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Original Research Article

Perceived stress and sleep quality among patients visiting primary and community health centres in Kerala: COVID-19 pandemic context

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ABSTRACT

Background: The quality of sleep, a multifaceted construct encompassing factors such as duration, continuity, and depth, plays a pivotal role in cognitive function, while perceived stress, the subjective appraisal of stressors and one's ability to cope with them, has been identified as a significant factor affecting various aspects of individuals' lives. The present study aimed to investigate "Perceived stress and sleep quality among patients who visited community and primary health centers in Kerala during the COVID-19 pandemic".
Methods: The sample of the study consist of 60 patients aged between 18 and 50, who visited community and primary health centers in Kerala. Questionnaire for Perceived Stress Scale – Malayalam Version and Sleep Quality Scale were used in this study.
Results: Findings of the study reveals that the patients visiting community and primary health centers in Kerala during the COVID-19 pandemic experience slightly elevated levels of perceived stress, closely aligned with general stress scores. However, their sleep quality remains largely normal, with only minor deviations.
Conclusions: The study reveals a negative impact of pandemic-related stress on sleep timing and quality among these patients. Consequently, it underscores the importance of addressing both stress levels and sleep quality during such public health crises.

Keywords: Community health centers, COVID-19, Perceived stress, Sleep quality

INTRODUCTION

The COVID-19 pandemic, originated in December 2019 in China, has emerged as a profound stressor for humanity. The World Health Organization (WHO) declared it a Pandemic Health Emergency of International Concern in January 2020, and by mid-January 2021, the global tally surpassed 90 million cases and two million deaths. The pandemic's swift spread and alarming death rates created widespread fear, significantly impacting mental health. WHO (2022) has characterized the COVID-19 pandemic as one of the most significant global crises in generations, with far-reaching repercussions for health systems, economies, and societies.

During the pandemic, various stressors, including social isolation, restrictions, quarantine measures, and virus-related fears, have detrimentally affected individuals' mental health. Reports from WHO (2022) indicate a surge in psychological distress, symptoms of depression,

anxiety, and post-traumatic stress. Notably, healthcare workers have exhibited signs of more widespread suicidal thoughts and behaviors. Uncontrollable and unpredictable stressors, such as natural disasters, have been shown to alter sleep patterns, leading to lower sleep quality.[1]

The impact of the pandemic on individuals' sleep is profound, with no universal definition for sleep quality. Generally, good sleep quality involves falling asleep quickly, experiencing uninterrupted sleep appropriate for one's age, and minimal wakeups. The pandemic has disrupted this essential aspect of daily life.

Perceived stress is a crucial factor influencing sleep quality, with a reduction in perceived stress associated with improved sleep.[2] General public, as opposed to frontline workers, experienced more vicarious traumatization during the pandemic, with higher perceived stress linked to increased anxiety and negatively affecting sleep quality.[3]

Seeking medical attention during the pandemic, even for non-COVID-related reasons, added to existing panic and stress. The intricate relationship between sleep and mental health, encompassing depression and anxiety, is well-established.[4]

The Perceived Stress Scale (PSS), developed by Cohen et al, is a widely used tool for assessing stress levels. Elevated perceived stress levels are associated with increased anxiety and detrimentally impact sleep quality during the COVID-19 pandemic.

Previous research underscores the significance of perceived stress as a major obstacle to sleep quality, with higher perceived stress levels correlating with poorer sleep quality.[5-8] Importantly, a reduction in perceived stress predicts an improvement in sleep quality.[2]

Understanding the intricate interplay between stress, sleep quality, and mental health is paramount, especially in the context of unprecedented events like the COVID-19 pandemic. Addressing these issues is vital for promoting overall well-being and mitigating the potential long-term consequences of the current global health crisis.

