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Sleep Quality and Stress Levels Among Nurses: A Single Center Study

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Abstract

The issue of nurses' sleep quality, which has a significant impact on their mental health, has not received enough attention. Nurses' stress and mental health can affect patient care, so poor sleep quality in nurses can lead to stress and patient harm. Thus, this study examines the relationship between sleep quality and stress in nurses at a university hospital in Kuantan, Malaysia. This cross-sectional study used convenience sampling. A total of 101 nurses in the hospital were recruited to complete a series of questionnaires, including the Pittsburgh sleep quality index (PSQI) and the depression anxiety stress scale 21 (DASS21). SPSS version 23.0 was used to analyze the data. Hypothesis testing was conducted with an independent sample t-test. The mean age of the participants was 27.2 ± 4.15 years; 88.1% of the participants were Malay and 98.0% were female. A total of 86.1% nurses reported having poor sleep quality. Most (76.2%) had normal stress levels, 9.9% were mildly stressed, and 5.0% were moderately stressed. According to the findings, 5.0% of nurses had extremely severe stress, and 4.0% had severe stress. Poor sleepers had a higher stress score (t 93.984 = -6.395, p < .001). This study suggests that sleep quality may have an impact on the psychological wellbeing of nurses. Thus, hospital administrations must address this issue for nurses to help them provide high-quality patient care.

Keywords: nurses, psychological wellbeing, sleep quality

Abstrak

Kualitas Tidur dan Tingkat Stres di Kalangan Perawat: Studi Pusat Tunggal. *Masalah kualitas tidur perawat, yang memiliki dampak signifikan pada kesehatan mental mereka, belum mendapatkan cukup perhatian. Stres dan kesehatan mental perawat dapat memengaruhi perawatan pasien, sehingga kualitas tidur yang buruk pada perawat dapat menyebabkan stres dan bahaya bagi pasien. Oleh karena itu, penelitian ini menguji hubungan antara kualitas tidur dan stres pada perawat di sebuah rumah sakit universitas di Kuantan, Malaysia. Studi potong lintang ini menggunakan sampel kenyamanan. Sebanyak 101 perawat di rumah sakit direkrut untuk mengisi serangkaian kuesioner, termasuk Indeks Kualitas Tidur* Pittsburgh *(PSQI) dan Skala Depresi Kecemasan Stres 21 (DASS21). SPSS versi 23.0 digunakan untuk menganalisis data. Pengujian hipotesis dilakukan dengan uji t independen. Usia rerata partisipan adalah 27,2 ± 4,15 tahun; 88,1% dari mereka adalah orang Melayu dan 98,0% perempuan. Sejumlah 86,1% perawat melaporkan memiliki kualitas tidur yang buruk. Sebagian besar (76,2%) memiliki tingkat stres normal, 9,9% mengalami stres ringan, dan 5,0% mengalami stres sedang. Berdasarkan hasil, 5,0% perawat mengalami stres sangat parah, dan 4,0% mengalami stres parah. Orang dengan tidur buruk memiliki skor stres yang lebih tinggi (t 93,984 = -6,395, p < 0,001). Studi ini menyarankan bahwa kualitas tidur dapat berdampak pada kesejahteraan psikologis perawat. Oleh karena itu, administrasi rumah sakit harus mengatasi masalah ini untuk membantu perawat memberikan perawatan pasien berkualitas tinggi.*

Kata Kunci: *kualitas tidur, perawat, psikologis perawat*

Introduction

Nursing professionals must deal with a heavy workload, work–family conflict, irregular schedules, and task complexity in the provision of daily patient care. These challenges may have a negative impact on nurses' sleep quality (Djupedal et al., 2022; Eun & Shin, 2020; Hwang & Yu, 2021). Sleep is essential for every human being to ensure good physical and psychological health. According to Manzoli et al. (2018), sleep can be defined as a "physiological condi-

tion and has two essential patterns: non-rapid eye movement (NREM) sleep and rapid eye movement (REM) sleep, when rapid eye movements, muscular hypotonia, or atonia are present."

For nurses, having good-quality sleep can improve the quality of care given to their patients. Nurses are the hospital organization's backbone supporting the hospital's operations. Their role is vital, as they take care of the patients around the clock. Hence, sleep quality is crucial for nurses so that they can provide optimal patient care.

