Sleep Deprivation and its Associated Factors Among the Hospitalised Patients

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ABSTRACT

Introduction: Sleep is an important factor in maintaining health and wellbeing of an individual. Various factors can lead to poor sleep quality in a patient during hospitalization. Therefore, the purpose of this study was to assess the prevalence of sleep deprivation and its associated factors among the hospitalized patients.

Methods: This study was done using descriptive survey design. A total of 65 hospitalized patients were selected for the study using non-probability purposive sampling technique. Informed written consent was taken from each respondent beforehand. Data was collected by interviewing the patients meeting the criteria with pretested semi-structured interview schedule at their bedside by maintaining privacy through bedside curtains. Collected data were analyzed by using descriptive statistics and inferential statistics i.e., chi-square test and Fisher's exact test.

Results: Almost all (98.8%) of respondents had sleep deprivation on the first night of hospitalization which decreased in frequency with increased length of hospital stay. Majority (73.8%) of respondents expressed that hospital environment was disturbing to sleep. Hospital noise (95.8%) and light (66.6%) were reported as the most disturbing factors. Sleep deprivation was associated with hospital environment (p=0.036, p=0.002, p=0.002) on first, second, and third day of hospitalisation. This study revealed no significant association of sleep deprivation with age and pain or discomfort of respondents.

Conclusions: Hospital environment is the most important factor of sleep deprivation among hospitalized patients, particularly noise and light. Hospital staff should be more careful during the night shift and take measures to minimize noise and lights in the ward to promote sound sleep among patients.

Key words: Noise; hospitalized patients; sleep quality; sleep deprivation

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INTRODUCTION

Sleep is a periodic, reversible state of cognitive and sensory disengagement from the external environment. Sleep is a basic physiologic need of human beings that operates in a circadian rhythm. It is a period when the body restores its physical and psychological functions for maintaining the individual's health. Sleep is triggered by light–dark changes in 24-hour cycle.[1] Adequate sleep is essential for optimum performance, mood, and general health. An adult needs seven or more hours of sleep per night for optimum health and wellbeing. Sleep duration of less than seven hours in 24-hours period is inadequate sleep or sleep deprivation.[2] A cross-sectional study conducted in the Netherlands among 2005 patients revealed that the sleep duration and quality were significantly reduced in hospitalized patients as compared to their habitual sleep at home.[3]

Sleep deprivation results in several physical and psychological health problems. Sleep deprivation affects many organ functions and produces different health consequences including weakening of immune system, increase in adverse cardiovascular events, cognitive impairment, and increased risk of falls and fractures in elderly.[4] These occur as a consequence of persistent low-grade systemic inflammation, as well as deficiency of immunity resulting into increased susceptibility to infections. Sleep deprivation also negatively affects the psychological functioning. Patients who experience sleep deprivation show increased levels of fatigue, anxiety, stress, and depressive symptoms. As patients experience more fatigue and sleep deprivation, they report higher levels of pain.[6] Sleep deprivation causes increased daytime somnolence, and thus increase in proneness to accidents.

Patients who experience sleep deprivation have an increased length of hospital stay, longer antibiotic therapy, and have an increased risk of death from septicemia.[1] Patients who experience sleep deprivation throughout their hospital stay have increased 1-year mortality rates.[5] Patients with sleep deprivation are liable to develop post-ICU psychiatric disorders also.[7,8]

Sleep deprivation among hospitalized patients can directly affect clinical outcomes of patients. Identifying relevant and potentially modifiable factors associated with sleep disturbances can serve as the remedial measures to sleep deprivation.[3] The objective of the study was to assess the prevalence of the sleep deprivation and find out the association of sleep deprivation with selected demographic, disease-related and hospital-factors among hospitalized patients. In this study inadequate sleep or sleep deprivation was defined as the sleep duration of less than seven hours in 24-hours period.[2]

METHODS

A descriptive survey design was used to identify the status of sleep deprivation among hospitalized patients among the adult patients aged 20 years or above and hospitalized for at least 3 days. The study subjects were chosen from medical and surgical wards of Shree Birendra hospital, Chhauni, Kathmandu Nepal. Data was collected for around two weeks through semi structured interview between 14 Jan 2021 to 27 Jan 2021. The study was initiated after getting approval from the Hospital Director of SBH. The statements were prepared in English and converted to local language for easy understanding. Interview schedule was divided into two parts: part I included questions related to the socio- demographic, family characteristics, hospital related and disease-related factors of the respondents; part II consisted of sleep related questions.

