EFFECT OF SLEEP QUALITY ON ACADEMIC PERFORMANCE AND CLASS ATTENDANCE OF MEDICAL STUDENTS DURING RAMADAN

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Abstract

Introduction: To determine sleep quality of medical students in the month of Ramadan and associate this relation to their academic performance and class attendance.

Methodology: An observational cross-sectional study was conducted on undergraduate medical students in a private medical college. Demographic data including gender, age, and the Pittsburgh Sleep Quality Index (PSQI) were collected. Academic performance and class attendance of students during and after Ramadan were compared with all scores of PSQI. The association between PSQI score and academic achievement and attendance in class was determined using Pearson's Chi square. A p-value of ≤0.05 was taken as significant.

Results: The average PSQI score was 9.91 ± 3.07 SD. The average attendance and test results of the participants in the month of Ramadan was 71.45 ± 4.24 SD (in %) and 62.23 ± 4.32 SD (in %) respectively. The average attendance and test result of the participants after the month of Ramadan was 80.26 ± 7.29 SD (in %) and 84.76 ± 5.94 SD (in %) respectively. Pearson product moment correlation showed that correlation between the average attendance and the average results during the Ramadan was statistically insignificant (p-value = 0.14) while the correlation between the average attendance and the average result after the Ramadan was statistically highly significant (i.e., p-value < 0.00).

Conclusion: Our study concluded that poor sleep quality of students in Ramadan affects their academic performance and class attendance.

Keywords: Intermittent fasting, fasting, Muslims, medical school, medical students, quality, sleep, academics, academic test scores, test performance

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Introduction

Fasting has long been a crucial component of many religions and cultures.[1] Muslims around the world refrain from eating, drinking, and smoking from dawn till dark for one month during the Ramadan fast.[2] The approach to enhancing health and its services in various scientific treatments has continued to revolve around fasting.[3] Fasting in particular plays a crucial influence in helping people, especially students, deal with problems like despair and anxiety.[4]

Sleep is considered to be an inextricable part of human health, which is important in performing mental and physical functions.[5] Getting enough sleep is essential for developing cognitive abilities including memory retention. It supports the maintenance of executive functioning, memory processing, attention, and sensorimotor integration.[6]

Studies on the effect of Ramadan on sleep patterns showed delay in times for waking and sleeping however there is no evidence of increase in daytime sleepiness found.[7] Numerous epidemiological and laboratory research have demonstrated that reduced sleep duration and poor sleep quality can result in a variety of detrimental health effects, including weight gain and chronic conditions.[8] Poor sleep quality is associated with emotional disturbances, irregular sleep patterns and daytime sleepiness.[9] In view of the above, the performance of students is also significantly influenced by their metal wellness.[10] Maheshwari and Shaukat in 2019 established that Poor sleep quality among Pakistani medical students has a detrimental effect on their academic performance.[11]

Poor sleep quality and sleep deprivation have been associated to lower work performance, bad decision-making, medical errors, and burnout among health science students, healthcare professionals, and emergency responders[12]

There has been noticed a profound change in lifestyle during Ramadan. In countries like Saudi Arabia, school timing is delayed due to increase in

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activities like late night prayer, shopping and watching television which consequently leads to delay in bedtime and daytime sleepiness, but Ramadan had no effect on Muslim students' workgroup attendance, according to studies, as they did not miss any courses while they were fasting [13].

This study aims to determine sleep quality of medical students in the month of Ramadan and associate this relation with their academic performance and class attendance so that certain changes could be made in academic plan during Ramadan to bring improvement in overall performance of students.

Methods

In Central Park Medical College, Lahore, an observational cross-sectional study was conducted from 1st April, 2022 to 1st June, 2022. This study was approved by the 'institutional review board'. Purposive convenience sampling of undergraduate medical students of both genders and above 18 years was done. Informed consent was obtained. Demographic data including gender, age, and the Pittsburgh Sleep Quality Index (PSQI), were collected using a standardized questionnaire. The PSQI is a useful tool for assessing the consistency and quality of sleep. The seven components it evaluates—subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disruptions, usage of sleeping pills, and daytime dysfunction—are all related to sleep. The scale has a minimum score of 0 and a maximum value of 21. The "global score of PSQI" is the total of the PSQI's seven components. The PSQI global score of 5 denotes "poor sleep quality." For its seven components, the PSQI has an internal consistency score of 0.83 and a reliability coefficient (Cronbach's alpha) of 0.83.[11,14]

Data regarding academic performance and class attendance of students was obtained from the student affairs section of the medical college.

The data was entered and analysed using SPSS for Windows, version 22.0 (IBM Corp., Armonk, NY, USA). To determine frequencies and percentages, demographic data were grouped. Each PSQI component was categorized. Academic performance and class attendance of students was calculated during and after Ramadan and compared with all scores of PSQI. The association between PSQI score and academic achievement and attendance in class was determined using Pearson's Chi square. A p-value of ≤0.05 was taken as significant.

