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An Assessment of Sleep Quality and Associated Factors in Hospitalized Patients: Perspectives from a Tertiary Care Setting in the Eastern Region of Saudi Arabia

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ABSTRACT: Sleep is a vital component of human behavior essential for survival and long-term health. However, hospitalized patients frequently experience poor sleep quality due to environmental and illness-related disruptions, which can hinder recovery. This study aimed to assess sleep quality and identify associated factors among hospitalized patients in a tertiary care setting in the Eastern Region of Saudi Arabia. A descriptive, cross-sectional design was utilized, involving 345 adult participants recruited through convenience sampling. Data were collected using the Richards-Campbell Sleep Questionnaire (RCSQ), assessing five core items: sleep depth, latency, awakenings, return to sleep, and overall quality. Non-parametric tests were employed for data analysis. Patients reported a moderate mean sleep quality score of 3.59/6. Although 69.6% provided a positive overall rating, 63.5% experienced light sleep and 48.4% struggled with sleep latency. Statistical analysis revealed that age and hospital department did not significantly correlate with sleep quality. However, a slight positive correlation was found between longer hospitalization and improved sleep onset, suggesting environmental adaptation. Sleep disturbances are a prevalent, systemic issue in hospital settings, primarily driven by extrinsic environmental factors. Enhancing sleep quality requires institutional interventions, such as implementing protected sleep cycles and reducing nocturnal clinical interruptions.

KEYWORDS: Environmental disruptors, Hospitalized patients, Patient-centered care, Sleep quality, Richards-Campbell Sleep Questionnaire, Saudi Arabia.

INTRODUCTION

Sleep is a dynamic component of human behavior that is essential to survival and long-term health. It is an indispensable process that contributes to various vital functions, including memory consolidation, immune system regulation, neuroendocrine function, and cognitive stability (Kryger et al., 2010). Because sleep is so critical to recovery, nurses are strategically positioned within healthcare settings to promote sleep health as a core component of patient care (Thomas et al., 2012).

However, hospitalized patients frequently suffer from disturbed, low-quality sleep characterized by overnight intrusions, unfamiliar surroundings, and illness-related cycle disturbances. The consequences of this sleep-wake dysfunction are severe, impacting a person's physical, emotional, and cognitive state. Research by Morse and Bender (2019) suggests that poor sleep leads to longer hospital stays, worse prognoses, and negative patient experiences. Furthermore, sleep deprivation is linked to immunologic dysregulation and autonomic dysfunction; in clinical settings, shorter sleep durations are independently associated with higher risks of impaired fasting glucose and hyperglycemia (Morse & Bender, 2019).

The drivers of poor sleep in the hospital are multifactorial, categorized into intrinsic and extrinsic factors. Intrinsic factors are tied to the patient's medical condition, including physical pain, delirium, and psychological comorbidities like anxiety or depression (Park & Kyong, 2023). Conversely, extrinsic factors involve the hospital environment, such as lighting, temperature, and humidity. A primary extrinsic disruptor is noise from medical devices, healthcare professionals, and other patients. Wesselius et al. (2018) found in a study of 2,005 patients that noise was the most disruptive factor for sleep onset and the second most common cause of nocturnal awakenings. This is compounded by necessary clinical interruptions such as vital sign monitoring and medication

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administration, which frequently occur during normal sleeping hours and trigger cortical arousal (Holleck et al., 2023; Morse & Bender, 2019).

Despite the prevalence of these disruptions, the management of sleep-wake dysfunction remains a challenge. While pharmacological aids like sedative-hypnotic drugs are widely used, prescribed to 45% to 70% of adult inpatients, non-pharmacological interventions must be considered the first line of defense. These include noise reduction strategies, strategic illumination, and relaxation aids (Morse & Bender, 2019; Park & Kyong, 2023). Studies, such as that by Filip et al. (2022), demonstrate a sharp decline in sleep quality upon hospital admission, with patients sleeping nearly an hour less than they do at home. These findings highlight a critical need to raise awareness of sleep quality and promote more effective sleep-enhancing therapies in the clinical setting.

Poor sleep quality has been associated with a range of emotional, cognitive, and motivational disturbances. In clinical settings, sleep disturbances have been shown to exacerbate patient discomfort, delay wound healing, intensify pain, and hinder recovery, ultimately impacting patients' ability to perform daily activities. However, despite the well-documented consequences of poor sleep quality among hospitalized patients, there remains a significant gap in the literature, particularly within the context of Saudi Arabia. To date, there has been limited research conducted in this area, and few studies have specifically examined the issue in the Eastern region. Thus, there is a need for localized research to better understand the prevalence and implications of sleep disturbances in hospitalized patients within this specific cultural and healthcare context.

