Exclusion criteria

1. Psychiatric illness
2. Cognitive impairment
3. Patient with long term sedative medications.

Sample size

Sample size was collected based on the formula.

$$N = Z^2 pq / l^2$$

$$= 4pq / l^2$$

$$= 4 \times 48 \times 52 / 49 \quad (l=7)$$

$$l = \text{absolute error } N=204.$$

Taking prevalence from a study conducted in Nepal in 2024 by Bikram Kafle, Suraj Tiwari, Arpana Pokhrel, Rajesh Shrestha, Yashoda Bagale, Nabin Pahari, the prevalence was 48.03%, and according to that, the sample size was found to be 204.^[9]

The dependent variable was sleep quality, which was assessed using the Pittsburgh Sleep Quality Index (PSQI).

The independent variables included age, gender, and profession. Lifestyle-related variables such as screen time, caffeine consumption, sleep duration, and physical activity were also included. In addition, the presence of lifestyle disorders, including obesity, diabetes mellitus, and hypertension, was assessed as independent variables.

Short Description of Conduct of Study

This cross-sectional observational study will be conducted among healthcare workers at Dr. Moopen's Medical College. The healthcare workers included in this project are doctors, nurses, paramedical staff, and Class IV workers.

The primary aim of the study is to assess the quality of sleep and identify its association with lifestyle conditions such as obesity, hypertension, and other related health issues in healthcare workers. The study will also explore potential lifestyle and demographic factors influencing sleep quality. A stratified random sampling will be used to select 204 healthcare workers from a tertiary care hospital. The population will be stratified into 4 groups: Doctors, nurses, paramedical staff, and class 4 workers. Participants will be selected proportionally from each strata based on the respective workforce in the hospital using simple random sampling, with each strata, that is, 51-doctors, 51 nurses, 51-paramedical staffs, and 51-class 4 workers, to ensure a representative sample. Data will be collected through a questionnaire consisting of two parts. The first part includes demographic details, lifestyle habits, and medical history, including the presence of comorbidities. The second part includes the PSQI, a standardized and validated tool used to assess sleep quality.

Participants will complete the questionnaire either in person or through a secure online form. The questionnaire will be provided 1 week before data collection to understand and familiarize the questions so that an accurate data can be obtained. Data confidentiality will be strictly maintained, and participation will be voluntary. No personally identifiable information will be collected to ensure anonymity and honest reporting.

In a tertiary care hospital, Class IV health care workers (also known as Group D or support staff) are essential personnel who carry out non-clinical, manual, and operational support tasks that enable the smooth functioning of the healthcare facility. Class IV workers include Ward Attendants/Ayahs, Sweepers/ Sanitation Staff, Hospital Attendants, Kitchen and Laundry Workers, and Waste Handlers.^[19] Data management and Statistical analysis details.

All responses will be tabulated by the investigator using Microsoft Excel 2019 software. Statistical analysis of all data will be

made using JAMOV 2.3.28. Data will be analysed in the form of mean, standard deviation, and percentage.

RESULTS

The present cross-sectional study was carried out among 204 healthcare workers in a tertiary care hospital to assess the prevalence of poor sleep quality among them. The observations of the present study are mentioned as:

- Sociodemographic factors and lifestyle factors
- Prevalence of poor sleep quality
- Association between sociodemographic factors and lifestyle factors with poor sleep quality.

Study Population

A total of 204 healthcare workers were enrolled in the study. The majority were female (57.4%), married (67.2%), and belonged to the Hindu religion (48.0%). Nearly two-thirds (63.7%) held a professional degree, and the distribution across job categories was balanced, with Class IV workers, Doctors, and Nurses each comprising 25% of the sample, while Lab Technicians and Pharmacists together accounted for 25%. Most participants (52.0%) had 0–5 years of work experience, worked 7–10 h/day (66.7%), and belonged to the middle socioeconomic stratum (47.5%). Among lifestyle factors, 66.7% consumed 1–2 cups of caffeine daily, 74.5% were non-alcoholics, and only 12.3% reported smoking. Regarding phone usage after 9 PM, 42.6% reported always using their phones, while only 6.9% reported never doing so. Among comorbidities, 27.5% had diabetes, 28.4% had hypertension, and 5.9% had a cardiac disorder [Table 1].