Nonetheless, the issue of sleep quality among nurses has historically been overlooked. Work-related factors have been found to be associated with sleep disturbances among nurses (Kim-Godwin et al., 2021). Haile et al. (2019) study revealed that 25.6% of nurses suffered from shift work sleep disorder. According to Dong et al. (2020), the prevalence of sleep disturbances among clinical nurses in general hospitals in mainland China is 55%. Furthermore, Roskoden et al. (2017) found that nurses who work in shifts suffer from low sleep quality compared to non-shift nurses. A study conducted in Iran found that 56% of nurses experienced poor quality sleep, and those in the surgery department had the highest rate of poor sleep quality (Bazrafshan et al., 2018). Olawale et al. (2017) found that 48.6% of nurses in Najran, Saudi Arabia, experienced sleep disturbances. A study in educational hospitals in Iran showed that 95.5% of nurses had sleep problems, and in Sarang et al. (2019), 63% of nurses had poor sleep quality. This is supported by Tarhan et al. (2018), who found that 61.9% of nurses had sleep problems. Overall, the evidence indicates that nurses' sleep quality is poor.

Nena et al. (2018) reported that employees in tertiary university hospitals in Greece who worked shift work hours often felt unhappy and in a bad mood compared to those on regular office hours (8 am to 5 pm). Similarly, Zhang et al. (2016) reported that more than 70% of nurses in Shanghai, China, had poor sleep quality, stress, and "rotating shift work-related symptoms." A study conducted among nurses at Cibinong Regional Public Hospital showed that 57% had poor sleep quality (Rizky & Hendra, 2018). Compromised sleep quality may increase the risk of poor psychological wellbeing and decrease quality of life (Musa et al., 2018). In general, the demanding nature of this profession, coupled with long work hours, compassion fatigue, and inadequate support, may take a significant toll on nurses' psychological wellbeing. This was supported by Shi et al. (2020), who stated that nursing is a high-risk occupation with high exposure to stress. A cross-sectional study of 102 nurses in Australia by Maharaj et al. (2018) found that the prevalence of stress was 41.2%. Tran et al. (2019) also reported that 18.5% of nurses in Vietnam had elevated levels of stress. Ghazwin et al. (2016) revealed that 8.5% of nurses in Iran displayed mild to severe stress levels, and a study in Egypt and Saudi Arabia showed that the prevalence of stress among nurses was 55.9%, ranging from mild to severe (Arafa et al., 2021). Pérez-Fuentes et al. (2019) found that nurses with short sleep durations were likely to have increased levels of stress. In brief, nurses are at a high risk of experiencing poor sleep quality and stress due to the demanding nature of their job, which often involves long shifts, high work-loads, and exposure to critical situations.

As a result of stress, nurses may be unable to deliver good patient care. According to Tran et al. (2019), workplace stress can result in accidents, decreased productivity, and poor judgment. There are numerous studies on psychological wellbeing in Malaysia (Chan et al., 2021; Ibrahim et al., 2021; Samsudin et al., 2021), but a relative lack of studies specifically on nurses. The lack of information regarding the possible relationship between sleep quality and stress levels among nurses in Malaysia may impede the development of effective management strategies for improving the quality of care provided to patients as a result of these factors. This study aimed to determine the sleep quality and stress levels of nurses and the rela-

tionship between them.

Methods

This study was conducted at a public state university hospital in the east coast region of Peninsular Malaysia. A total of 101 male and female nurses participated in this study and were recruited using a convenience sampling method. The inclusion criteria of the participants included registered nurses of any gender who were currently working in the hospital. The exclusion criteria were those with a medical history of mental illness and those currently on prescribed sleeping medication. Invitations to participate in the online survey were sent to all registered nurses through email and social media. Prior informed consent was obtained, and the participants were informed that their participation was strictly voluntary.

To evaluate the overall quality of sleep, the Pittsburgh Sleep Quality Index (PSQI) was utilized. It is a self-reported assessment consisting of 19 items that measure subjective sleep during the past month. The items are rated on a 4-point Likert scale, from 0 (not during the past month) to 3 (three or more times a week). The PSQI comprises seven components: duration of sleep, habitual sleep efficiency, sleep onset latency, sleep disturbance, use of sleep medication, and daytime dysfunction. The scores of these seven components are summed up to obtain a single global PSQI score, which ranges from 0 to 21. To classify sleep quality as "Good" (PSQI < 5) or "Poor" (PSQI ≥ 5), cut-off scores were used (Kim-Godwin et al., 2021).

