

CROSS SECTIONAL STUDY OF SLEEP QUALITY AMONG YOUNG UNDERGRADUATE MEDICAL REHABILITATION AND APPLIED MEDICAL STUDENTS WITH STRESS

Abdullah M Al-Shenqiti

Faculty of Medical Rehabilitation Sciences, Taibah University, Madinah, Saudi Arabia

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ABSTRACT

Most medical rehabilitation and applied medical students suffer from disturbed sleep due to academic and clinical demands. The aim of our study was to assess the relationship between the psychological stresses and sleep quality to inform the organization of mental health programs in medical rehabilitation and applied medical colleges. In order to do this, we evaluate and compare sleep quality in medical students at various phases of their medical course in order to help prevent the effect of stress during their study period. The 300 Medical Rehabilitation and applied medical students from Taibah University, were invited to participate in a cross sectional questionnaire based study on the effect of stress on sleep quality. 271 students completed the forms fully irrespective of the year of study. The instruments used in data collection were self-reported Pittsburg Sleep Quality Index (PSQI), the General Health Questionnaire (GHQ12) and Depression and Anxiety Scale. The results obtained from the instrument components were analyzed for the total sample including the male and female students. 52.05% of the students reported having fairly bad sleep quality. Moreover, there was a relationship between sleep quality, general health status of students, and depression - anxiety status, i.e., a significant difference in coefficient correlation $r = 0.532$, $p = 0.0001$ ($p < 0.05$). In our study, we concluded that the majority of the medical rehabilitation and applied medical students in our study seem to be more exposed to poor quality of sleep which could have an impact on academic performance. Active interventions should be implemented to improve sleep hygiene, to reduce depression and anxiety in medical rehabilitation and applied medical students.

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1. Introduction

Sleep is a natural physiological phenomenon. The assessment of sleep quality involves the extent and perception of comfort after arousal from sleep and the quantitative factor assesses the sleep time span [1]. Lack of sleep can lead to various severe physical and mental health risks. [2] Many researchers have suggested that lifestyle factors, heavy workload, community demands, and excessive use of technology can affect sleep timespan, extent and perception of comfort. [3] Most of the studies conclude that reduction of sleep will lead to major health issues at an earlier stage in life. Studies carried out on university students have shown an high incidence, approximately $\geq 40\%$ of reduced sleep timespan < 7 hours and a low quality of sleep as per Pittsburg Sleep Quality index (PSQI). [2][4-6]

Sleep timespan and perception of comfort are commonly predicted to vary according to sex and stage of life [7] There have been reports of a greater risk of poor sleep quality among female students. [8,9] The typical psychological symptoms among the students were depression, stress and anxiety. [10,11] which in turn has a direct relation with quality of sleep and educational performance. Inadequate sleep causes lower levels of concentration, attention deficit, and fatigue, whereas adequate sleep and lesser latency period in sleep brings about greater educational performance. Lack of sleep also leads to reduction of cognitive functions like problem solving, concept and absence from institutions. [12] There are higher chances of lack of sleep in medical students because of expectations in terms of educational performance and more clinical responsibilities.

* Corresponding author: Abdullah M Al-Shenqiti: alshenqitiirehab@hotmail.com

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Clinical activities and medical studies bring with them an enormous syllabus burden which might add to the helpless rest quality well beyond that previously experienced by present day society. Further to this, as some students stay in hostels away from home, they need to change their lifestyle according to the accommodation provided to them. This can lead them to higher chances of sleep deprivation and will impact on their mental and physical capabilities. In order to improve the general nature of medical student's lives, including their performance of academic progress a better understanding of the etiology of rest issues in clinical trainees is essential.

In Asian countries, epidemiological studies of sleep issues among medical students have been conducted in China, Hong Kong, Malaysia, India, and Iran. In China, 19% of medical students were found to have poor sleep quality as evaluated by the Pitts-burgh Sleep Quality Index (PSQI), with differences seen between long stretches of study however not between genders. [13] Another study of Chinese medical students details that over 90% of the undergraduates had encountered inordinate sleepiness in class, with a larger number of female students affected than male students [14]. Approximately 70% of Hong Kong medical students reported lack of sleep, affirmed by smart watch recordings, with no large differences reported for gender or age. [15] The mean sleep period for the entirety of the student survey questionnaires was just 6.6 hours. [15] A large survey investigation of medical students in Malaysia revealed that daytime sleepiness happened in 35.5% of students and bad sleep quality was reported by 16%. [16] Daytime sleepiness was evident fundamentally progressively basic among medical students (versus preclinical), and in those with self-evaluated sleepiness quality and mental stress; yet in this group, daytime poor sleep was not related to the quantity of hours sleep at nighttime. Depression and anxiety can lead to poor sleep quality among students due to academic conditions. Depression is classically identified by anguish, melancholy, and frustration, whereas anxiety attributes to needless tension in dispassionate possession and mutual relationships; general distress is a familiar aspect of both anxiety and depression [17]. Certainly, anxiety, depression, and stress are considered as substantial signs of psychological well-being[18].

