



# The Prevalence And Interplay Of Sleep Quality, Daytime Sleepiness And Perceived Stress Among Indian Doctors

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## **Abstract:**

This study investigated the relationships between daytime sleepiness, sleep quality, and perceived stress in a sample of 100 doctors aged 25-50. Moderate correlations were found between the variables assessed using the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), and Perceived Stress Scale-10 (PSS-10). These findings, along with average scores indicating borderline good sleep quality, normal sleep propensity, and moderate stress, suggest the sample may have reported relatively mild sleep disturbances and stress levels. Further research is needed to explore these relationships in larger and more diverse physician populations.

## **Introduction:**

Sleep and stress are fundamental aspects of human physiology and psychology, influencing various aspects of health and well-being. Sleep, essential for development, cognitive function, and emotional regulation, is intricately linked with metabolic regulation and immune function (Zielinski et al., 2016). Good sleep quality and adequate sleep duration (i.e 7 to 8 hours in a 24-hour period) are necessary for good health (Charles et al., 2011)

Conversely, stress, an adaptive response to maintain bodily equilibrium, can disrupt sleep patterns through the activation of neuroendocrine pathways, particularly the hypothalamic-pituitary-adrenal (HPA) axis (Martire et al., 2020). This interplay between sleep and stress is

of significant concern, especially among individuals exposed to chronic stressors such as healthcare professionals.

Research has consistently demonstrated the detrimental effects of sleep deprivation on physiological and psychological health, including hypertension, obesity, impaired immune function, and cognitive performance (Worley, 2018). Moreover, inadequate sleep has been associated with increased fatigue, diminished mindfulness, and reduced satisfaction of basic needs (Campbell et al., 2018). Stress, particularly occupational stress, poses a significant challenge to well-being, with healthcare professionals, in particular, experiencing high levels of organizational role stress (Irfana, 2012).

Studies examining the relationship between stress and sleep among healthcare professionals reveal a high prevalence of excessive daytime sleepiness and maladaptive sleep hygiene practices among medical residents in India, highlighting the detrimental effects of demanding work hours on sleep quality (Mastin et al., 2012)

Furthermore, the relationship between stress and sleep extends beyond mere correlation, as evidenced by studies investigating coping mechanisms and interventions. Phipps (1988) and Tattersall et al. (1999) identified various sources of stress among healthcare professionals and proposed strategies for mitigating burnout and distress, emphasizing the importance of social support and workload management.

Research has shown a high prevalence of poor sleep quality among medical students, correlating with elevated blood pressure and body mass index, underscoring the multifaceted impact of sleep on overall well-being (Krishna & Shweta, 2008)

## **Sleep Quality**

Sleep quality is defined as an “individual's self-satisfaction with all aspects of the sleep experience”. Sleep quality has four attributes: sleep efficiency, sleep latency, sleep duration, and wake after sleep onset. (Nelson et al., 2021). Research findings show a significant negative correlation between perceived stress and sleep quality among urban Indian residents, indicating the pervasive impact of stress on sleep habits (Shelar et al., 2022). Research conducted by Fortunato & Harsh (2006) reveals that personality and work-related stress influences different aspects of sleep quality. Poor nighttime sleep was significantly correlated with fatigue intensity, as was daytime sleepiness (Salahuddin et al., 2009). Study conducted by Carvalho et al., (2021) reveal findings that high rates of abnormal daytime sleepiness and poor sleep quality among healthcare professionals in Brazil.

## **Daytime Sleepiness**

The creator of the Epworth Sleepiness Scale defines sleepiness as the likelihood and ease of transitioning from wakefulness to sleep under certain conditions. Various factors, including time of day, duration of wakefulness, previous sleep quality, posture, activity, and environmental stimuli, influence whether someone is awake or asleep at any given moment (Johns, 2010). Studies on sleep deprivation consistently demonstrate negative effects on mood, cognitive performance, and motor function. These effects stem from an increased tendency to sleep and a disruption of wakefulness. Executive attention, working memory, and other higher cognitive functions are especially prone to impairment from sleep loss (Durmer & Dinges, 2005).

Individuals experiencing excessive daytime sleepiness face a heightened risk of accidents while driving or working and generally have worse health outcomes compared to similar adults (Pagel, 2009)

## **Perceived Stress**

Selye (1956) coined the term "stress" to describe the impact of anything that significantly disrupts homeostasis. The perceived or real threat to an organism is known as the "stressor," and the reaction to this stressor is termed the "stress response." While stress responses originally developed as adaptive mechanisms, Selye noted that prolonged and intense stress responses

could potentially result in tissue damage and illness (Selye, 1978). Before the creation of the PSS, evaluating stress typically centered on concrete measures, such as the occurrence rates, of particular stressors like chronic illness, bereavement, or changes in family dynamics. This

approach often neglected the impact of an individual's personal interpretation of stressors on their experience. Cohen et al. (1983) recognized this absence of subjectivity in stress assessment as a limitation and addressed it by introducing the PSS. Almojali and colleagues (2017)

conducted a study which documents a statistically significant association between stress and poor sleep quality among medical students. Research conducted by Rocha & Martino (2010) revealed that stress level was a factor directly correlated to sleep, showing that the higher the stress score, the worse the quality of sleep.

