

## Quality of sleep for hospitalized patients in Rasoul-Akram hospital

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### Abstract

**Background:** Sleep disturbances have negative effects on medical conditions, mental health and cognitive performance. It was shown that about 60% of inpatients suffer from sleep problems. The aim of this study was to assess the correlation between sleep quality and other factors in the inpatients of Rasoul-e-Akram hospital.

**Methods:** In this cross-sectional study, all the hospitalized patients in twelve wards of Rasoul-e-Akram hospital during September 2012, were examined. Sleeping habits of 209 inpatients of different wards were assessed through the Persian version of Pittsburgh Sleep Questionnaire (PSQI). A self-designed 18- question questionnaire was conducted for all patients in order to assess their attitude to interior and atmosphere of wards. Content validity and test retest reliability were evaluated. The pain level was also measured by the visual analog scale (VAS) and scores analyzed by the statistical methods of frequency, percentage, chi-square and logistic regression.

**Results:** The mean of the total scores in PSQI was  $8.8 \pm 4.8$  and 70.8% of the patients were 'poor sleepers' (global PSQI > 5). Age and gender had no effect on the PSQI total score, but the number of roommates, type of the ward, hospitalization period, presence and severity of pain, taking sleep medication and attitude toward the overall atmosphere and interior of wards have caused deviation in scores.

**Conclusion:** Sleep problems are quite frequent in medical inpatients. Pain management and modification of the ward interior and atmosphere can impact inpatients sleep quality.

**Keywords:** Sleep quality, hospitalized patients, Pittsburgh Sleep Questionnaire.

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### Introduction

Proper sleep is essential for a person's health and wellbeing. Generally less than 6 hours sleep is considered to be insomnia and associated with increasing risk of accidents, fallings, irritability and fatigability, cognitive decline, psychomotor disturbances and morbidity and mortality. Moreover insomnia can lead to high blood pressure and greater C-reactive protein (CRP) concentration, which are inductive of coronary artery disease (1-8).

According to the National Sleep Founda-

tion (NSF), sixty percent of American adults suffer from sleep disorders (1). Pourafkary et al. showed that prevalence of sleep disorders in general population of Iran was 35.22%. Moreover daytime sleepiness (64%), difficulty in falling sleep (41.3%), nightmare (16.9%), sleep talking (26.4%), sleep paralysis (16.5%), sleep terror (9.6%) and sleep walking (7.1%) were the frequent sleep disturbances in their study (9).

Sleep disturbances were also frequently reported by hospitalized patients. The ma-

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majority of patients suffer from insomnia in the first three days of hospitalization.(10) There were various precipitants for sleep disturbances in inpatients, which include: psychiatric disorders, anticipatory anxiety for surgical or diagnostic procedures, and type of medical and surgical problems (10, 11).

For instance, Pimental et.al study, done in two hospitals in Belo Horizonte, showed that the main causes of sleep disturbances were environmental factors including noise (45.7%), temperature (22.9%) and number of roommates (20.0%). Furthermore, 29% of the inpatients could not sleep, because of their medical condition and 17% became insomniac because of psychological problems (12).

Sleep quality is particularly important in inpatients of a general hospital.

It was shown that the rate of hospitalization increased among inpatients suffering from sleep disturbances (13-14).

Accordingly, it is valuable to determine the risk factors for sleep disturbances in inpatients of general hospitals. Unfortunately, there are few studies of sleep problems among Iranian inpatients of general hospitals. This study assessed the sleep quality and its correlation with the aforementioned subjects.

## Methods

### *Participants and setting*

In this cross-sectional study, all the inpatients of Rasoul-e-Akram hospital-a training hospital affiliated to Iran University of medical sciences who were hospitalized during September 2012, included in this study. The patients were enrolled to the study through available non-probability sampling.

Inclusion criteria were: being hospitalized for at least seven days, 18 years old or above, being conscious, literate and able to communicate in Persian.

All the patients filled the informed consent and were aware that refusing to participate in the study would not influence their treatment process.

At the end of September, 209 inpatients of twelve wards including Internal Medicine, Orthopedics, Obstetrics-Gynecology, Neurology-neurosurgery, Surgery, Post-CCU, Pain, Dermatology-Oncology, ENT, Nephrology, Psychiatry and Ophthalmology were asked about their quality of sleep, severity of pain and attitude towards wards atmosphere.

