Sleep Quality, Wellbeing and Happiness in Medical Undergraduates in Western India

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ABSTRACT

Background: Medical students appear to be one group that is especially vulnerable to sleep problems. The study’s objective was to evaluate the sleep quality, wellbeing, and happiness of Indian medical students at various stages of their education, as well as students from all three major streams (allopathic, ayurveda, and homoeopathic medicine).

Methodology: A convenience sample of 873 medical students was used in this cross-sectional and questionnaire-based study, which included homoeopathic (n=205), allopathic (n=389), and ayurvedic (n=279) medical students. The tools used were the Medical Outcomes Study Sleep Scale, the Short Depression – Happiness Scale, and the Short Warwick-Edinburgh Mental Well-Being Scale.

Results: Students in the Allopathic stream showed statistically significantly worse sleep quality ratings than students in the Homoeopathic and Ayurvedic streams. Further, when compared to students in the second and fourth years, third-year students had significantly lower sleep quality ratings. The happiness measure had a statistically significant positive relationship with wellbeing (rho = 0.56, p.001), sleep quality (rho = 0.13, p.001), and sleep adequacy (rho = 0.25, p.001).

Conclusion: Sleep is essential for maintaining human bio-psychosocial homeostasis. Further, happiness and well-being were linked to sleep disturbance and other sleep domains in a substantial way. A concerted effort should be made to educate medical students about sleep hygiene and practical techniques to improve their sleep quality.

Keywords: medical students, sleep, wellbeing, happiness, sleep quality

INTRODUCTION

Sleep is vital for the maintenance of proper functioning of both mental and physical functions of human body. Sleep related issues are frequent in the general population, and medical students appear to be one subset that is particularly sensitive to poor sleep than in non-medical students. The primary variables contributing to poor sleep are their academic load, emotional symptoms and bad sleep habits. Further, recent studies report high prevalence internet overuse and excessive smartphone usage is associated with poor sleep among medical students.

Poor sleep quality is a major concern among medical students. Sleep quality affects academic performance in a large proportion of medical students. Medical students are frequently at risk for mental health illness. The prevalence rate of anxiety and depressive symptoms among medical students was substantially higher than the general population. Further, low quality of sleep was significantly linked to high stress levels among medical students. Sleep quality was significantly associated with depression, anxiety, and stress. Furthermore, the consumption of caffeine, cigarette and alcohol is associated with...
increment in poor sleep quality among medical students.

Despite the fact that poor sleep quality is frequent among medical students and is linked to a variety of unfavourable health outcomes, the majority of the survey research focused on allopathic medical students. In this study, we used a multi-stream sample from India, including allopathic, ayurvedic, and homeopathic medical students. We look at Indian medical students’ sleep quality, wellness, and depression/happiness at all phases of their education and all three main streams of medical education.

METHODS AND MATERIALS

This is a cross-sectional and questionnaire-based study included medical students attending allopathic, ayurvedic, and homoeopathic stream of medical students enrolled from different medical schools, Pune, Maharashtra, India. Due to missing data, fifteen participants were removed, the study sample consisted of total 873 medical students who included homoeopathic (n=205), allopathic (n=389), and ayurvedic (n=279) by using a convenience sample. Participants age ranged from 18 to 27 years with a mean age of 20.25 years (SD=1.14). A total of 238 males (27.3%) and 635 females (72.7%) constituted the final sample. Participants were not provided with any incentives for their participation. Each participant read and signed an informed consent document. All procedures were reviewed and accepted by the appropriate institutional review board, and was conducted between April 10th and July 30th 2017. Participants were given questionnaire packets including demographic details and self-report measures. Students completed the questionnaire in group sessions during regular academic hours. The average completion time for the sessions was 35 minutes. After participants completed the packet of questionnaires, they were debriefed about the study.