This study aimed to investigate the perceived stress and sleep quality among patients who visited community and primary health centres in Kerala during the COVID-19 pandemic. Specifically, the objectives were as follows to study the perceived stress among patients visiting community and primary health center in Kerala during COVID-19; to study the sleep quality among patients visiting community and primary health center in Kerala during COVID-19; 3) To study the relationship between perceived stress and sleep quality among patients visiting community and primary health center in Kerala during COVID-19.

METHODS

Questionnaire for perceived stress scale-Malayalam version and sleep quality scale were used in this study. To maintain the confidentiality in data collection and reporting, informed consent was obtained from the participants in the study as well as from the appropriate health studies committee of Diabcare India convened on 8th of March, 2022.

Inclusion criteria

This study included individuals from the general population who visited primary health centers in Kerala during the COVID-19 pandemic. The target age group for inclusion ranged between 18 and 50 years. By focusing on this demographic, the study aimed to capture a representative sample of adult patients seeking healthcare services in community and primary health settings.

Exclusion criteria

The population excluded from this study comprised individuals meeting specific criteria that could potentially confound the research findings. Excluded were patients undergoing severe medical conditions, those under inpatient care, individuals with a psychiatric diagnosis or currently on psychotropic drugs, those with chronic medical conditions, and individuals who had tested positive for COVID-19. The rationale for these exclusions was to ensure a homogeneous study population and to minimize the influence of external factors that could impact perceived stress and sleep quality, thus enhancing the internal validity of the research outcomes.

Data collection

Data were collected from a sample of 60 patients aged between 18 and 50, who visited community and primary health centres in Kerala. A convenient sampling method was employed to gather the data. Data's were collected from a period of 8 months, beginning from October 2022 to May 2023.

Tools

Questionnaire for Perceived Stress Scale-Malayalam version

A 5-point Likert scale with 10 items measuring perceived stress related to COVID-19. The scale included 4 reverse-scored items, with a cut-off score of 25 indicating high stress due to the pandemic. The PSS-10 demonstrated good internal consistency in both adult and university student population sand adequate reliability over 2-week and 4-week periods. The construct, convergent and concurrent validity has been established.

Sleep quality scale-single item visual analogue scale

The sleep quality scale employed in this study utilized a single-item Visual Analogue Scale (VAS) where participants rated the quality of their sleep over the past 7 days on a scale ranging from 1 to 10. Participants were instructed to assign a score of 0 for "Terrible," 1-3 for "Poor," 4-6 for "Fair," 7-9 for "Good," and 10 for "Excellent" quality of sleep. This single-item scale demonstrated favorable measurement characteristics, exhibiting strong concurrent criterion, convergent/divergent validity, known-groups validity, and acceptable test-retest reliability (0.62). Furthermore, the scale proved capable of measuring responsiveness and capturing clinically meaningful changes in sleep quality. The simplicity and effectiveness of this single-item VAS made it a valuable tool for assessing and understanding the subjective sleep experiences of the participants in the context of the study.

Procedure

Data were collected from individuals aged 18 to 50 who visited primary health centres in Kerala during the COVID-19 pandemic. A convenient sampling method was employed to collect data from various regions of Kerala. Informed consent was obtained from each participant before inclusion in the study. Participants were given self-reported scales to assess sleep quality and perceived stress.

Data analysis

The research employs several statistical methods to analyze the data comprehensively. Descriptive statistics, including mean, standard deviation, and percentages, are used to describe the sample's characteristics, such as age, gender distribution, and education levels. Correlation analysis, specifically Pearson correlation coefficients, assesses the relationships between perceived stress, sleep, and age. An independent t-test compares the mean sleep duration between males and females to evaluate gender differences in sleep duration. Additionally, a one-way ANOVA examines differences in perceived stress based on education level, assessing whether there are significant differences in perceived stress scores among participants with varying educational backgrounds. These statistical methods collectively provide a thorough analysis of the variables within the study sample.