In this study, our main objective is to assess the relationship of quality of sleep and stress and their impact on general health among undergraduate medical rehabilitation students

2. Methods

The cross-sectional study of undergraduate students was conducted in Medical Rehabilitation Sciences College and Applied Medical Sciences College of Taibah University, Madinah, Saudi Arabia, with the approval of the ethical committee of Taibah University Medical Rehabilitation Sciences (TUCMRS) (#CMR-RT-2018-06) during the academic year of 2019-20. The participants (undergraduate students) were taken from all departments of Medical Rehabilitation and Applied Medical colleges. There were 271 participants in our study. The purpose of the study was explained to the participants and informed consent was obtained.

Data Collection

In this study, the questionnaires were self-administered. Quality of sleep was assessed with the help of a self-rated questionnaire, the Pittsburgh Sleep quality Index, general health was assessed with GHQ 12, and Depression and Anxiety scale.

PSQI questionnaire

The PSQI questionnaire consists of 10 main questions. The first nine questions are answered by the participant and the tenth by their roommate. The tenth question is not scored in the PSQI, which will not include scoring. The aim of this questionnaire is to assess the quality of sleep. The questions have been designed to assess 7 components: sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction and are scored on a scale of 0-3. Questions 1 – 4 relate to the past and include information about bedtime at night, minutes to fall asleep at night, getting up time in the morning, and actual hours of sleep at night. Instead, questions 5 – 10 ask about the present and require participants to rate their answers in the following way, 0 - Not during the past month, 1 - Less than once a week, 2 - Once or twice a week, 3 - Three or more times a week. The scores for all seven components were added up to achieve the global Pittsburgh sleep quality index score. The score ranges from 0 – 21, a greater score indicates a poorer quality of sleep.

General health questionnaire 12 (GHQ12)

The GHQ12 is made up of 12 questions intended to assess general health over the past month. Subjects were asked to rate level of general health on a 0 to 3-point scale. (0 - more than usual, 1 - same as usual, 2 - less than usual, 3 - much less than usual). The rating scale for six questions was reversed (0 - not at all, 1 - no more than usual, 2 - rather more than usual, 3 - much more than usual). The total score was calculated for the 12 questions for each participant and the final score was between 0 to 36. A total score of >15- 19 indicates a sign of stress and a score >20 would indicate severely problematic and psychologically distressed for the past month.

Depression and anxiety scale

Depression and anxiety were measured using a scale which labels depression and anxiety as normal, mild, moderate and severe.

The study was approved by the ethical committee of Taibah University Medical Rehabilitation Sciences (TUCMRS) approval (#CMR-RT-2018-06).

Statistical analysis

SPSS 19 application was used for statistical analysis for all of the questionnaire results and the results were compared by gender (Male and Female Students). The CI (confidence Interval) of 95% was targeted at the significance level of 0.05 (5%). The null hypothesis association between PSQI, GHQ12 and depression anxiety scale was achieved using Person correlation, Chi square test, and linear regression model.

3. Results

The We conducted a cross-sectional study to find the effect of stress on sleep quality in Taibah University Medical Rehabilitation and Applied Medical students. A total of 271 (Male 121 and female 150) completed the forms and data was collected from the students irrespective of study year.

Sleep quality was measured from very poor to excellent and students are described accordingly. In all subjects, 52.05% of students fall in the poor sleeper group with a global PSQI score > 5.

A gender comparison showed that more male students suffered from poor quality of sleep compared to female students.

Male students fell asleep later even when they tended to go to bed earlier due to shorter sleep duration, smoking habits, and efficiency of less habitual sleep. Female students were more inclined to nap in the daytime because of sleep disturbances.

Most of the students had not maintained their general health according to the results from GHQ12 were 89.5% as the distribution of male and female students was 39.7% and 49.8% respectively and no significance was found in their results. The Female students (55.4%) suffered from severe stress when compared to Male students (44.6%). Anxiety (43.6%) and depression (43.8%) was found significantly among the students.

PSQI Items	MaleStudents (Mean±SD)	Female Students (Mean±SD)	Average %
Bedtime (hr./PM)	11.02±2.25	11.35±0.45	11.19±1.35
Wakeup Time (hr./AM)	6.35±1.32	6.02±2.32	6.19±1.82
Sleep Quality (%)	76%	79%	77.5%
Sleep Latency (min)	7.84 ± 1.21	7.78 ± 1.43	7.81±1.31
Sleep Duration (Hr)	6.08 ± 3.60	7.01 ± 3.69	6.91±3.33
How many Hours Sleep Needed	7.73 ± 1.29	7.77 ± 1.10	7.75±1.19
Habitual Sleep Eff.	93.2 ± 9.21	95.05± 8.21	94.15± 8.7
Sleep Disturbances (%)	26.4%	30.1%	28%
Daytime dysfunction (%)	20.9%	30.2%	26%
Medication for sleep (%)	3.1%	3.7%	3.4%
Poor sleep quality (%)	52.5%	51.6%	52.05%

