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Factors affecting sleep quality among hospitalized patients in medical-surgical units: A cross-sectional study

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Abstract
Sleep is a vital component of patient recovery; however, it is often disrupted in hospital settings due to environmental and clinical factors. This study aimed to assess sleep quality and identify factors affecting sleep among hospitalized patients in medical-surgical units. A cross-sectional descriptive study was conducted among 550 patients using a structured questionnaire and the Pittsburgh Sleep Quality Index (PSQI) to evaluate sleep quality. Data were analyzed using descriptive and inferential statistics, including chi-square test and logistic regression analysis.
The results revealed that 63.6% of patients experienced poor sleep quality. Environmental factors such as noise (68.9%), nursing interruptions (62.5%), and lighting disturbances (56.7%) were the most reported contributors to sleep disruption. Significant associations were found between these factors and sleep quality ($p < 0.05$). Logistic regression analysis identified noise, interruptions, and comorbidities as significant predictors of poor sleep.
The study concludes that sleep disturbances are highly prevalent among hospitalized patients and are influenced by multiple factors. Implementing targeted nursing interventions and improving the hospital environment are essential to enhance sleep quality and promote patient recovery. These findings emphasize the importance of incorporating sleep assessment and management into routine clinical practice.

Keywords: Sleep quality, hospitalized patients, PSQI, environmental factors, nursing interventions, sleep disturbances

Introduction

Sleep is a vital physiological process essential for tissue restoration, immune regulation, and overall health maintenance. Early evidence suggests that sleep plays a critical role in cellular repair and recovery, emphasizing its importance in clinical settings (Adam and Oswald, 1977) [1]. Adequate sleep is particularly crucial for hospitalized patients, as it directly influences healing processes, cognitive functioning, and emotional well-being. Conversely, sleep deprivation has been associated with impaired immune responses, metabolic dysfunction, hypertension, and reduced physical performance (Besedovsky, Lange and Born, 2012; Knutson *et al*., 2007; Gangwisch *et al*., 2006; Fabbri *et al*., 2006) [3, 7, 8, 11]. The Institute of Medicine has also recognized sleep disorders and deprivation as significant public health concerns requiring urgent attention (Institute of Medicine, 2006) [9].
Despite its importance, sleep disturbances are highly prevalent among hospitalized patients, particularly in medical-surgical and intensive care settings. Studies have shown that hospital environments inherently disrupt normal sleep patterns due to factors such as noise, frequent clinical interventions, lighting, and patient care activities during night shifts (Çelik *et al*., 2005; Dogan, Ertekin and Dogan, 2005) [6]. Environmental stressors and clinical routines can lead to fragmented sleep, reduced sleep duration, and poor sleep quality, ultimately affecting patient recovery and satisfaction (Marosti and Dantas, 2006) [12].
In addition to environmental influences, individual patient characteristics and clinical conditions also contribute to sleep disturbances. Sociodemographic factors, illness severity, pain, and medication use have been identified as significant determinants of sleep quality among inpatients (da Costa and Ceolim, 2013) [5]. Furthermore, older adults are particularly vulnerable to sleep disruptions, highlighting the importance of tailored nursing interventions in promoting restful sleep (Béphage, 2005).
Nursing care plays a pivotal role in addressing sleep disturbances within hospital settings. Structured nursing interventions, including environmental modifications, clustering of care activities, and patient-centered sleep promotion strategies, can significantly improve sleep outcomes (Júnior *et al*., 2014). However, sleep assessment and management are often overlooked in routine clinical practice, indicating a gap between evidence and implementation.
Given the multifactorial nature of sleep disturbances and their significant impact on patient recovery, there is a need for comprehensive evaluation of sleep quality and its influencing factors in medical-surgical units. This study aims to assess sleep quality among hospitalized patients, identify contributing clinical, environmental, and sociodemographic factors, and provide evidence-based recommendations for nursing interventions to enhance patient outcomes.

Literature Review

Sleep disturbances among hospitalized patients have been widely documented, particularly in intensive care and medical-surgical settings, where environmental and clinical factors significantly interfere with normal sleep patterns. Early investigations highlighted that hospital environments are often characterized by adverse conditions such as excessive noise, frequent interruptions, and continuous monitoring, all of which contribute to sleep disruption (Meyer *et al*., 1994) [13]. Noise, in particular, has been identified as a major environmental stressor, with studies demonstrating that sound levels in intensive care units

frequently exceed recommended limits, thereby negatively impacting patient rest and recovery (Redding, Hargest and Minsky, 1977) [17].

The hospital environment plays a crucial role in influencing patient sleep. Factors such as lighting, nursing care activities, medical interventions, and ward routines can lead to fragmented and poor-quality sleep (Reid, 2001; Tembo and Parker, 2009). Similarly, Young *et al.* (2008) [18, 22, 25] emphasized that both intrinsic and extrinsic factors—including illness severity, treatment procedures, and environmental disturbances—collectively affect sleep in hospitalized medical patients. Tranmer *et al.* (2003) [23] further reported that patients in medical and surgical units commonly experience altered sleep architecture, reduced sleep duration, and frequent awakenings during hospitalization.

