

Original Research Article

The Prevalence of Sleep Disturbances and the Related Factors in Medical Interns of Tabriz Branch of Islamic Azad University

Sepideh Herizchi Ghadim^{1*} and Maryam Saadat Siadati²

¹Assistant Professor, Research Center of Psychiatry and Behavioral Sciences,
Tabriz University of Medical Sciences, Iran

²General Practitioner, Tabriz Branch of Islamic Azad University, Iran

**Corresponding author:*

ABSTRACT

The high prevalence of sleep disorders and its impact on individual's physical and mental health lead to human errors and occupational accidents. This study aimed to examine the prevalence of sleep disorders and the related factors on medical interns. This descriptive- analytical study was done in the form of census among all medical interns of Tabriz Islamic Azad University in 2015. The volunteers completed the Pittsburgh Sleep Quality questionnaire after obtaining informed consent. Descriptive statistics and the latest version of SPSS were used to analyze the data. 193 interns with a mean age of 24.83 years completed the Pittsburgh Sleep Quality questionnaire. 59.5% of whom were female and 40.5% were male and 48% were non-native. Based on the questionnaire, 76.5% of interns had trouble sleeping. The average score of sleep quality calculated on a scale of Pittsburgh was $6/85 \pm 3/08$. 6/64% were suffering from poor sleep quality. Good sleep quality of those living rental home was lower than the ones living in dormitory or personal house. No significant finding was found in examining the relationship between various demographic variables and sleep quality in this study. Although the number of students who smoke was low (9%), they had poor sleep quality. 29% of interns used sleep medications and 2.6% of them had very serious sleep problem In this study, since the prevalence of sleep disorders among medical interns was high, a need was felt for consultation and planning as well as intervention to promote mental and physical health.

Keywords

Sleep disorders,
medical interns,
sleep scale of
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Introduction

DSM-5 has defined sleep – wake disorder as a range of disorders encompassing insomnia and little sleep to respiratory problems, rhythm disorder, restless leg syndrome and medication-induced disorder that people with this disorder are usually dissatisfied with the quality, timing and amount of sleep

– wake periods. Daytime inconvenience and dysfunction have been considered as the prevalent features in all sleep - wake disorders (1).

Sleep is one of the essential needs of man which covers about one- third of human life.

Any disorder, disease or lack of sleep can have direct effects on individual awareness and activities and the events during waking can interact directly or indirectly the quality and quantity of sleep as well. Therefore, sleep is as essential as your waking time and a healthy sleep is necessary for an efficient waking with a sense of health and freshness (2).

The high prevalence of sleep disorders and its induced impact on physical and mental health have caused the medical community to take it into consideration. So that, nowadays, it can seldom happen that a patient cannot find a center for diagnosis and treatment of sleep disorders in advanced countries (3). In addition, the impact of these disorders on occupational accidents and errors has caused occupational sleep medicine to be regarded as a branch of science (4, 5, 6).

Various studies have shown that sleep disorders are not only one of the major causes of occupational accidents and fatal accidents, but it has impact on productivity and quality of activity among the employed. Increasing job error, concentration and learning disorders, adverse effects on behavior and mood of workers, increasing absence from work and decreasing motivation and job satisfaction are other complications related to sleep disorders among the employed (7).

It is said that decreased sleep to under standard values is associated with depressing symptoms in the next two weeks (8). Sleep disorders are also the initial manifestation of many psychiatric diseases as well as behavioral disorders such as depression, anxiety, and alcohol and drug abuse (9). Sleep plays an important role in human health (10). Hormones secretion in the body's neuroendocrine system is either

the function of the circadian clock in the suprachiasmatic nucleus or the sleep-wake homeostasis system (11). Sleep, especially deep sleep is associated with increased secretion of GH and GHRH (12).

Insomnia (lack of opportunity to get enough sleep) and poor sleep quality in shift workers will also have numerous physical and mental side effects on the individual. Research on fatigue has revealed that the individuals may also experience cognitive disorders (13). Lack of sleep is the most common cause of daytime sleepiness, especially by advancing societies (14).

The results of various studies on the prevalence of sleepiness are very different. Part of this difference is due to the different tools used in different studies, the different nature characteristics of individuals and economic status; social customs in different societies could also explain part of the difference in the results of different studies (15, 16).

In a review study in which the results of 24 epidemiological studies were examined, the prevalence of sleepiness has been reported between 0.03 to 36% in different studies (17). There are also many diseases that appear with the same symptom. All types of disorders that cause sleep fragmentation, such as obstructive sleep apnea, circadian rhythm sleep disorders, periodic limb movement syndrome, restless leg syndrome, etc. can cause daytime sleepiness in patient despite having sufficient sleep (18, 20).