RESULTS

The descriptive characteristics of the sample is given in the Table 1. The study sample consists of 103 participants out of which, 32 participants (31.07%) identify as male, while the majority, comprising 71 participants (68.93%), identify as female. The average age of the study participants is 34.16 years, with a standard deviation of 9.92. The age range spans from 17 to 62 years. The educational composition of the sample is categorized into three groups: "No formal education," "School," and "Higher education." The smallest group consists of 5 participants (4.85%) with no formal education, while the majority, comprising 54 participants (52.43%), have attained higher education. A middle-sized group, consisting of 44 participants (42.72%), completed their education at the school level.

Table 1: Descriptive characteristics of the study sample.

	N	M	SD	Min.	Max.
Gender	103				
Male	32				
Female	71				
Age	103	34.16	9.92	17	62
Education	103				
No	5				
School	44				
Higher	54				

Table 2: M, SD and inter correlation between perceived stress, sleep and age.

Variables	M	SD	1	2	3
Perceived stress	27.57	5.58	-		
Sleep	6.91	2.09	-0.20*	-	
Age	34.16	9.92	0.08	-0.15	-
*P<0.05					

The data presented in Table 2 provides key insights into the relationship between perceived stress, sleep, and age. Participants reported a mean perceived stress score of 27.57 (SD=5.58). The mean sleep score is 6.91 (SD=2.09). There is a negative correlation of -0.20 between perceived stress and sleep ($p<0.05$). The correlation coefficients reveal a positive but weak correlation (.08) between age and perceived stress and a negative, albeit modest, correlation (-0.15) between age and sleep. The correlation between perceived stress and age is ($r=0.08$, $p>0.05$) and the correlation between sleep and age is ($r= -0.15$, $p<0.05$).

Table 3: Difference in perceived stress based on gender.

	Males		Females		t
Variables	M	SD	M	SD	
Perceived stress	27.41	4.83	27.64	5.93	0.19
p>0.05					

Table 3 shows the results of an independent t-test conducted to examine the difference between the sleep duration of males and females. The results showed that males (M=7.50, SD=1.90) reported significantly more hours of sleep on average compared to females (M=6.65, SD=2.12), $t(df) = 1.87$, $p>0.05$.

The results presented in Table 4 explore the differences in sleep based on gender.

Table 4: Difference in sleep based on gender.

Variables	Males		Females		t
	M	SD	M	SD	
Sleep	7.50	1.90	6.65	2.12	1.87
P>0.05					

An one-way ANOVA was conducted to examine differences in perceived stress based on education level. Participants with no formal education have a mean perceived stress score of 31.80 (SD=5.80). Individuals with a school education have a mean perceived stress score of 27.86 (SD=5.95). Those with a higher education level have a mean perceived stress score of 26.94 (SD=5.17). The F-statistic is 1.86, and the associated p value is greater than 0.05.

Table 5: Difference in perceived stress based on education.

Variables	NO		School		Higher		F
	M	SD	M	SD	M	SD	
Perceived stress	31.80	5.80	27.86	5.95	26.94	5.17	1.86
P>0.05							

Table 6: Difference in sleep based on education.

Variables	NO		School		Higher		F
	M	SD	M	SD	M	SD	
Sleep	4.40	2.30	7.07	2.19	7.02	1.86	4.03
P<0.05							

The results presented in Table 6 explore the differences in sleep based on education levels, with mean (M) and standard deviation (SD) values for sleep scores in individuals with no formal education, those with a school education, and those with a higher education. The table also includes the F-statistic and its associated p-value.

DISCUSSION

The descriptive characteristics presented in Table 1 offer valuable insights into the study sample. These findings serve as a foundation for discussing the demographic profile and potential implications for the study. The sample consisted of 60 participants, with a notable gender disparity. The average age was 34.16 years (SD=9.92), reflecting a moderately diverse age group (17-62 years).