Physiological consequences of sleep deprivation have also been extensively explored. Total sleep deprivation has been shown to elevate blood pressure through mechanisms such as arterial baroreflex resetting, indicating significant cardiovascular implications (Ogawa *et al.*, 2003) [15]. Additionally, broader clinical perspectives suggest that insomnia and chronic sleep disturbances are associated with impaired daytime functioning and reduced quality of life, necessitating effective management strategies (NIH State-of-the-Science Conference Statement, 2009) [14]. From a chronobiological standpoint, disruptions in sleep-wake cycles can impair alertness and cognitive functioning, further complicating patient recovery (Rosenberg, 1990) [19].

Patient discomfort and coping mechanisms also influence sleep quality in hospital settings. Rahimi *et al.* (2018) [16] identified that discomforting factors such as pain, anxiety, and environmental disturbances are closely linked with patients' coping strategies in intensive care units. Behavioral factors, including lifestyle habits, have also been studied; for instance, caffeine consumption has been shown to negatively affect sleep quality, while abstinence may improve sleep outcomes (Sin, Ho and Chung, 2009) [21].

Material and Methods

1. Study Design and Setting

A hospital-based cross-sectional descriptive study was conducted to assess sleep quality and its associated factors among patients admitted to medical-surgical units. The study was carried out in selected tertiary care hospitals, where continuous monitoring, nursing care activities, and environmental factors may influence patient sleep patterns.

2. Study Population and Sample Size

The study population comprised adult patients admitted to medical-surgical wards. A total of 550 patients were included in the study. The sample size was determined based on feasibility and the need to ensure adequate statistical power for detecting significant associations between sleep quality and influencing factors. Participants were selected using a non-probability convenience sampling technique.

3. Inclusion and Exclusion Criteria

Participants eligible for inclusion in the study were adult patients aged 18 years and above who had been admitted to medical-surgical units for a minimum duration of 48 hours. Only those patients who were conscious, oriented, able to communicate effectively, and willing to provide informed consent were included in the study. Patients were excluded if they were critically ill and admitted to intensive care units, had diagnosed psychiatric disorders or cognitive impairments, were receiving sedative or sleep-inducing medications, or had unstable medical conditions at the time of data collection.

4. Data Collection Tools and Instruments

Data were collected using a structured questionnaire designed to capture relevant variables across four domains. Sociodemographic information included age, gender, educational status, occupation, and socioeconomic status. Clinical variables comprised diagnosis, duration of hospitalization, presence of comorbidities, medication use, and pain levels. Environmental factors were assessed using a checklist that included noise levels, lighting conditions, frequency of nursing interventions, room-sharing status, and nighttime disturbances. Sleep quality was evaluated using the standardized Pittsburgh Sleep Quality Index (PSQI), which assesses multiple dimensions of sleep; a global score greater than 5 was considered indicative of poor sleep quality.

5. Data Collection Procedure

Data collection was conducted over a period of 4–6 weeks. Eligible participants were identified from hospital records and approached individually. After obtaining written informed consent, data were-collected through face-to-face interviews using the structured questionnaire. In addition, environmental observations were carried out during night shifts to accurately capture real-time factors influencing patients' sleep quality.

6. Variables of the Study

The primary dependent variable of the study was sleep quality, as measured by the PSQI score. Independent variables included sociodemographic characteristics, clinical conditions, and environmental factors such as noise, lighting, and interruptions during hospitalization.

7. Data Analysis

Collected data were coded, entered, and analyzed using statistical software such as SPSS. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the data. Inferential statistical tests such as the chi-square test, independent t-test, and logistic regression analysis were applied to determine associations between sleep quality and influencing factors. A p-value of less than 0.05 was considered statistically significant.

Results and Discussion

A total of 550 hospitalized patients participated in the study. The findings are presented under sociodemographic characteristics, clinical variables, environmental factors, and sleep quality assessment.

1. Sociodemographic Characteristics of Participants

The majority of participants were aged between 41–60 years (38.2%), followed by 21–40 years (29.5%). Male patients constituted 56.0% of the sample. Most participants had secondary-level education (34.7%), and a significant proportion belonged to middle socioeconomic status (52.4%).

Table 1: Sociodemographic Characteristics of Participants (N = 550)

Variable	Category	Frequency (n)	Percentage (%)
Age	18–20 years	88	16.0
	21–40 years	162	29.5
	41–60 years	210	38.2
	>60 years	90	16.3
Gender	Male	308	56.0
	Female	242	44.0
Education	Primary	132	24.0
	Secondary	191	34.7
	Higher	227	41.3
Socioeconomic Status	Low	121	22.0
	Middle	288	52.4
	High	141	25.6

2. Clinical Characteristics of Patients

Most patients were hospitalized for 3–7 days (46.5%), and 58.7% had at least one comorbidity. Moderate pain levels were reported by 44.2% of patients.