There are other disorders caused due to the dysfunction of the nervous system and excessive sleepiness is one of their symptoms. Narcolepsy is among these disorders that doctors often do not pay enough attention to and it is diagnosed with delay in most cases despite the fact that it

has been explained for many years (21). The other common cause of daytime sleepiness is night shift work (22). Alcohol, drugs, caffeine, and illegal addictive drug can also cause unwanted effects on sleep (23-26).

Some certain groups of the population are more prone to insomnia, the most important of which are university students, particularly, medical students who are at risk of psychiatric disorders than other students (27). Suicidal thoughts, aggression, turning to cigarettes and alcohol and drug abuse have been observed among university students with insomnia (8, 9, 28). The relationship between sleep and neurocognitive abilities including learning, memory size and individual academic results has been shown in some studies indicating the prefrontal cortex vulnerability against insomnia (29).

In a study carried out in Virginia (2006) by Roxanne Pritchard on sleep patterns and predictors on 1125 college students, in an online poll through PSQL questionnaire and other features, the result indicates that 25% of students had less than 6.5 hours night sleep and only 29.4 % of students devoted 8 hours to sleep round- the- clock. More than one third of the students had sleep disorders at least once a week, 75% of students felt fatigue and sleepy and 15% of the students pointed to being sleepy and dozing in class time once or more in a week. It is also documented that inadequate sleep and irregular waking were common among students in an alarming level so that an intervention programs for sleep disorders among university students have been recommended due to close relation of sleep quality with mental health (30).

A study conducted by Marlit Veldi on the sleep quality and more common sleep-related problems on 413 medical students in

Tartu University of Medical Sciences in Estonia has shown poor sleep quality in 6% of the students and very poor sleep quality in 1% using S & DHQ: Questionnaire on Sleep and Daytime Habits. There have been considerable gender differences in sleep patterns and sleep problems in the student population (31). Different results have been obtained from various studies on sleep disorders in medical students. In a descriptive cross-sectional study done by Syed Abolfazl Qureshi and Amir Hossein AghaJani through the census method, using the Epworth Sleepiness Scale and Pittsburgh questionnaire in 2016, the sleep quality of all medical students in Zanjan Faculty of Medical Sciences have been studied. Married people had significantly poor sleep quality than single ones. And the prevalence of poor sleep quality was significantly higher in people with a history of smoking and alcohol and coffee consumption. 35% of female students and 37.9% male students were excessively sleepy during the day; however, this difference was not statistically significant despite the fact that male students were more sleepy (32).

In a cross-sectional study carried out by Assiyeh Mansouri *et al.* on the relationship between sleep quality and mental health of students in dormitories of Tehran University Medical Sciences in 2011, there was significant differences between male and female students in the frequency of poor sleep quality. A significant correlation was also observed between sleep quality and mental health of students (33).

Masood Abbas Zadeh *et al.* studied medical students' sleepiness on 100 students from each educational level at Mazandaran University of Medical Sciences in 2003. In terms of adequate sleep with determining the probable snoozing in different daily positions using Epworth Sleepiness Scale

questionnaire (ESS), it has been reported that 53% of students scored 0-6 (enough sleep), 23% scored 7-8 (moderate sleepiness) and 24% scored 9 and over (excessive sleepiness) (34).

In a descriptive - cross sectional study, Esfandiar Matini examined the prevalence of sleep disorders and the related factors on 407 medical students of Tehran Islamic Azad University in 2010. In terms sleep quality, 9% of the studied people characterized their sleep quality excellent, 36.1% good, 39.3% satisfactory, 13.5% weak and 2% very bad. A significant statistical relationship was observed between the sleep quality of the students and fatigue and sleepiness while participating in class. In general, sleep disorders have been reported common among the interns and stagers (35). So far, among the studies conducted in recent years, no study has been done on sleep disorders on medical interns of Tabriz Islamic Azad University yet. And given the prevalence of this condition in the general population and also the preventability of damage in case of timely diagnose and appropriate intervention, considering the causes and mechanisms of its creating for educational planning by the universities in the country, carrying out this research seems necessary.

