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Sleep quality for undergraduate medical students

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Abstract :

Background:

Sleep is a complex biological process that helps human process new information, stay healthy, and feel rested. During sleep, the brain cycles through five stages: stage 1, 2, 3, 4, and rapid eye movement (REM) sleep. Sleep is important in the function of body systems, such as metabolism and immune system. Additionally, during sleep the body produces hormones that help the body grow and, build muscle, fight illnesses, and repair damage to the body .

Objective :

This study aims to understand sleep in medical students and compare them with non-medical students in general and estimate the prevalence of sleep problems among medical students.

Subject and Method :

This is a case-control study with the Pittsburgh Sleep Quality Index (PSQI), with participants of various undergraduate patients from medical (general medicine , pharmacy and dentistry students) and non- medical colleges in Baghdad, Iraq. The study was conducted from November 2022 to May 2023. Data were collected and compiled using Excel. The statistical analysis of the data was done using the IBM SPSS Statistic Data Editor version 24.0. t-test calculations were used to compare different variables with a P value < 0.05 considered significant.

Result :

Data was collected from both groups, 50 Medical students (16 male and 34 female) and 50 Non- medical students (17 male and 33 female). The male-to-female ratio was 1:3 . With a mean age of 21 ± 2 years. The mean age for the medical students group was 21.08 while the mean age for the non medical students group was 21.50. The global PSQI mean for the medical students group was $8.24(\pm 1.379)$ while the Global PSQI mean for the non medical students group was $7.46(\pm 2.749)$ when comparing means using an independent T-test. Sleep duration in hours was $5.86(\pm 1.863)$ for medical students While $6.56(\pm 1.897)$ for non medical students. Sleep efficiency also compared with a p-value (0.02) in medical students and non medical students and was 82.5% ($\pm 15.64\%$) , 89.5% ($\pm 13.89\%$) respectively.

Conclusion :

Sleep quality in medical students showing no significantly different when comparing with Non medical students in terms of PSQI global score, sleep duration , and sleep latency but significantly different in sleep efficiency.

Keywords: Sleep quality; sleep efficiency.

Introduction

Sleep is a complex biological process that helps human process new information, stay healthy, and feel rested ^[1]. It is characterized by a reduced consciousness, lowered metabolism, and decreased physical activity. It is a necessary physiological process that allows the body to rest and restore itself, both physically and mentally.

During sleep, the brain cycles through five stages: stage 1, 2, 3, 4, and 5 “rapid eye movement (REM) sleep” ^[1]. Different things happen during each stage. For example, we have a different pattern of brain waves during each one. our breathing, heart, and temperature may be slower or faster in some stages . Each sleep phase and stage is important to ensure that the mind and body are completely rested. Certain stages help to feel rested and energetic the next day, while other stages help you learn information and form memories. ^[1,2,4] it is also important in the function of body and other systems, such as metabolism and immune system. Sleep may also help body clear toxins from brain that build up while we were awake ^[3]. Additionally, during sleep the body produces hormones that help the body grow and, throughout life, build muscle, fight illnesses, and repair damage to the body. ^[2] Growth hormone, for example, is produced during sleep, and it is essential for growth and development. ^[5] Other hormones produced during sleep affect how the body uses energy, which may explain why lack of sleep contributes to obesity and diabetes. ^[6] so sleep is important for good health. ^[2]

Many causes in our life leading to lack of sleep include stress , medical condition , mental health disorder , travel or work schedule ,poor sleep habits , caffeine , nicotine and alcohol abuse ^[7] .

Not getting enough or enough quality sleep contributes in the short term, to problems with learning and processing information, and it can have a harmful effect on long-term health and well-being, also increases a person's risk for high blood pressure, heart disease and other medical conditions.^[2]

According to National Sleep Foundation, the recommended amount of sleep for adult is 7-9 hours per night. However, it is important to note that individual needs can vary and some people may feel well-rested with as little as 6 hours of sleep , while the others may require up to 10 hours. It's also worth noting that the quality of sleep is just as important as the quantity, so making sure to get good sleep is more important than hitting a specific number of hours.^[10]

Healthy sleep comprises many dimensions, including adequate duration, good quality, appropriate timing and the absence of sleep disorders.^[8,9]

Sleep is of particular interest in medical student populations because of the relationship between sleep and stress.^[11] Sleep loss, as measured by daytime sleepiness, has been shown to negatively impact academic performance in medical students.^[12]

Entering medical school presents students with increased academic pressures and stress levels, and Another study among medical students found that exam anxiety, environment, and irregular schedules contributed to poor sleep quality these new demands instigate changes in sleep and work habits , although medical students exhibit good health behaviours compared with other young adults, they also demonstrate significant changes to these habits as their education continues.^[11]

The medical student population is one of the populations that appear to be at increased risk for sleep deprivation because they need to be awake to do their duty in the hospital or are under constant stress because of their examinations. The prevalence of sleep disorders in the general population has been estimated to be 15% - 35%, and in medical students, it was evaluated at about 30%.^[13]

Recent studies have demonstrated that the sleep-wake cycle of medical students is characterized by insufficient sleep duration, delayed sleep onset, and occurrence of napping episodes during the day. Medical students require cognition and alertness abilities that are impeded by sleep disorders.^[13]

Aims of study

Based on the significance of sleep quality in medical students, this study aims: To understand sleep quality in medical students and compare them with non-medical students in general and estimate the prevalence of sleep problems among medical students .