Table 1. PSQI Gender

The correlation between the quality of sleep and general health was positively significant with $r = 0.122$ and $p = 0.048$ ($p \leq 0.05$). The students' sleep medication usage (3.4%) frequency is not significant, even in those who are affected by lack of sleep. Moreover, there is no significance in the correlation between the qualities of sleep with sleep problems and satisfied sleep. The distribution of satisfaction of sleep is the same across the categories of quality of sleep; most of the students' psychological stress and anxiety were due to lack of sleep (Table 2). Comparisons between the quality of sleep scales varied from poor to excellent (6 level scale) and Depression and Anxiety scale normal to extreme (Yes/No) of student measurements.

		NORMAL	MILD	MODERATE	SEVERE	Total	
Problem in Sleeping	Anxiety	No	n 120	16	13	1	150
		%	45.1%	6.0%	4.9%	0.4%	56.4%
	Yes	n	57	23	30	6	116
		%	21.4%	8.6%	11.3%	2.3%	43.6%
Depression	No	n	143	7	0	0	150
		%	53.6%	2.6%	0.0%	0.0%	56.2%
	Yes	n	107	10	0	0	117
		%	40.1%	3.7%	0.0%	0.0%	43.8%

Table 2. Comparison between the qualities of sleep with Depression & Anxiety.

4. Discussion

A heavy work schedule or timings and alterations in sleep wakeup cycle can increase the possibility of lack of sleep with physical and psychological illness.

Research shows that partial lack of sleep can lead to an increased proportion of mistakes among professionals during work, which occurs due to a heavy working roster. Lack of sleep can lead to a range of mental and neurophysiologic disparities like mood disorders and reduced attentiveness, which can have a direct impact on a person's productivity. Researchers have understood the relationship between sleep disturbance and insomnia because of tension/stress with the progression of depression in students of medical science. (14) There is a high incidence rate of 52.05 % of poor sleep quality among Medical Rehabilitation students in our study. Scientists in China concluded that 16.3% of young people (adolescents) suffer from sleep disorders and in Taiwan it is 40% which is greater than China. In the United States of America, the incidence was 16.3% among adolescents, 25.9% in adults above 18 years, and 71% of school students suffer from poor sleep quality. [15, 16, 17, 18]

Researchers have observed subjects from adolescents to young adulthood; they found the percentage of subjects who did not get enough sleep was between 54% and 74%. [19] There are a number of reasons which can lead to sleep disorders among students such as physical differences and social changes, behavioral harm and emotional impact, the use, and misuse of substances in this generation [20]. In developing countries like India, adolescents can have extravagant accountability which increases the frequency of poor sleep quality in this group. Other than that, there could be some more reasons like high dominance of poor general health quality and psychiatric disorders among students which can lead to greater poor quality sleep incidence. Research hereafter can evaluate the perception as a matter of point for poor sleep quality, which plays an important role in the working of educational institutes and the screening of students for sleep problems by the education system, particularly in those students who do not perform well.

In our work, there was a noteworthy alteration between the objective and subjective methods of measuring quality of sleep. In the subjective part, there were 47.95% of subjects with fairly good, very good sleep quality. 3.4% of subjects were on sleep medication. Concurrently, the PSQI results revealed that 52.05% of subjects had poor quality of sleep and 26% had dysfunction during the daytime.

In various studies, there were noteworthy differences in the psychological health states of students of different years with anxiety, depression, and stress. We found the results in our study to be similar to those of other studies on depression, i.e., 43.8% and anxiety, i.e., 43.6% in our subjects [21] The possibility of differences in results can be due to unawareness of symptoms among subjects in relation to the type of sleep disturbance. Thus, sleep quality was reported to be very good or good. Furthermore, objective and subjective evaluation have to be considered for quality of sleep, even though the assessment of poor quality of sleep has been done. Since there is a moderate relation between the two and that an individual constituent partially could imitate the person's point of view in extension with few constituents in their intention of patterns of sleep. Lastly, subjects may have given untrustworthy responses to the questions.

In our study, there is a close relation between self-assessed general health, self-assessed quality of sleep, and anxiety and depression assessment. The outcome contributes to a clue that quality of sleep can be used for general health as an indicator. This relationship is consistent with research which suggests a connection between the general health grades of youngsters and quality of sleep and vice versa [20]. Further investigations could clarify the cause for the high occurrence of poor sleep quality.

5. Conclusions

In our study, we concluded that most of the Medical Rehabilitation and Applied medical students seem to be more exposed to poor quality of sleep disturbance. This has a negative effect examination performance, and active interventions should be implemented to improve sleep hygiene, and reduce depression and anxiety in medical rehabilitation and applied medical students, improving knowledge and practices of medical students [22-25].

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