Results

199 medical students provided the data, which was gathered online on google documents. The mean age of the participants was 21.17 ± 1.18 SD (in years). About 116 (58.3%) of the participants were females and the remaining 83 (41.7%) were males. Approximately 110 (55.3%) of the participants were hostelite and 89 (44.7%) were day scholars. About 67 (33.7%) of the participants were from 2nd year MBBS, 75 (37.7%) were from 3rd year MBBS and 57 (28.6%) were from 4th year MBBS. The average family members in the house were 5.78 ± 4.69 SD. The average rooms in the house were 2.46 ± 3.56 SD. The average PSQI score was 9.91 ± 3.07 SD. The PSQI score ranged from 4 to 19. The median of the PSQI was 10 below which approximately 50% of the respondent's score lies. A score of 8 and 12 are the lower and upper quartile below which 25% and 75% of the respondent's score fall.

Table I: Average attendance of each class in Ramadan and after Ramadan

Undergraduate Class	Average attendance during Ramadan	Average attendance after Ramadan
Second year	66.47%	89.63%
Third year	76.44%	72.43%
Fourth year	70.73%	79.56%

In Table I, there exists a significant difference in the average attendance of second year MBBS (i.e.p-valu <0.00). However, this difference was statistically insignificant for third and fourth year MBBS.

Table II: Average attendance and academic performance of all the classes during Ramadan and after Ramadan

	During Ramadan	After Ramadan
Average attendance	71.45 ± 4.24 SD (in %)	80.26 ± 7.29 SD (in %)
Academic performance	62.23 ± 4.32 SD (in %)	84.76 ± 5.94 SD (in %)

In Table II, the test of significance revealed that a

statistically significant difference was observed between the average attendance and academic performance during and after Ramadan (i.e., t= -8.81, p-value < 0.00 & t= -22.53, p-value <0.00).

Pearson product moment correlation showed that correlation between the average attendance and the average results during the Ramadan was statistically insignificant (p-value = 0.14) while the correlation between the average attendance and the average result after the Ramadan was statistically highly significant (i.e., p-value < 0.00).

Attendance during Ramadan was insignificantly related with PSQI score (i.e. r= -0.01, p-value = 0.90). Similarly, test results during Ramadan were insignificantly related with PSQI score (i.e. r= -0.05, p-value = 0.53).

PSQI scores revealed that a large proportion of students did not take any medicine during the month of Ramadan to help sleep. About 23 (11.56%) of the students used medicines three or more times in a week whereas 14 (7.04%) of the students took once or twice in a week (Figure 1).

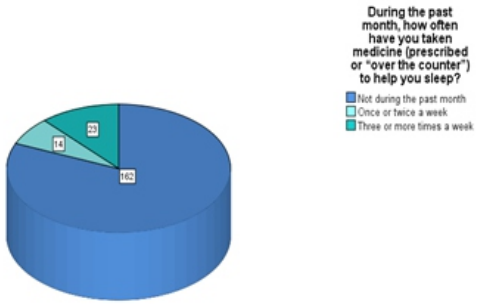

Figure 1: Proportion of students who took medicine to help sleep

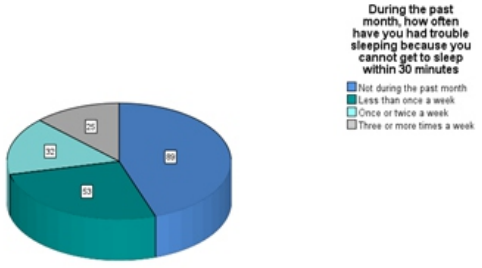

Figure 2: Proportion of students who had trouble sleeping

About 89 (44.72%) of the students did not have any trouble sleeping within 30 minutes after going to bed. About 53 (26.63%) had trouble sleeping less than once a week, 32 (16.08%) had trouble sleeping once or twice a week (Figure 2).

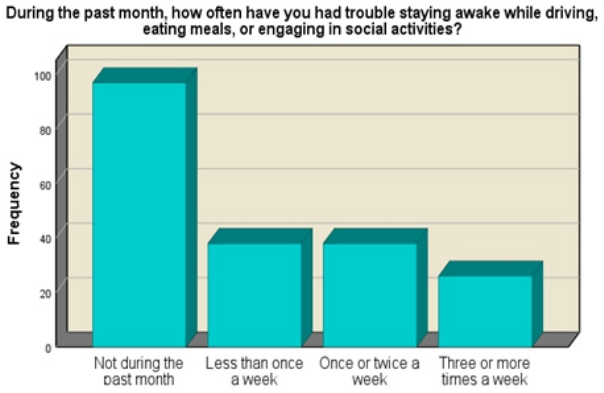

Figure 3: Proportion of students who had trouble in staying awake

About 97 (48.74%) of the students reported that they do not have any trouble in staying awake while driving, eating meals, or engaging themselves in social activities. The proportion of students who faced trouble less than a week and once or twice a week remained the same (Figure 3).