Subjects and Methods

This is a case-control study with a web-based questionnaire with participants of various undergraduate patients from medical (general medicine, pharmacy and dentistry students) and non-medical colleges in Baghdad, Iraq. The study was conducted from November 2022 to May 2023, and the questionnaire was designed after reviewing different studies used in other studies in different countries. The questionnaire was distributed to all individuals through direct interaction and the application of a Google form. The questionnaire was preceded by a full explanation of the purpose of the study. Admission to enrol in the study being 18 years of age or older was a prerequisite.

Ethical approval was obtained from the Community Department of Al-Kindy College of Medicine - University of Baghdad after reviewing the study protocol. Written consent was obtained from each participant enrolled in the study after clarification to them of the purpose of the study.

Questions are designed to include age, gender, and specific questions related to the purpose of the study. Subjects on sedation or hypotonic drugs were excluded from the study.

The PSQI was used ,(which is designed to assess an individual's subjective sleep quality. It was developed by researchers at the University of Pittsburgh to provide a reliable and valid measure of sleep quality and disturbances in clinical and research settings). and translated into Arabic .Arabic-translated PSQI was validated in January.

Students from both medical and non-medical groups were given a PSQI to assess the presence of a sleep disorder including sleep duration, sleep efficiency, sleep latency, sleep disturbance, sleep quality, daytime dysfunction and frequency use of sleep medication. The global PSQI score is calculated by adding up the seven component points, providing an overall score ranging from 0 to 21, with a lower score indicating healthier sleep quality. Traditionally, items from the PSQI have been collected to create a score to measure overall sleep quality. An overall score of 5 or more indicates poor sleep quality and a score less than 5 is considered normal.

Data were collected and compiled using Excel. The statistical analysis of the data was done using the IBM SPSS Statistic Data Editor version 24.0. t-test calculations were used to compare different variables with a P value < 0.05 considered significant.

Results

Data was collected from both groups, 50 Medical students (16 male and 34 female) and 50 Non-medical students (17 male and 33 female). The male-to-female ratio was 1:3, With a mean age of 21 ± 2 years. The mean age for the medical students group was 21.08 while the mean age for the non-medical students group was 21.50. see Tables 1 and 2.

Group	N	Mean	Std. Deviation	P value
Medical students	50	21.08	1.589	0.227
Non-medical students	50	21.50	1.854	

Table 1. Difference between mean and standard deviation of age of studied personnel according to groups.

Gander	N	Mean	Std. Deviation	P value
Male	33	0.32	0.479	0.834
Female	67	0.34	0.471	

Table 2. Difference between mean and standard deviation of gender of studied personnel.

