Effect of COVID-19 Lockdown on Sleep Quality and Insomnia in Collegiate Students

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The COVID-19 Pandemic necessitates strict lockdowns worldwide to prevent its spread, which has hurt people’s lives, including students, on a physical, economic, and emotional level. This study examines the impact of the COVID-19 lockdown on the quality of sleep and the prevalence of insomnia among college students in Chennai. Using a random sampling approach, collegiate students (n=450) are invited to complete Pittsburgh Sleep Quality Index (PSQI) and Insomnia Severity Index (ISI). Frequencies, unpaired T-test, and the chi-square test were the statistical techniques employed to assess the data. The findings imply that 48% of students experienced poor sleep quality, and 37% reported Subthreshold insomnia during the COVID-19 lockdown. Even though no gender difference was observed regarding the overall sleep quality and insomnia scores, there is a significant association observed between gender with sleep quality; however, those failed to show a significant association with insomnia. Thus, the study concluded that the lockdown has affected sleep quality and led to insomnia among college students.

Keywords: COVID-19; life quality; Insomnia; Lockdown; Sleep quality; Sleep disorders.
Effects on young adults, especially students. Ali et al. (2021) also stated that the government-mandated lockdown could mitigate psychological levels. It is also suggested that sleep quality is very strongly associated with mental health. For instance, most persons with clinical depression demonstrate insomnia features, a substantial risk element for depression. Simon Evans et al. (2021) stated the effect of the pandemic and lockdown on sleep quality and diurnal preference, which are closely interconnected with mental health, chiefly in young adults. During lockdowns, sleep habits have altered due to social isolation and variations in social rhythms (work- and daily work). Sleep disorders or insufficient sleep disorders lead to accidents, depression, epilepsy, diabetes, cardiac disease, and reduced life quality.

Few studies have been conducted on sleep and sleep disorders during the COVID-19 pandemic. On reviewing the literature across the globe, authors measured the sleep quality of different populations during the lockdown through the “Pittsburgh sleep quality index (PSQI)” and. Other than the common public, Marelli et al. (2021) studied the effect of the COVID-19 lockdown on university administration staff and students in Italy. It was found that 60.2% and 73.3% of the university administration staff and students felt poor sleep quality. Ali et al. (2021) also reported that the sleeping pattern among Pakistani students was mainly affected due to the lockdown during the COVID-19 pandemic. Furthermore, few researchers have studied the effect of the COVID-19 pandemic and lockdown on sleep and mental health among students across the globe. Likewise, in the Indian context, researchers have exclusively studied the influence of the COVID-19 lockdown on sleep quality and perceived stress among the general population of India during the COVID-19 pandemic through PSQI and the insomnia severity index (ISI), respectively.

Nevertheless, much-limited studies have been conducted to ascertain the quality of sleep of Indian students. Realizing this research gap, this study examined the effect of the COVID-19 lockdown on sleep quality and Insomnia in collegiate students, particularly in Tamilnadu, India. Thus, this study aims to address: (i) the extent of the quality of sleep and insomnia; (ii) any difference between gender in the overall quality of sleep and Insomnia, and (iii) any association between gender concerning the two categories of sleep quality (“good” or “poor”) and four categories of Insomnia and (iv) any relationship between sleep quality (i.e., PSQI total score) and Insomnia (i.e., ISI total score) among the Collegiate students during the COVID 19 pandemic.

METHODOLOGY

Study Design

A cross-sectional observational study design was adopted to study the impact of the COVID-19 lockdown on sleep quality and insomnia in collegiate students, particularly in Tamilnadu, India.

Samples

All the undergraduate students studying from the first year to the final year belonging to SRM College of Health Science were identified as the population for this study. Among them, 450 students were picked up using a random sampling approach. Utmost care was taken to recruit students from all the health science programs in this study.

Methods

With prior permission from the head of each health science college and following the guideline for researching at SRM College, the researchers have sent the survey link and surveyed all the students via email. All the students were asked to respond after filling out the informed consent form. The survey was kept open for a
The data were analyzed using the Statistical Package of Social Sciences (SPSS) version 20.0 (IBM Corp). To evaluate the gathered data, categorical variables (PSQI Scores/Sleep quality categories) expressed as frequencies & percentages, and continuous variables (PSQI global score/ISI total score) were presented using means and standard deviations. An unpaired T-test was used to study the differences between gender concerning sleep quality and insomnia as measured through PSQI global score and ISI total score, respectively. In addition, a Chi-square test was used to evaluate the association between gender concerning the stages of sleep quality and four categories of insomnia. A P-value of less than 0.05 was considered statistically significant.

RESULTS

Demographic details of the participants

Of 400 students who participated, 41% were males, and 59% were female. Male students’ mean age is 20.76, whereas the mean female was 20.44 years. Table 1 shows the PSQI global score and ISI total score for the entire sample and male and female students separately. The overall global PSQI score was 5.81±3.26 for all participants; male students’ scores were 6.07, whereas female students’ scores were 5.63. Similarly, the ISI total score was 8.19±5.81 for all participants; the ISI total score for males and females is 8.61 and 7.89, respectively.

