

## Stress and Sleep Patterns Among Indians During the COVID-19 Lockdown: An Observational Study

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### Abstract:

**Introduction:** Mental health is an important issue which is generally ignored, unlike physical well-being of patients. The COVID-19 pandemic not only disrupted the economy of our country but also affected the general and mental well-being of people. It increased anxiety and stress level among people. This could cause insomnia and sleep disturbances. Stress and related psychiatric disorders often stem from prolonged sleep interruptions.

**Objective:** This study examined sleep disturbances in Indians during the COVID-19 pandemic.

**Methods:** This cross-sectional study recruited 412 Indians to complete anonymous questionnaires. The researchers used the Insomnia Severity Index (ISI) to analyse sleep interruptions before and during the COVID-19 pandemic. SPSS version 20 was used to analyse the data using descriptive and inferential statistics.

**Results:** Before and after the COVID-19 pandemic, sleep disturbances among Indian respondents varied significantly. In India, the prevalence of clinically moderate insomnia has increased dramatically. Before the commencement of the pandemic, only 3.9% of the participants exhibited moderate to severe levels of clinical insomnia. After the onset of the pandemic, this percentage increased to 17.5%. Prior to the pandemic's onset, the average ISI score was  $6.36 \pm 4.66$ , whereas it was  $8.02 \pm 6.02$  afterwards.

**Conclusion:** During the COVID-19 pandemic, the results of our study indicate that people are suffering greatly from sleep disturbances and ask for additional research and proactive measures to improve sleep quality.

**Keywords:** COVID-19; Insomnia; Mental Health; Sleep Disturbances.

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### Introduction

Sleep is a physiological quiescence reported in many animals, including fruit flies and humans [1]. So, a large part of the human lifespan is devoted to this mysterious condition. Sleep regulates neurobehavioral, cognitive, memory consolidation, nociception, appetite, immunological, and hormonal functions and is necessary for human health [2-4]. Sleep difficulties may indicate or cause more serious medical conditions. Sleep quality and disturbances are linked to occupational activities, health and psychological well-being, and mortality [5, 6]. People with anxiety, stress symptomatology and depression have more sleep problems and a sense of time dilation [7, 8].

A thorough review and meta-analysis found that many pandemic victims had psychiatric issues. Nearly one-third of participants had such symptoms, including stress (43%), anxiety (37%), depression (43%), and sleep problems (43%). In India, 9% of people had insomnia and 30% had occasional insomnia [9]. Insomnia is characterised by difficulty

falling asleep, staying asleep, early morning awakenings, or little rejuvenation. Sleep duration, quality, and immunological responses to viral, bacterial, and parasitic illnesses are interdependent. The above infections can alter sleep patterns. SARS-CoV-2 transmission and severity can be reduced by improving sleep quality and length [10].

### Materials and Methods

This cross-sectional study examined sleep disturbances among Indians during the COVID-19 pandemic. The Indian government promptly implemented a statewide lockdown when the WHO declared COVID-19 a pandemic. This study took place in India from May to June 2020. The researchers recruited 412 participants using convenience sampling.

**Inclusion criteria:** Patients who were aged 18 years or older, who were able to read and write English, and who gave their informed consent were included in this study.

**Exclusion criteria:** Patients who were infected with COVID-19 or any respiratory disease, had a chronic disease condition, had a history of alcohol consumption or smoking or refused to provide study consent were excluded from the study.

In light of the implementation of a nationwide lockdown, an online poll was administered, wherein questionnaires were disseminated electronically to anyone meeting the criteria for participation. The questionnaires were created using a digital platform, specifically Google Forms, and distributed to participants through electronic communication channels such as email, Facebook, and WhatsApp message. The participants were provided with a hyperlink to access the survey, the completion of which required an estimated duration of 30 minutes. The respondents successfully filled out a web-based online survey while maintaining anonymity.

### Questionnaire formation

The construction of the self-structured questionnaire was informed by a comprehensive examination of relevant literature and the utilisation of the Insomnia Severity Index (ISI). The researchers utilised a questionnaire to collect socio-demographic data and assess the occurrence and intensity of sleep disruptions in the form of insomnia.