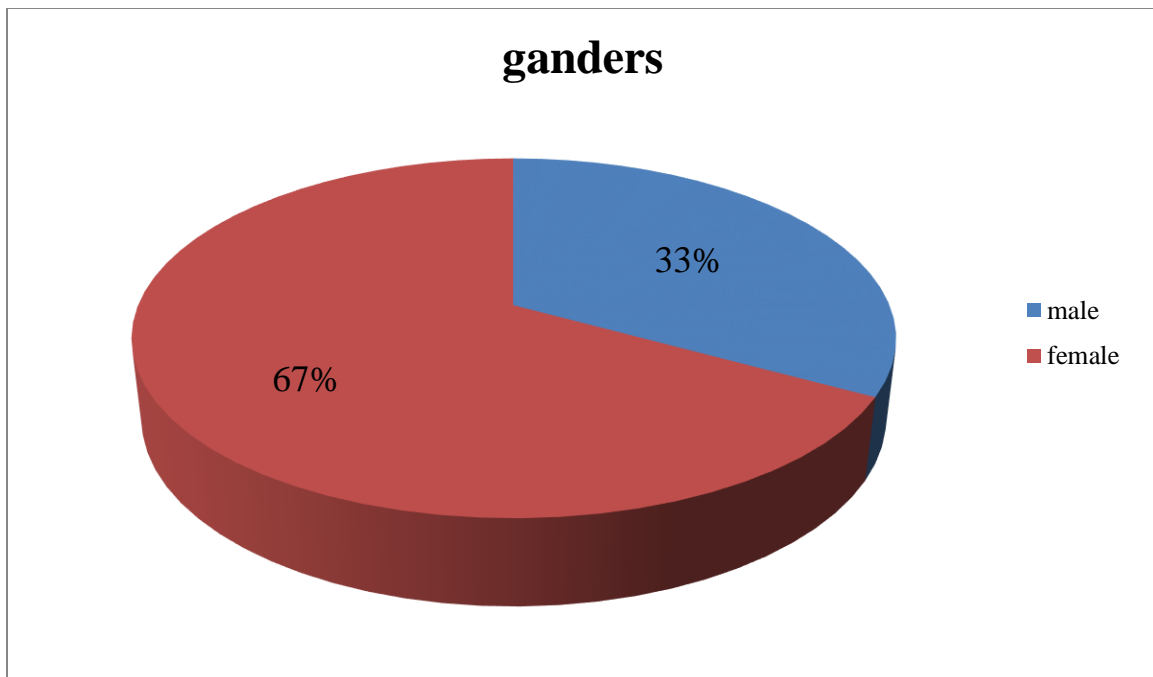


Figure 1. male to female ratio

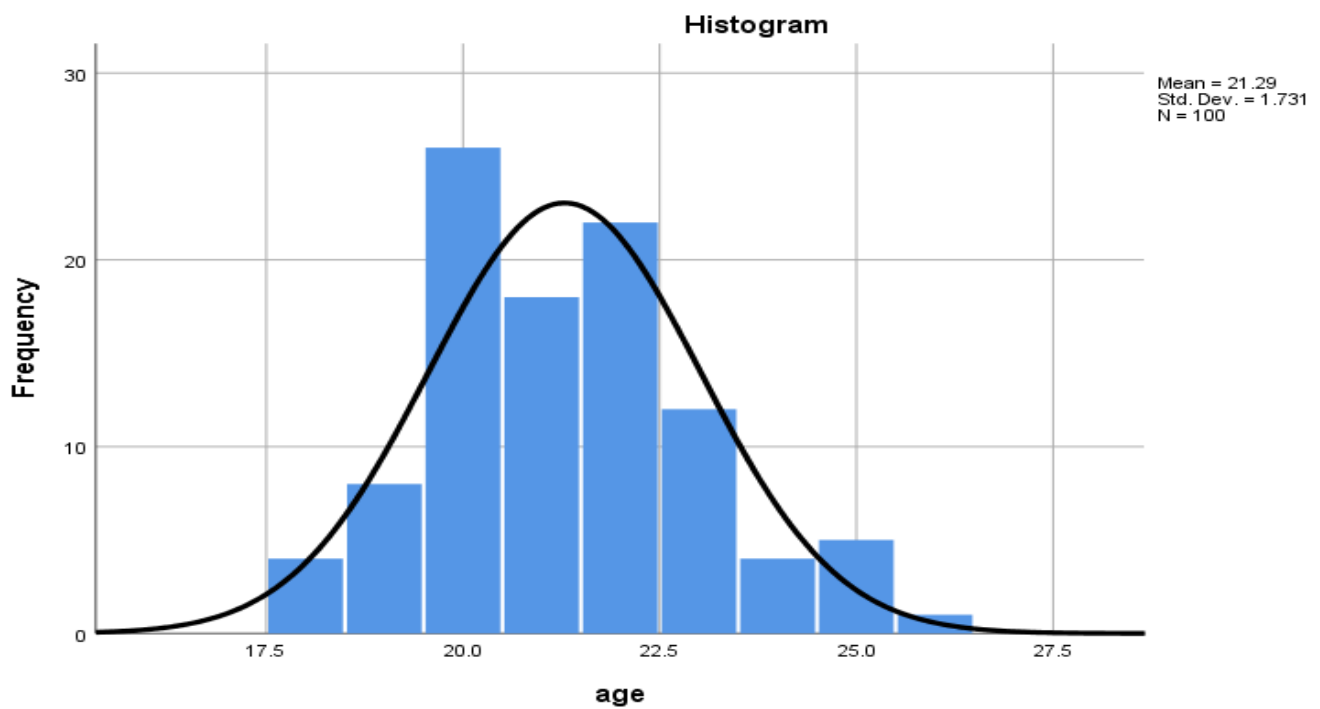


Figure 2. mean age of both groups

The global PSQI mean for the medical students group was 8.24(\pm 1.379) while the Global PSQI mean for the non-medical students group was 7.46(\pm 2.749) when comparing means using an independent T-test. The p value was 0.192 . Sleep duration in hours was 5.86(\pm 1.863) for medical students While 6.56(\pm 1.897) for non-medical students The P value was 0.66 . Sleep latency onset was in minutes, also compared with a P value 0.081 . see table 3

	Medical students	Non-medical students	P value	Test value	df
Global PSQI score	8.24 (\pm1.379)	7.46 (\pm2.749)	0.192	-1.132	98
Sleep duration in hours	5.86 (\pm 1.863)	6.56 (\pm1.897)	0.66	1.862	98
Sleep latency in minutes	24.44 (\pm27.165)	35.16 (\pm33.338)	0.081	1.763	98
Sleep efficiency %	82.5% (\pm15.64 %)	89.5% (\pm13.89 %)	0.02	2.359	98

Table 3 . comparison between means and standard deviation of sleep duration in hours and sleep onset latency in minutes and global PSQI score according to the groups .