Materials and Methods

This descriptive - analytical study was done to assess sleep quality and daytime sleepiness of medical interns using the Pittsburgh questionnaire between March 2015 and March 2016. Pittsburgh questionnaire is a tool for measuring the quality of an individual's sleep pattern. After completing the questionnaire by the individual, scoring is done on the basis of zero to three and the maximum score which is three indicates no sleep problem. Total

score of five or more indicates poor sleep. Pittsburgh questionnaire has the reliability of 0.83 and its high reliability has been shown in several studies. A prepared questionnaire including demographic information and Pittsburgh Sleep Quality Index questionnaire using census method were distributed among all medical interns of Tabriz Islamic Azad University. To consider ethics, after explaining the method and purpose of research and the importance of the issue and assuring the participants if they feel that the answer to any of the questions may reveal the individual's identity, they could avoid answering; the questionnaire was made available to interested medical interns anonymously but coded. After completing the questionnaires by medical students of Tabriz Islamic Azad University, the data collected and analyzed by the SPSS18. The frequency tables and descriptive statistics and central tendency and dispersion were used. For comparison of quantitative variable, Independent T-Test (in case of normal distribution) and Mann-Whitney test (in case of non-normal distribution) and Chi-Square test for qualitative variables were used. And the results were statistically significant in all cases of the study in case $P \leq 0.05$.

Pittsburg Sleep Quality Index (PSQI) Questionnaire is composed of 8 subscales. This questionnaire differentiates poor from good sleep quality by measuring seven areas (components): subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction over the last month. Eighth subscale is the total score achieved from the total score of the other subscales.

In the first 7 sub-scales, the score of the individual is 0 -3 interpreted as follows:

Lack of sleep problem: 0

Moderate sleep problem: 1

Serious sleep problem: 2

Very serious sleep problem: 3

The total score or the total score of 7 subscales will be in the range of 0 to 21, obtaining a score over 5 means poor sleep quality.

The validity and reliability of Pittsburgh Index and its sensitivity for reviewing sleep quality were examined in several internal and external studies. Doctor Boyce *et al* (1989) first developed and introduced this questionnaire; they obtained its internal consistency using Cronbach's alpha 0.83. The validity and reliability of the Iranian version of the questionnaire were 0.86 and 0.8 respectively (shahrifar, 2010 Haideri, Ehteshamzadeh and Marashi, 2011). In addition, the reliability of the questionnaire obtained in another study using Cronbach's alpha and split-half method were 0.46 and 0.52 respectively (shahrifar, 2010 Haideri, Ehteshamzadeh and Marashi, 2011).

Results and Discussion

1. Examining demographic information of medical interns.

A total of 193 medical interns participated in this study. As shown in Table 1-1, most of the participants in this study were female (115). The mean age of interns was 24.83 years. The youngest was 22 and the oldest was 28 years old. The lowest frequency include 16 people aging 22 years and the highest frequency included 70 people aging 25 years. As indicated in Table (2-1), sleep latency, use of sleeping medications, and daytime function scored the highest (1.12

and 1.71) and sleep efficiency scored the lowest (0.65). Also, the mean score of 6.85 for the sleep quality with the standard deviation of 3.08 was obtained for the aforementioned population. Results of Table (2-1) have also shown that many interns (about 64%) suffered from poor sleep quality and about 28% of whom had good sleep quality. (According to the standard of sleep quality questionnaire, scores more than five are the people with poor sleep quality.)

Demographic factors relationship with sleep quality

Poor sleep quality, this difference was not significant ($p>0.05$). Based on Table (3-1), although a large proportion of women compared with men had no significant relationships was observed between marital status, economic status, alcohol use, being native and sleep quality as well as seven dimensions of sleep.

Statistical results of Table (3-1) showed a statistically significant relationship between type of residency and sleep quality ($p<0.05$). The interns living in a rental home (5 people) were the lowest number of interns with good sleep quality. As shown in Table (3-1), there have been significant relationship between smokers and non-smokers and sleep quality so that 56 non-smokers had a good sleep quality and more people (111 people) were suffering from poor sleep quality.

According to the statistical results in Table 4-1, there was no significant relationship between smoking / non-smoking and daytime function ($p=0.30$). The results also showed that the smokers had a significantly higher mean score in terms of subjective sleep quality, sleep duration, sleep disturbance, use of sleeping medications and general sleep quality score dimensions

($p < 0.05$); however, non-smokers were significantly suffering from the sleep latency and sleep efficiency dimensions ($p = 0.04$, 0.0018).

As shown in Table (4-2), there was a significant difference in subjective sleep quality ($p < 0.002$) so that people who drink alcohol were more likely suffering from subjective sleep quality disorder. There was no statistical difference in other dimensions of sleep quality ($p < 0.05$).