The instrument was pre-tested on 10% of the total sample size i.e six samples in the same hospital, for correct understanding of the instrument and the necessary modification was done. Ethical approval was taken from institutional Review Committee of Nepalese Army Institute of Health Sciences, Sanobharyang, Nepal. An informed consent was obtained from each participants prior to data collection by explaining the purpose of the study. Confidentiality of the information was ensured by maintain privacy by using bed side screen while interviewing. Data analysis was done via statistical package for the social science (SPSS) version 20 through descriptive and inferential statistics. Chi-square test was used to find out the association of different variables to the sleep deprivation considering P value of <0.05 as significant association.

RESULTS

65 hospitalized patients admitted for various cause with sleep problems were included in the study.

Table 1 reveals that fracture was the commonest (27.7%) cause of hospitalization followed by diabetes mellitus (16.9%). Majority (73.8%) of the respondents had some kind of pain or discomfort.

Table 1. Disease Related Characteristics among the Respondents

Variables	No. of patients admitted	Percentage (%)
Cause of Hospitalization (n=65)		
Fractures	18	27.7
Diabetes Mellitus	11	16.9
Cholelithiasis	9	13.8
Hypertension	9	13.8
Pancreatitis	7	10.8
Nephrolithiasis	6	9.2
Others (e.g. Appendicitis, Pneumonia, ACL tear)	5	7.7
Presence of Pain or Discomfort (n=65)		
Yes	48	73.8
No	17	26.2
Severity of Pain or Discomfort (n=48)		
Mild	26	54.1
Moderate	19	39.5
Severe	3	6.25

Table 2. The table shows that the majority (76.9%) of the respondents had 3-11 days of hospital stay. The majority (73.8%) of the respondents stated that hospital environment was unfavorable and almost all of them (95.8%) stated noise as the main disturbing factor followed by light (66.6%).

Table 3 reveals that about half (50.8%) of the respondents had difficulty in falling asleep and half (49.3%) had shorter duration of sleep sometimes. 47.7% of respondents woke up in between sleep and 46.2% woke up earlier than usual daily.

In Table 4, sleep quality in different days of hospitalization are shown. The proportion of respondents with duration of sleep as seven hour or more increased with days of hospitalization from 9.2% on first day to 38.8% on the third day.

Table 5 presents the association of sleep deprivation with selected variables on days 1, 2 and 3 of hospitalization. Higher proportion of respondents with unfavorable hospital environment had sleep deprivation than those with favorable hospital environment on days 1, 2 and 3, and this difference was statistically significant (p=0.036).

Table 2. Hospital-related Characteristics among the Respondents

Variables	Frequency (no. of patients)	Percentage (%)
Duration of Hospitalization (n=65)		
3-11 Days	50	76.9
12 Days and above	15	23.1
Hospital Environment (n=65)		
Favorable	17	26.2
Unfavorable	48	73.8
Disturbing factors * (n=48)		
Noise	46	95.8
Light	32	66.6
Change in environment	14	29.1
Diagnostic procedures	9	18.7
Room temperature	8	16.6
Uncomfortable bed	8	16.6
Nursing procedures (e.g. taking vital signs)	4	8.33
Others (e.g. Health workers)	5	10.4

**Multiple responses*

Table 3. Frequency of Sleep Problems Experienced by the Respondents (n=65)

Variables	Never (%)	Sometimes (%)	Daily(%)	Mean SD±
Difficulty in falling asleep	20.0	50.8	29.2	1.09 ±0.7
Waking up in between sleep	9.2	43.1	47.7	1.38 ±0.65
Waking up earlier than usual	12.3	41.5	46.2	1.34 ±0.69
Shorter duration of sleep	16.9	49.3	33.8	1.17 ±0.7

Table 4. Sleep Quality during Hospitalization on Different Days of Hospitalization (n=65)

Variables	Day 1 (%)	Day 2 (%)	Day 3 (%)
Time needed to fall asleep (n=65)			
≥30 minutes	16.9	29.2	40.0
More than 30 minutes	83.1	70.8	60.0
Total duration of sleep (n=65)			
≥7 hours	9.2	24.6	33.8
<7 hours	98.8	75.4	66.2
Woke up before usual time (n=65)			
Yes	69.2	66.2	60.0
No	30.8	33.8	40.0
If yes, how much time earlier?	(n=45)	(n=43)	(n=39)
Less than 30 minutes	6.6	34.8	48.7
30 minutes or more	93.3	65.1	51.2

There was no statistically significant association of the prevalence of sleep deprivation with age and presence of pain or discomfort on days 1,2 and 3. There is also statistically significant association of the prevalence of sleep deprivation with sex of the respondents (p=0.025) on day 2 indicating a significantly a higher proportion of the female respondents with sleep deprivation.