Prevalence of Poor Sleep Quality

The overall prevalence of poor sleep quality among healthcare workers was 43.9% (89/204). More than half of the participants (56.1%) reported good sleep quality [Table 2].

Bivariate Analysis of Factors Associated with Poor Sleep Quality

In the bivariate analysis using the Chi-square test, alcohol consumption was the only factor significantly associated with poor sleep quality. Healthcare workers who consumed alcohol had a 55.8% prevalence of poor sleep compared to 39.5% among non-consumers ($\chi^2 = 4.18$; $P = 0.041$).

Although caffeine intake >2 cups/day showed a higher prevalence of poor sleep (56.8% vs. 39.0%), this association did not reach statistical significance ($P = 0.113$). Similarly, sex ($P = 0.785$), working hours ($P = 0.177$), phone usage after 9 PM ($P = 0.154$), smoking ($P = 0.368$), exercise ($P = 0.917$), diabetes ($P = 0.891$), and hypertension ($P = 0.683$) showed no significant associations with sleep quality [Table 3].

Logistic Regression Analysis: Predictors of Poor Sleep Quality

In the unadjusted logistic regression analysis, caffeine intake >2 cups/day (odds ratio [OR] = 2.27; 95% confidence interval [CI]: 1.09–4.73; $P = 0.026$) and alcohol consumption (OR = 2.16; 95% CI: 1.11–4.22; $P = 0.023$) were significantly associated with poor

Table 1: Sociodemographic, lifestyle, and clinical characteristics of study participants ($n=204$)

Characteristic	Category	n (%)
Sex	Female	117 (57.4)
	Male	87 (42.6)
Marital status	Unmarried	62 (30.4)
	Married	137 (67.2)
	Divorced	5 (2.5)
Religion	Hindu	98 (48.0)
	Muslim	55 (27.0)
	Christian	51 (25.0)
Education level	Below graduation	34 (16.7)
	Graduate	40 (19.6)
	Professional degree	130 (63.7)
Job title	Class IV worker	51 (25.0)
	Doctor	51 (25.0)
	Lab technician/pharmacist	51 (25.0)
	Nurse	51 (25.0)
Years of experience	0–5 years	106 (52.0)
	6–10 years	43 (21.1)
	>10 years	55 (27.0)
Working hours	<6 h	21 (10.3)
	7–10 h	136 (66.7)
	>10 h	45 (22.1)
Socioeconomic status	Lower	11 (5.4)
	Lower middle	22 (10.8)
	Middle	97 (47.5)
	Upper middle	60 (29.4)
Type of family	Upper	14 (6.9)
	Extended nuclear	10 (4.9)
	Joint	46 (22.5)
Caffeine intake	Nuclear	148 (72.5)
	None	24 (11.8)
	1–2 cups/day	136 (66.7)
Smoking	>2 cups/day	44 (21.6)
	Yes	25 (12.3)
Alcohol consumption	No	179 (87.7)
	Yes	52 (25.5)
Exercise	No	152 (74.5)
	Never	33 (16.2)
	Rarely	49 (24.0)
	×2–3/week	58 (28.4)
Phone use after 9 PM	Daily	64 (31.4)
	Never	14 (6.9)
	Sometimes	56 (27.5)
	Often	47 (23.0)
Diabetes	Always	87 (42.6)
	Yes	56 (27.5)
Hypertension	No	148 (72.5)
	Yes	58 (28.4)
Cardiac disorder	No	146 (71.6)
	Yes	12 (5.9)
	No	192 (94.1)

Table 2: Prevalence of poor sleep quality among healthcare workers ($n=204$)

Sleep quality	n	Percentage
Good	115	56.1
Poor	89	43.9
Total	204	100

sleep quality. Sex ($P = 0.651$), working >10 h ($P = 0.083$), and phone usage after 9 PM ($P = 0.350$) did not show significant associations.