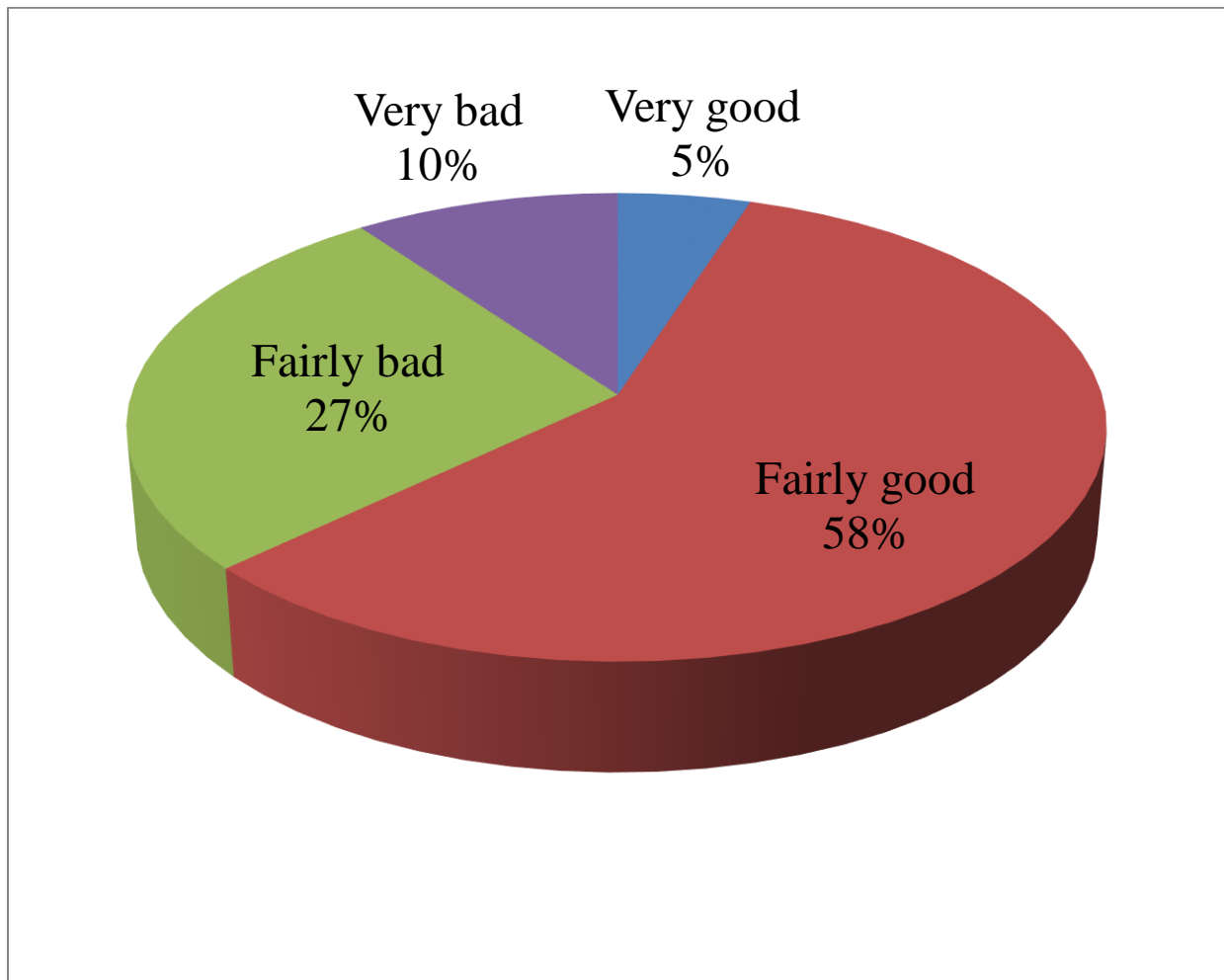


Figure 2 .sleep quality of studied personnel.