MEASUREMENTS

Short Depression – Happiness Scale: In order to go beyond the zero point of existing depression measures, the Short Depression – Happy Scale was developed in order to assess not only the absence of depression but also the existence of happiness. The scale consists of six items, three items measuring happiness (e.g., I felt that the life was enjoyable) and three reverse coded items measure depressive states (e.g., I felt dissatisfied with my life). On a four-point scale, participants assess how often they feel the way indicated in the item 0 = never, 1 = rarely, 2 = sometimes, 3 = often). Based on a total score of 0 (depressive state) through 9 (neither unhappy nor happy) to 18 (very happy). Cronbach’s alpha of 0.65 indicates that the scale has good internal consistency in the current investigation, demonstrating its reliability.

Medical Outcomes Study - Sleep Scale (MOS-Sleep): The MOS-Sleep is a 12-item questionnaire that assesses sleep quality and quantity. The scale is divided into six subscales: sleep disturbance, which quantifies an individual’s capacity to fall asleep and stay restful sleep (four items), Snoring (one item), sleep awakening, short of breath or with headache (one item), sleep adequacy, refers to the amount of sleep required to restore wakefulness (two items), somnolence, which quantifies the amount of daytime drowsiness or sleepiness (3 items), and sleep quantity is a metric that indicates (in hours) how much sleep a person gets each night. A categorical scale ranging from “all of the time” to “none of the time” is used to rate the ten elements on the scale. One question uses a five-point likert scale to ask about how long it takes you to fall asleep, ranging from “0 to 15 minutes” to “more than 60 minutes”. Further, sleep quantity is an open-ended question that records the average number of hours of sleep each night. To express the percentage, all dimensions besides sleep quantity are translated with a 0–100 scale. Higher scores associated with domains of Sleep Disturbance, Somnolence, Awaken Shortness of Breath and the Snoring show impairment of sleep, whereas lower values for Sleep Quantity and Sleep Adequacy demonstrate problems with sleep. Previous findings indicate that the MOS-Sleep scale is an accurate and reliable measure of sleeping quality and of sleep-related issues with 0.70 Cronbach’s alpha coefficients. The MOS-Sleep scale has a good internal reliability, according to the current study, with a Cronbach’s alpha of 0.69.

Short Warwick-Edinburgh Mental Well-Being Scale: The SWEMWBS comprises of seven items that assess participants’ mental well-being by asking them questions about their feelings over the last two weeks (for example, “feeling positive about the future” or “feeling relaxed”). The 14-item full version Warwick-Edinburgh Mental Health Scale (18) was used to develop the SWEMWBS seven items. The items are all expressed in positively statement. The scale has a score range at 7–35 with higher values reflect better mental health. Previous research indicates that the SWEMWBS scale is a valid and reliable indicator of mental well-being with 0.89 Cronbach’s alpha coefficients. With a Cronbach’s alpha of 0.79, the SWEMWBS has shown high psychometric qualities in this study.

STATISTICAL ANALYSIS

We transferred the recorded data from questionnaire sheets to an excel spreadsheet and double-checked the data entry for any typographical errors. R statistical software, version 4.0.2, was used to conduct all of the analyses (R Core Team, 2020). The OSF link contains the dataset utilised in this investigation. The Shapiro-Wilk test was performed to determine the normality of each variable’s data distribution. Non-parametric Spearman’s rank correlation coefficients for continuous data are
used in analysis. For group differences, Mann Whitney U-test and Kruskal-Wallis H test were used.

RESULTS

A Kruskal-Wallis test revealed statistically significant differences between medical school years (see Table 2): the ‘First Year’ (n = 131), ‘Second Year’ (n = 274), ‘Third Year’ (n = 251), and ‘Fourth Year’ (n = 217) for the Happiness scores, χ²(3) = 9.040, p = 0.029, sleep disturbance scores χ²(3) = 20.159, p = 0.001, snoring χ²(3) = 10.087, p = 0.018, quality of sleep, χ²(3) = 19.453, p = 0.001, sleep adequacy χ²(3) = 10.885, p = 0.012 and Sleep Problem Index-II χ²(3) = 9.261, p = 0.026.