The ISI comprises seven items that evaluate:

- sleep maintenance (middle),
- sleep onset (initial) severity,
- satisfaction with current sleep patterns,
- interference with daily functioning,
- early morning awakening (terminal) problems,
- level of distress caused by the sleep problem,
- noticeable to others/impairing quality of life.

Each item is scored on a 5-point Likert scale from 0 to 4, yielding a total score of 0-28. The results were interpreted as follows: absence of insomnia (0-7), subthreshold insomnia (8-14), moderate insomnia (15-21), and severe insomnia (22-28).

### Statistical Analysis

The responses from the subjects were collected using a Google form. The collected data were analysed using descriptive and inferential statistics with SPSS version 20 (IBM Corp., Armonk, NY, USA) statistical software. The socio-demographic variables were described using a descriptive analysis of frequency, percentage distribution, mean, and standard deviation. In inferential analysis, a paired t-test was used to assess the quality of sleep before and during the COVID-19 pandemic, and the chi-square test was used to assess the association between sleep disturbance and selected variables. During the COVID-19 pandemic, the Karl-Pearson correlation coefficient was used to determine the relationship between socio-demographic variables and sleep disturbances. The limit of statistical significance was set to  $p < 0.05$  (two-sided).

### Results

412 Indians were recruited, 192 (46.60%) of whom were female and 220 (53.39%) of whom were male. As seen in Table 1, the mean age of the subjects was  $29.7 \pm 10.0$  years. According to the ISI, participants' sleep quality varied significantly before and during the pandemic. The prevalence of insomnia increased from 36.89% before the COVID-19 pandemic to 47.08% during the pandemic. Similarly, the prevalence of subthreshold insomnia prior to the onset of the pandemic was 33%, and 3.88% of the subjects had moderate to severe insomnia, which changed substantially during the pandemic period and subsequent lockdown. The prevalence of subthreshold insomnia decreased to 29.61%, while the number of individuals with moderate insomnia increased to 34 (16.50%) and the severity of clinical insomnia (0.97%) remained unchanged. Before and during the COVID-19 pandemic, the mean ISI scores were  $6.36 \pm 4.66$  and  $8.02 \pm 6.02$ , respectively.

**Table 1: Socio-demographic characteristics of respondents**

Variables	Value	Percentage
<b>Age(in years)</b>		
16-30	284	68.93 %
31-45	96	23.30 %
46-60	24	5.83 %
>60	8	1.94 %
<b>Sex</b>		
Male	220	53.39 %
Female	192	46.60 %

The difference in sleep disturbance before and during the COVID-19 pandemic is presented in Table 2 ( $t=3.23$ ). During the COVID-19 outbreak, subjects had substantially more difficulty falling asleep ( $t=2.74$ ) and staying asleep ( $t=1.98$ ) than they did prior to the outbreak. During the pandemic, the subjects' satisfaction with their present sleep patterns decreased significantly ( $t=3.03$ ). During the COVID-19 outbreak, sleep problem-related anxiety levels increased significantly ( $t = 3.74$ ).

**Table 2: Sleep Disturbances before and during COVID-19**

Components of insomnia issue	ISI score		
	Before COVID-19	During COVID-19	t-value
Difficulty staying asleep	0.73 ± 0.90	0.89 ± 1.02	1.98*
Awakening problem	1.04 ± 1.13	1.19 ± 1.25	1.33
Difficulty falling asleep	0.76 ± 0.92	1.02 ± 1.17	2.74*
Impairment of quality of life	0.87 ± 0.95	1.04 ± 1.07	1.86
Worried about current sleep problem	0.73 ± 0.88	1.12 ± 1.19	3.74*
Satisfaction with current sleep pattern	1.20 ± 0.88	1.50 ± 1.21	3.03*
Interfere with daily functioning	1.09 ± 1.05	1.26 ± 1.16	1.63

## Discussion

The COVID-19 pandemic in 2020 exemplifies a novel zoonotic catastrophe, giving rise to substantial global ramifications in healthcare, mental well-being, and societal dynamics [14]. The present study employed the ISI scores to assess the prevalence of sleep disruptions among Indian participants prior to and during the COVID-19 pandemic. The results of this study indicate that Indians exhibited a higher susceptibility to sleep disruptions, such as insomnia, in the period subsequent to the onset of the COVID-19 pandemic compared to the preceding period. The sleep patterns of the whole populace were impacted, and notable disparities were seen between the pre-pandemic and pandemic periods. The results presented alignment with the outcomes of a prior investigation, wherein a notable proportion of individuals from Hong Kong, ranging from 30% to 40%, reported a deterioration in their sleep quality and a substantial occurrence of insomnia during the COVID-19 epidemic [15].