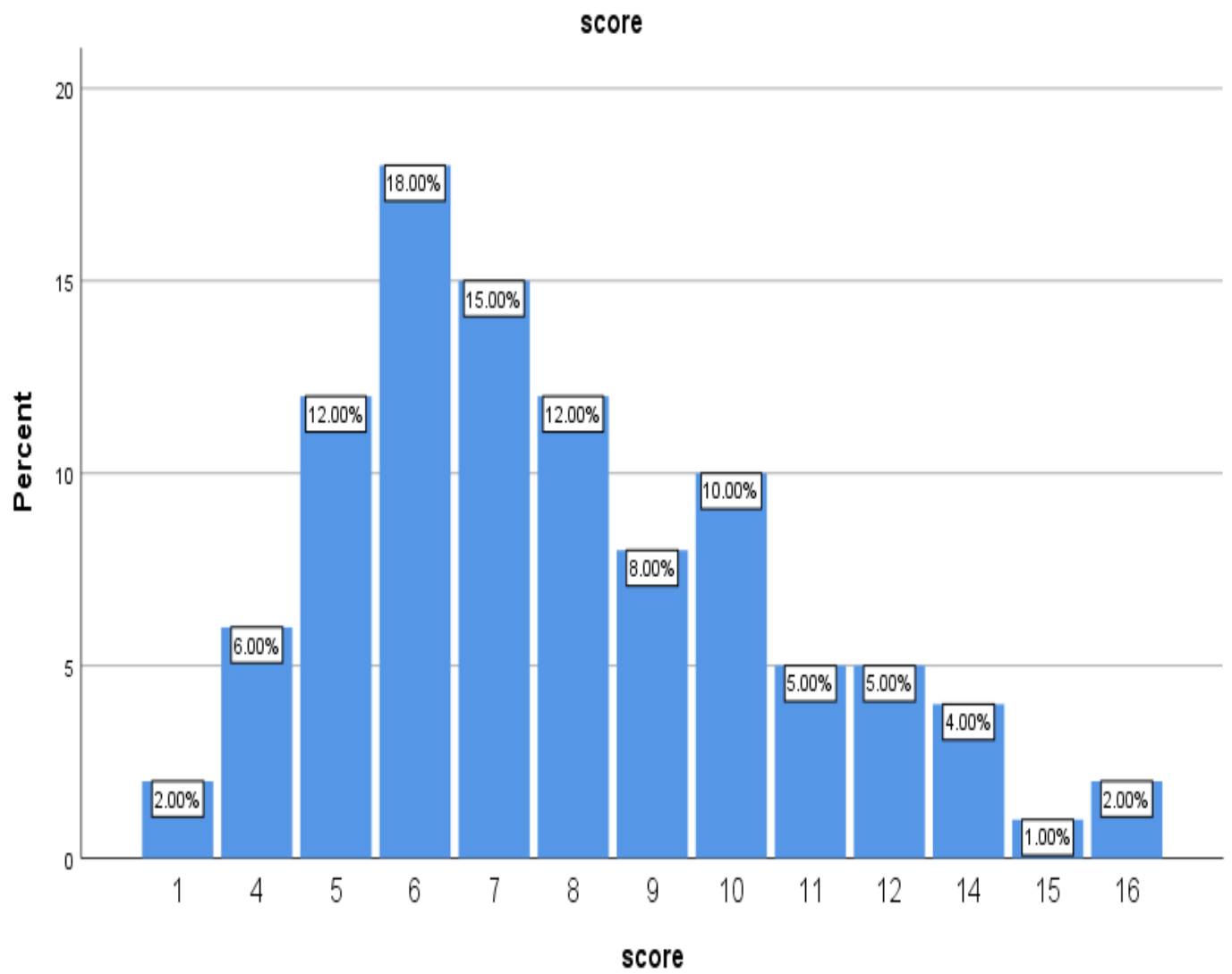


Figure 4. global PSQI score

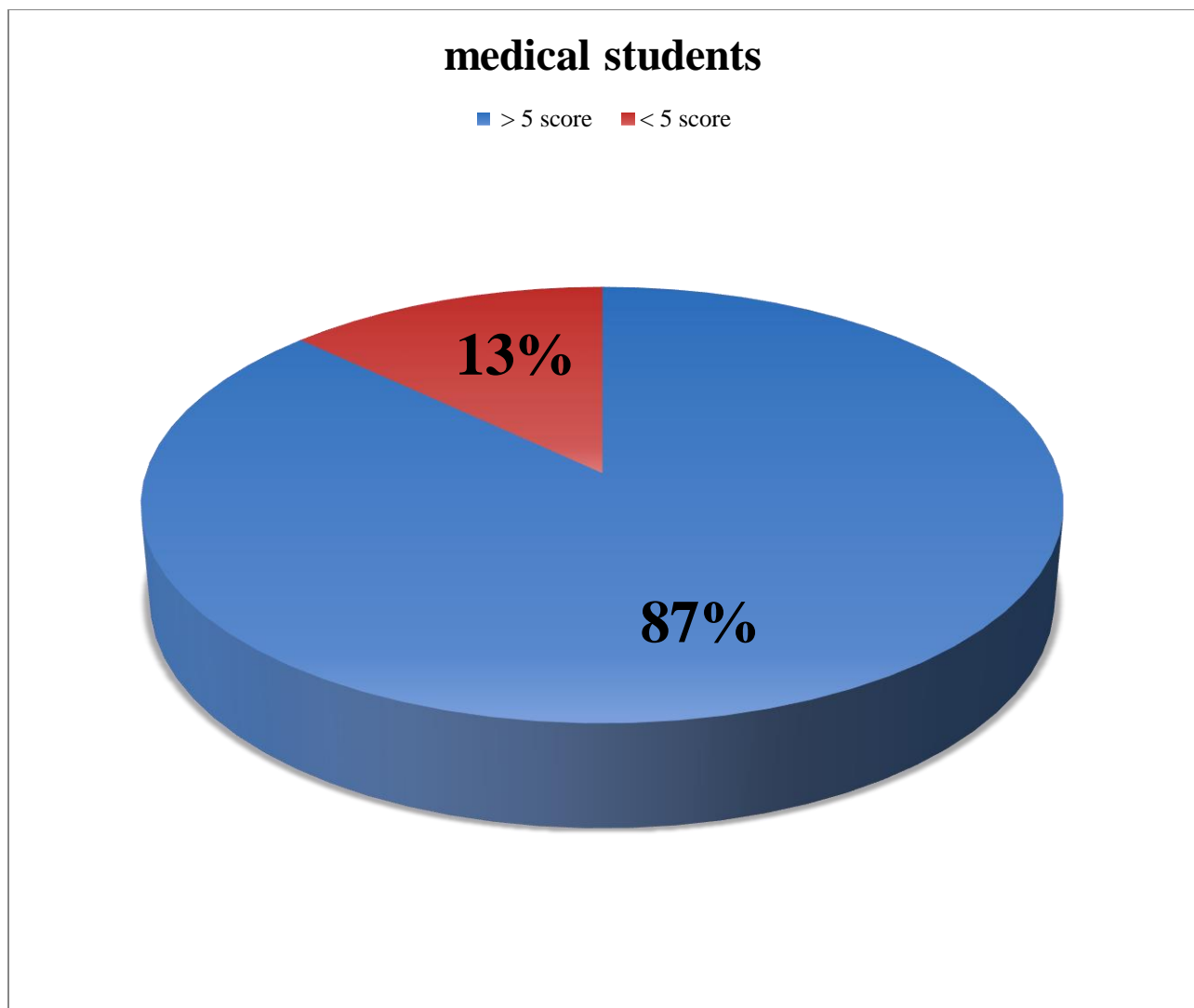


Figure 5. The percentage of medical students who show a score more than 5 score.