Pair-wise comparisons were carried out using the Dunn’s (1964) technique, with a Bonferroni correction used for multiple comparisons. Using post hoc analysis, it was revealed that second year students (mean rank = 466.93) reported statistically significantly higher happiness scores when compared to third year students (mean rank = 408.71) (p = 0.047). Sleep disturbances were also statistically significantly lower among second year students (mean rank = 398.99) compared to fourth year students (mean rank = 490.75) (p = 0.001), and statistically significantly lower among third year students (mean rank = 415.22) compared to fourth year students (p = 0.007). Further, the results indicated that third-year students (mean rank = 416.41) had significantly lower snoring scores than fourth-year students (mean rank = 473.47) (p = 0.018). Furthermore, the results indicated that third-year students (mean rank = 382.77) had statistically significantly poorer quality of sleep ratings as compared to students in the second year (mean rank = 468.96) (p = 0.001) and the fourth year (mean rank = 460.76) (p = 0.003). The findings also revealed that there were statistically significant variations in sleep adequacy ratings was seen between the second-year students (mean rank = 472.69) and the third-year students (mean rank = 407.08). An additional statistically significant difference in Sleep Problem Index-II scores was identified between the Third Year (mean rank = 406.01) and the Fourth Year (mean rank = 473.65).

A Kruskal-Wallis test revealed statistically significant differences between medical students of different schools (see Table 3): the ‘Homoeopathic’ (n = 205), ‘Ayurvedic’ (n = 389), and ‘Allopathic’ (n = 279) for the sleep disturbance, χ²(2) = 8.934, p = 0.011, quality of sleep, χ²(2) = 9.126, p = 0.010, somnolence, χ²(2) = 16.817, p = 0.001, and sleep problem index, χ²(2) = 8.564, p = 0.014. The post hoc analysis found that Ayurvedic students (mean rank = 411.06) had significantly less sleep disturbance than Allopathic students (mean rank = 469.79) (p = 0.009). Medical students reported sleeping quality an average of 7.07(SD=1.16) hours per night over the previous four weeks, with a range of 3 to 12 hours each night. Further, the results revealed that students in the Allopathic stream (mean rank = 400.96) had statistically lower quality of sleep ratings than students in the Homoeopathic stream (mean rank 456.94) (p 0.036) and the Ayurvedic stream (mean rank 452.34) (p 0.021). Furthermore, the results indicated that Allopathic students (mean rank 485.55) had statistically higher levels of somnolence than students in the Homoeopathic (mean rank 456.94) (p 0.036) and the Ayurvedic stream (mean rank 452.34) (p 0.021). When compared to Allopathic (mean rank 472.41) (p 0.023) students, Homoeopathic (mean rank 410.60) students endorsed lower ratings on the sleep problems index.

A Mann-Whitney U test was run to determine if there were differences in variables among gender categories. The data has shown that there was statistically significant differences between gender level among medical students in wellbeing level for Female (mean rank =420.95) were statistically significantly lower than for Male (mean rank = 479.82), U = 85756.00, z = -3.08, p = 0.002, sleep disturbance level for Female (mean rank =407.24) were statistically significantly lower than for Male (mean rank = 410.03), U = 82688.00, z = -5.17, p = 0.001, snoring level for Female (mean rank =410.03) were statistically significantly lower than for Male (mean rank = 508.95), U = 92688.00, z = -5.17, p = 0.001, snoring level for Female (mean rank =407.24) were statistically significantly lower than for Male (mean rank = 516.40), U = 94461.50, z = -6.91, p = 0.001, sleep awakening level for Female (mean rank =416.11) were statistically significantly lower than for Male (mean rank = 492.73), U = 88288.00, z = -4.45, p = 0.001 and somnolence level for Female (mean rank =426.60) were statistically significantly lower than for Male (mean rank = 464.74), U = 82167.00, z = -2.00, p = 0.045.