Relationship between caffeine intake (coffee) and sleep quality dimensions

Table (4-3) indicated the relationship between caffeine intake (coffee) and sleep quality dimensions among medical interns. Based on the statistical results, there was no significant relationship between the sleep quality dimensions and amount of coffee used in a month ($p < 0.05$).

Relationship between the living place and sleep quality dimensions

Table (4-4) shows the relationship between the living place and sleep quality dimensions. The number of the interns living in their own home, dorm, their father's home and rental home were 66, 63, 39 and 25 respectively. As shown, a statistically significant difference was observed in the five dimensions of subjective sleep quality, sleep latency, use of sleeping medications, daytime function and general sleep quality score ($p < 0.05$). The results of scores on living place indicated that interns living in the rental homes were suffering more from sleep disturbances in different dimensions.

Relationship between history of sedative drugs and sleep quality dimensions

According to the results, 56 of the participants used sleep medications. As seen

in (4-5), interns taking sleep medications were significantly suffering from the dimensions of subjective sleep quality, sleep duration, sleep disturbance and general sleep quality scores. However, no statistically significant difference was seen in sleep latency, sleep efficiency and daytime function ($p < 0.05$).

The average of recommended on calls by interns for internship period

Result analysis showed that the average of recommended on calls by interns for internship period was 4.73 with standard deviation of 1.81. As demonstrated in Figure (33-4), the highest number was 73 interns with 5 on calls a month.

This study which aimed at determining the prevalence of sleep disorders on 193 Medical Interns at the Medical Faculty of Tabriz Islamic Azad University in 2015 showed that the majority of these students had sleep problems. So that 76.9% of the studied sample had sleep problems. Considering the prevalence of sleep disorders in the general population which is 15-42% (7), this figure is a high prevalence. While in the study of Seyed Abolfazl Qureshi and Amir Hossein AghaJani, the prevalence of poor sleep among interns in Zanjan Medical Sciences School was 35.5%. The prevalence of poor sleep quality among the students of Tehran University of Medical Sciences have been reported 73.3% in the study of Asiyeh Mansouri *et al.* in the study of Marlit Veldi *et al.* on the sleep quality and more common sleep-related problems on 413 medical students (19-33 years old) at the University of Tartu, Estonia, only 7 percent had poor sleep quality.

The mean score of sleep quality on Pittsburgh scale was 6.85 ± 3.08 in the sample under study which is relatively high.

Whereas, in the study of Asiyeh Mansouri *et al.* on the students of Tehran University of Medical Sciences living in dormitory, the average score of PSQI was 8.57 with confidence intervals of 8.10-9.04 that the high score could be due to the dormitory living and related stresses.

The mean age of interns in Tabriz Islamic Medical University was 24.83 years, the highest frequency was at the age of 25 years encompassing 70 out of 193 students. 28.7% of interns at Tabriz Islamic Medical University had good sleep quality. 10.8% of interns in Tabriz Islamic Medical University had the daytime function problems related to sleep disorders. 64.6% were suffering from poor sleep quality. No significant finding was seen in the relationship between various demographic variables and sleep quality in this study. In terms of sex, 59.5% of interns were female and 40.5% were male and sex had no significant effect on the good and poor sleep quality. The female students had the same sleep quality as the male did. In addition, 72% of the interns were single and 27% were married. No significant relationship was observed in terms of marital status in this study which was not consistent with the study of Ling Tsai (65) and similarly, Qureshi *et al.* have reported the sleep quality of the married people significantly worse than the single ones in their study. In the present study, 52% of interns were native and 48% were non-native. Only the smallest number of the interns living in the rental homes had good sleep quality. Smoking and alcohol use is very low among medical students of Islamic Azad University of Tabriz, so that only about 9% and 4% use cigar and alcohol respectively. Although the number of smokers were low (15 out of 193) they all were suffering from poor sleep quality and the smokers had a higher chance of undesirable sleep quality. There was a significant