Table 1 shows no significant difference between gender concerning sleep quality and insomnia as revealed through the p-value at 95% confidence level. Table 2 depicts the categorization of the participants based on their response to PSQI Scores as either ‘good quality sleep’ (<5) or ‘poor-quality sleep’ (>5) and four stages of the Insomnia Severity Index. The results found that 48% of students experienced poor sleep quality during the covid pandemic, as shown through the PSQI global score. Similarly, 37% of them reported Subthreshold insomnia, and 9% have moderate Clinical insomnia. 51% of the students said that they do not have clinically significant insomnia. It is noteworthy to mention that only 2.5 % have severe clinical insomnia.

(Further exploration was carried out to study whether there is an association between gender concerning each category of sleep quality and insomnia index (Table 3).

From the results, it is observed that there is an association between gender, taking into consideration each stage of sleep quality, as...
shown by the p-value at 0.05 levels of significance (p<0.05). 34% (n=135) of females reported good sleep during COVID 19 pandemic, whereas 18% (n=73) of male students agreed to it. However, there is no association between gender about all the four categories of insomnia, as revealed through the p-value (p=0.276).

Table 4 shows the relationship between PSQI and ISI totals scores of collegiate students during COVID 19 pandemic, and it is found that there is a significant positive correlation between the two parameters at 0.01 levels (r=0.70, p < 0.001).

**DISCUSSION**

Even though several studies have been conducted to ascertain the effect of lockdown on students’ sleep quality, minimal studies have focused on examining gender impact on sleep quality and insomnia among college students during the pandemic. Thus, the authors intended to document the effect of the COVID-19 lockdown on sleep quality and insomnia in collegiate students, and it attempted to uncover whether there is no difference between gender concerning sleep quality and insomnia.

Table 4 shows the relationship between PSQI and ISI totals scores of collegiate students during COVID 19 pandemic, and it is found that there is a significant positive correlation between the two parameters at 0.01 levels (r=0.70, p < 0.001).

**Table 1.** Comparison between male and female students regarding PSQI global score and ISI total Scores during COVID 19 emergency

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Gender</th>
<th>Mean ± SD</th>
<th>Independent t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSQI global score</td>
<td>Male</td>
<td>6.07± 3.18</td>
<td>1.343</td>
<td>0.180-ns</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>5.63± 3.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISI total score</td>
<td>Male</td>
<td>8.61± 5.95</td>
<td>1.224</td>
<td>0.222-ns</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>7.89± 5.71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ns-Not Statistically significance at 95% (p >0.05).
Our study findings indicated that half of the respondents experienced poor sleep quality, as evident from the PSQI score (>5, 48%) during the lockdown period enforced because of the pandemic. Similarly, over 35% experience subthreshold insomnia, and less than 10% are prone to clinical insomnia during the lockdown period. This finding might be due to traumatic incidents, such as those caused by the COVID-19 outbreak can create psychological distress and anxiety symptoms that negatively affect sleep quality. Another reason might be the change in the strategy of reducing physical contact to reduce the spread of COVID-19, and the government of India enforced a nationwide lockdown on 24th March 2020 for 21 days to combat the spread of the coronavirus, and it has extended until August 2021. Furthermore, to continue to provide educational support to the

<table>
<thead>
<tr>
<th>PSQI score</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>208</td>
<td>52</td>
</tr>
<tr>
<td>&gt;5</td>
<td>192</td>
<td>48</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ISI Scores &amp; Insomnia Stages</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No clinically significant insomnia (0-7)</td>
<td>205</td>
<td>51.3</td>
</tr>
<tr>
<td>Subthreshold insomnia (8-14)</td>
<td>149</td>
<td>37.2</td>
</tr>
<tr>
<td>Clinical insomnia (moderate severity) (15-21)</td>
<td>36</td>
<td>9.0</td>
</tr>
<tr>
<td>Clinical insomnia (severe) (22-28)</td>
<td>10</td>
<td>2.5</td>
</tr>
<tr>
<td>ISI total score</td>
<td>400</td>
<td>100</td>
</tr>
</tbody>
</table>

![Bar chart showing PSQI and ISI scores](image)

**Table 2.** Categorization of Sleep quality and insomnia reported by the participants during COVID-19 pandemic
Table 3. Association between gender with regard to the stages of sleep quality and insomnia