Table 1: Summarises the demographic characteristics of the sample population

<table>
<thead>
<tr>
<th>Level</th>
<th>Overall (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion</td>
<td></td>
</tr>
<tr>
<td>Buddhist</td>
<td>9 (1.0)</td>
</tr>
<tr>
<td>Christian</td>
<td>17 (1.9)</td>
</tr>
<tr>
<td>Hindu</td>
<td>797 (91.3)</td>
</tr>
<tr>
<td>Islam</td>
<td>33 (3.8)</td>
</tr>
<tr>
<td>Jain</td>
<td>15 (1.7)</td>
</tr>
<tr>
<td>Others</td>
<td>2 (0.2)</td>
</tr>
<tr>
<td>Year of Study</td>
<td></td>
</tr>
<tr>
<td>Ms1</td>
<td>131 (15.0)</td>
</tr>
<tr>
<td>Ms2</td>
<td>274 (31.4)</td>
</tr>
<tr>
<td>Ms3</td>
<td>251 (28.8)</td>
</tr>
<tr>
<td>Ms4</td>
<td>217 (24.9)</td>
</tr>
<tr>
<td>Economic</td>
<td></td>
</tr>
<tr>
<td>High Income</td>
<td>32 (3.7)</td>
</tr>
<tr>
<td>Low Income</td>
<td>26 (3.0)</td>
</tr>
<tr>
<td>Middle Income</td>
<td>815 (93.4)</td>
</tr>
<tr>
<td>Marital</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>1 (0.1)</td>
</tr>
<tr>
<td>Single</td>
<td>872 (99.9)</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
</tr>
<tr>
<td>Hostel Accommodation</td>
<td>395 (45.2)</td>
</tr>
<tr>
<td>Parental Home</td>
<td>378 (43.3)</td>
</tr>
<tr>
<td>Rented Accommodation</td>
<td>100 (11.5)</td>
</tr>
<tr>
<td>Motive to Join Course</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>49 (5.6)</td>
</tr>
<tr>
<td>Own Interest</td>
<td>744 (85.2)</td>
</tr>
<tr>
<td>Parental Influence</td>
<td>80 (9.2)</td>
</tr>
</tbody>
</table>
Furthermore, wellbeing statistically negative, statistically significant association observed with and wellbeing, (rho = 0.56, p < .001), quality of sleep (rho = 0.13 p < .001), and sleep adequacy (rho = 0.25, p < .001). Further, the Spearman’s rank correlation rho between happiness and wellbeing negative, statistically significant association observed with and wellbeing disturbance (rho = -0.40, p < .001), snoring (rho = -0.14, p < .001), sleep awakening (rho = -0.28, p < .001), somnolence (rho = -0.25, p < .001), and Sleep Problem Index II (rho = -0.33, p < .001). The Spearman’s rank correlation rho between wellbeing negative, statistically significant correlation with sleep disturbance (rho = -0.31, p < .001), sleep awakening (rho = -0.20, p < .001), somnolence (rho = -0.25, p < .001) and Sleep Problem Index II (rho = -0.31, p < .001). Furthermore, wellbeing statistically significant positive association with quality of sleep and sleep adequacy (rho = 0.12, p <0.001).

**DISCUSSION**

In this study we have reported quality of sleep, well-being and happiness among 1st to 4th year medical students from Allopathy, Ayurveda, and Homeopathy streams. The results of batch-wise comparison of medical students are reported below. All the results reported here are statistically significant. Results revealed that second year students reported higher happiness scores than the third-year students. Similarly, higher level of happiness was reported among second year medical student’s i.e., 60.8% among first year and third year medical students. Likewise, there was a decrease in sleep quality among first year and third year medical students.
when compared to second year and fourth year students. Scores on sleep adequacy was higher in second year students than the third-year students. Similarly, low sleep adequacy was reported among third year students when compared to second year and fourth year students. Overall, higher Sleep Problem Index II scores were identified in the fourth year when compared to third year medical students. In contrast, low levels of Sleep Problems Index were seen among fourth year students. As it is known that curricular burden is different from 1st to 4th year of medical education, their stress levels and coping strategies also differ accordingly. This could be the reason for difference among students.

