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Original Article

Prevalence of sleep disorders in emergency and allied medicine students at Gilan University of Medical Sciences in 2021

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Abstract

Introduction: Poor sleep quality influences daily functioning, making sleep quality an important clinical construct. Indeed, inadequate sleep quality can serve as a significant symptom of various medical and sleep disorders. Poor sleep can impair academic and social performance as it reduces students' concentration in the classroom. This study aimed to investigate the quality of sleep and its correlation with background variables among emergency and allied medicine students studying at Gilan University of Medical Sciences.

Method: In this descriptive cross-sectional study, a total of 555 male and female students from Gilan University of Medical Sciences were selected via a multistage random sampling method in 2021. The data was collected using a demographics form and the Pittsburgh Sleep Quality Index. Data were analyzed with SPSS version 16 using descriptive (prevalence, mean, standard deviation) and inferential (Chi-square test, Fisher's exact test) statistical tests. The significance level was set at $P < 0.05$.

Results: The research results indicated that the majority of participants fell within the 21-year-old age group (30.45%) and identified as female (59.65%). In terms of marital status, 57.7% of the students were married. Half of the students experienced poor sleep quality. The mean score for sleep duration was reported to be higher than the scores for other subscales. Students' sleep efficiency was similarly low. In this regard, the Friedman test results revealed significant differences between the scores of the sleep quality subscales ($P=0.001$).

Conclusion: The study's results indicated that the sleep quality of emergency and allied medical students at Gilan University of Medical Sciences was below average. Additionally, the students reported a higher mean score in the sleep latency subscale than in other subscales. In order to enhance the students' sleep quality and address sleep latency issues, it is recommended to implement planning along with nursing interventions. Effective measures can be taken to improve the sleep quality of this group of students by providing suitable educational and welfare conditions.

Keywords: Students, Sleep Disorders, Emergency Medical Technician, Allied Medicine

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Introduction

The significance of sleep for health and physical performance has been recognized since the time of Hippocrates. Disturbed sleep has long been regarded as a potential cause of illness in people of all ages (1).

Experiencing poor sleep quality, which includes subjective experiences such as difficulty falling asleep, frequent awakenings during the night, or feeling tired during the day, undoubtedly reduces cognitive performance. Individuals with poorer memory complain of experiencing impaired sleep. This phenomenon is particularly common among college students, given the high pressure associated with academic performance in this population. The subjective quality of sleep is of such importance that it can even result in placebo effects on cognitive performance.

However, the scientific evidence regarding the relationship between the experienced subjective quality of sleep and cognitive performance remains inconclusive (2-6).

Electroencephalogram measurements (i.e., objective measures) can be used to evaluate sleep parameters; however, these measurements are time-consuming and costly. Consequently, researchers and clinicians frequently rely on questionnaires (i.e., subjective measures) to evaluate sleep parameters (such as sleep latency, sleep quality, sleep disturbances, and sleep duration). Researchers have discovered that subjective perceptions of sleep and objective measurements of sleep latency, sleep duration, and sleep efficiency do not always correspond (7, 8).

Sleep deprivation or low-quality sleep can lead to disorders in the functioning of the central nervous system. These functions may be associated with appetite regulation and body temperature regulation, as well as higher-level functions such as memory and hearing. Insomnia is also associated with an increased probability of unintentional accidents and medical errors (9).

Insufficient sleep is linked to various adverse health and social outcomes, such as underperformance in educational or professional settings. Reduced sleep duration is associated with seven out of the 15 leading causes of death in the United States, which include cardiovascular disease, malignant neoplasm, cerebrovascular disease, accidents, and diabetes (10, 11). Intensive academic programs, new social opportunities, and a sudden change in the sleep environment can be additional factors that contribute to these disorders (12). Previous studies have indicated that the prevalence of insomnia among college students is approximately 69% (11).

The most prevalent sleep disorder among Omani medical students, according to a study, is narcolepsy (88%), followed by insomnia (36.4%), affective disorders (14%), nightmares (7.4%), and sleepwalking (4.2%) (12). According to another study, roughly 13.6% of medical students had sleep disorders. For example, 9.86 percent had difficulty falling asleep and numerous night wakings, and 8.61 percent had morning dysfunction as a result of poor sleep (13).