relationship between smoking and sleep quality ($p < 0.007$). And there was no significant relationship between alcohol use and sleep quality ($p < 0.71$). Of course, history of alcohol use as the addiction and regular use of alcohol was not declared directly in the questionnaire. In terms of smoking, Qureshi *et al.* also showed that smokers had significantly undesirable sleep quality. 77% of Interns in Tabriz Islamic Azad University had moderate economic status and 23% stated that their economic status was good but no significant relationship was found between sleep quality and economic status ($p < 0.14$). Some studies have also shown that there was an inverse relationship between economic status and the sleep disorders. 48% of interns at Islamic Azad University of Tabriz had 1-3 cups of coffee a month. Another important finding in this study was that 56 interns (29%) were taking sleeping medications. The interns using sleep medications were significantly suffering from subjective sleep quality, sleep duration, sleep disorder and general sleep quality scores dimensions which is consistent with the study of Marlit Veldi (31). No statistically significant difference was observed in sleep delay, sleep efficiency and daytime function. 2.6% of the interns using sleep medications had very serious sleep problems. In other words, the sleep quality of those using sleep medications was significantly more undesirable than non-users. Qureshi *et al.* got the same findings in their study. They referred to sleep medications abuse to justify these findings. However, in addition to sleep medications abuse, even if they are prescribed by doctor, it can indicate that people take these medications because of sleep problems and therefore, they have poorer sleep quality compared with those who do not take medications due to lack of sleep problems.

Table.1-1 Demographic information of medical interns

Smoking		Alcohol abuse		Social class			Coffee drinking (cups a month)		
Yes	No	Yes	No	Down	Middle	High	0	1-3	4-20
18	175	9	184	0	150	43	41	93	59
9%	91%	4%	96%		77%	23%	21.5%	48%	30.5%

Table.1-1 Demographic information of medical interns (Continued)

Gender		Marital Status		Nativity	
Male	Female	Married	Single	Native	Nonnative
78	115	53	140	100	93
40.5 %	59.5 %	27 %	73 %	52 %	48 %

Table.2-1 Mean scores of Sleep Quality Questionnaire dimensions

Sleep quality subscale	Mean	Students Not existing problem during the past month (0)	Students with Moderate problems during the past month (1)	Students with Severe problems during the past month(2)	Students with Very severe problems during the past month(3)
subjective sleep quality	1.02±0.72	45 23.1%	103 52.8%	41 21.0%	4 2.1%
sleep duration	0.98±0.90	69 35.4%	67 34.4%	46 23.6%	10 5.1%
sleep latency	1.71±1.01	31 15.9%	38 19.5%	72 36.9%	46 23.6%
habitual sleep efficiency	0.65±1.00	116 59.5%	36 18.5%	12 6.2%	20 10.3%
sleep disturbances	0.94±0.65	43 22.1%	116 59.5%	32 16.4%	0 0
use of sleeping medications	1.12±1.05	141 72.3%	20 10.3%	27 13.8%	5 2.6%
daytime dysfunction	1.12±1.05	75 38.5%	39 20%	58 29.7%	21 10.8%
total score of Sleep quality	6.85±3.08	Students with total score <5 , Good sleep quality 56 30.7%		Students with total score > 5, Poor sleep quality 126 69.2%	

Table.3-1 Demographic factors relationship with sleep quality

Variable		Good sleep quality	Poor sleep quality	p- value
Gender	Male	20	53	0.42
	Female	36	72	
Marital status	Single	37	96	0.17
	Married	19	28	
Place of residence	Private home	12	51	0.01**
	Dormitory	26	32	
	Parent's home	13	23	
	Rented home	5	20	
Social class	Down class	0	0	0.14
	Middle class	41	104	
	High class	15	22	
Smoking	Positive	0	15	0.007**
	Negative	56	111	
Alcohol abuse	Positive	2	6	0.71
	Negative	54	120	

Table.4-1 The relationship between smoking / non-smoking and sleep quality dimensions

Variable	Subjective sleep quality	Sleep duration	Sleep latency	Habitual sleep efficiency	Sleep disturbances	Use of Sleeping medications	Daytime Dysfunction	Total score
Smoker	1.61	1.50	1.26	0.06	1.27	0.83	1.33	8.06
Non smoker	0.96	0.93	1.75	0.70	0.91	0.42	1.10	6.74
p- value	0.001	0.01	0.04	0.018	0.005	0.06	0.03	0.004

Independent T-Test

Table.4-2 The relationship between alcohol use and sleep quality dimensions

Variable	Subjective sleep quality	Sleep duration	Sleep latency	Habitual sleep efficiency	Sleep disturbances	Use of Sleeping medications	Daytime Dysfunction	Total score
Use of alcohol	2.00	1.44	1.62	0.00	1.00	0.77	1.11	7.87
Not Use of alcohol	0.97	0.96	1.71	1.02	0.93	0.45	1.13	6.81
p- value	0.002	0.14	0.66	0.06	0.77	0.24	0.95	0.34