## **Purpose**

The purpose of this study is to investigate and understand the complex relationships among the variables of sleep quality, daytime sleepiness, and perceived stress in resident doctors.

## **Hypothesis**

1. There is a positive correlation between poor sleep quality and perceived stress among attending physicians.
2. Daytime sleepiness in attending physicians is positively correlated with perceived stress.
3. Poor sleep quality is positively correlated with daytime sleepiness.

## Method Sample

In this study, 100 doctors/attending physicians from India participated, with ages ranging from 25 to 50 years.

## Measures

1. **The Pittsburgh Sleep Quality Index (PSQI)** was developed by Buysse and colleagues. It is a self-rated questionnaire which assesses sleep quality and disturbances over a 1-month time interval. Nineteen individual items generate seven “component” scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The sum of scores for these seven components yields one global score. A global PSQI score over 5 indicates poor sleep relative to clinical and laboratory measures, and higher scores indicate poorer sleep quality. (Buysse et al., 1989)
2. **The Epworth Sleepiness Scale (ESS)** developed by Dr. Murray Johns is a self-administered questionnaire with 8 questions. Respondents are asked to rate, on a 4-point scale (0-3), their usual chances of dozing off or falling asleep while engaged in eight different activities. The ESS score (the sum of 8 item scores, 0-3) can range from 0 to 24. The higher the ESS score, the higher that person’s average sleep propensity in daily life (ASP), or their ‘daytime sleepiness’ (Johns, 1990).
3. **The Perceived Stress Scale-10 (PSS-10)** determines how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes a number of direct queries about current levels of experienced stress. The PSS was designed for use in community samples with at least some high school education. The assessed items are general in nature rather than focusing on specific events or experiences. (Cohen et al., 1983)

## Methodology

Participants received an explanation regarding the research's objectives before completing questionnaires via Google Forms. Each participant received gratitude for their cooperation. Subsequently, standardized psychological assessments were administered to the participants.

## Analysis of Data

## Results

The research used t-test analysis to understand the relationship between sleep quality, daytime sleepiness, and perceived stress. Table 1 presents mean and standard deviation data, Meanwhile, Table 2 illustrates correlations among sleep quality, daytime sleepiness, and perceived stress.

**Table 1**

Mean and Standard Deviation scores of 100 Healthcare Professionals with Variables Perceived Sleep Quality, Daytime Sleepiness, and Perceived Stress.

	Sleep Quality	Daytime Sleepiness	Perceived Stress
N	100	100	100
Mean	5.94	6.82	16.9
Standard Deviation	3.35	4.23	6.22

**Table 2**

Correlation Matrix of Perceived Sleep Quality, Daytime Sleepiness, and Perceived Stress.

	Sleep Quality	Daytime Sleepiness	Perceived Stress
Sleep Quality	—		
Daytime Sleepiness	0.431	—	
Perceived Stress	0.533	0.511	—

Note.  $p < 0.01$

## Discussion

The study aimed to explore the relationships between sleep quality, daytime sleepiness and perceived stress. The results found several moderate correlations. Firstly, a moderate correlation was observed between sleep quality and perceived stress ( $r=0.533$ ,  $p<.01$ ), which shows that poor sleep quality may or may not contribute to perceived stress. This inference presents itself to be slightly inconsistent with the research conducted by Rocha & Martino (2010) which revealed that stress level was a factor directly correlated to sleep, showing that the higher the stress score, the worse the quality of sleep. Secondly, a moderate correlation was observed between daytime

sleepiness and perceived stress ( $r=0.511$ ,  $p<.01$ ) which is different in case of medical students (Almojali et al., 2017). Lastly a moderate correlation was found between sleep quality and daytime sleepiness ( $r=0.431$ ,  $p<.01$ ) which contradicts study conducted by Carvalho and colleagues (2021)

## Conclusion

This study investigated the relationships between daytime sleepiness, sleep quality, and perceived stress among a sample of doctors. While previous literature suggests strong correlations between these variables, the current findings revealed only moderate associations. This discrepancy might be attributable to the sample characteristics, with mean scores indicating borderline good sleep quality, normal sleep propensity, and moderate perceived stress. Future research with larger and more diverse samples is warranted to confirm these findings.

Despite the moderate correlations observed, it is crucial to acknowledge the significance of sleep for physician well-being. Given the demanding nature of the medical profession, doctors are susceptible to experiencing sleep disturbances, excessive daytime sleepiness, and high stress levels. These factors can negatively impact their cognitive performance, emotional well-being, and patient care. Therefore, prioritizing sleep hygiene practices and stress management strategies remains essential for promoting optimal health and functioning among physicians.

## Limitation and points for further research

This study has several limitations. First, it relied on self-reported sleep quality, which may not accurately reflect objective sleep patterns (Jackowska et al., 2011). Second, the study did not explore the specific work stressors that can contribute to poor sleep, such as work overload, role conflict, autonomy limitations, and repetitive tasks (Knudsen et al., 2007). Understanding these dynamics could provide valuable insights. Additionally, the study did not consider potential gender differences in sleep patterns and stress responses. Finally, a more concise age range for participants might have yielded more focused results.

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