Insomnia exhibits a high prevalence and is correlated with psychological reactions and suboptimal sleep hygiene in the context of the COVID-19 pandemic. The findings of our investigation indicate that the occurrence of insomnia was 36.9% prior to the onset of the COVID-19 pandemic, compared to 47.1% during the pandemic. This trend aligns with the results of a study conducted in Italy, which observed a rise in insomnia rates from 40.5% to 52.4% [16]. A study conducted in China with the objective of evaluating alterations in sleep patterns and psychological responses during the COVID-19 pandemic revealed a notable rise in the prevalence of insomnia, namely from 26.2% to 33.7% [17].

A contrasting study conducted in the Netherlands presented findings that challenge the aforementioned conclusion, proposing a correlation between sleep quality during the COVID-19 pandemic and sleep quality prior to the pandemic [18]. Approximately 25% of the subjects indicated an enhancement in the quality of their sleep, while 20% of individuals who had previously experienced satisfactory sleep before to the pandemic reported a decline in their sleep patterns during the implementation of lockdown measures. The survey

additionally revealed that 11.7% of the whole population experienced challenges in initiating sleep, 5.3% encountered difficulties in maintaining sleep, and 12.6% reported premature awakening.

According to a poll conducted in India, it was found that a significant proportion of individuals experienced interrupted sleep patterns as a result of the COVID lockdown [19]. Specifically, 67% of respondents who were engaged in remote work reported having modified their sleep schedules. Additionally, 50% of participants acknowledged that their sleep patterns had been negatively affected. However, it is worth noting that a majority of respondents, around 81%, expressed optimism that their sleep schedules would improve once the lockdown measures were lifted. The percentage of respondents with a bedtime after midnight increased from 25% before the lockdown to 35% after the lockdown. Similarly, the percentage of participants who reported sleeping fewer than 6 hours per night increased from 25% before the lockdown to 36% after the lockdown.

Indian respondents experienced a statistically significant decline in sleep disturbances before and during the COVID-19 pandemic. During the COVID-19 pandemic, the current study revealed that 29.6% of participants had subthreshold insomnia, 16.5% had moderate insomnia, and 1% had severe clinical insomnia. During the COVID-19 outbreak in India, a previous study found that the prevalence of insomnia was 60.5% (31.8% subthreshold, 23.2% moderate, and 5.5% severe) [20]. Comparing the rate of clinical insomnia prior to and during the COVID-19 pandemic, a comparable study in China found a 37% increase [21].

The current study revealed that the prevalence of insomnia was higher among female participants, while clinically severe insomnia was more prevalent among subjects younger than 45 years old. In China, a cross-sectional investigation revealed that the combination of anxiety and stress diminishes the beneficial effects of social capital on sleep quality [22]. Another study examining the effect of coronavirus disease on sleep quality in China revealed that participants with a Wuhan exposure history exhibited longer sleep latency, confirming

that subjective sleep quality, delayed sleep onset, sleep fragmentation, and sleep duration all regulated the effect of a Wuhan exposure history on post-traumatic stress disorder [23]. The results of the study suggested that sleep quality declined over time, while symptoms of posttraumatic stress increased [23]. A previous study sought to assess the mental health burden of the Chinese population during the outbreak and found that 18.2% of the population had poor sleep quality, with healthcare workers reporting the highest rate of poor sleep quality (23.6%) [24]. The findings of our study also indicated that alterations in sleep patterns were evident after the country was placed under complete closure. Consequently, our analysis revealed that stress in the form of the COVID-19 pandemic and lockdown has a significant impact on the quality of life of Indians.

### Conclusion

Our study revealed a high prevalence of inadequate sleep among Indian individuals. The ISI sheds light on the commonly disregarded reality of sleep patterns. Before and during the COVID-19 pandemic, the number of Indians who experienced sleep disturbances increased significantly. During the COVID-19 pandemic and lockdown, the public should be educated about the importance of good sleep quality for maintaining mental health and reducing the prevalence of insomnia through appropriate health education.

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