DISCUSSION

This study revealed that the majority (73.8%) of the respondents experienced the hospital environment to be detrimental to sleep and almost all (95.8%) stated that noise was the most disturbing factor to sleep. Similar results found in study conducted in the Netherlands among 2005 patients also revealed that majority (70.4%) of the patients were awakened by external causes and the most reported sleep-disturbing factors were noise from other patients, medical devices, pain, and frequent toilet visits.[3] Similar study done in Thailand showed that the noise and light were identified as the most common causes of sleep deprivation among hospitalized patients.[4] Similar finding was reported in a

Table 5. Association of sleep deprivation with age, sex, hospital environment and presence of pain/discomfort on days 1, 2 and 3 of hospitalization.

Variables	Sleep Deprivation on different Days								
	Day 1			Day 2			Day 3		
	Present	Absent	p-Value*	Present	Absent	p-Value*	Present	Absent	p-Value*
Age(in years)									
20-39	89.2	10.8	0.692	73	27	0.604*	62.2	37.8	0.434
40 and above	92.9	7.1		78.6	21.4		71.4	28.6	
Sex									
Male	87.9	12.1	0.672	63.6	36.4	0.025*	57.6	42.4	0.138
Female	93.8	6.3		87.5	12.5		75	25	
Presence of pain/ discomfort									
Yes	91.7	8.3	0.648	75	25	0.592*	66.7	33.3	0.883
No	88.2	11.8		76.5	23.5		64.7	35.3	
Hospital environment									
Favorable	76.5	23.5	0.036	47.1	52.9	0.002	35.3	64.7	0.002
Unfavorable	95.8	4.2		85.4	14.6		77.1	22.9	

study conducted on 240 hospitalized patients with heart failure in Tehran where almost all (91.2%) respondents had a poor sleep quality.[9]

This study revealed no significant association of the prevalence of sleep deprivation with age of the respondent on the first, second and third night of hospitalization. Whereas study conducted in Netherland among 2005 patients, with majority (57.0%) of the respondents aged above 65 years revealed that they experienced fewer sleep disturbances in the hospital[4] possibly because they were used to more disrupted sleep at home due to age factor.

In the present study there was significant association between prevalence of sleep deprivation and sex of respondents on second night of hospitalization (p=0.025) but no significant association of the prevalence of sleep deprivation and sex of the respondents was found on first and third night of hospitalization. The current study revealed no significant association between sleep deprivation with pain and discomfort during the first, second as well as the third night of hospitalization. In contrast to these findings, a study conducted in postoperative ward of Forth Valley Royal Hospital of UK involving 102 patients identified pain as the predominant factor, with 48.0% and 47.7% of patients giving this as the main reason for their interrupted sleep in the first and second postoperative days respectively.[10] The disparity might be because although this study was conducted in a surgical ward, during the study period there were all kinds of medical as well as surgical patients admitted in the ward because of the shortage of beds in other wards due admission of COVID 19 patients in some other wards.

This study revealed a significant association between sleep deprivation and the hospital environment during first (p=0.036), second (p=0.002) as well as on the third (p=0.002) day of hospitalization. In the hospital environment, noise and light were the most disturbing factors for sleep deprivation (95.8% and 66.6% respectively). Similarly, a study conducted in the postoperative ward of Forth Valley Royal Hospital of UK involving 102 patients also identified environmental factors (noise and disturbances from other patients, and nursing staff) as a significant factor disturbing patients' sleep during hospitalization.[10]

This study showed that sleep deprivation was reduced with increasing length of hospitalization which might be due to adjustment with the environment and decreased level of pain/discomfort after receiving treatment modalities. Similar study conducted in Thailand among 96 patients demonstrated a high prevalence of poor sleep quality in hospitalized patients, and the sleep quality was partly improved after the third day of admission which is explained as due to familiarity of patients to the hospital environment and the improvement of medical illness.[4] Light exposure and pain were stated to be the factors associated with poor sleep quality.

CONCLUSIONS

The study concludes that sleep deprivation is prevalent among hospitalized patients. Hospital environment is an important factor in sleep deprivation among the hospitalized patients; particularly noise and light are the most disturbing factors. Hospital staff should be more careful during the sleep hours of patients and try to minimize these hospital environmental factors as far as possible.

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