A study's findings also revealed that the mean length of sleep for college students was 5.9 ± 0.79 hours, with 69.95% of medical students experiencing poor sleep quality. The sleep duration exhibited a significant relationship with the students' age (P=0.01) and educational level (P=0.026). In fact, as the age and educational level of students increased, particularly during their clinical and internship years, the duration of their nightly sleep diminished. Additionally, it was observed that the interns had the shortest duration of sleep, with the majority of these students reporting a sleep duration of less than 7 hours (14). Sleep disorders were reported in 73.8% of students from a Saudi medical university (15). The rate was higher among emergency medical students due to job stress and a high work-study volume. The prevalence and severity of sleep problems that resulted in poor sleep quality among these students were so high that poor sleep was regarded as an unidentified public health concern (16, 17).

Despite the high prevalence and problem of poor sleep quality among students, few studies have been conducted in this area. Moreover, the

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few that have been conducted in our country have also focused on students at universities of medical sciences. Most of the studies conducted on sleep quality have primarily focused on the elderly or specific categories of patients (18, 19). On the one hand, there is a gap in research in this area. On the other hand, there is a high prevalence of psychological pressure and anxiety among emergency medicine students, which can lead to sleep quality and quantity disorders. This study aims to investigate the quality of sleep among emergency medicine and allied medical students at Gilan University of Medical Sciences and to identify the most influential factors affecting the quality of sleep among these students. Hopefully, this can offer solutions that can enhance the quality of sleep, thereby aiding in the improvement of individuals' physical, mental, and social health.

Materials and Methods

This descriptive-analytical study was conducted with 613 undergraduate students from the second to eighth semesters of the emergency and allied medicine (operating room and anesthesia) programs at Gilan University of Medical Sciences in the academic year 2020-2021. The sampling method used in this study was a multistage random sampling technique, which combined stratified and cluster sampling methods. The number of students included in the sample was calculated by considering the ratio of the population of each field to the total number of students Table 1.

Sample size formula:

$n=(Z1-\alpha/2 + Z1-\beta)2\div(1/2\ Ln1+r/1-r)2 +3$

$Z1-\alpha$ = 95% confidence interval $Z1-\alpha/2 = 1.96$

In the present research, academic fields are regarded as research categories, while classes are viewed as clusters in the sampling method. Therefore, the calculated sample size for that field of study was determined based on the anticipated sample size and the ratio of each field's population to the total number of students being studied. Furthermore, several classes were investigated randomly as research clusters based on the expected volume in each discipline. Therefore, the sample size required for this study was calculated as n=555 individuals. With a 10% attrition probability, the total number of samples was determined to be n=605. The inclusion criteria for this study comprised being enrolled in the 2nd to 8th semesters, not holding a full-time job, and expressing a willingness to participate.

The exclusion criterion was the failure to complete the questionnaire. The Pittsburgh Sleep Quality Index (PSQI) was utilized alongside a demographics form. Developed by Daniel J. Buysse et al., PSQI is utilized to measure sleep quality. It consists of nine general questions and seven components, including self-reported sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The majority of the multiple-choice questions are concise and clear, and they are scored on a scale of 0 to 3. The index's total score ranges from 0 to 21. Higher scores indicate poorer sleep quality, with a score above 5 indicating a significant sleep disorder. The scale's reliability is reported to be 0.83, while its validity has been reported in various studies to range between 79% and 89.6% (20, 21). Notably, the research protocol was approved by the ethics committee of Gilan University of Medical Sciences, with the ethics code IR.GUMS.REC.2018.308.

Table 1: Sample size in each category (field of study) at Gilan University of Medical Sciences

Field's title	No.	Percent
Emergency medicine	133	40
Operating room	240	30
Anesthesia	240	30
Total	555	100

Results

The research results showed that most participants fell within the 21-year-old age group (30.45%) and identified as female (59.65%). Regarding marital status, 57.7% of the students were married Table 1.

Moreover, half of the students experienced poor

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sleep quality Table 2. The results presented in Table 2 indicate that a significant portion (30.45%) of the participants were twenty-one years old. In terms of gender, the majority (65.59%) were female. Moreover, 43.93 percent of the samples were single, and the majority (69.01%) were locals. Most participants (44.68%) were found to reside in the dormitory. The majority (60.54%) of the samples had a family income level of two million tomans or more, and the majority (96.04%) had no specific diseases. As Table 3 indicates, 49.91% of the participants had poor sleep quality.