After adjusting for all other variables in the multivariable logistic regression model, caffeine intake >2 cups/day (adjusted odds ratio [AOR] = 2.34; 95% CI: 1.10–5.01; $P = 0.028$) and alcohol consumption (AOR = 2.11; 95% CI: 1.04–4.27; $P = 0.039$) remained statistically significant independent predictors of poor sleep

Table 3: Bivariate analysis of factors associated with poor sleep quality (n=204)

Variable	Categories	Poor sleep n (%)	Good sleep n (%)	χ^2	P-value
Sex	Female	52 (44.4)	65 (55.6)	0.074	0.785
	Male	37 (42.5)	50 (57.5)		
Marital status	Divorced	1 (20.0)	4 (80.0)	2.39	0.303
	Married	57 (41.6)	80 (58.4)		
	Unmarried	31 (50.0)	31 (50.0)		
Religion	Christian	21 (41.2)	30 (58.8)	0.202	0.904
	Hindu	43 (43.9)	55 (56.1)		
	Muslim	25 (45.5)	30 (54.5)		
Type of family	Extended nuclear	5 (50.0)	5 (50.0)	0.6	0.741
	Joint	18 (39.1)	28 (60.9)		
	Nuclear	66 (44.6)	82 (55.4)		
Education level	Below graduation	17 (50.0)	17 (50.0)	1.917	0.383
	Graduate	20 (50.0)	20 (50.0)		
	Professional degree	52 (40.0)	78 (60.0)		
Job title	Class IV worker	19 (37.3)	32 (62.7)	2.133	0.545
	Doctor	21 (41.2)	30 (58.8)		
	Technician/pharmacist	26 (51.0)	25 (49.0)		
	Nurse	23 (45.1)	28 (54.9)		
Experience	0–5 years	48 (45.3)	58 (54.7)	0.418	0.811
	6–10 years	19 (44.2)	24 (55.8)		
	>10 years	22 (40.0)	33 (60.0)		
Working hours	<6 h	9 (42.9)	12 (57.1)	4.93	0.177
	7–10 h	63 (46.3)	73 (53.7)		
	>10 h	15 (33.3)	30 (66.7)		
Socioeconomic status	Lower	5 (45.5)	6 (54.5)	1.25	0.87
	Lower middle	12 (54.5)	10 (45.5)		
	Middle	41 (42.3)	56 (57.7)		
	Upper middle	25 (41.7)	35 (58.3)		
	Upper	6 (42.9)	8 (57.1)		
Caffeine intake	None	11 (45.8)	13 (54.2)	4.36	0.113
	1–2 cups	53 (39.0)	83 (61.0)		
	>2 cups	25 (56.8)	19 (43.2)		
Smoking	Yes	13 (52.0)	12 (48.0)	0.812	0.368
	No	76 (42.5)	103 (57.5)		
Alcohol consumption	Yes	29 (55.8)	23 (44.2)	4.18	0.041*
	No	60 (39.5)	92 (60.5)		
Exercise	Never	14 (42.4)	19 (57.6)	0.506	0.917
	Rarely	23 (46.9)	26 (53.1)		
	×2–3/week	26 (44.8)	32 (55.2)		
	Daily	26 (40.6)	38 (59.4)		
Phone use after 9 PM	Never	5 (35.7)	9 (64.3)	5.26	0.154
	Sometimes	18 (32.1)	38 (67.9)		
	Often	22 (46.8)	25 (53.2)		
	Always	44 (50.6)	43 (49.4)		
Diabetes	Yes	24 (42.9)	32 (57.1)	0.019	0.891
	No	65 (43.9)	83 (56.1)		
Hypertension	Yes	24 (41.4)	34 (58.6)	0.167	0.683
	No	65 (44.5)	81 (55.5)		

* $P < 0.05$ (statistically significant)

quality. Sex (AOR = 0.76; 95% CI: 0.41–1.43; $P = 0.401$), working >10 h/day (AOR = 0.52; 95% CI: 0.25–1.09; $P = 0.084$), and phone usage after 9 PM (AOR = 1.84; 95% CI: 0.52–6.42; $P = 0.342$) did not show statistically significant associations in the adjusted model [Figure 1].

