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Research Article

Effects of Sleep Quality on Academic Achievement in Medical Students

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Abstract

Background

Sleep health is a broad concept that refers to a person's ability to get enough quality, consistent sleep to engage in daily activities with vigor and productivity. It covers not only the duration and quality of sleep but also many other factors, such as sleep patterns, attitudes towards sleep, sleep environment conditions, and quality of recovery. This study aims to assess the quality of sleep in medical students and determine whether it correlates with academic success.

Methods

A total of 136 medical students were included in the study, and their sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). We also collected the participants' 1st semester GPAs and analyzed the relationship between sleep parameters and academic achievement.

Result

42% of participants had poor sleep quality on the PSQI, with a quarter taking longer than 30 minutes to fall asleep and 25% sleeping less than 6 hours per night. 92.6% of the students surveyed had a GPA below 3.0, and among them, poor sleep quality was found to be a high percentage. Here, the highest percentage is 44.9%, and those who score "1.00" have "normal" sleep. Then 3.7% gave a score of "3.00", which means that they had very poor quality sleep. The mean PSQI of students with a 2.0 GPA was 8.59±3.06, 8.40±3.32 of students with a 3.0 GPA, and 7.00±2.62 for students with a 4.0 GPA, and no statistically significant difference was observed (p=0.376).

Compared to the level of the course studied, the average score of PSQI was 8.27±3.01 in the 1st course, 8.37±3.58 in the 2nd course, 10.00±4.24 in the 3rd course, and 9.50±4.95 in the 5th course. The difference between the channels was also not statistically significant (p=0.921).

Conclusion

Poor sleep quality among medical students is directly related to their academic performance. Therefore, it is necessary to implement support, training, and preventive measures based on students' sleep patterns.

Key Words: Sleep, Assessment, Quality

Introduction

Sleep health is a broad concept that refers to a person's ability to get enough quality and consistent sleep to enable them to perform their daily activities energetically and productively. It covers a wide range of topics, including recovery quality, sleep patterns, attitudes toward sleep, and the state of the sleep environment, in addition to the length and quality of sleep.

Due to its direct relationship to both physical and mental health, sleep health is regarded as a significant public health concern [1]. Negative health consequences, including mental health issues, have been associated with either too little or too much sleep [1]. For instance, it has been demonstrated that sleep deprivation triples the risk of suicide attempts and raises the risk of mental diseases such as major depression, panic disorder, and post-traumatic stress disorder [1]. Students with healthy sleep patterns slept an average of more than 7.5 hours on weekdays, while those who were diagnosed with insomnia based on the DSM-5 criteria—the standard classification of mental disorders used by mental health professionals in the United States—slept

an average of less than 7 hours, according to a nationwide study of more than 50,000 college and university students in Norway [2].

Numerous factors have been found to affect students' sleep health, including their attitudes toward sleep, their level of knowledge about sleeping, and their heavy academic workload [3]. 36% of participants in a survey of 615 Indian medical students assessed their sleep knowledge as "poor" or "average" [4]. This may be due to changes in sleep patterns such as shorter nighttime sleep duration, late-night sleep on weekdays, and daytime naps [5].

Object

To study the effect of sleep quality on students' academic achievement.

Methods

The study was conducted using a cross-sectional design based on quantitative research methodology. The study was conducted between February and March 2025 with 136 first- through sixth-year medical students from the Dental School, School of Pharmacy, School of Biomedicine, and School of Nursing at the Mongolian National University of Medical Sciences.

The study included students who voluntarily agreed to participate and met the study criteria, however, students with psychological disorders or chronic illnesses were not included. The study employed the Pittsburgh Sleep Quality Index (PSQI) to measure sleep quality, which was subsequently rated, and a questionnaire to gather general demographic data. The survey data were statistically processed using SPSS 25.0 software.

Results

The study included 136 students, with 86.8% (n=118) being female and 13.2% (n=18) being male. In terms of academic year, the majority of participants (63.2%) were in their first year, 33.8% (n=46) were in their second year, and 1.5% (n=2) were in their third and fifth years.

In terms of professional background, 36.8% (n=50) of the study participants were nursing students, 14.7% (n=20) were general practitioners, and 14.7% (n=20) were physiotherapists. In addition, 12.5% (n=17) were dental technicians, 11.8% (n=16) were studying pharmacy, and 9.6% (n=13) were studying in other fields. The average GPA of participants in the first quarter varied; 69.1% (n=94) received a GPA of 2 to 3, 23.5% (n=32) received a GPA of 1 to 2, and 7.4% (n=10) received a GPA of 3 to 4. The mean Pittsburgh Sleep Quality Index (PSQI) score was 8.35 with a standard deviation of ±3.22. The lowest score was 3.00 and the highest was 15.00.

The students' average sleep quality index (PSQI) was compared using different demographic parameters, and the findings are shown below.