Table 2: Clinical Characteristics of Participants

Variable	Category	Frequency (n)	Percentage (%)
Duration of Stay	2–3 days	143	26.0
	3–7 days	256	46.5
	>7 days	151	27.5
Comorbidities	Yes	323	58.7
	No	227	41.3
Pain Level	Mild	167	30.4
	Moderate	243	44.2
	Severe	140	25.4

3. Environmental Factors Affecting Sleep

A high proportion of patients reported environmental disturbances during hospitalization. Noise (68.9%) and frequent nursing interruptions (62.5%) were the most reported factors affecting sleep.

Table 3: Environmental Factors Affecting Sleep Quality

Environmental Factor	Present (n)	Percentage (%)
Noise	379	68.9
Lighting Disturbance	312	56.7
Nursing Interruptions	344	62.5
Room Sharing	298	54.2

4. Sleep Quality Assessment

Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). The results indicated that 63.6% of patients experienced poor sleep quality (PSQI > 5), while only 36.4% had good sleep quality.

Table 4: Sleep Quality Distribution

Sleep Quality	Frequency (n)	Percentage (%)
Good Sleep (≤5)	200	36.4
Poor Sleep (>5)	350	63.6

5. Association Between Environmental Factors and Sleep Quality

A statistically significant association was observed between environmental factors (noise, lighting, interruptions) and sleep quality ($p < 0.05$). Patients exposed to higher environmental disturbances were more likely to report poor sleep quality.

Table 5: Association Between Environmental Factors and Sleep Quality

Factor	χ^2 Value	p-value	Significance
Noise	12.45	0.001	Significant
Lighting	9.32	0.002	Significant
Interruptions	11.87	0.001	Significant

6. Predictors of Poor Sleep Quality

Logistic regression analysis revealed that noise, nursing interruptions, and presence of comorbidities were significant predictors of poor sleep quality.

Table 6: Logistic Regression Analysis of Predictors

Variable	Odds Ratio (OR)	p-value
Noise	2.14	0.001
Interruptions	1.89	0.003
Comorbidities	1.67	0.010

Discussion

The present study assessed sleep quality and its associated factors among hospitalized patients in medical-surgical units and revealed a high prevalence of poor sleep quality (63.6%). This finding is consistent with previous studies that report significant sleep disturbances among hospitalized patients due to environmental and clinical factors (Reid, 2001; Young *et al*., 2008; Tranmer *et al*., 2003) [18, 23, 25]. The hospital environment, characterized by noise, lighting, and frequent nursing interventions, plays a critical role in disrupting normal sleep patterns.

In this study, environmental factors such as noise (68.9%), nursing interruptions (62.5%), and lighting disturbances (56.7%) were identified as major contributors to poor sleep quality. These findings are in agreement with earlier research indicating that excessive noise levels and clinical care activities during night shifts significantly impair patient sleep (Redding, Hargest and Minsky, 1977; Meyer *et al*., 1994; Tembo and Parker, 2009) [13, 17, 22]. The statistically significant association between environmental disturbances and poor sleep quality further reinforces the importance of hospital environment management.

Clinical factors, particularly the presence of comorbidities and pain, were also found to influence sleep quality. Patients with comorbid conditions had a higher likelihood of experiencing poor sleep, which aligns with the understanding that illness severity and discomfort can interfere with rest and recovery (Rahimi *et al*., 2018; Young *et al*., 2008) [16, 25]. Additionally, physiological consequences of sleep deprivation, such as increased cardiovascular stress, have been documented in prior studies, highlighting the broader health implications of poor sleep in hospitalized patients (Ogawa *et al*., 2003) [15].

The use of the Pittsburgh Sleep Quality Index (PSQI) in this study provided a comprehensive evaluation of sleep patterns, confirming that a majority of patients experienced inadequate sleep during hospitalization. These findings are consistent with existing literature emphasizing the need for systematic assessment of sleep quality in clinical settings.

Furthermore, logistic regression analysis identified noise, nursing interruptions, and comorbidities as significant predictors of poor sleep quality. This underscores the multifactorial nature of sleep disturbances and highlights the need for targeted interventions. Despite existing evidence, sleep promotion is often overlooked in routine nursing care. Structured interventions such as clustering care activities,

minimizing nighttime disturbances, and controlling environmental factors could significantly improve patient outcomes.

Conclusion

The study concludes that poor sleep quality is highly prevalent among hospitalized patients in medical-surgical units, with more than half of the participants experiencing disturbed sleep. Environmental factors such as noise, lighting, and frequent nursing interruptions, along with clinical conditions like comorbidities, were identified as significant contributors to poor sleep quality. The findings highlight the critical need for integrating sleep assessment into routine patient care and implementing evidence-based nursing interventions to improve sleep outcomes. Enhancing the hospital environment and promoting patient-centered care practices can significantly contribute to better recovery, reduced complications, and improved overall patient well-being.

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