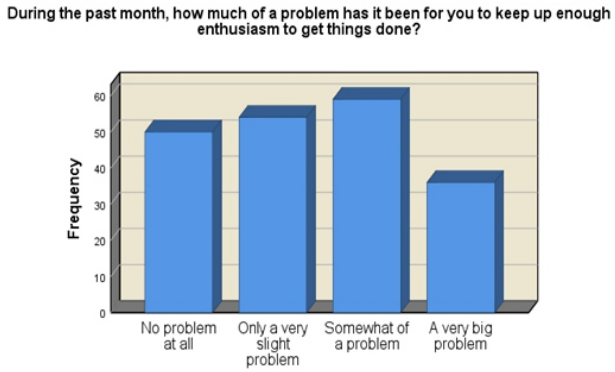

Figure 4: Proportion of students who find problem to keep enthusiasm to get things done

About 59 (29.64%) of the students found it somewhat a problem to be enough enthusiasm to get things done. Nearly 54 (27.13%) and 50 (25.13%) found only a slight problem and no problem at all respectively (Figure 4).

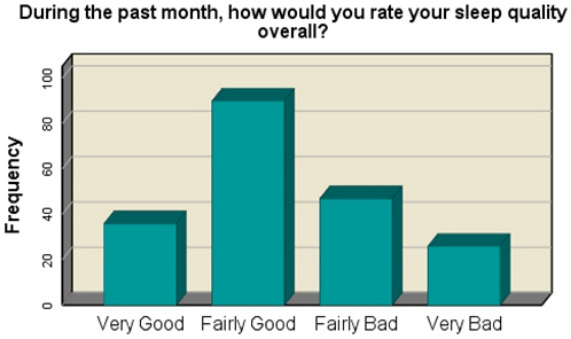

Figure 5: Overall quality of sleep of students

Overall, most of the students i.e., 90 (45.22%) favoured that their sleep quality was fairly good during the month of Ramadan followed by 47 (23.62%) students who said that their sleep quality was fairly bad. Only 36 (18.09%) of the students said that the sleep quality was very good during the month of Ramadan (Figure 5).

Test of significance revealed that a statistically significant difference was observed between the average attendance and academic performance during and after Ramadan (i.e., t= -8.81, p-value < 0.00 & t= -22.53, p-value <0.00).

Discussion

A total of 199 medical students provided the data. The participants were 21 years old on average. 41.7% of the participants were men and 58.3% were women. The study group included 2nd year, 3rd year and 4th year undergraduate medical students as 33.7%, 37.7% and 28.6% respectively.

An observational study conducted in 2020 amongst four continents showed poor sleep quality by 52.7% with mean PSQI score of 6.1 in students during the month of Ramadan.[15] There was a decrease of almost 1-hour sleep during Ramadan as compared to before Ramadan in a systematic review conducted on people with sedentary lifestyle versus the people with active lifestyle. It was also noted that sleep was more disturbed for the active people as compared to sedentary people during Ramadan.[16] Our study also indicated significant sleep disturbance during Ramadan in which sleep was bad in 23.64% of students and 29.64% of the students found it somewhat a problem to be enough enthusiasm to get things done. 27.13% and 25.13% found only a slight problem and no problem at all in sleep respectively. The PSQI score ranged from 4 to 19. The average PSQI score was 9.91±3.07 SD.

Studies have shown that fasting in Ramadan is physiologically demanding and therefore it has a negative impact on educational performance of students.[17] A study done by Mohammed A. Alsaggaf et al. emphasized that the poor performance in studies during Ramadan is related to inability to sleep within 30 minutes of going to bed and frequent night wakening.[18] According to Afifi (1997) students who observed fasting in Ramadan had reduced activity, less desire to study and lower ability to concentrate among more than 50 percent of subjects.[19]

However, research entitled "effect of fasting on students' mental health" conducted by Sadeghi and Mazaheri showed students who fast have better mental health than those who did not fast.[20] A TIMSS data collection done from 1995-2019 showed an increase in scores of both math and science subjects by 11% in Ramadan. Moreover, the PISA (Program for International Student Assessment) test score gap between Muslims and non-Muslims was reduced by 2.5-3.0 % in the month of Ramadan.[15] A study done by Khoshniat Nikoo et al., also showed positive association of fasting with mental health of individuals.[21] Our study revealed that average academic performance of students during Ramadan was poor i.e., 62.23% as compared to 84.76% after Ramadan.

A study by Oosterbeek and van der Klaauw, did not discover any evidence that Muslim students attended fewer classes because of Ramadan, so the performance drop was not the result of decreased attendance.[17] In contrary to this, our study showed raised average attendance after Ramadan (80.26 %) as compared to attendance in Ramadan (71.45 %).

More studies should be conducted during Ramadan to reveal a clearer picture of students' sleep quality, academic performance and class attendance so that modified academic plans can be formulated during this Holy month keeping in view the increased spiritual activities for better outcomes.

Conclusion

Our study concluded that poor sleep quality of students during Ramadan affects their academic performance and class attendance.

Authors Contribution: FAM: Conception of work, Interpretation of data and Drafting. **ZR:** Conception of work, Drafting, and revising. **NM:** Design of work, and Drafting. **IY:** Acquisition and Analysis of data and revising. **AS:** Acquisition and Analysis of data and drafting. **NS:** Design of work and drafting. **SN:** Acquisition and Analysis of data and revising.
All authors critically revised and approve its final version.

Conflict of Interest: No conflict of interest among authors.

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