Independent T-Test

Table.4-3 Relationship between caffeine intake (coffee) and sleep quality dimensions

Coffee drinking (cups a month)	Subjective sleep quality	Sleep duration	Sleep latency	Habitual sleep efficiency	Sleep disturbances	Use of Sleeping medications	Daytime Dysfunction	Total Score
0	1.12	0.95	1.82	0.76	0.79	0.31	0.87	6.59
1- 3	1.08	1.06	1.63	1.04	1.04	0.53	1.20	6.98
4- 20	0.84	0.90	1.80	0.89	0.89	0.48	1.24	7.08
p- value	0.09	0.55	0.48	0.48	0.06	0.31	0.15	0.70

One way-ANOVA

Table.4-4 Relationship between the Place of Residence and sleep quality dimensions

Place of Residence	Subjective sleep quality	Sleep duration	Sleep latency	Habitual sleep efficiency	Sleep disturbances	Use of Sleeping medications	Daytime Dysfunction	Total score
Private house	1.06	1.03	2.03	0.87	0.96	0.34	1	7.25
Dormitory	0.82	0.91	1.46	0.38	0.86	0.33	0.98	5.93
Parents' house	1.07	0.92	1.74	0.72	1.07	0.56	1.38	7.05
Rented house	1.32	1.12	1.44	0.64	0.84	0.92	1.44	7.72
p- value	0.02*	0.74	0.008*	0.06	0.33	0.01	0.08	0.03

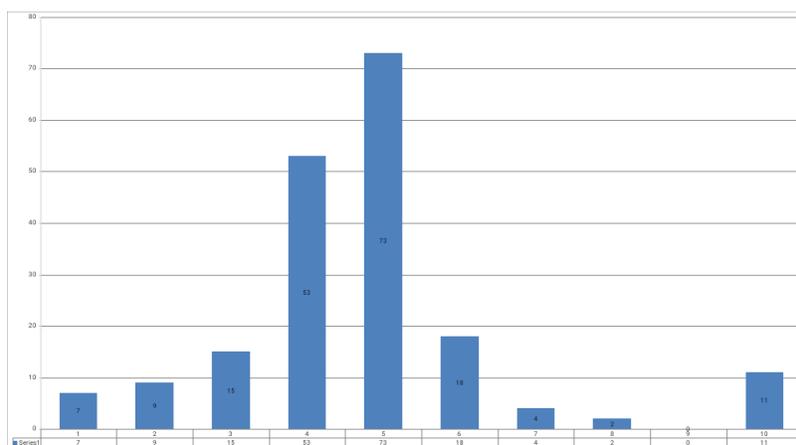
One way-ANOVA

Table.4-5 Relationship between history of sleep medications and sleep quality dimensions

Variable	Subjective sleep quality	Sleep duration	Sleep latency	Habitual sleep efficiency	Sleep disturbances	Use of Sleeping medications	Daytime Dysfunction	Total score
Use of sleeping pill	1.33	1.61	1.87	0.55	1.12	0.92	1.21	8.44
Not Use of sleeping pill	1.61	0.72	1.64	0.68	0.86	0.27	1.09	6.22
p- value	0.000	0.000	0.16	0.42	0.009	0.000	0.47	0.000

Independent T-Test

Fig.1 The frequency distribution of the proposed on call numbers by medical interns in a month



On the other hand, sleep medications can be taken when there are anxiety, stress, worries, problems relating to the interference of working conditions with the education field and preoccupation about future job. The workload and interrupted sleep due to on calls as well as the availability of medications and more knowledge to the nature of the drugs can be effective factors in the use of medications in this group.

In conclusion, in general, this study showed that sleep quality of medical interns at Tabriz Islamic Azad University was not desirable which can lead to undesirable general function and education in a large number of interns.

Recommendation to the authorities and further studies

According to the results obtained in the present study, supporting the medical interns in terms of attention to their sleep, making some plans such as counseling and screening courses as well as interventions to improve their sleep patterns such as more access to dormitory and improving condition of the dormitories to promote the students' mental and physical health seem necessary. In terms of the relationship between many variables

and sleep quality of students, despite consistency of the present study results with other studies so far, re-examining of these relationships are recommended to in the further studies to make use of the obtained results more decisively in the planning.

Since the population of the study was on-call interns in educational centers, the results of this study cannot be generalized to other educational levels, conducting similar studies in other levels of medical education such as basic sciences and pathogenesis and apprenticeship and even in comparison with other fields of medical sciences in the future will be better.

Conflict of interest

There is not any conflict of interest in this research.

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