This study aimed to assess the quality of sleep and identify its associated factors among hospitalized patients at selected hospitals in the eastern region of Saudi Arabia.

METHODS

Research Design

This study utilized a descriptive, cross-sectional research design to assess sleep quality and its associated factors among hospitalized patients. This design was chosen as it allowed for the collection of data at a single point in time to describe the prevalence of sleep disturbances and identify contributing factors within the specific clinical setting of selected hospitals in Eastern Region, Saudi Arabia.

Participants

The target population consisted of adult patients admitted to hospitals in the Eastern region. A total of 334 participants were recruited using a convenience sampling technique, a method selected to ensure the feasibility of data collection within the hospital environment during the study period. Eligible participants included adults aged 18 years or older of any gender or ethnicity who had been hospitalized for at least three consecutive days. Furthermore, participants were required to be capable of providing independent informed consent and willing to participate in the study. Conversely, patients were excluded if they were under 18 years of age, possessed a documented cognitive impairment or intellectual disability that precluded meaningful participation, or were unable to read, write, or understand the language used for data collection.

Instruments

The primary instrument for this study was the Richards-Campbell Sleep Questionnaire (RCSQ), a validated tool specifically designed to evaluate sleep in hospitalized populations. The questionnaire consisted of five items assessing sleep depth, sleep latency, frequency of awakenings, returning to sleep, and overall sleep quality, with an additional optional item included to assess perceived noise levels. Responses were recorded on a Visual Analogue Scale (VAS) ranging from 0 to 100 mm, and a total score was derived by averaging the five core items, where lower scores represented poorer sleep quality. Regarding its psychometric properties, the tool had previously demonstrated high internal consistency ($\alpha = 0.89$) and strong test-retest reliability (ICC = 0.85). Furthermore, its construct validity was supported by factor loadings between 0.72 and 0.89, while content validity was established through a formal review by five sleep specialists.

Data Analysis

Data was analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize participant demographic characteristics and sleep quality scores. The normality of the sleep quality scores was assessed using the Shapiro–Wilk test; because the data exhibited a non-normal

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distribution, non-parametric tests specifically the Kruskal–Wallis's test were employed to compare differences in sleep quality across various demographic groups. Statistical significance for all tests was set at a p-value of < 0.05.

Procedures

Data collection was carried out over a four-month period between September and December 2025. Following Institutional Review Board (IRB) approval, researchers visited the hospital wards to identify eligible patients via nursing charts and consultation with clinical staff.

Once identified, researchers approached potential participants to explain the study's purpose. Those who met the inclusion criteria and provided written consent were given the questionnaire. To ensure consistency, the researchers remained available to clarify questions while the patients completed the tool in their hospital rooms. Completed questionnaires were collected immediately to ensure a high response rate and maintain data security.

Ethical Considerations

The study proposal was submitted to the Institutional Review Board (IRB) of the Mohammad Al-Mana College of Health Sciences (MACHS) and obtained formal ethical approval (SR/RP/227). Participation was entirely voluntary, and participants were informed of their right to withdraw at any time without impact on their medical care. Informed consent was obtained from all individuals after a full explanation of the study's nature and purpose. To ensure anonymity and confidentiality, no identifying information was collected; instead, each questionnaire was assigned a unique code number. All procedures were non-invasive, ensuring minimal risk to the participants.

RESULTS

A total of three hundred forty-five (N=345) hospitalized patients from selected hospitals participated in the study.

Table 1: Demographic Profile of Hospitalized Patients (N=345)

	Item	Frequency (f)	Percentage (%)
Gender	Male	162	47.00%
	Female	183	53.00%
Age	<18	12	3.50%
	18-25	27	7.80%
	26-35	120	34.80%
	36-45	86	24.90%
	46-55	51	14.80%
	56-65	30	8.70%
	66 and more	19	5.50%
Marital status	Single	60	17.40%
	Married	264	76.50%
	Divorced	10	2.90%
	Widowed	11	3.20%
Educational Level	Illiterate	25	7.20%
	Read & write	11	3.20%
	Primary school	10	2.90%
	Middle school	22	6.40%
	University	150	43.50%
	High school	102	29.60%
	Postgraduate	25	7.20%
Residency	Urban	314	91.00%
	Rural	31	9.00%

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Hospitalization Duration	<3 days	135	39.10%
	3-5 days	155	44.90%
	5-7 days	35	10.10%
	7-10 days	11	3.20%
	≥11 days	9	2.60%

Table 1 reveals that majority of the participants are females (53%), they are particularly among individuals ages 26–35 (34.80%) and 36–45 (24.90%) and married (76.5%). Educational level presents that most participants are holders of university degrees (43.5%) and reside in urban areas (91%). In terms of hospital duration, majority of the participants are hospitalized within 3-5 days (44.90%).

