Students' Corner

Sleep Deprivation and its associated factors among general ward patients at a Tertiary Care Hospital in Pakistan

Majid Shafiq[1], Farah F. Salahuddin[2], Maham Siddiqi[7], Zaman Shah[4], Rehmat Ali[5], Rizwan A. Siwani[6], Ayesha Saleem[7], Kashif Shakoor Shaikh[8], Ali Khan Khuwaja[9]

Medical College[1-8] and Department of Community Health Sciences[9], Aga Khan University, Karachi.

Abstract

Objective: To estimate the occurrence rate of sleep deprivation and to identify the environmental, staff-related and patient-related factors associated with SD among general ward patients of a tertiary care hospital in Pakistan.

Methods: In a cross-sectional study, a pre-tested questionnaire was administered to 108 patients admitted into the general medical and general surgical wards of Aga Khan University Hospital, Karachi.

Results: In all, 50 (46.3%) respondents felt deprived of adequate sleep in the hospital. Worry about illness disturbed the night-time sleep of 47 (43.5%) patients; most of these had SD (70%) ($p<0.001$). Other patients' noise disturbed 31.5% of study subjects and a significant majority (68%) of these had SD ($p=0.003$). Over 17% of study subjects reported cell phone's ringing as a disturbing factor; more by those with SD (68%) compared to those with no SD (32%); again the difference was significant ($p=0.003$). Physical discomfort and presence of cannula were reported as disturbing factors by 41.7% and 28.7% of the study subjects respectively but these were not significantly associated with SD.

Conclusion: Our study revealed that sleep deprivation occurs commonly among general ward patients in tertiary care setting. Factors found to be associated with SD were amenable to modification to a greater extent (JPMA 56:614;2006).

Introduction

Sleep is an essential part of the normal human circadian rhythm. It is essential for maintenance of physical, sexual and mental functions of the body. Studies well document the negative effects of sleep deprivation (decreased vigilance, impaired decision-making, reduced concentration, irritability, sleepiness, increased fatigue, and difficulty in thinking clearly). Sleep deprivation (SD) is also well recognized as a stressor, affecting human health in many adverse

ways including memory impairment and prolonged treatment spans of patients suffering from various illnesses.[1-4] This may result in increased costs from prolonged hospitalization for the patients admitted to a hospital. It has been noted in various hospital-based studies that nocturnal interactions of health care providers with in-patients have actually been counter-beneficial as they leave patients with fewer opportunities of continuous sleep.[1,3,5]

A tertiary care center offers a suitable setting to study the occurrence of SD among inpatients and its association with patients' perceptions about the disease, environment and the nocturnal care being provided to them. Not only is there a wide range of diseases presenting to such a center, an extensive socio-demographic and ethnic variety of patients is also seen due to a scarcity of such facilities in a developing country like Pakistan.

While studies have reported that patients admitted into tertiary care centers have been seen to sleep poorly, with identified causes being largely preventable,[5,6] there is little data to comment on the situation at tertiary care centers in Pakistan.

With this background, a study was carried out by a group of medical students of The Aga Khan University, Karachi with the objectives of estimating the frequency of SD among general ward patients of a tertiary care hospital and investigating for associations between SD and various environmental, health personnel-related and patient-related factors relevant to the hospital ward setting, thereby paving.

Patients and Methods

In a cross-sectional study, 108 consecutive patients admitted into the general medical (n=79) and general surgical (n=29) wards of Aga Khan University Hospital (AKUH), Karachi during August 2004 were interviewed. All patients who met the selection criteria during this time period and gave informed verbal consent were interviewed. Those patients who were aged >15 years and who had spent at least two consecutive nights in the ward were included. Patients who were excluded from the study were those who had been on any medications with sedative or other central nervous system effects during the past three days (noted from each patient's medical records), those with already diagnosed sleep disorders, those who were mentally challenged or unable to respond clearly and those admitted in the semi-private, private or specialist wards (e.g. obstetrics and gynecology wards or the intensive care unit).

A self-designed questionnaire was used as the information collecting tool. Face-to-face administration of the questionnaire was performed by a group of pre-trained medical students. After it was formulated in English, the questionnaire was translated into the local language (Urdu) in order to limit interviewer bias. Finally, in order to identify and correct any discrepancies during the translation process, the questionnaire was back-translated by a group of investigators not involved in the original translation. The questionnaire was pre-tested on a group of patients admitted in the semi-private wards of the same hospital.

The questionnaire's first section recorded patient demographics, diagnosis and the medications on record. Queries on various aspects of the hospital ambience were asked in the next section. The patients were asked whether the presence of any of these was significant enough to cause a disturbance during their sleep at night-time. Similar questions were asked in the context of attributes and behaviour of the hospital staff and aspects of the patient's own life and personality.

"Sleep deprivation" was thought to be best assessable using patient's own perception of the same. Patients were asked a straight-forward question at the end of the questionnaire: "do you feel that you are deprived of adequate sleep in the hospital?" Possible responses to this question were "yes" and "no".