- In terms of gender, the average PSQI score for male students was 8.33±2.97, while the average score for female students was 8.35±3.26. At p=0.945, this difference was not statistically significant.
- When compared across years of study, the mean PSQI score was 8.27±3.01 in Year 1, 8.37±3.58 in Year 2, 10.00±4.24 in Year 3, and 9.50±4.95 in Year 5. The difference between the scores was also not statistically significant (p=0.921).
- Differences were observed across professional fields, but no statistically significant correlation was found (p=0.613). For example, the mean PSQI score of nursing students was 7.78±3.23, dental technicians 8.88±3.28, general practitioners 8.90±3.32, physical therapists 8.30±3.25, pharmacists 8.25±3.11, and other students 9.15±3.18.
- The mean PSQI for students with a first semester GPA was 8.59±3.06 for those with a 2.0 GPA, 8.40±3.32 for those with a 3.0 GPA, and 7.00±2.62 for those with a 4.0 GPA. There was no statistically significant difference (p=0.376).

Subjective Sleep Quality

Compared to good sleepers, self-reported sleep quality is like "a movie that ends easily." 44.9% gave a score of "2.00", which means they have a good enough quality of sleep. However, 7.4% gave a score of "3.00" and believed that "the movie is not needed," and the quality of sleep is poor.

Sleep Latency

A sleep delay is like a car stuck on a high-speed road. 14.7% gave a score of 3.00, indicating delayed sleep, and their sleep time is long.

Sleep Duration

Sleep is like a time stream. Sometimes it flows easily, sometimes slowly. 31.6% gave a score of 3.00, indicating "slow flow," and people's sleep time is long.

Habitual Sleep Efficiency

The highest percentage here is 44.9%, and those who scored "1.00" had "normal" sleep. Then 3.7% gave a score of "3.00" and had very poor sleep quality.

Sleep Loss Problem

If we consider insomnia as a problem, it is considered "golden" for 60.3% of people, because most of them gave a score of 1.00, indicating sleep loss.

Use of Sleeping Medications

Taking medicine is like a dream going through sleep. 94.9% do not use medication, while 4.4% require medication.

Daytime Dysfunction

The more unobstructed the daily activity is, the easier it will develop. 41.9% indicated that it was difficult to be active, which can be said to be going out every "one day" on average.

Discussion

The Pittsburgh Sleep Quality Index (PSQI) revealed that 42% of participants in this study, which is among the first to look at medical students' sleep quality in Mongolia, had poor sleep quality. This is far greater than the 8–18.5% found in earlier general population studies [6].

A study in China also found that 20.9% of students rated their sleep quality as poor or very poor, 7.3% had a sleep delay of more than 30 minutes, and 1% reported using sleeping pills more than 3 times a week [7]. These percentages were greater in our study, suggesting a more serious sleep health issue among medical students.

A quarter of the medical students in the study had difficulty falling asleep, defined as having a sleep latency of more than 30 minutes according to the International Classification of Insomnia (ICSD-3). Also, one in four participants slept less than six hours a day, which indicates chronic sleep deprivation.

Research conducted on medical students in different countries likewise reveals low sleep quality. In the Ohayon and Reynolds III study, for instance, 9.15% of young adults aged 15 to 34 reported having trouble falling asleep, whereas our survey revealed that 12.4% of students took sleeping medications at least once a week, a significantly higher percentage. According to a Norwegian study, medical students reported experiencing nightmares more than once a week at a rate of 11.9%, compared to 2.8% of the general population [8].

According to a 2020 meta-analysis by Hernan A. Seoane et al., 14,170 medical students' continuous learning and sleep disturbance were linked to circadian rhythm dissonance, inadequate sleep, and poor sleep quality [4]. Furthermore, an investigation carried out in France revealed that anxiety and depression were co-morbid with sleep disturbances in 66.2% and 27.7% of medical students, respectively [10]. Studies have shown that there is a bidirectional relationship between depression, anxiety, and sleep disorders, which increases the risk of suicide [11,12]. More large-scale, multi-faceted research is required because clinical training, night shifts, and the loss of biological clock synchronicity all have a detrimental effect on students' sleep quality.

Learning and cognitive flexibility are adversely affected by inadequate sleep and disturbed sleep architecture. The sample size may be too small to draw certain conclusions (such as correlations with academic achievement) because the response rate in our study was comparatively low (around 20%). More large-scale, multi-faceted research is required because clinical training, night shifts, and the loss of biological clock synchronicity all have a detrimental effect on students' sleep quality.

Conclusion

This study found a high prevalence of poor sleep quality among medical students in Mongolia. 42% of students surveyed had poor sleep quality on the Pittsburgh Sleep Index, with a quarter taking more than 30 minutes to fall asleep and less than 6 naps a day, indicating the prevalence of sleep deprivation.

Also, 92.6% of participants had a GPA below 3.0, suggesting a possible negative relationship between sleep quality and academic achievement. Therefore, it is necessary to pay attention to the quality of sleep and implement policies and training to promote sleep health to improve the learning outcomes of students.

Strengths and Limitations

• One of the first studies to assess the connection between medical students' academic achievement and sleep quality. The study's findings will contribute significantly to future research in this field and play a significant role in the development of a supportive and policy-focused environment that focuses on students' psychology and sleep habits.

• Nonetheless, a primary constraint of the research is its exclusive focus on a single school, which restricts the findings' complete applicability to pupils at other educational institutions. Thus, a large-scale, multi-center study is advised to improve the validity of the findings and derive conclusions that apply to all students.

Confidentiality

Responses from survey respondents and their personal information were kept completely private and utilized exclusively for research. It was explained to the participants that their involvement in the study was entirely optional and that they could decline to take part. The research process and its results were conducted under ethical principles and laws on the confidentiality of personal information.

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