Our findings support the established negative correlation between perceived stress and sleep quality (r=-0.20, p<0.05). This aligns with prior research highlighting the bidirectional relationship between stress and sleep.[10] Participants reporting higher stress levels tended to experience poorer sleep, reinforcing the notion that stress disrupts sleep architecture and vice versa.[4] Interestingly, age did not significantly correlate with perceived stress (r=0.08, p>0.05) or sleep quality (r=-0.15, p>0.05). This is somewhat unexpected given research suggesting older adults might experience more sleep disturbances.[5] Further studies with larger samples are needed to explore this null finding in more diverse populations, considering factors like pre-existing health conditions that might influence sleep in older adults.[11] For instance, the research highlights how chronic health conditions, more prevalent in older adults, can disrupt sleep patterns and exacerbate stress responses.

Similarly, although males reported slightly more sleep duration than females (males: M=7.50 hours, females: M=6.65 hours), this difference was not statistically significant (p>0.05). This contrasts with some previous research suggesting gender disparities in sleep patterns, where women tend to report shorter sleep duration.[9] It's possible that other factors not examined in this study, such as occupational demands or childcare responsibilities, might be influencing sleep duration within each gender group. Recent research supports this notion, highlighting the influence of work-family conflict on sleep quality, particularly for women.[8] Their study found that women with high work-family conflict were more likely to report poorer sleep quality compared to men in similar situations.

Furthermore, perceived stress levels did not differ significantly between males and females (p>0.05). This aligns with some studies but contradicts others that have reported higher stress levels in women.[9] Our findings suggest that within this specific sample and during the COVID-19 pandemic context, gender may not be a major differentiating factor for perceived stress. Further research exploring the interplay between gender, stress, and sleep during pandemics is warranted.[6] Studies suggest that gender roles and social expectations might influence stress responses differently for men and women during crisis situations.[9] Their research found that during a pandemic, women reported higher stress related to childcare and household responsibilities compared to

men, warranting further investigation in the context of COVID-19.

While the mean sleep scores for males (M=7.50 hours) were higher compared to females (M=6.65 hours), this difference was not statistically significant ($p>0.05$). This suggests that gender alone may not be a strong predictor of sleep duration in this sample. This finding is somewhat unexpected given prior research on gender disparities in sleep.[9] It's possible that other unmeasured factors, such as occupational stressors or childcare responsibilities, might be influencing sleep duration to a greater extent than gender in this specific context. Future studies that consider these additional factors alongside gender might provide a more nuanced understanding of sleep variations.

Education level, however, did appear to be a significant factor influencing sleep quality.[11] Education level emerged as a significant factor influencing sleep quality ($F(2, 100)=4.03$, $p<0.05$). Individuals with no formal education reported significantly lower sleep scores (M=4.40, SD=2.30) compared to those with either a school-level education (M=7.07, SD=2.19) or higher education (M=7.02, SD=1.86). This aligns with research suggesting socioeconomic disparities in sleep health.[1] Potential explanations for this association could include limited access to resources that promote good sleep hygiene (e.g., comfortable beds, quiet sleeping environments) or increased exposure to stress factors associated with lower educational attainment (e.g., job insecurity, financial strain).

The aim the study to investigate the perceived stress and sleep quality among patients who visited community and primary health centers in Kerala during the COVID-19 pandemic. This study included individuals aged 18 to 50 who visited primary health centers in Kerala during the COVID-19 pandemic. Previous research indicates that perceived stress and sleep quality have significant positive association.[10] And there are studies which investigated the multifaceted nature of the relationship between perceived stress, sleep quality. Gender, age, and profession were identified as factors influencing the dynamic interplay between perceived stress and sleep quality.[12] The study provides significant insights into the complex relationship between perceived stress, sleep quality, and demographic variables. Specifically, it uncovers a notable negative correlation between perceived stress and sleep quality, indicating that heightened stress levels are associated with poorer sleep quality. Additionally, weak positive correlations between age and perceived stress, as well as modest negative correlations between age and sleep, suggest that older individuals may experience slightly higher stress levels and marginally poorer sleep quality.

Furthermore, the study highlights a gender difference in sleep duration, with males reporting significantly more sleep hours than females. Lastly, it underscores substantial disparities in sleep scores based on education levels, with individuals with lower education levels exhibiting poorer sleep quality compared to their more educated counterparts.