Table 2: Distribution of Hospitalized Patients Admissions (N=345)

Department/ Unit	Frequency (f)	Percentage (%)
MSW	54	15.70%
FMW	81	23.50%
VIP	11	3.20%
OB/GYN	71	20.60%
MMW	72	20.80%
Oncology	10	2.90%
ORTHO	19	5.50%
GW	3	0.90%
FSW	8	2.30%
CCU	2	0.50%
FGW	1	0.30%
ENT	12	3.50%
OBW	1	0.30%

Table 2 presents the distribution of hospitalized patients' admissions. The data shows that most patients were concentrated in a few departments, notably the Female Medical Ward (23.50%), Obstetrics and Gynecology (20.60%), Male Medical Ward (20.80%), and Male Surgical Ward (15.70%).

Table 3: Perceived Sleep Quality of Hospitalized Patients

Richard- Campbell Criteria	Description	Frequency (f)	Percentage (%)
Sleep depth	Light sleep	219	63.50%
	Deep sleep	126	36.50%
Ability to return to sleep	Couldn't get back to sleep	141	40.90%
	Got back to sleep immediately	204	59.10%
Sleep latency (first time got to sleep)	I Fell asleep almost immediately	178	51.60%
	Just never could fall asleep	167	48.40%
Awakenings from sleep	Awake very little	243	70.40%
	Awake all night long	102	29.60%
Sleep quality	A bad night's sleep	105	30.40%
	A good night's sleep	240	69.60%
Noisy level	Very quiet	252	73.00%
	Very noisy	93	27.00%

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The Richard-Campbell Sleep Questionnaire results in Table 3 reveal that majority experienced light sleep (63.5%) and were able to return to sleep after waking (59.1%), though a significant number faced difficulties either staying asleep (40.9%) or falling asleep initially (48.4%). Most patients were awake only briefly during the night (70.4%) and rated their overall sleep positively (69.6%). Environmental noise was generally not a major issue, with 73% describing their surroundings as quiet.

Table 4: Total Sleep Quality Score of Hospitalized Patients

	N	Mean	Median	SD	Minimum	Maximum	Shapiro-Wilk W	Shapiro-Wilk p
Total Sleep Quality Score	345	3.59	4	1.82	0	6	0.914	<.001

Table 4 presents the total sleep quality scores among hospitalized patients. The mean score of 3.59 and a median value of 4.00 as revealed from the results indicate that sleep quality was moderately rated across the sample. The score ranged from 0 (very poor) to 6 (very good), with a standard deviation of 1.82, suggests notable variation in perceived sleep quality. The distribution was tested for normality using the Shapiro-Wilk test indicated statistically significant deviation from normal distribution (p-value of less than .001).

Table 5: Correlation Matrix of Sleep Quality and Associated Variables

		Age	Hospitalization Duration	Sleep Depth	Return to sleep	Sleep Latency	Awakening from sleep	Sleep Quality	Noisy Level	Total Sleep Quality
Age	Spearman's rho	—								
	df	—								
	p-value	—								
Length of hospital stay	Spearman's rho	0.195	—							
	df	343	—							
	p-value	**<.001**	—							
Sleep Depth	Spearman's rho	0.089	0.053	—						
	df	343	343	—						
	p-value	0.098	0.324	—						
Return to sleep	Spearman's rho	0.003	0.109	0.361	—					
	df	343	343	343	—					
	p-value	0.952	0.043	**<.001**	—					
Sleep Latency	Spearman's rho	0.028	-0.115	0.422	0.316	—				
	df	343	343	343	343	—				
	p-value	0.601	**0.033**	**<.001**	**<.001**	—				
Awakening from sleep	Spearman's rho	0.077	0.02	0.294	0.418	0.237	—			
	df	343	343	343	343	343	—			
	p-value	0.154	0.714	**<.001**	**<.001**	**<.001**	—			
Sleep Quality	Spearman's rho	-0.014	0.048	0.434	0.469	0.347	0.508	—		

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	df	343	343	343	343	343	343	—		
	p-value	0.791	0.37	**<.001**	**<.001**	**<.001**	**<.001**	—		
Noisy Level	Spearman's rho	0.065	0.009	0.176	0.04	0.209	-0.05	0.111	—	
	df	343	343	343	343	343	343	343	—	
	p-value	0.228	0.862	0.001	0.462	**<.001**	0.354	**0.039**	—	
Total Score	Spearman's rho	0.068	0.032	0.727	0.684	0.676	0.611	0.731	0.375	—
	df	343	343	343	343	343	343	343	343	—
	p-value	0.21	0.556	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	<.001	—