<table>
<thead>
<tr>
<th>PSQI &amp; ISI categories</th>
<th>Male N (%)</th>
<th>Gender Female N (%)</th>
<th>Total N (%)</th>
<th>Chi-Square</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality of sleep (&lt;5)</td>
<td>73(18.3)</td>
<td>135(33.8)</td>
<td>208(52)</td>
<td>5.737</td>
<td>0.017*</td>
</tr>
<tr>
<td>Poor quality of sleep (≥5)</td>
<td>90(22.5)</td>
<td>102(25.5)</td>
<td>192(48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No clinically significant insomnia (0-7)</td>
<td>78(19)</td>
<td>129(32.3)</td>
<td>205(51.3)</td>
<td>4.86</td>
<td>0.276-ns</td>
</tr>
<tr>
<td>Subthreshold insomnia (8-14)</td>
<td>70(17.5)</td>
<td>79(19.6)</td>
<td>149(37.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical insomnia (moderate severity) (15-21)</td>
<td>13(3.3)</td>
<td>23(5.8)</td>
<td>36(9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical insomnia (severe) (22-28)</td>
<td>4(1)</td>
<td>6(1.5)</td>
<td>10(2.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Statistical significance at 95% (p < 0.05), ns-Not Statistically significance at 95% (p > 0.05).

Table 4. Correlation coefficient showing the relationship between PSQI and ISI totals scores of collegiate students during COVID 19 pandemic

<table>
<thead>
<tr>
<th>Parameters</th>
<th>M ± SD</th>
<th>N</th>
<th>Correlation (r)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISI total score</td>
<td>8.19 ± 5.81</td>
<td>400</td>
<td>0.702</td>
<td>0.0001***</td>
</tr>
<tr>
<td>PSQI global score</td>
<td>5.81 ± 3.26</td>
<td>400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*** Statistically significant at 95% (p < 0.05).

students during the lockdown, most colleges shift to the online teaching method, which necessitates continuous usage of computers by the students. As a result, students are accumulating to the new life of study, which may influence sleep quality36.

An earlier study also indicated that those students use devices and gadgets late at night, which may impair their sleeping patterns35. Another possible explanation is that those blue lights from devices and gadgets can suppress melatonin secretion, thus reducing sleep quality37, 38. In this study, 51.3% of the respondents reported no clinically significant insomnia during the lockdown period. This observation is contrary to Marelli et al. (2021), who found that the Italian COVID-19 lockdown potentially affected sleep and psychological well-being7. This effect was more significant in students than administrative staff and greater in females than males. It is observed that the home quarantine during the lockdown showed a more significant impact on the sleep habits of students than workers concerning bedtime and wake-up delay. Previous studies have also stated that during the lockdown, sleep habits altered from the social limitations and to a change of social rhythms, like working and daily events plan16, 39, 40. The reason for difference between our observation as well reported in the earlier studies need to be discovered in future studies.

Further exploration was carried out to ascertain how sleep quality and insomnia varies between gender. There is no difference between males and females regarding the overall sleep quality and insomnia as visualized through the PSQI global and ISI total scores (p>0.05). Contrary to our observations, Li et al. (2020) observed that the females showed significantly higher than males on PSQI total score and sleep disturbances. Notably, Alharbi et al. (2021) observed no significant gender difference in insomnia among the Saudi population41.

Likewise, while categorizing the participants’ response between good quality (<5) and poor quality of sleep (≥5), a significant association was found between the gender. In line with this finding, an earlier study by Cheng et al. (2012) found that poor sleep quality was significantly associated with undergraduate students and the female gender. On the contrary, no significant association was found between...
the gender while categorizing the participants’ responses as per four categories of insomnia (p=0.276). More females than males reported subthreshold insomnia [male=18%; females=20%] and clinical insomnia [male=4%; females=6%] (Table 4). Contrary to this finding, Cheng et al. (2012) observed that gender is closely related to insomnia in college students during COVID-1942.

Lastly, this study observed a positive relationship between PSQI and ISI totals scores of college students during the COVID-19 pandemic. Conversely, Varma et al. (2021) observed poorer sleep quality and increased insomnia-related symptoms during the COVID-19 pandemic43.

CONCLUSION

This study revealed the effect of the COVID-19 lockdown on sleep quality and insomnia in collegiate students. During the COVID-19 lockdown, nearly half of the collegiate students experienced poor sleep quality. Also, 37.2% experienced subthreshold insomnia, and less than 10% were prone to clinical insomnia. Furthermore, no gender difference was observed among collegiate students regarding the overall sleep quality and insomnia scores. The gender of the collegiate students showed a significant association with sleep quality; however, those failed to show a significant association with insomnia. A positive relationship was observed between PSQI and ISI totals scores of the collegiate students during the COVID-19 pandemic. These findings clearly stated that the COVID-19 lockdown has affected sleep quality and led to insomnia among collegiate students.

Limitations

The conclusion of this study is based on the responses of the students from selected study settings, and the findings must be generalized with caution. Further, this study covers only health science college students’ perceptions of sleep quality and insomnia, and future work should cover more comprehensive samples of students belonging to other academic disciplines. Finally, since the findings are from self-reported surveys, further work can use more sophisticated clinical methods must be adopted to study insomnia and sleep quality.

ACKNOWLEDGEMENTS

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Conflict of Interest

There is no conflict of interest

Funding Source

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