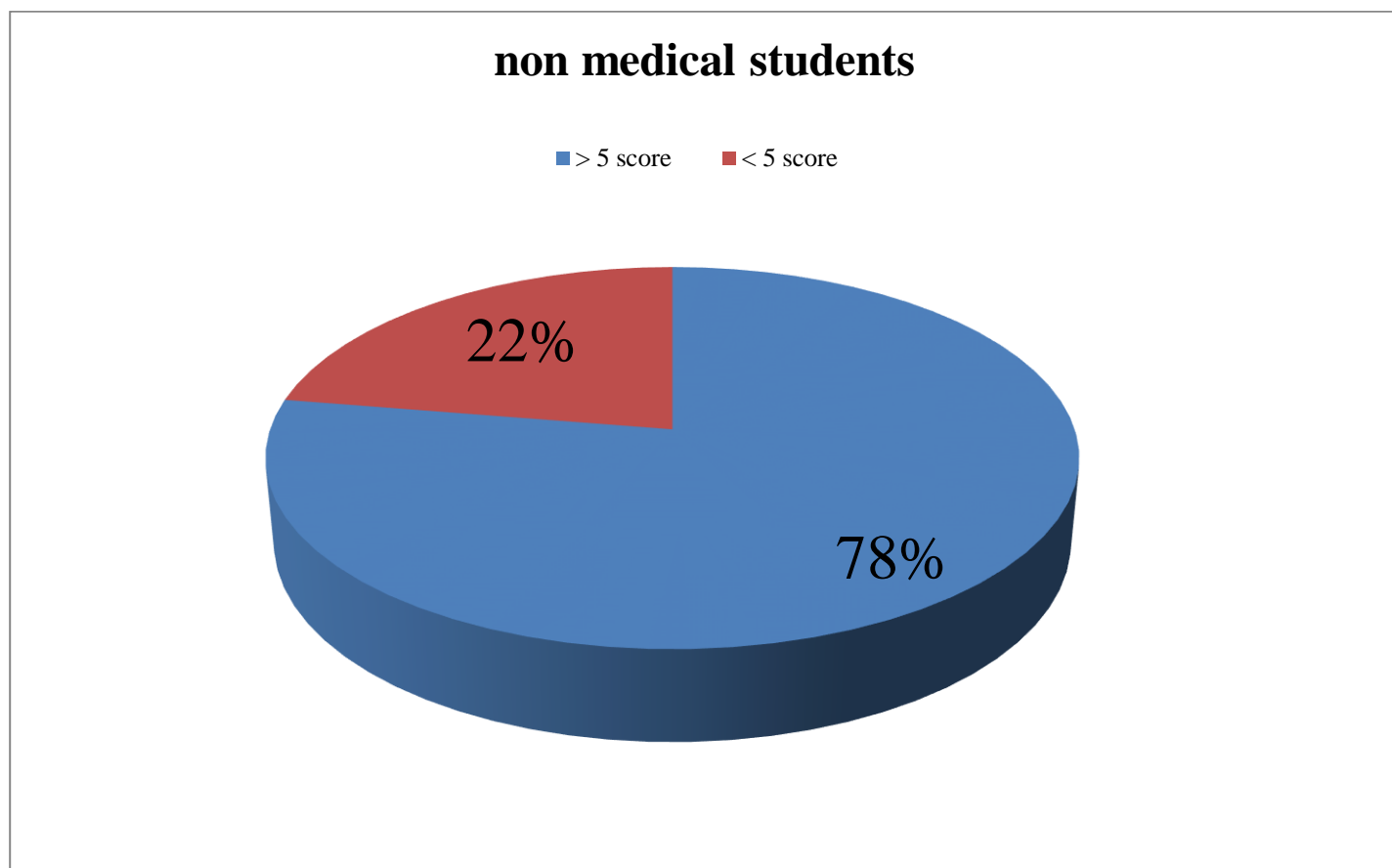


Figure 6. the percentage of non-medical students who show a score more than 5 score.