Table 2: Frequency distribution of study participants according to personal factors

Personal factors		No.	Percent
Age (year)	≤ 20	156	28.11
	21	169	30.45
	22	116	20.90
	≥ 23	114	20.54
Gender	Male	191	34.41
	Female	364	59.65
Marital status	Single	513	43.92
	Married	42	57.7
Localness	Local	383	69.01
	Non-local	172	30.99
Residence	Dormitory	248	44.68
	Relative's house	43	7.57
	Rented house	81	14.59
	Personal house	183	32.97
Family income level (Million tomans)	< 0.5	27	4.84
	0.5 – 1	40	7.21
	1 – 1.5	51	9.19
	1.5 – 2	101	18.20
	≥ 2	336	60.54
Disease	Yes	22	3.96
	No	533	96.04

Table 3: Frequency distribution of studied samples according to sleep quality

Primary variables		Status	Percent	95% confidence interval	
			Lower Limit	Upper Limit	
Sleep Quality	Inappropriate	277	49.91	45.76	54.06
	Appropriate	278	50.09	45.94	54.24

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Table 4: Statistical indicators of sleep quality subscales among the participants

Subscale	Mean	Standard deviation	Median	Minimum	Maximum	P-value
Self-reported sleep quality	1.12	0.56	1	0	3	0.001*
Sleep latency	1.32	0.95	1	0	3	
Sleep duration	1.13	0.1	1	0	3	
Habitual sleep efficiency	0.28	0.67	1	0	3	
Sleep disturbances	0.99	0.46	1	0	3	
Use of sleeping medication	0.13	0.5	1	0	3	
Daytime dysfunction	1.03	0.78	1	0	3	

*Friedman test

The results of the Friedman test indicated statistically significant differences between the scores of sleep quality sub-scales (P=0.001).