The nurses' stress levels were determined using the depression anxiety stress scale 21 (DASS-21) questionnaire. Descriptive statistics were calculated using percentages and means. Independent sample t-tests were used to determine the association between sleep quality level and nurses' stress scores. A p-value less than 0.05 (two-sided) was defined as statistically significant. The Statistical Package for the Social Sciences (SPSS) version 26 software (IBM SPSS Inc., Chicago, IL, USA) was used. Ethical approval from the Institutional Review Board and the Clinical Research Center of the hospital was obtained prior to data collection.

Results

This study included 101 nurses from a university hospital in Kuantan, Malaysia. The participants' mean (standard deviation [SD]) age was 27.16 years (4.15). Most participants (88.1%) were female and of Malay extract (98.0%). Of the participants, 49.5% were single, 96% had a diploma, and 4% had obtained a bachelor's degree. Furthermore, 14.9% of the participants had a post basic certificate (Table 1).

Table 1. Sociodemographic Background of the Nurses

Variables		Frequency (%)	Mean (SD)
Age (years)			27.16 (4.15)
Gender	Male	12 (11.9)	
	Female	89 (88.1)	
Race	Malay	99 (98.0)	
	Others	2 (2.0)	
Marital status	Single	50 (49.5)	
	Married	49 (48.5)	
	Divorce	2 (2.0)	
Family history of mental illness	Yes	1 (1.0)	
	No	100 (99.0)	
Highest educational level	Diploma	97 (96.0)	
	Degree	4 (4.0)	
Post basic certificate	Yes	15 (14.9)	
	No	86 (85.1)	