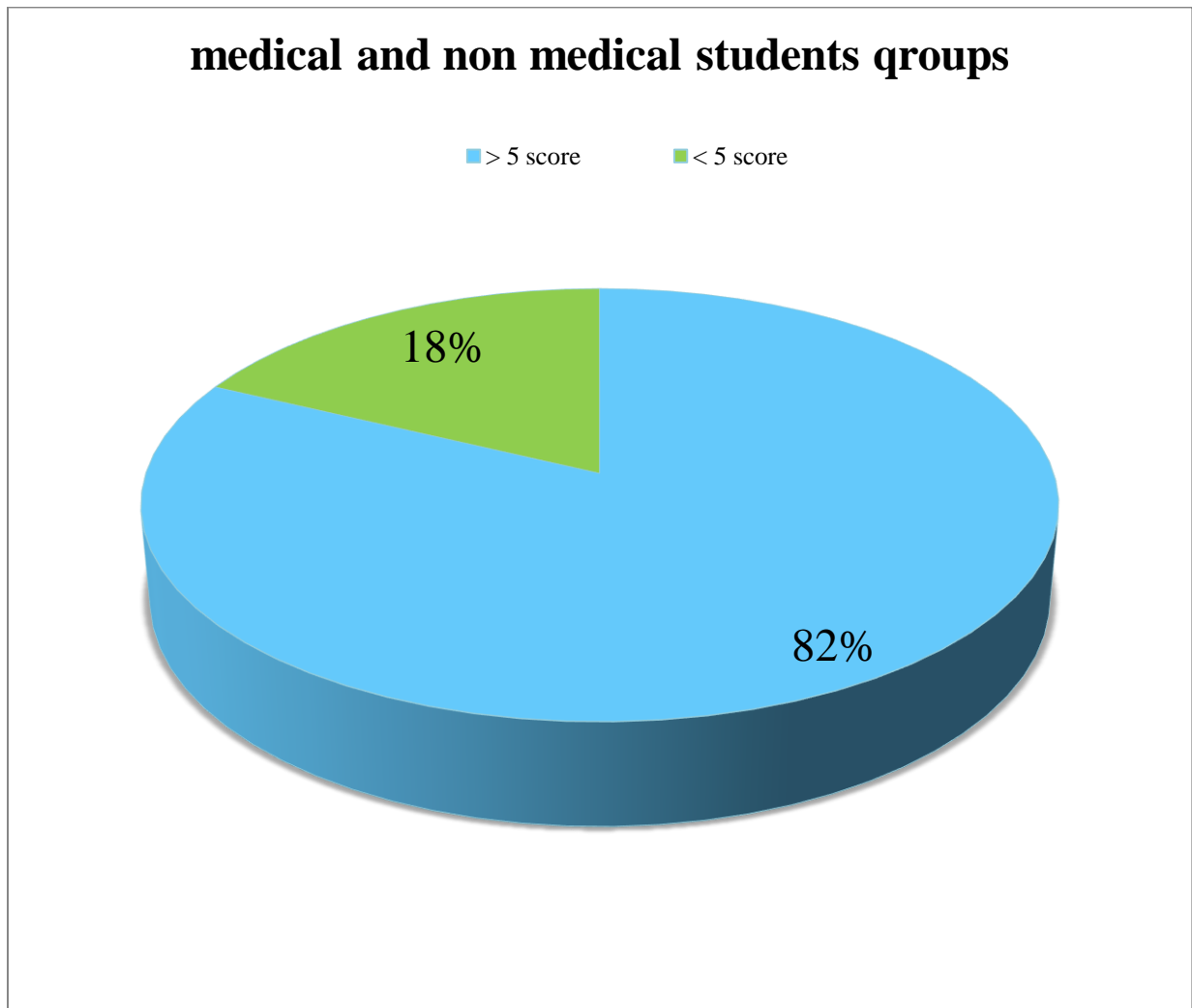


Figure 7. The percentage of the both groups who show more than 5 score.