Next, we have compared between all the three streams of medical education. In our study, Ayurvedic students had less sleep disturbance than Allopathic students. Overall, students in the Allopathic stream had lower quality of sleep ratings, higher levels of somnolence than the Homoeopathy and the Ayurvedic stream students. Low sleep problems index was reported among Homoeopathic students when compared to Allopathic students. This finding from our study is noteworthy because we were unable to identify any comparisons across various streams of medical education.

With the advancement in technology getting everything on tip of the finger which can be the best thing that happened to mankind, but this has many disadvantages too especially on health. Around 46% of medical college students reported smart phone addiction with significant correlation to poor sleep quality and high perceived stress. There was a significant association between Internet Addiction, poor sleep quality and depression among medical students (medical college, Delhi) from 1st to 4th year and internship students. Internet addiction was significantly more among students residing in hostels than those residing with their family and high stress levels were reported among students aged between 17-20 years. In this study, when compared between female and male students, female students reported lower levels in wellbeing, sleep disturbance, snoring, sleep awakening, somnolence when compared to male students. There is a significant positive correlation between smartphone addiction females-33.33% and males-46.15%, poor sleep quality (63.39%) and poor health status (62.05%) among medical students. The reason for gender difference could be smart phone addiction.

There was a significant positive correlation between Happiness and wellbeing, quality of sleep and sleep adequacy. However, negative correlation was reported between Happiness and sleep disturbance, snoring, sleep awakening, somnolence, and Sleep Problem Index II. Similarly, wellbeing is negatively correlated with sleep disturbance, sleep awakening, somnolence, and Sleep Problem Index II and positively correlated with quality of sleep and sleep adequacy. However, poor sleep quality is more prevalent among medical students and is a common problem among medical students. Results highlight the relationship between sleep and psychological wellbeing.

Several factors contribute to poor sleep quality among medical students. Excessive daytime sleepiness (EDS) and sleep deprivation are two issues that medical students frequently encounter. The rigorous academic load, exam anxiety, and tight schedules of medical students cause persistent stress. In light of the numerous studies that have been conducted on medical students’ poor sleep quality, internet addiction, and/or excessive smart phone use has a relationship, it is necessary to take this into consideration. Further, the disparity between students in the allopathic and other medical streams, as well as other difficulties, must be recognized and addressed throughout their medical education, and relevant interventions should be implemented.

The results of the study should be viewed in light of a number of limitations. To generalize our findings, we need to look at the significant relation between sleep and psychological wellbeing with a larger number of samples from multiple institutions. There was no face-to-face interview, and all data was acquired using a self-reporting questionnaire, introducing the possibility of response bias. The relationship between sleep and well-being in medical students can be better understood using objective measurements of sleep. The data were obtained at a specified point in time of the year, providing the possibility of confounding variables, and environmental conditions were not taken into consideration when collecting the data. Longitudinal design would be more beneficial in determining how sleep quality changes as student’s progress through the years.

**CONCLUSION**

To the best of our knowledge, this was the first study in India to compare the sleep quality, wellness, and happiness across different streams of medical students. Our findings indicate that medical students studying allopathic medicine are more likely than medical students studying homeopathy or ayurvedic medicine to suffer from sleep-related issues. Further, the happiness and wellbeing had significant association with sleep disturbance and other domains of sleep. An effort needs to be made to enlighten medical students about sleep hygiene and practical ways to improve the quality of their sleep which in turn enhance there wellbeing and happiness. These assessments will assist students in developing suitable sleep management strategies that will improve their sleep quality as well as have an impact on their psychosocial well-being.

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REFERENCES