DISCUSSION

The present study revealed a prevalence of poor sleep quality of 43.9% among healthcare workers in a tertiary care hospital in North Kerala. This finding is consistent with previous studies conducted in similar settings. A study conducted in Nepal among 127 healthcare workers found a prevalence of poor sleep quality of 48.03%^[7] while a study in Ethiopia reported a 58.9% prevalence among healthcare professionals.^[6]

Sociodemographic Findings

The study sample showed good representation across different demographic categories. The majority of participants were married (67.2%), belonged to the Hindu religion (48.0%), and came from nuclear family structures (72.5%). Most participants belonged to the middle socioeconomic class (47.5%) and held professional degrees (63.7%), reflecting the educational requirements in the healthcare profession.

The equal distribution across major job categories (Class IV workers, doctors, nurses – 25% each) ensured comprehensive representation of different levels of healthcare workers, from support staff to medical professionals. The majority of participants (52.0%) had 0–5 years of experience, indicating a relatively young workforce.

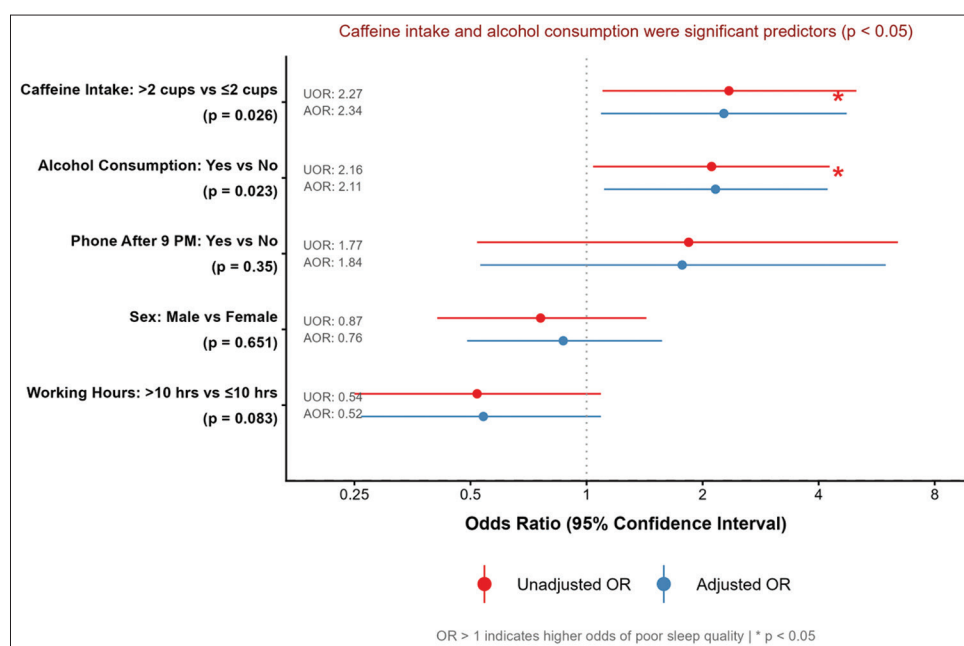


Figure 1: Unadjusted and adjusted odds ratios for predictors of poor sleep quality ($n=204$). * $P<0.05$ (statistically significant)

Work-Related Factors

Most healthcare workers (66.7%) worked 7–10 h/day, which is within normal working hours. However, 22.1% worked more than 10 h daily, which could contribute to sleep disturbances. Interestingly, working hours did not show a statistically significant association with poor sleep quality in this study ($P = 0.177$), contrary to what might be expected.