Data were entered and analyzed in the Statistical Package for Social Sciences (SPSS) 13.0 software. Frequencies of all variables were generated. For patients disturbed by each variable, a division was made between those who said that they were deprived of adequate sleep in the hospital and those who said they were not. The chi-square test was applied to test the association of SD with different variables. A p-value of <0.05 was taken as the criterion for significant association.

Results

Demographic profile of the study subjects is given in Table 1. A total of 108 patients participated in the study, with a preponderance of males, 71 (65.7%) and of those with age above 40 years, 62 (57.4%) of the 108 study subjects 53 (49%) had schooling of up to six years and 55 (51%) had schooling of more than six years. Urdu was identified as the mother tongue by 52 (48.1%) subjects, followed by Sindhi and other local languages.

In total, 50 (46.3%) subjects felt deprived of adequate sleep during their hospital stay (Figure). Associations of different factors with sleep deprivation are described in Table 2. Of the total of 108 study subjects, worry about illness was disturbing the night-time sleep of 47 (43.5%). Thirty-three of these patients (i.e. 70% of 47) had SD while 14 did not; the difference was statistically significant ($p<0.001$). Other patient's noise was disturbing the sleep of 34 (31.5%) study subjects; 23 of these had SD while 11 did not. This difference was statistically significant ($p=0.003$). Cell phone's noise was reported as a disturbing factor by

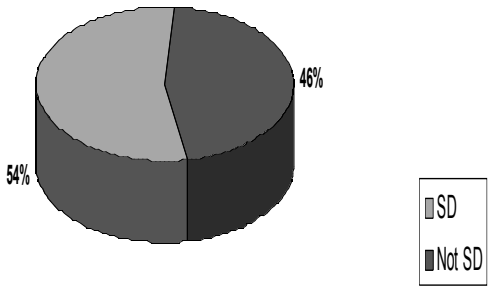
Table 1. Demographic characteristics of study subjects (n=108).

Characteristic	Number (%)
Age (years)	
≤ 40	46 (42.6)
> 40	62 (57.4)
Sex	
Male	71 (65.7)
Female	37 (34.3)
Education (in years)	
≤ 6	53 (49.1)
> 6	55 (50.9)
Ethnicity (Mother tongue)	
Urdu	52 (48.1)
Sindhi	14 (13.0)
Punjabi	10 (9.3)
Gilgiti/Chitrali	8 (7.4)
Pashto	6 (5.6)
Other (Persian, Seraiki, etc.)	18 (16.7)

Table 2. Association of major disturbing factors with SD among study subjects

Disturbing factor	No. of patients n (%)	SD + ve n (%)	SD - ve n (%)	p-value
Worry about illness	47 (43.5)	33 (70)	14 (30)	<0.001
Physical discomfort	45 41.7)	22 (49)	23 (51)	0.648
Other patients' noise	34 (31.5)	23 (68)	11 (32)	0.003
Cannula	31 (28.7)	18 (58)	13 (42)	0.12
Cell phones' noise	19 (17.6)	13 (68)	6 (32)	0.003

Figure: Occurence of SD among the study subjects



19 (17.6%) study subjects; significantly more commonly by those with SD (13) compared to those with no SD (p=0.003). Physical discomfort and presence of a cannula were reported as disturbing factors by 45 (41.7%) and 31 (28.7%) study subjects respectively but these were not seen to be significantly associated with SD.

A small number of patients (six in total) said that their night-time sleep was disturbed by lighting conditions; this was not found to be associated with SD. Other aspects of the hospital environment (including bedding, temperature, etc) were not associated with SD either.

Discussion

In addition to various physical and mental illnesses, SD is associated with delayed recovery from illness[7], thereby placing an additional burden on finances and resources. Therefore, by taking steps to prevent or overcome it, the overall burden of disease could possibly be reduced. It becomes all the more important to quantify the burden of SD among in-patients in a developing country, where optimal channeling of limited resources is crucial.

The estimated occurrence rate of SD among the general ward in-patients in this study was 46.3%. This is higher than the community based value of 20.4%, reported by Hublin et al[8] for the Helsinki population. However, it is arguable that the higher occurrence of SD among this study was largely due to effects of their respective illnesses. In a hospital-based study, no less than 65% of the studied patients slept badly in the hospital.[9] According to Redeker et al,[10] 64% cardiac surgery patients reported sleep disturbances even 4 weeks after the operation. However, cardiac surgery patients may be considered to be near the end of a spectrum of patients requiring hospital admission.

Studies of sleep patterns implicate the environment of hospital as an important cause in preventing adequate sleep.[11-13] Environmental factors include lighting, temperature, and bedding, among others. Honkus VL has shown that light may significantly contribute towards a patient's inability to sleep.[14] Electric lighting in the hospital environment is found to be inappropriate for the maintenance of normal neuroendocrine rhythms in humans.[15] which results in sleep disturbance. Only six (5.5%) patients interviewed in this study said that the lighting disturbed their night-time sleep and only two among these patients said they were sleep deprived. Likewise, other environmental aspects mentioned above were not associated with SD either. One possible explanation for this discrepancy could be that this study investigated disturbances in the patients' sleep at night-time only (when the lighting would be considerably dimmer.