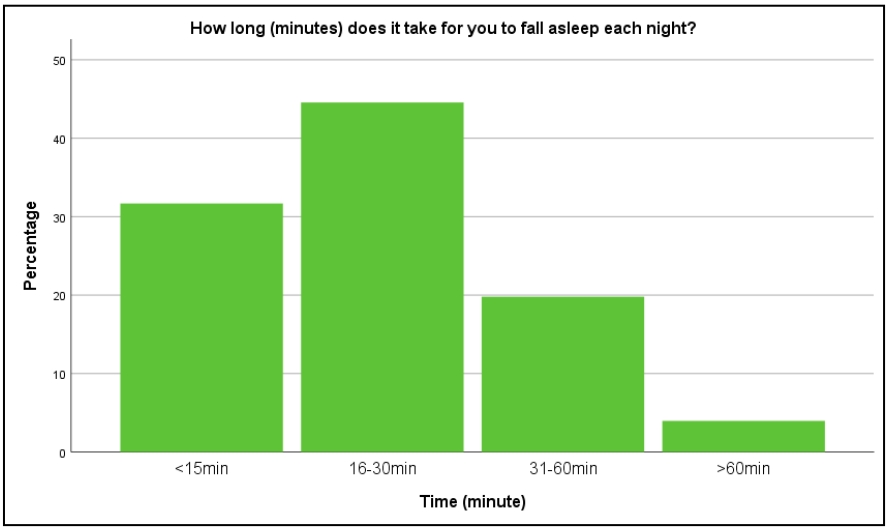

Figure 1. The Estimated Duration Between Going to Bed and Sleeping

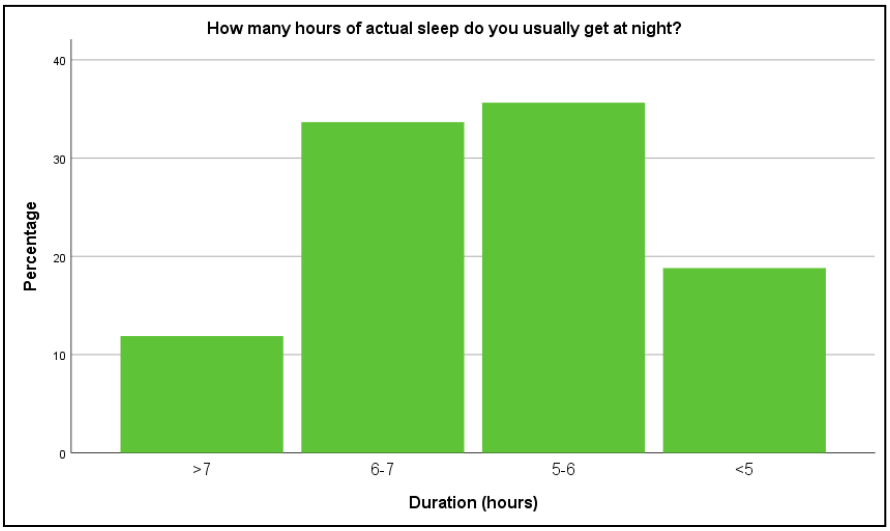

Figure 2. The Estimated Duration of Sleep (in Hours) of the Nurses (n = 101)

Figure 1 shows the estimated duration between going to bed and sleeping. The findings showed that most participants fell asleep after around 16 to 30 minutes of actually going to bed. Figure 2 shows the estimated duration of sleep (in hours) of the nurses (n = 101). The data shows that most participants slept 5 to 7 hours at night.

Table 2 describes the sleep quality among the nurses (n = 101). The findings revealed that most of the nurses felt that they had had relatively good sleep quality in the past month. The majority had experienced trouble sleeping once or twice a week due to the inability to fall asleep within 30 minutes of going to bed (38.6%) or waking up in the middle of the night or early in the morning (32.7%). Most of the nurses rarely experienced (less than once a week) trouble sleeping due to an urgent need to go to the toilet (31.7%) and feeling very hot (46.5%). The majority did not experience any trouble sleeping due to being unable to breathe comfortably (77.2%), feeling very cold (32.7%), coughing, or snoring loudly (62.4%), having nightmares

(57.4%), or having pain (79.2%). Although the nurses rated their sleep as fairly good, according to the PSQI, the majority of the nurses (86.1%) were suffering from poor sleep quality (Table 3).

Figure 3 shows the stress level distribution among nurses (n = 101). The findings demonstrate that most nurses (76.2%) had normal stress levels; 9.9% had mild stress and 5.0% had moderate stress. The findings also revealed that approximately 5.0% of the nurses experienced extremely severe stress, and 4.0% had severe stress.

Table 4 describes the association between sleep quality and stress scores among nurses. The findings showed that the nurses with poor sleep quality had significantly higher stress scores than those with good sleep, *t* (93.984) = -6.395,

Table 2. Sleep Quality of the Nurses (n = 101)

Variables	Frequency	Percentage
In the past month, how have you rated the overall quality of sleep?		
Very good	11	10.9
Fairly good	73	72.3
Fairly bad	17	16.8
In the past month, how often have you had trouble sleeping because you [cannot fall asleep within 30 minutes]		
Not during the past month	13	12.9
Less than once a week	26	25.7
Once or twice a week	39	38.6
Three or more times a week	23	22.8
In the past month, how often have you had trouble sleeping because you [woke up in the middle of the night or early in the morning]		
Not during the past month	7	6.9
Less than once a week	33	32.7
Once or twice a week	33	32.7
Three or more times a week	28	27.7
In the past month, how often have you had trouble sleeping because you [need to get up to go to the toilet]		
Not during the past month	24	23.8
Less than once a week	32	31.7
Once or twice a week	31	30.7
Three or more times a week	14	13.9
In the past month, how often have you had trouble sleeping because you [cannot breathe comfortably]		
Not during the past month	78	77.2
Less than once a week	19	18.8
Once or twice a week	4	4.0
In the past month, how often have you had trouble sleeping because you [cough or snore loudly]		
Not during the past month	63	62.4
Less than once a week	17	16.8
Once or twice a week	19	18.8
Three or more times a week	2	2.0
In the past month, how often have you had trouble sleeping because you [feel very cold]		
Not during the past month	33	32.7
Less than once a week	32	31.7

Table 2. Sleep Quality of the Nurses (n = 101)