Table 5 shows the correlation analysis scores between the quality of sleep among hospitalized patients and associated factors. The findings revealed that age has a weak but statistically significant positive relationship with length of hospital stay ($\rho = 0.195$, $p < .001$) while age does not significantly correlate with most sleep-related variables. Its associations with sleep depth ($\rho = 0.089$, $p = .098$), return to sleep ($\rho = 0.003$, $p = .952$), sleep latency ($\rho = 0.028$, $p = .601$), awakenings ($\rho = 0.077$, $p = .154$), and sleep quality ($\rho = –0.014$, $p = .791$) are all weak and non-significant. The analysis reveals generally weak but statistically significant correlations between the length of hospital stay and certain sleep-related variables. A modest positive correlation was found with the ability to return to sleep ($\rho = 0.109$, $p = .043$), but a weak negative correlation with sleep latency ($\rho = –0.115$, $p = .033$). correlations with other sleep variables such as sleep depth ($\rho = 0.053$, $p = .324$), awakenings ($\rho = 0.020$, $p = .714$), sleep quality ($\rho = 0.048$, $p = .370$), and noisy level ($\rho = 0.009$, $p = .862$) were not statistically significant.

Table 6: Comparison of Sleep Quality of Hospitalized Patients Across Hospital Admissions

	χ^2	df	p
Total Score	**14.6**	**14**	**0.404**

Table 6 shows that a no statistically significant difference ($\chi^2 = 14.6$, $df = 14$, $p = 0.404$) in the quality of sleep of hospitalized patients and hospital admissions.

DISCUSSION

The present study assessed the sleep quality and its associated factors among hospitalized patients in selected hospitals in the Eastern Province of Saudi Arabia. Overall, the findings suggest that although most hospitalized patients reported generally acceptable sleep quality, a considerable proportion continued to experience sleep disturbances. These conditions were particularly relative to difficulties with sleep latency, maintaining sleep, and returning to sleep after awakening. These findings are consistent with the common understanding that hospitalization disrupts normal sleep patterns. Morse and Bender (2019) attested that environmental, physiological, and psychological factors during hospitalization greatly contribute to the patients' sleep experience.

A notable observation is that age showed no significant relationship with sleep quality, contradicting the common assumption that older adults experience poorer sleep. Previous studies supported this finding, implying that no significant association exists among hospitalized older adults and elderly (Adib-Hajbaghery et al., 2012; Koshy et al., 2024; Zhang et al., 2009). Furthermore, these literatures suggest that environmental factors outweigh individual age-related differences. Holleck et al. (2023) and Wesselius et al. (2018) affirmed that extrinsic disruptions such as noise, lighting, vital sign checks, and nighttime clinical activities play a dominant role in disturbing sleep in hospitals. Therefore, it is plausible that sleep disturbances in this study were more environmentally than biologically driven, minimizing age-related variation.

In contrast, a slight association was detected between longer hospitalization and better ability to return to sleep as well as faster sleep onset. Although the effects were small, this trend may indicate a gradual adaptation to the hospital environment over time. This aligns with the idea that patients can become habituated to hospital noise and interruptions after several days, reducing their reactivity to these stimuli. Several studies confirmed significant improvements in the slopes of subjective ratings of sleep

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quality (Gathecha et al., 2016), a gradual increase in sleep quality from admission through day four (de Gans et al., 2025), and improved sleep latency (onset), efficiency, and subjective quality attributed to familiarity of patients to the hospital environment and clinical improvement (Kulpatcharapong et al., 2020). However, this contrasts somewhat with previous studies that link prolonged hospitalization with worsening sleep due to illness severity and cumulative stress (Park & Kyong, 2023). Additionally, Ghanbari Jolfaei et al. (2014) found a negative correlation between sleep quality and the duration of hospitalization, suggesting that longer stays might be associated with more severe medical conditions or "demoralization" that prevents better sleep. The discrepancy may relate to the relatively short average hospital stay in this sample, where most patients were admitted for fewer than five days, possibly before long-term deterioration typically appears.

Importantly, sleep quality did not differ significantly across hospital departments, suggesting that sleep challenges were systemic rather than unit specific. A massive review encompassing 203 studies and nearly 18,000 patients concluded that poor sleep quality and quantity are insufficient across the board for hospitalized patients. The researchers found that roughly 76% of studies reported sleep deficits regardless of the specific patient group or department, reinforcing the "systemic" nature of the problem (Burger et al., 2022). However, Malini et al. (2023) found a statistically significant difference between ICU and general ward patients, with ICU patients having much higher Pittsburgh Sleep Quality Index (PSQI) scores (poorer sleep). In this present study, the uniformity across units implies that improving sleep quality will require institutional rather than department-specific interventions.