In this study, noise from mobile phones and noise from other patients were most significantly associated with SD. This is consistent with results of previous studies done in nursing homes and intensive care units where noise was the major factor associated with SD.[6,15] However, the sources of noises identified from those studies are different. Some of the factors identified by them are noises from equipment, nursing staff conversations and alarms. A

number of factors may be responsible for this difference. Firstly, this study setting was of general medical and surgical wards rather than nursing homes or critical care units. Besides, patient expectations and attitudes may be different in the South Asian setting. For instance, some patients may feel grateful at any human presence around them and may not deem the nurses' activities intrusive on any count.

Although it was not found to be significantly associated with SD, the presence of a cannula did disturb a substantial number of patients' night-time sleep. Other studies have also revealed that venous cannulas and urinary catheters may be sources of significant discomfort in many patients.[6]

A stressful event often precipitates disturbances in sleep. Being in the hospital and undergoing surgery are classic examples. Intrinsic factors such as fear and stress may precipitate or perpetuate sleeping disorders.[7] In our study too, worry about illness was seen to be associated with SD. On the other hand, physical discomfort caused by the patients' pathological conditions was not associated.

The possibility of recall bias may be counted as a limitation of this study. It is possible that patients who were sleep deprived were able to recall and narrate their hospital experiences more clearly than those who were not. Secondly, this study was carried out in only one hospital, which may not be a true representative of all tertiary care hospitals. And since it was a private hospital, it is possible that the overall occurrence of SD may be even higher in other hospital setups than what was observed in this study.

This study suggests a high occurrence of SD among the admitted patients in a tertiary care hospital of Pakistan. This warrants extensive studies for more accurate estimation of the same.

Patients' worry about illness has also been seen to be associated with SD. This factor can be ameliorated by greater communication between the health care providers and the patients.

In conclusion, sleep deprivation appears to be a very common problem among our in-patients, with many of the associated factors being modifiable. However, more studies are needed on this subject with a larger sample size and representative hospitals and patients. This would enable us to gather truly applicable results and to formulate hospital policies accordingly.

Acknowledgements

Authors wish to thank the administration of AKUH general wards for granting permission to interview their in-patients as well as have access to their medical records. We are grateful to those patients who gave their informed consent for participation in this study. We are also grateful to Dr. Bilal Iqbal, Assistant Professor at Department of Community Health Sciences, AKU, for offering his useful advice during the stages of study planning and data analysis.

References

1. Alvarez GG, Ayas NT. The impact of daily sleep duration on health: a review of the literature. Prog Cardiovasc Nurs 2004;19: 56-9.
2. Guan Z, Peng X, Fang J. SD impairs spatial memory and decreases extra cellular signal-regulated kinase phosphorylation in the hippocampus. Brain Res 2004;1018:38-47.
3. Perla E. Psychiatric problems and sleep disorders in surgical intensive care. A polygraphic study: 8 cases. Agressologie 1989;30: 603-16.
4. Schulze G. Sleep protects excitatory cortical circuits against oxidative damage. Med Hypotheses 2004;63: 203-7.
5. Tamburri LM, DiBrienza R, Zozula R, Redeker NS. Nocturnal care interactions with patients in critical care units. Am J Crit Care 2004;13:102-12.
6. Calvete VR, Garcia AMB, Uriel LP, Fernandez LV, Medin CB. Patients' sleep in intensive care units and sleep-modifying factors. Enferm Intensiva 2000;11: 10-16.
7. Adam K, Oswald I. Sleep helps healing. Br Med J 1984;289: 1400-1.
8. Hublin C, Kaprio J, Partinen M, Koskenvuo M. Insufficient sleep--a population-based study in adults. Sleep 2001;24: 392-400.
9. Kuivalainen L, Ryhanen A, Isola A, Merilainen P. Sleep disturbances affecting hospital patients. Hoitotiede 1998;10: 134-43.
10. Redeker NS, Ruggiero JS, Hedges C. Sleep is related to physical function and emotional well-being after cardiac surgery. Nurs Res 2004;53: 154-62.
11. Reid E. Factors affecting how patients sleep in the hospital environment. Br J Nurs 2001;10: 912-15.
12. Olofsson K, Alling C, Lundberg D, Malmros C. Abolished circadian rhythm of melatonin secretion in sedated and artificially ventilated intensive care patients. Acta Anaesthesiol Scand 2004;48: 679-84.
13. Wood AM. A review of literature relating to hospital with emphasis on the sleep of the ICU patient. Intensive Crit Care Nurs 1993;9: 129-36.
14. Honkus VL. SD in critical care units. Crit Care Nurs Q. 2003;26: 179-89.
15. Stevens RG, Rea MS. Light in the built environment: potential role of circadian disruption in endocrine disruption and breast cancer. Cancer Causes Control 2001;12: 279-87.
16. Schnelle JF. The nighttime environment, incontinence care, and sleep disruption in nursing homes. J Am Geriatr Soc 1993;41: 910-4.