These findings underscore the critical importance of addressing stress-related sleep disturbances, particularly among vulnerable groups such as older adults and individuals with lower education levels. Targeted interventions aimed at promoting better sleep hygiene and stress management techniques could significantly improve overall well-being in these populations.

This study has few limitations. Assessment of sleep duration and quality were from self-reported data and may have resulted in some bias. Majority of the participants are females with age between 19 and 53, and males consist of a minor population. Still there are several strengths for this study. To the best of my knowledge, there is no such study conducted on perceived stress and sleep quality among patients visiting community and primary health center in Kerala during COVID-19 pandemic. The questionnaire was designed for community use in local language, and so questions and the response alternatives are easy to understand. Perceived stress scale questionnaire of general in nature and sensitive too. Perceived stress scale was found to be a good instrument to assess stress.

CONCLUSION

The perceived stress among patients visiting community and primary health center in Kerala during COVID-19 is a little higher but very close to general perceived stress score. The sleep quality among patients visiting community and primary health centers in Kerala during COVID-19 was nearly normal. The sleep timing/quality of patients visiting the community and primary health center in Kerala during COVID 19 pandemic is negatively affected by the stress that they experience. These findings suggest that both the sleep quality and the perceived stress levels need attention during a pandemic like COVID-19. Since quality of sleep has significant association with various health risks, reduction of stressors with tested interventions should be added in disaster plans.

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REFERENCES

1. Hefez A, Metz L, Lavie P. Long-term effects of extreme situational stress on sleep and dreaming. Am J psych. 1987;144(3):344-7.
2. Eliasson AH, Kashani M, Mayhew M, Ude A, Hoffman J, Vernalis M. Reducing perceived stress

improves sleep quality: a longitudinal outcomes study. Chest. 2010;138(4):913A.
3. Li Z, Ge J, Yang M, Feng J, Qiao M, Jiang R, et al. Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. Brain, behavior, and immunity. 2020;88:916-9.
4. Sleep Foundation. Sleep Hygiene, 2024. Available at: https://www.sleepfoundation.org/sleep-hygiene. Accessed 11 June, 2024.
5. Åkerstedt T, Orsini N, Petersen H, Axelsson J, Lekander M, Kecklund G. Predicting sleep quality from stress and prior sleep-a study of day-to-day covariation across six weeks. Sleep Med. 2012;13(6):674-9.
6. Brand M, Young KS, Laier C. Prefrontal control and internet addiction: a theoretical model and review of neuropsychological and neuroimaging findings. Front Hum Neurosci. 2014;8:375.
7. Ma C. Association of sleep quality with depression in police officers. Int J Emerg Ment Health. 2011;13(4):267-77.
8. Gerber AS, Huber GA, Doherty D, Dowling CM, Ha SE. Personality and political attitudes: relationships across issue domains and political contexts. Am Polit Sci Rev. 2010;104(1):111-33.
9. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav. 1983;24(4):385-96.
10. Charles LE, Slaven JE, Mnatsakanova A, Ma C, Violanti JM, Fekedulegn D, et al. Association of perceived stress with sleep duration and sleep quality in police officers. Int J Emerg Ment Health. 2011;13(4):229-41.
11. Kalmbach DA, Anderson JR, Drake CL. The impact of stress on sleep: Pathogenic sleep reactivity as a vulnerability to insomnia and circadian disorders. J Sleep Res. 2018;27(6):e12710.
12. Hrozanova M, Moen F, Pallesen S. Unique predictors of sleep quality in junior athletes: the protective function of mental resilience, and the detrimental impact of sex, worry and perceived stress. Front Psychol. 2019;10:1256.
13. Si G, Xu Y, Li M, Zhang Y, Peng S, Tan X. Sleep quality and associated factors during the COVID-19 epidemic among community non-medical anti-epidemic workers of Wuhan, China. BMC Public Health. 2021;21:1270.

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