### *Procedure*

The quality of sleep was assessed through the Persian version of Pittsburgh Sleep Quality Index (PSQI).

The PSQI is a self-rated questionnaire designed by Buysse et al. for assessing subjective sleep quality over the past month. In this study we changed the past month to past week.

The psychometric properties in insomniac patients and excessive daytime sleepiness were confirmed to be fair (15). It consists of seven 'component' scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction, all of which are summed to a single global score. In a previous study, the Persian version of PSQI was validated and its reliability were also assessed (Chronbach's $\alpha$ =0.83). Total score more than 5 is defined as sleep disturbance (16).

The pain level was measured by the visual analog scale (VAS).Patients were asked to assess the level of their average pain by placing a mark on a horizontal line that was 10 cm long.

Inspired by Vartiainen and Hakola (17) a questionnaire with 18 questions was designed to assess patients' satisfaction of the ward interior and the general ward atmosphere. Each question had five grades (totally disagree, slightly disagree, hard to say, slightly agree, totally agree). And the total score was 90. To evaluate the content validity of this questionnaire delphi method was used. Six experts (five associative professor of psychiatry and one assistant professor of psychiatry) revised the questions in three rounds. Test retest reliability was evaluated

within 5 days for 42 inpatients ( $r=0.74$ ).

The Data were analyzed using correlation, chi-square, ANOVA, t-test and logistic regression. The level of significance was set up at  $p < 0.01$ .

## Results

Subjects' demographic characteristics are presented in Table 1.

70.8% of the samples had PSQI score more than 5. The mean score of The PSQI was  $8.8 \pm 4.82$ .

The results showed that the frequency of a total score of greater than 5 in the Pittsburgh questionnaire did not differ regarding to gender ( $p=0.36$ ) and age ( $p=0.28$ ).

In contrast, using correlation test total score of the Pittsburgh questionnaire was significantly different based on number of room-mates ( $p=0.01$ ,  $r=0.164$ ), duration of hospitalization ( $p=0.002$ ,  $r=0.218$ ), presence and severity of pain ( $p=0.001$ ,  $r=0.501$ ), taking sleep medications ( $p=0.0001$ ,  $r=0.247$ ) and satisfaction of the

Table 1. Demographic and other characteristics of subjects (n=209)

Variable	No (%)
Gender	
Female	106(50.7)
male	103(49.3)
Age	38+_12
Mean duration of hospitalization (MIN-MAX)	9.1+_2.1 (7-32)
Mean numbers of roommates (MIN-MAX)	1.8+_1.2 (0-8)
types of sleeping medication	
clonazepam	34
lorazepam	1
diazepam	22
oxazepam	11
alprazolam	1
zolpidem	4
Pain	
No	119(56.9)
Mild	28(13.4)
Mod	34(16.3)
Severe	21(10)
Extremely severe	7(3.3)
PSQI mean component scores	
subjective sleep quality	1.29±0.8
sleep latency	1.38±1
sleep duration	1.89±0.8
habitual sleep efficiency	1.22±1.1
sleep disturbances	1.22±0.5
use of sleeping medication	1.2±0.8
daytime dysfunction	0.9±0.8
total	8.8±4.8
Ward	
medicine	40(19.1)
Orthopedics	30(14.4)
Obstetrics-Gynecology	23(11)
Neurology-neurosurgery	20(9.6)
Surgery	29(13.9)
Post-CCU	14(6.7)
pain	14(6.7)
Dermatology-Oncology	14(6.7)
ENT	10(4.8)
Nephrology	10(4.8)
Psychiatry	10(4.8)
Ophthalmology	9(4.3)
Satisfaction of wards atmosphere and interior	69.48+-9.13

ward. ( $p=0.001$ ,  $r=-0.263$ )

In summary, higher number of roommates, longer duration of hospitalization, presence and severity of pain, sleep medications and negative attitude towards ward atmosphere were accompanied with poor sleep.

Out of the patients hospitalized in different wards, mean score of subjective sleep quality and mean of sleep duration were the highest in neurologic patients and the lowest in psychiatric and orthopedic patients. Nevertheless the rate of taking sleep medicines and the mean scores of daytime dysfunction were the lowest in neurologic patients and the highest in psychiatric and orthopedic patients. Using ANOVA, it was revealed that the total score of PSQI was significantly different between inpatients of different wards ( $F=3.671$ ,  $df_{total}=207$ ,  $p=0.0001$ ).

Using logistic regression total score of PSQI was not significantly different based on pain ( $p=0.037$ ), type of ward ( $p=0.471$ ), satisfaction of ward ( $p=0.605$ ), gender ( $p=0.278$ ), age ( $p=0.161$ ), number of roommates ( $p=0.144$ ) and duration of hospitalization ( $p=0.152$ ) and the only variant that significantly affected sleep quality was taking sleep medicine ( $p=0.001$ ).

### Discussion

In this study, the mean of total score of PSQI was  $8.8\pm 4.8$  and 70.8% of the samples gained a total score greater than 5.

The mean of total score of PSQI in advanced cancer patients in Mistakidou's study was  $11.72\pm 4.4$  (18). The different results could be due to the differences in sampling methods, because sleep disturbance has been one of the most frequent side effects experienced by patients with cancer (19,20) and it could be the reason for higher global score of PSQI in that study.

A study carried out by Dogan et al. (2005) showed that the PSQI mean score in 150 hospitalized patients of a general hospital was 7.9 (11). Their sampling method was more similar to ours. Similarly, they pointed out that patients in psychiatric

ward experienced more sleep problem than the other wards.

We did not find a significant relationship between demographic factors and sleep, conversely some of the studies demonstrated that the quality of sleep was influenced by demographic factors such as age and gender. For example in the study by Dogan et al. showed that female patients had worse sleep quality than male patients. And in Sendir's study, aging was a risk factor of poor sleeping (21). In a study, which was conducted in a general hospital in Zahedan, Iran, it was shown that 62% of elderly inpatients had sleep disorders, although they used a self-designed questionnaire for assessing the quality of sleep and they did not compare the sleep of elderly in patients with other ages (22).

We found out that patients dissatisfaction from the ward, higher number of roommates and severity of pain were associated with poor sleep. Lane et al. and Sendir et al. also reported that compared to demographic factors, environmental factors such as noise and factors, such as pain and tension had a greater effect on sleep quality (21,23) and these findings indicate the importance of management of pain and modification of the ward atmosphere and interior in improving sleep patterns in hospitalized patients.

Lei et al. also carried out a study on 397 patients in a general hospital. They indicated that 56.7% of patients suffered from sleep disturbances; and the mean score of PSQI after hospitalization was 7.34 and the most precipitants of poor sleep had other concerns, such as the need to use the toilet at nights and environmental factors (24).

In a study conducted on 200 inpatients of university-affiliated hospitals in Babol, Iran, was shown that 63.6% of patients had sleep problems; the mean score of PSQI as  $5.97\pm 3.02$  and consistent with our study, a negative correlation was found between sleep quality and the duration of hospitalization. The reason might be that the longer hospitalization is associated with more severe medical conditions, demoralization

and adjustment disorder (25).

Our study indicated that sleep problems were more in patients of psychiatric and orthopedic wards, although after using multiple regressions and adjusting for other factors, the type of the ward was no longer associated with poor sleep. Similarly other studies reported the most sleep problems in patients of psychiatric and orthopedic wards (11,25). The high rates of sleep disturbances in orthopedic patients can be explained by the high prevalence of pain in them. Other studies also demonstrated that secondary and primary sleep disorders are more common in patients with psychiatric disorders (26). In Pourafkary's study, psychiatric patients compared with general population used more hypnotic agents and the prevalence of sleep disorders in them was significantly higher than general population (9). And it might be the cause of high proportion of sleep disturbances in inpatients of psychiatric wards.

As it was expected, taking benzodiazepines was associated with higher scores of PSQI (26-27).

The present findings should be settled considering the limitations. The data were gathered through a cross-sectional study. Furthermore, there were plenty of factors which influence the quality of sleep; factors such as psychiatric disorders, type of medical and surgical illness, concerns about diagnostic procedures, prognosis, outcome and treatment, health anxiety and other factors which we did not control.

Additional research is necessary to resolve these limitations.

### Conclusion

Sleep problems are quite frequent in medical inpatients. With regard to the complications of sleep disorders and their important role on the course of diseases and quality of life, it is crucial to assess sleep disorders among hospitalized patients, and educate them about sleep hygiene. Furthermore, strategies like pain management and modification of the ward interior and atmosphere could be taken for prevention

and management of sleep problems in these patients.

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