Variables	Frequency	Percentage
Once or twice a week	27	26.7
Three or more times a week	9	8.9
In the past month, how often have you had trouble sleeping because you [feel very hot]		
Not during the past month	46	45.5
Less than once a week	47	46.5
Once or twice a week	7	6.9
Three or more times a week	1	1.0
In the past month, how often have you had trouble sleeping because you [have nightmares]		
Not during the past month	58	57.4
Less than once a week	28	27.7
Once or twice a week	11	10.9
In the past month, how often have you had trouble sleeping because you [are in pain]		
Not during the past month	80	79.2
Less than once a week	11	10.9
Once or twice a week	7	6.9
Three or more times a week	3	3.0
In the past month, how often have you taken medication (prescription/over-the-counter medication) to help you sleep?		
Not during the past month	97	96.0
Less than once a week	3	3.0
Once or twice a week	1	1.0

Table 3. Distribution of Sleep Quality Based on the PSQI Score Among Nurses

Variables	Frequency (%)
PSQI score: <5 good sleep quality	14 (13.9)
PSQI score: ≥5 poor sleep quality	87 (86.1)

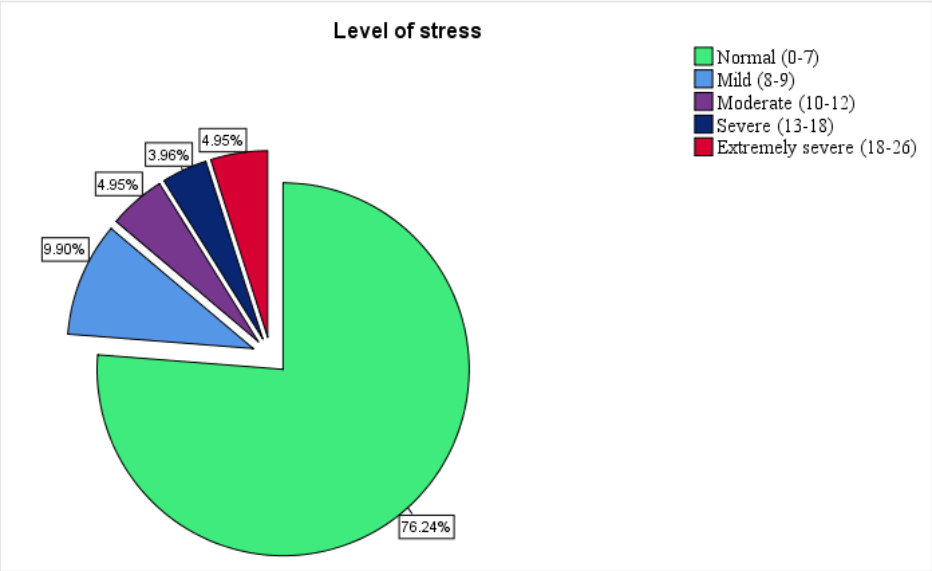

Figure 3. Level of Stress Among Nurses (n = 101)

Table 4. Association Between Sleep Quality and Stress Among Nurses (n = 101)

Sleep Quality (score)	N	Stress (score)		Independent Sample t-test			
		Mean	SD	t	df	p	Mean Difference
Good sleep quality (0–4)	14	0.57	1.158	-	93.984	<.001	-4.325
Poor sleep quality (≥5)	87	4.90	5.609	6.395			

($p < .001$). The average stress score for nurses with good sleep quality was 4.325 lower than the average stress score for nurses with poor sleep quality. Hence, we were able to accept the hypothesis that sleep quality was significantly associated with stress levels among nurses at a university hospital in Kuantan, Malaysia.

Discussion

Sleep quality is vital to human beings, as sleep is when we rest our bodies. According to Chatterjee and Saha (2018), good sleep quality means that an individual feels energetic and has enough sleep without any disturbances before waking up to resume daily living activities. The nature of the nursing profession, which includes numerous demands to meet patients' needs, working in shifts, and a lack of time, can seriously impact their psychological health (Maharaj et al., 2018). Chatterjee and Saha (2018) found that among nurses who had poor sleep quality, this was related to sleep duration and sleep latency. The COVID-19 pandemic may have played a role in affecting sleep duration among nurses. Djupedal et al. (2022) reported that the work scheduling among nurses in Norway during the pandemic was associated with increased reports of worse sleep quality (OR = 2.68, $p < .001$) and reduced sleep duration (OR = 4.56, $p < .001$). A similar study conducted a-mong Norwegian nurses revealed that 11.9% reported shorter sleep durations during the COVID-19 pandemic than before. There was also a significant increase in the proportion of nurses who reported sleeping fewer than six hours per night, from 11.0% before to 15.9% after the pandemic.