We also found no significant difference in sleep duration , global PSQI score, sleep efficiency among the two genders of the medical students group. The mean age for males was 21.81(\pm 1.504) and the mean age for females was 20.47(\pm 1.559). see table 4

	Male	Female	P value	Test value	df
Global PSQI score	8 (\pm2.921)	8.35 (\pm3.329)	0.718	0.363	48
Sleep duration in hours	5.81 (\pm1.721)	5.88 (\pm1.950)	0.903	0.122	48
Sleep latency in minutes	28.44 (\pm41.862)	22.56 (\pm16.964)	0.481	-0.710	48
Sleep efficiency %	84.37% (\pm12.85%)	81.64 % (\pm16.90%)	0.570	-0.571	48

. Table 4. comparison between two genders of medical students group

Discussion

The current study focused on the sleep quality of undergraduate medical students (general medicine, dentistry and pharmacy) in Baghdad, Iraq, to find out if there is a negative effect of studying medicine on sleep in relation to this study. This study found that the percentage of female participants in this questionnaire was More than half of the sample (67%) and men were (33%).

Sleep disturbances in medical students have been reported frequently in many previous studies, Among university students around the world from both the East and the West, sleep deprivation is common. A total of 47% of the medical students group experienced sleep disturbances, compared to 45% of the non-medical students. Both groups had a non-significant p-value (> 0.05) in PSQI, sleep duration and sleep latency Except sleep efficiency was significant with a p-value (0.02). In Oman (Al-Shaqsi, 2015) found that over 60% of medical students had poor sleep quality,^[14] Similar findings have been reported in studies conducted in different countries, including the United States, Canada, and Taiwan (Azad et al., 2019; Chen et al., 2021).^[15] Another study of medical students in China found that 70.3% of participants had poor sleep quality, as assessed by the PSQI (Yang et al., 2021).^[16]

The low rate obtained in our results can be explained by the comparison of medical students with students of high academic level such as the engineering group. Our study assessed sleep disturbances in both medical and non-medical student groups, separately.

Our study showed that the mean average of hours slept by medical students compared with non-medical students is 5.81 ± 1.863 and 6.56 ± 1.897 , respectively .with p- a value was non-significant (0.66) . In congruence with our findings, studies conducted in Saudi Arabia, and Slovenia showed that medical students slept $5.8 \pm 1.3h$ and 5.84 ± 0.61 hours on average respectively.^[17,18]

Concerning sleep latency in minutes, although the medical student's group was lower than the non-medical student's group at 24.44 ± 27.165 and 35.15 ± 33.338 , respectively, the difference was not significant between medical and non-medical students with a p-value of 0.081. Another study published in the Journal of American College Health found that medical students had an average sleep latency of 24.35 minutes.^[19]

The results for the sleep efficiency component showed that sleep efficiency in medical and non-medical students was $82.5\% \pm 15.64\%$ and $89.5\% \pm 13.89\%$, respectively with a significant p-value of 0.02. The results showed that sleep efficiency significantly decreased after sleep deprivation for medical students. These results agree with others, including a study conducted in India found that the mean sleep efficiency of medical students was 80.4%^[15]. While a study conducted in Saudi Arabia found that the mean sleep efficiency of medical students was 77.2%, which is lower than the recommended threshold of 85% for good sleep quality (Alhazmi et al., 2018).^[20]

The cause of these results among medical students can be attributed to hectic schedule in medical college and increased academic load.

There have been several studies examining sleep quality in male and female medical students. Some of these studies have found differences in sleep quality between males and females, while others have not.

This study found no significant differences in sleep quality between males and females with a p-value (>0.05), In comparison with other studies These results agreed with a study published in the Journal of Sleep Research in 2016 examined sleep quality in 112 medical students (51 males and 61 females) in Turkey,^[21] And found no significant differences in sleep quality between males and females, but did find that overall sleep quality was poor in both groups of students.

Another study published in the Journal of Clinical Sleep Medicine in 2015 examined sleep quality in 269 medical students (128 males and 141 females) in Brazil.^[22] The study found that female medical students had poorer sleep quality than male medical students and that this was associated with higher levels of stress and anxiety.

Limitations

Limitations of the study include related small size sample, the fact that students were from colleges in Baghdad city only, and the unavailability of well-equipped sleep laboratories. further studies are needed to include all Iraqi governorates.

Conclusions

Sleep disturbances are common in medical students and showing no significantly different when comparing with Non medical students in terms of PSQI global score, sleep duration , and sleep latency but significantly different in sleep efficiency. Additionally, no significant different in the sleep quality for male and female of medical students group.

Recommendations

Improving sleep quality in students can have a positive impact on their academic performance, mental and physical health, and overall quality of life. Here are some solutions that have been suggested to improve sleep quality in medical students (Stress management, Regular physical activity, and Time management)

The investigations should continue in different regions of the country and the world, to monitor the profile of such students and encourage the translation of findings into health promotion practices.

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Appendix of research: