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SLEEP DISORDERS AMONG INPATIENTS AT AL MOUWASAT UNIVERSITY HOSPITAL, DAMASCUS, SYRIA

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ABSTRACT

Background: Sleep disorders are common and unrecognized complaint in the general population. Hospitalization seems to interfere with maintenance and quality of patients' sleep leading to increased prevalence of sleep disturbance in inpatients. Limited research in this topic is done especially in Syria. This study aims to investigate sleep quality and affecting factors in inpatients at Al Mouwasat hospital. **Methods:** A cross sectional study conducted at Al Mouwasat University Hospital, which is the main hospital for patients from all Syrian areas during the crisis, between June 2015 and March 2016. 289 inpatients was randomly selected from surgical and internal wards. Pittsburgh Sleep Questionnaire (PSQI) was administered to assess their sleep patterns and risk factors, where numerous environmental factors related to hospitalization were analyzed to inspect their attribution to sleep disorders. **Results:** Patients' hospitalization is accompanied with poor quality of sleep. 37.02% suffered from difficulty in initiating sleep. About half of the participants (49.13%) reported having difficulties in staying

awake all daytime. Pain was reported by 78.55% of the participants in both internal and surgical wards as the most affecting factor, followed by fear and worry (75.43%), noise (68.17%), boredom (60.55%) and yearning from family 50.17%. Mean PSQI score for total poor sleep quality=6.5±3.4, total poor sleep=47.06%. **Conclusion:** Sleep problems are quite frequent among inpatients at Al Mouwasat Hospital. Hospitalization affects patients' sleep patterns by many factors. The most reported factors are pain and noise. More research is needed to assess types and causing factors and management of sleep disorders among inpatients.

KEYWORDS: Hospitalization, insomnia, Sleep disorders, The Pittsburgh Sleep Quality Index, Syria.

INTRODUCTION

Sleep is considered as one of the most important natural physiological and psychological needs for all human being forming one third of their lifetime.[1] It is a frequent reversible state of insensible attachment and awareness of external environment. Average sleeping hours are estimated between 6 and 9.[2] Sleep regulation refers to periods needed to move from sleeping to awakening.[3] Sleep disorders have become an important public health issue. These disorders may be qualitative or quantitative.[2] Patients who sleep less than 6 hours are considered insomniac. Insomnia is a chronic condition for 10% of adults, it gets worse during recovery[4] and it is the most common disturbance among patients. In addition, about third of the individuals in the United States have suffered from insomnia during their lives.[5]

Generally, it is associated with increasing risk of accidents, violence, fallings, irritability, fatigability, cognitive decline, psychomotor disturbances, morbidity and mortality.[6] Accordingly, insufficient sleep manifests with decreased pain tolerance, lack of patient's corporation with medical staff, patient's boredom, stress and sometimes aggression leading to lowering in quality of life, emotional and cognitive status and memory. It also decreases attention causing learning difficulties.[7] In addition, it increases the blood pressure, infection rate due to immunological inhibition and delays wound healing. Moreover, it is believed that sleep insufficiency induces coronary artery disease.[7] Therefore, sleep quality could be considered as new modifiable cardiovascular risk factor.[8]

As hospital is not favorable environment for good sleep quality, sleep disorders rates in inpatients are higher than the general population.[9] Variable health cases prompt sleep

disorders such as surgical procedures either by the surgical stress or by organic changes. In fact, any kind of pain, worry or stress caused by organic illness, chronic diseases, psychological catastrophes and some medications can cause insomnia.[10]

There is evidence suggesting that in-hospital-stay attributes to affect sleep characteristics with numerous factors like noise, sounds of monitors, lightening, types of assisting ventilation[11], medications and healthcare instruments (like NG tubes) which cause disturbances in sleep/awake cycle.[12] Being in new places, uncomfortable beds and pillows, temperature changes, frequent nursing entrance, or physiological illnesses, being afraid from a disease or even medical tests, lack of privacy and self-control: all at once, have a great impact on patients' sleep with the observed abnormalities in total sleep time, and stage during sleep.[13] In addition, patient recovery especially for those in intensive care unit (ICU) imposes patients to abnormalities in either quality or quantity of sleep, difficulty in staying awake, or a decrease in deep sleep stage (N3) and rapid eye movement stage (REM).[14] Parasomnia (which include REM disorders) and dyssomnia are the primary types of sleep disorders during hospitalization.[15,16]

Rehabilitation is a critical period after when; creating multidisciplinary approach enables patients to reach optimal recovery. Moreover, understanding sleep disturbances in patients with different complains may help nursing staff to improve the quality of sleep while providing healthcare.[17]

In this study, we aim to investigate sleep disorders among in-hospital patients, to assess quality and duration of sleep, demographic variables, other factors that negatively affect sleep during hospitalization to better understand the contributing factors and help improving quality of life and healthcare for these patients.

METHODS

A cross-sectional study was performed on inpatients at Al Mouwasat University Hospital, Damascus, Syria, between June 2015 and March 2016. The patients were selected randomly from both surgery and internal medicine wards. A random sample of 289 patients was selected from each room typically; first and third bed. We included all conscious and responsive patients who are not on any psychological treatment and do not have a previous diagnosed sleeping disturbance. We included only patients who have stayed in the hospital between 7 and 10 days.

We administered a questionnaire containing Pittsburgh sleep quality index (PSQI) and some items derived from previous studies.[18,19] The questionnaire included sections for demographics and self-assessment of sleep disturbances. PSQI questionnaire was translated to Arabic, checked and approved by Faculty of Medicine of Damascus University scientific research committee. The questionnaire reliability for internal consistency was tested (Cronbach alpha 0.7). Confidence interval was of 95% and the average deviation 2% and the acceptable level of significance was ($P < 0.05$).

PSQI includes nineteen items to assess the disturbance, quality, quantity, habits and sufficiency of sleep, as well as daily activity disturbances. Scoring was calculated according to PSQI instructions[29], a score of 5 or more is considered to be associated with poor sleep quality.

Ethical approval was obtained from Faculty of Medicine of Damascus University and Al Mouwasat Hospital administration. A written informed consent was obtained from all patients. Statistical Analysis was done using SPSS 23 (IBM Corporation, NY, USA).

RESULTS

We investigated 295 patients, six questionnaires (0.02%) were eliminated due to missing data and final analysis included 289 questionnaires. Participants were 65.05% males (n = 188) and 34.95% females (n = 101). Patients from internal medicine wards represented 53.63% of the participants (n = 155), in addition to 46.37% (n = 134) from surgical wards. Participants' ages ranged from 19 to 70 years with an average of 45.24 ± 11.13. Educational level of participants varied from elementary school (35.99%), middle school (28.03%), high school (18.69%), and collage degree (4.84%), with an illiteracy percentage of 12.46%. Of all patients, 197 were married (68.17%), 19 were single (6.57%), 58 were divorced (20.07%) and 15 were widowed (5.19%). 64.01% of participants were smokers. Participants mean BMI was 30.98 ± 7.11. 89.7% of participants shared accommodation with another patient in their room. Characteristics of participants are summarized in Table 1.

Most of patients went to sleep before 11:00 PM (66.79%), while 21.45% slept between midnight and 02:00 AM. A percentage of 32.56 needed less than 15 minutes to sleep, 30.42% needed 16-30 minutes, 19.72% needed 31-60 minutes whereas 17.30% needed more than 60 minutes, therefore, we can say that (37.02%) suffer from difficulty in initiating sleep. About half of patients reported to wake up around 7 o'clock in the morning (49.5%), 35.2% wake up

around 6:00 AM and 15.3% around 5:00 AM. About half of the participants reported that they do not have any difficulty to stay awake all day. However, 21.11% found difficulties in staying awake during the day for once, 22.15% for twice and 5.87% for 3 times resulting in 49.13% having difficulties in staying awake all daytime.

Pain was found as the most contributing factor reported by 78.55% of the participants in both internal and surgical wards, followed by fear and worry (75.43%), noise (68.17%), boredom (60.55%) and yearning from family 50.17%. Table 2 shows percentages of all factors leading to negative impact on patients' sleep. Results of our data showed that feeling pain is the most important complaint for patients (53.72%), followed by not being able to sleep within 30 minutes (52.85%), frequent noise (51.30%) and hue light (50.43%). The least important was waking up to enter the toilet with a frequency of 40.43%. These results are interpreted in Table 3.

By studying the quality of sleep, results showed that 66.78 scored less than 5 according to PSQI (31.49% of participants slept very well, 35.29% slept well), while 19.38% had poor and 13.82% had very poor sleep quality (mean PSQI score for total poor sleep quality = 6.5 ± 3.4, total poor sleep = 47.06%). By studying the factors that led to poor sleep quality according to PSQI results, the was no statistical difference between groups of males and females, department, number of beds in shared rooms or participants who reported disturbance from sounds of devices and who did not (Mann-Whitney U test, $P < 0.05$). On the other hand, there was a significant statistical difference of PSQI scores between people who reported pain as a disturbing factor, in addition to changing of sleeping place, frequent entrances of nurses, uncomfortable beds (Mann-Whitney U test, $P < 0.05$). This is shown in Table 4: the relationship of the study variables with sleep quality according to PSQI.

Table 1: Shows participants demographic characteristics.

Demographic Characteristics	n = 289	100%
Wards		
Internal medicine	155	53.63
Surgery	134	46.37
Gender		
Male	188	65.05
Female	101	34.95
Age		
15-29 years	41	14.19
30-39 years	49	16.96
40-49 years	53	18.34

50-59 years	69	23.88
> 60 years	77	26.64
Educational level		
Illiteracy	36	12.46
Elementary school	104	35.99
Middle school	81	28.03
High school	54	18.69
Collage degree	14	4.84
Marital Status		
Married	197	68.17
Single	19	6.57
Divorced	58	20.07
Widowed	15	5.19
Smoking Status		
Smoker	185	64.01
Non-smoker	104	35.99
BMI	30.98 ± 7.11	
>25	42	14.53
25-30	126	43.60
30-40	85	29.41
>40	36	12.46

Table 2: Shows answers regarding factors leading to negative impact on sleeping.

		Internal Wards	Surgery Wards
Pain	No	122	105
	%	%78.71	%78.35
Sounds of medical devices	No	14	13
	%	%9.03	%12.38
Patients noise	No	91	94
	%	%58.71	%89.52
Changing Rooms	No	30	23
	%	%19.35	%21.90
Uncomfortable bed	No	55	41
	%	%35.48	%39.05
Restriction	No	41	30
	%	%26.45	%28.57
Frequent medical interventions in the night	No	61	23
	%	%39.35	%21.90
Boredom	No	95	63
	%	%61.29	%60.00
Frequent nursing entrance	No	64	45
	%	%41.29	%42.86
Patient's worry and stress	No	110	82
	%	%70.97	%78.10
Yearning to Family	No	85	47
	%	%54.84	%44.76

Table 3: Shows the weights regarding the frequencies of patients' complaints.

		None	Once	Twice	3 <times	Total	Relative weight
Couldn't sleep within 30 min	No	75	132	56	26	289	%52.85
	%	%25.95	%45.67	%19.38	%9.00	%100.00	
Waking up during night or in the early morning	No	85	115	78	11	289	%41.30
	%	%29.41	%39.79	%26.99	%3.81	%100.00	
Waking up to enter WC	No	79	133	70	7	289	%40.43
	%	%27.34	%46.02	%24.22	%2.42	%100.00	
Couldn't breathe normally	No	158	75	43	13	289	%42.30
	%	%54.67	%25.95	%14.88	%4.50	%100.00	
Cough/High snoring	No	113	114	39	23	289	%47.58
	%	%39.10	%39.45	%13.49	%7.96	%100.00	
Hue Light	No	159	88	34	8	289	%50.43
	%	%55.02	%30.45	%11.76	%2.77	%100.00	
Frequent Noise	No	217	51	12	9	289	%51.30
	%	%75.09	%17.65	%4.15	%3.11	%100.00	
Nightmares	No	130	108	34	17	289	%44.64
	%	%44.98	%37.37	%11.76	%5.88	%100.00	
Sensing pain	No	61	147	58	23	289	%53.72
	%	%21.11	%50.87	%20.07	%7.96	%100.00	

Table 4: Shows the study variables of sleep quality according to PSQI.

			No sleeping disturbance	There's sleeping disturbance	Total	Mann-Whitney U	*P*-Value
Gender	Male	No	99	89	188	9417.5	0.896
		%	%34.26	%30.80	%65.05		
	Female	No	54	47	101		
		%	%18.69	%16.26	%34.95		
Department	Abdominal	No	79	76	155	0.867	0.01
		%	%27.34	%26.30	%53.63		
	Surgical	No	59	46	105		
		%	%20.42	%15.92	%36.33		
	Intensive care	No	15	14	29		
		%	%5.19	%4.84	%10.03		
Numbers of bed at the same room	Two beds	No	7	12	19	5.61	0.04
		%	%2.42	%4.15	%6.57		
	3beds	No	93	65	158		
		%	%32.18	%22.49	%54.67		
	More than 3 beds	No	53	59	112		
		%	%18.34	%20.42	%38.75		
Pain	No	No	58	4	62	0.425	0
		%	%20.07	%1.38	%21.45		
	Yes	No	95	132	227		
		%	%32.87	%45.67	%78.55		

Sound of the devices	No	No	98	31	129	0.71	0.02
		%	%33.90	%10.70	%44.60		
	Yes	No	14	146	160		
		%	%4.84	%50.50	%55.34		
Changing sleeping place	No	No	124	110	234	0.002	0.972
		%	%42.91	%38.06	%80.97		
	Yes	No	29	26	55		
		%	%10.03	%9.00	%19.03		

DISCUSSION

There is evidence that sleep restriction leads to undesirable behavioral and physiological effects. Measuring sleep quality in hospital is challenging and most researches on sleep patterns were conducted on patients of ICU. Polysomnography is rarely used in published research on patients during hospitalization where often used on patients at ICU.[20] Therefore, surveys were of high benefit to investigate sleep disorders widely.[21] To the best of our knowledge, this study is the first in Syria to evaluate the quality of sleep, and influence of external factors on sleep patterns during hospitalization.

Hospitalization may exacerbate natural changes of sleep.[22] Fifty percent of inpatients suffer from sleeping disturbance; either in its duration or in quality, which affects patients' quality of life.[23] In our study about half of patients (47.06%) suffered from sleeping disorders either in initiating or maintaining sleep and these findings are similar to other studies of Şendir et al and Hajbaghery et al 51% and 55%.[24] A systematic review revealed that hospitalization is accompanied with initiating sleep disorders.[25] Among all patients in our sample 37.02% suffered from difficulties in initiating sleep. Sleep hours were also affected and decreased since most of patients went to bed late and woke up early in the morning. Of inpatients, 33.20% had total poor sleep according to the PSQI questionnaire. This is also consistent with the published data.[24,25]

The mean total of PSQI score was (7.66) with (3.43) standard deviation similar to Jolfaei et al.[26] Difficulty in staying awake affects directly quality of life of inpatients and disturbs their circadian rhythm; about 49.13% of our sample had difficulties in staying awake all daytime Pain is a risk factor for low-quality sleep.[27] However, relation between pain and sleep is controversial. Many studies revealed that hospitalization increases feeling of pain.[10,28] On the other hand, pain is reported to be a risk factor for sleep disorders. In our sample pain was the major factor affecting sleep disorder with significant statistical difference (Mann Whitney

U = 0.425, *p value* = 0.000) this is reflected in Table 3 and it is similar to the study conducted by Jolfaei A G et al.[26] On the other hand, some factors were found by Kiejna A et al[29] showing that men had better sleep quality. Their study also revealed that age is a risk factor for poor sleep.[30] In our study no other factors amongst demographic variable affected patients' sleep significantly except for low educational level which was accompanied with relatively poor sleep but with no significant statistical difference (*p* value > 0.05) as some published data suggested.[31]

Fear of being sick (75.43%) was the second rated factor affecting patients' sleep. Whereas the third factor was the surrounding environmental (68.17%) factors such as noises of medical equipment, roommates' sounds and many other forms of noise like noises of machines, staff, visitors, other patients, treatment and diagnostic procedures. Similar to other studies[32], these forms of noise have negative impact on inpatients' sleep and recovery. Frequent entrances of nurses, as well as uncomfortable beds were also reported by our patients to affect sleep with significant statistic value (*p value* < 0.01).

Number of beds at the same room was accompanied with increase in sleep disorders with no significant difference, which may be explained by noise of roommates. It was reported with (4.16%, 22.49%, 20.42%) for rooms containing two, three and more than three beds respectively with (*p* value = 0.04). Jolfaei et al study revealed similar results.[26] Uncomfortable bed was accountable for sleep disturbance in (37.27%) of inpatients. Southwell and Wistow's study found that uncomfortable bed or plastic sheets affected sleep negatively, such factors may imply solutions to improve patients' sleep by improving beds' quality.[33]

Inpatients in internal ward had better sleep quality compared to those in surgical ward as 45.4% of them scored more than five and half points compared to 60.8% of inpatients in surgical ward. This can be explained by patients' fear of surgical procedures or may be resulted from the medical conditions varying between internal and surgical unites in severity and pain. However, this difference is not significant statistically (*p value* < 0.05). Some studies also had similar results[34], while other study found inpatients in surgical ward have better sleep quality.[35] Furthermore, factors affecting sleep were reported relatively in similar percentages in both internal and surgical unites as shown in Table 2.

CONCLUSION

We found that hospitalization is accompanied with poor quality of sleep, affected by a variety of factors. The major risk factors for these disorders were pain and hospital environmental factors such like noise. Further research should be done to inspect the relationship between sleep and patients recovery, and to assess hospital factors that could be controlled to improve patients' quality of life during hospitalization.

Study Limitations: Our study was restricted to include only one hospital. However, this hospital is one of the biggest medical centers in Syria with the highest number of inpatients from all around Syria. Other limitation of our study that it is a cross-sectional study which did not allow to follow up patients to see how these factors or patients' illness affect sleep nature in a long term. Further research should be done in methodology that is more rigorous and in a wider spectrum.

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Competing interest

None of the authors has any competing interests. The authors alone are responsible for the content and writing of the article.

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