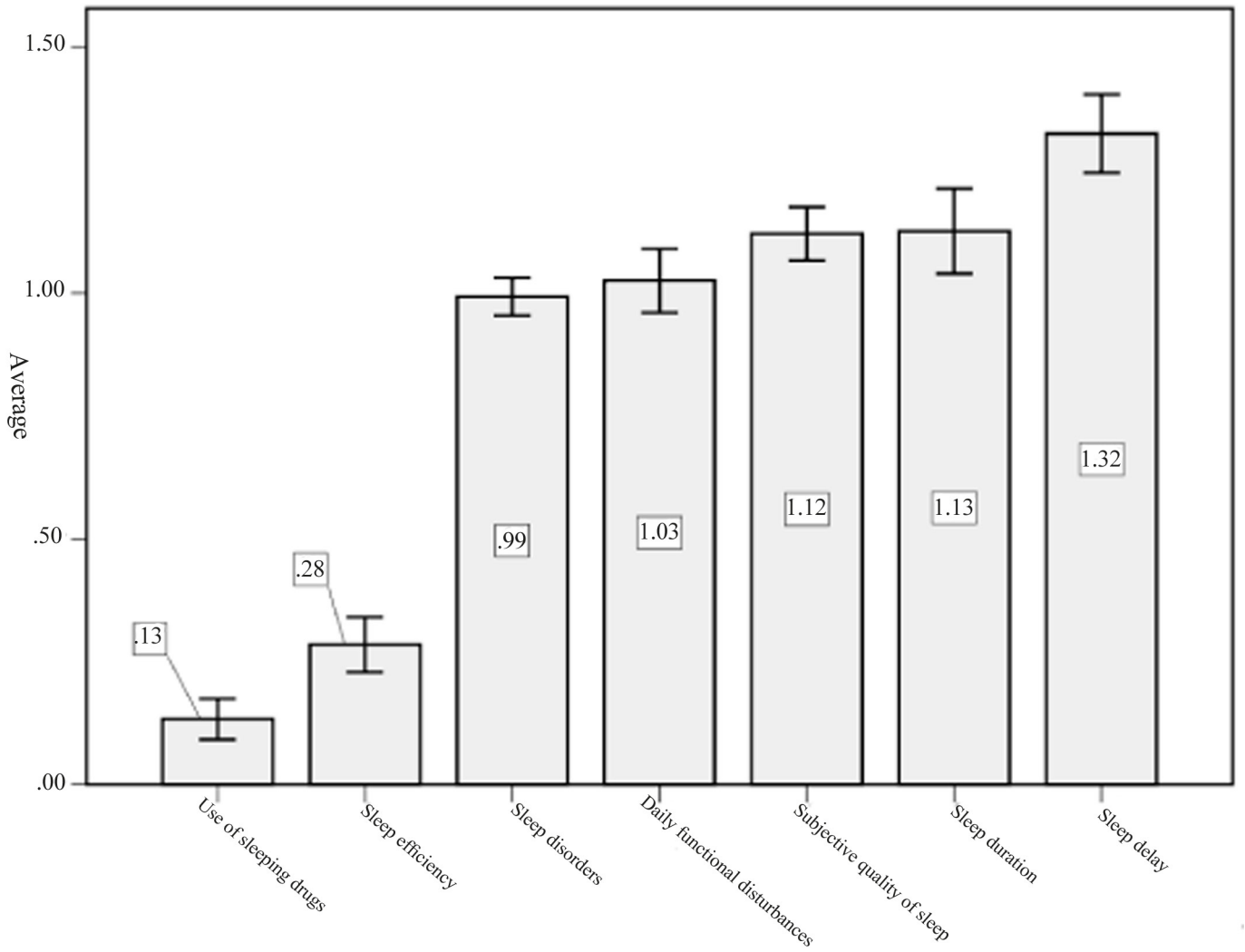

Figure 1: Sleep quality subscales

As illustrated in Figure. 1, the mean score of the sleep latency subscale was higher than that of the other subscales. The sleep efficiency score of students was similarly low. As such, the results of the Friedman test indicated significant differences between the scores of the sleep quality subscales (P=0.001).

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Discussion

In this study, the authors aimed to investigate the prevalence of sleep disorders among medical science students, particularly those specializing in emergency medicine. Similar to the operating room and anesthesia students, these students often face stressful shifts and missions, including night shifts, as part of their internship credits. The study's findings revealed that approximately half (49.91%) of the students examined experienced poor sleep, a result that aligns with previous studies (22, 23). Atadokht et al. demonstrated that in comparison to local students residing at home, students residing in dormitories tended to sleep and wake up at later times. Moreover, the dormitory-residing students experienced sleep disturbances, indicating that local students had better sleep quality. The research findings indicated that approximately half of the students in the study had an unfavorable average sleep quality. Studies conducted in other countries have also indicated that over half of the emergency room and clinical staff experience poor sleep quality (24). Many studies have reported that poor sleep among these personnel or students results from excessive fatigue caused by night shifts and simultaneous studies (25-27). Sleep and rest are essential human needs. Disruptions to the sleep-wake cycle can affect various physiological functions of the body. As a crucial health factor, sleep significantly influences the quality of human life and physical and mental well-being (28). Based on this principle, it is important to minimize the sleep problems experienced by emergency medicine personnel and students, who are the first line of treatment. This will enable them to assist their fellow humans with heightened awareness and physical strength.

In this study, sleep latency and mean sleep duration were found to be more prevalent than other subscales. Contrary to certain studies, an absence of sleep problems, fatigue, and vigilance-related behavior among Emergency Medical Services workers is a peculiar phenomenon that has prompted further investigation (29). The sleep efficiency of the students was also low. These findings are consistent with the majority of studies (30, 31). According to one study, students reported frequent need for sleep and sleepiness during classes. Indeed, medical students reported experiencing severe sleepiness (32). One notable observation is the remarkably low usage of sleeping pills among the students in our study, despite their background in medical sciences and familiarity with various types of sleep aids. This was in contrast to other studies where the prevalence of sleeping pill use among non-medical students was reported to be over 20% (33). Alternatively, at one of the universities of medical sciences in Saudi Arabia, the prevalence of sleeping pill abuse among its students was 21.30% (34).

One limitation of this study is that the data were collected through self-report forms, which may impact the confidence in the accuracy of the data. In this study, to mitigate the impact of this variable on the findings, Cronbach's alpha internal reliability was computed, yielding a coefficient of 0.85.

Conclusion

The study's results indicated that the sleep quality of emergency and allied medicine students at Gilan University of Medical Sciences was below average. Additionally, the findings revealed that these students reported higher sleep latency levels than other subscales. It is suggested that planning and nursing interventions be utilized to improve students' sleep quality and reduce their sleep latency.

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Conflict of interest

The authors report no conflict of interest.

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