The findings of this study imply that sleep quality is significantly associated with elevated stress levels among nurses. In contrast, one study conducted among nurses in Kolkata showed no significant correlation between psychological health and sleep quality, possibly due to cultural or socioeconomic differences (Chatterjee & Saha, 2018). Nonetheless, various pieces of evidence support the findings that sleep quality is associated with the psychological wellbeing of nurses. A study by Tarhan et al. (2018) found a weak positive correlation between sleep quality and depression among nurses and a moderate positive correlation between sleep quality and anxiety. Similarly, a study among Hong Kong nurses found a significant correlation between poor sleep quality and depression (Cheung & Yip, 2016). A study in Tokyo also found that poor sleep quality, which included sleep satisfaction, efficiency, and duration, was significantly associated with depressive mood. Depression and anxiety are highly correlated with stress (Maharaj et al., 2018). In brief, the findings of this study support the current evidence that sleep quality is highly associated with psychological wellbeing among nurses.

There are a few plausible causes for the relationship between sleep quality and mental health in nurses. Sleep deprivation can be caused by a variety of factors, whether work-related or perso-nal, and it can aggravate symptoms of stress and burnout in nurses (Shah et al., 2021). As a re-sult, nurses may experience emotional exhaust-ion, resulting in diminished job performance and satisfaction. Chronic sleep deprivation may cause a decline in mental wellbeing and lead to symptoms such as anxiety and depression. The emotional resilience of nurses may also play a role in the relationship between sleep quality and mental wellbeing. The ability of a person to adjust in the face of hardship and persistent se-rious life stresses is known as resilience (Kantor et al., 2023).

According to Eun and Shin (2020), daytime fixed nurses were shown to be more re-silient than shift nurses. This might be due to the consistency of their work schedules, which allows for consistent sleep patterns and improved stress management strategies. Labrague (2021) also found that resilience reduced the effects of COVID-19 pandemic fatigue on clinical nurses' mental health and sleep quality. By recognizing the issues behind sleep quality and understanding the importance of emotional resilience among nurses, healthcare organizations may take proactive actions to assist their staff, thereby increasing the overall quality of patient care and nurses' mental wellbeing.

Various studies have been conducted to acknowledge the factors associated with sleep quality and mental health among nurses worldwide. Accordingly, interventions and innovations have been carried out to address this issue. According to a systematic review, the prevalence rate of low sleep quality among nurses during the COVID-19 pandemic was between 18% and 38%, while stress and anxiety were among the factors associated with low sleep quality (Sheykhangafshe et al., 2021). In another systematic review among healthcare workers during the pandemic, the results revealed that the prevalence of insomnia, a type of sleep disorder, was 38%; it was higher among women (29%) than men (24%), and the main factor was working in a high-risk environment (Serrano-Ripoll et al., 2021). Qiu et al. (2020) also found that being a female and a nurse increased the risk of sleep disturbances among Chinese healthcare professionals. In a study by Kang et al. (2020), several therapies, such as aroma-inhalation therapy, shift rotation modifications, physical exercise, and cognitive-behavioral therapy, were evaluated, with aroma-inhalation therapy demonstrating significant improvements in sleep quality for shift work nurses.

This study had two limitations. First, due to the COVID-19 pandemic in Malaysia, the survey was conducted via an online survey, which may have limited the participants' ability to ask for additional clarification. To address this, we included contact information on the online forms to communicate better with the participants. Second, this study used a convenience sample, which raises the possibility of sampling bias. Therefore, applying the inclusion and exclusion criteria in convenience sampling serves as a strategic measure to mitigate potential limitations, enhancing the reliability and validity of the study findings.

Conclusion

The relationship between stress levels and sleep quality among nurses cannot be overlooked because both aspects can be harmful to the nurses' health and the quality of care they provide. To achieve optimal psychological wellbeing, the importance of nurses' sleep quality should not be underestimated. Hospital administrators should consider designing psychological awareness programs and intervention programs to improve nurses' sleep quality and psychological wellbeing and should avoid understaffing. More research is needed to identify effective interventions for managing stress and sleep disturbances to address these issues for nurses. Addressing the issue of sleep quality and stress among nurses is critical to their wellbeing, job satisfaction, and the provision of high-quality patient care.

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