Consistent with previous research, a substantial proportion of patients reported light sleep, difficulty falling asleep, and multiple awakenings. These patterns reflect the influence of both intrinsic factors and extrinsic factors as extensively discussed in the literature (Kryger et al., 2010; Morse & Bender, 2019; Wesselius et al., 2018). A systematic review by Burger et al. (2022) specifically identified pain and anxiety as the most frequent internal factors, and noise and room occupancy as the most frequent external factors for poor sleep. In addition, although most of the hospitalized patients rated their environment as “quiet,” sleep problems persisted, suggesting that noise is only one contributor. Pain, stress related to illness, and interruptions for care activities may have played equally significant roles, even if not explicitly captured in the questionnaire. Morse and Bender (2019) further claimed that sleep-wake dysfunction is multifactorial, as attested similarly by observations from previous studies (Buxton et al., 2012; El Arab et al., 2025; Zhang et al., 2024).

One interesting finding is that most participants gave overall positive ratings for sleep despite reporting specific sleep difficulties. This discrepancy may indicate response bias, cultural norms of minimizing discomfort, or patient expectations that poor sleep is “normal” during hospitalization. Filip et al. (2022) found a similar pattern, where objective sleep quality declined significantly during hospitalization, but patients underreported the severity of disturbances. This tendency may reflect coping strategies, normalization of hospital routines, or prioritization of medical recovery oversleep. Moreover, inpatients often reported high sleep quality and satisfaction scores even when data showed decreased sleep duration and increased awakenings (Terp et al., 2018), or patients may rate their sleep as "better" based on subjective perception rather than objective metrics, potentially because they expect sleep to be poor in a medical setting (Locihová et al., 2025). Notably, patients may provide socially desirable responses or feel a "gratitude bias" toward their caregivers that masks negative experiences (Lloyd et al., 2023).

Finally, the results underscore the persistence of sleep disturbances in hospital settings despite advances in patient-centered care. Hospitalized patients highlight the need for structured sleep-promoting interventions, such as reducing nighttime interruptions, optimizing lighting, implementing quiet hours, and screening patients for sleep-related concerns. These recommendations are strongly supported by existing evidence showing that supportive interventions can substantially improve inpatient sleep and overall satisfaction (Holleck et al., 2023; Thomas et al., 2012).

CONCLUSIONS

This study demonstrates that sleep disturbances remain a prevalent challenge among hospitalized patients. The data suggests that subjective sleep quality is primarily influenced by exogenous environmental factors rather than patient-specific demographic profiles. Notably, a positive correlation was observed between the duration of hospitalization and sleep quality; increased length of stay was associated with improved sleep outcomes, potentially indicating a period of physiological or psychological adaptation to the clinical environment. Furthermore, these findings indicate that sleep impairment is a systemic issue across the institution, as sleep quality did not vary significantly between specific departments or hospital units

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RECOMMENDATIONS AND LIMITATIONS

Based on the study conclusions, recommendations to address sleep disturbances are essential. hospital policies should prioritize the implementation of "protected sleep cycles" by establishing designated quiet hours and consolidating non-essential clinical interventions. This should be supported by environmental modification protocols, such as dimming hallway lighting and utilizing low-stimulus alert systems, to mitigate the exogenous stressors identified across all hospital units. Furthermore, conducting regular interdisciplinary audits is essential to identify and remediate systemic infrastructure noise, ensuring a conducive sleep environment throughout the facility. In addition to environmental controls, nursing practice should focus on patient acclimatization and standardized monitoring. Establishing admission orientation protocols can help familiarize patients with the clinical sensory environment, potentially accelerating the adaptation process observed in long-term stays. Finally, integrating validated sleep assessment tools into electronic health records will allow clinicians to treat sleep quality as a vital sign, ensuring that sleep health is consistently monitored and addressed as a critical component of patient care.

Several limitations should be acknowledged regarding this study. First, sleep quality was assessed using self-reported measurements, which may introduce subjective bias. Additionally, the cross-sectional design prevents the establishment of causal relationships, allowing only correlation-based conclusions. The study's generalizability is also limited by its single-center setting, as data from one hospital may not represent other populations or healthcare environments. Finally, the evaluation of environmental variables was limited; while noise was addressed, other potentially influential factors such as lighting, temperature, and room structure were not examined.

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