Lifestyle and Health Factors

The study revealed concerning lifestyle patterns among healthcare workers. A significant proportion (42.6%) reported always using phones after 9 PM, which could interfere with sleep hygiene. High caffeine consumption was common, with 66.7% consuming 1–2 cups daily and 21.6% consuming more than 2 cups daily. The prevalence of health conditions was notable: 27.5% had diabetes, 28.4% had hypertension, and 5.9% had cardiac disorders. These chronic conditions, while not significantly associated with sleep quality in our study, represent important comorbidities among healthcare workers.

The statistically significant association found was between alcohol consumption and poor sleep quality ($P=0.041$). Healthcare workers who consumed alcohol had a higher prevalence of poor sleep quality (55.8%) compared to non-consumers (39.5%). This finding is consistent with literature that shows alcohol can disrupt sleep architecture, leading to fragmented sleep and reduced sleep quality despite its initial sedative effects.^[8,9]

In Saudi Arabia, an institution-based study at a tertiary hospital reported that 70.4% of physicians and nurses had poor sleep quality. Factors associated with poor sleep included female sex, shift work, physical inactivity, and smoking.^[28,29]

In India, studies among healthcare providers have also shown high prevalence rates. One multicentric study reported that 82.3% of participants slept <7 h per night, and 30.7% experienced excessive daytime sleepiness. Another hospital-based study found that 53.6% of doctors and 66.0% of nurses reported poor

sleep quality, with coffee consumption identified as a significant influencing factor.^[30,31]

Similarly, research from Turkey during the COVID-19 pandemic found a prevalence of poor sleep quality of 56.7% among healthcare workers, with higher rates among nurses (67.3%). Female gender, being a nurse, fewer years of work experience, and low social support were associated with poor sleep.^[32]

A nationwide study of Italian nurses reported that 65.4% suffered from insomnia, with night-shift work and geographic variation significantly influencing prevalence.^[2] Similarly, a hospital-based study in Northern Italy found that nearly 80.3% of healthcare workers experienced sleep disorders, mainly insomnia, during the pandemic. Female gender, divorced marital status, chronic illness, and self-isolation were significant predictors of poor sleep.^[33]

The prevalence found in our study (43.9%) falls within the range reported in international literature. The Ethiopian study reported a higher prevalence (58.9%),^[6] which could be attributed to different healthcare system pressures, cultural factors, or methodological differences. The Nepalese study (48.03%)^[7] showed similar results to our findings, possibly due to comparable healthcare settings and work environments in South Asian countries.

Poor sleep quality has a negative impact in different areas related to physical health such as type 2 diabetes,^[5] hypertension,^[6] and higher levels of body mass index^[7] among other adverse consequences. Worldwide, the prevalence of sleep problems ranges from 1.6% to 56.0%.^[14–16]

In a study from China, observed that 27.4% (110/402) of the surveyed healthcare professionals reported poor sleep quality, with a higher prevalence among those who were overweight or obese compared to their normal-weight counterparts (36.1% vs. 22.5%, $p = 0.003$).^[18] In India, long working hours, inadequate rest periods, and frequent night duties make healthcare professionals particularly vulnerable to sleep problems.^[23] Despite this, limited research has been conducted on the prevalence and determinants of poor sleep quality among Indian doctors, highlighting the need for context-specific studies.^[24]

CONCLUSION

This cross-sectional study demonstrates a substantial burden of poor sleep quality among healthcare workers, with nearly two-fifths (43.9%) of participants reporting poor sleep quality. Among the sociodemographic, occupational, and lifestyle factors examined, alcohol consumption was significantly associated with poor sleep quality, with alcohol users having higher odds of poor sleep quality than non-users (OR 1.94). These findings highlight sleep health as an important occupational well-being concern among healthcare workers, given its potential implications for individual well-being, work performance, and patient safety. Workplace-based strategies promoting healthy sleep practices, sleep hygiene, and reduction of harmful alcohol consumption may help address this concern. Further multicentric longitudinal studies are warranted to establish temporal relationships and identify potentially modifiable determinants of poor sleep quality among healthcare worker.

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