(RESEARCH ARTICLE)

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The relationship between sleep quality and depressive symptoms among young adults of India

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Abstract

The study aimed to understand the relationship between Sleep Quality and Depressive symptoms Among Young Adults of India. The data was collected from 310 participants aged between 18 to 27 years through convenience sampling. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), while depressive symptoms were measured using the Beck Depression Inventory (BDI). The analysis revealed a significant positive correlation ($r = 0.661$, $p < 0.001$) between PSQI and BDI scores, indicating a meaningful relationship between sleep quality and depressive symptoms. Individuals with poorer sleep quality tended to report higher levels of depressive symptoms, and vice versa. This finding underscores the bidirectional association between sleep disturbances and depression.

Keywords: Sleep quality; Depressive symptoms; Pittsburgh Sleep Quality Index; Beck Depression Inventory

1. Introduction

Sleep is a fundamental state of rest vital for mental and physical health. It facilitates memory consolidation, emotional regulation, and physical recovery, ensuring optimal cognitive function and vitality. This natural process is essential for overall well-being, supporting resilience and enabling us to navigate daily challenges with clarity and energy.

And sleep quality can be measured through various dimension such as duration, continuity, efficiency, and subjective satisfaction, is a fundamental aspect of human health (Grandner et al., 2010; Harvey et al., 2011). It reflects the overall experience of sleep and its restorative nature, influenced by various factors including lifestyle choices, environmental conditions, and individual differences by Walker (2017). Adequate sleep is essential for optimal cognitive function and emotional well-being, playing a crucial role in regulating mood, stress, and emotional resilience (Alvaro et al., 2013; Walker, 2017). Disruptions in sleep quality compromise memory consolidation and neurotransmitter balance, impacting mental health (Walker & Van Der Helm, 2009). Additionally, sleep deprivation impairs cognition and emotional regulation, exacerbating vulnerability to mental health challenges (Killgore, 2010).

On the other hand, depression, characterized by persistent feelings of sadness, changes in appetite or sleep patterns, fatigue, and impaired concentration, represents a significant mental health concern (Baglioni et al., 2011; Neckelmann et al., 2007). These depressive symptoms significantly affect daily functioning and overall quality of life (Baglioni et al., 2011). Depression shares a bidirectional relationship with sleep quality, where disruptions in sleep patterns can exacerbate depressive symptoms, and vice versa (Grandner et al., 2010; Harvey et al., 2011). Physiologically, sleep regulates mood and emotional resilience, with disturbances compromising memory and neurotransmitter balance (Alvaro et al., 2013). Psychologically, sleep deprivation impairs cognitive processes and emotional regulation, further contributing to the onset or exacerbation of depressive symptoms (Killgore, 2010). Neurobiologically, sleep and mental health are interconnected through shared pathways and neurotransmitter systems, influencing mood regulation (Walker & Van Der Helm, 2009).

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Several theories have been proposed to explain the complex relationship between sleep quality and depressive symptoms.

The Bidirectional Model suggests mutual reinforcement between poor sleep and depression, where sleep disturbances can contribute to the development or exacerbation of depressive symptoms, and vice versa (Baglioni et al., 2011). The Neurotransmitter Imbalance Hypothesis posits that alterations in neurotransmitter systems link sleep disturbances and depression (Krystal, 2012). Similarly, the Cognitive-Behavioral Model highlights negative thought patterns influencing both sleep and depression (Harvey, 2008). The Inflammatory Response Hypothesis suggests that inflammatory processes may underlie the relationship between sleep and depression (Irwin & Miller, 2007).

While individual studies have examined sleep quality and depression separately, there is a growing recognition of the need to explore their relationship comprehensively (Grandner et al., 2010; Harvey et al., 2011). Understanding the bidirectional association between sleep quality and depression is crucial for developing holistic approaches to mental health care (Baglioni et al., 2011; Neckelmann et al., 2007). This recognition has led to an increased emphasis on comprehensive studies that examine these variables together, particularly in post-lockdown scenarios and specific cultural contexts like India.

Exploring the interplay between depression and sleep quality among young adults is particularly important, given the unique challenges they face during this transitional phase (Baglioni et al., 2011; Neckelmann et al., 2007). Addressing these issues within specific cultural contexts like India is essential, considering the diverse societal norms and lifestyle factors prevalent in such regions. Comprehensive studies examining the relationship between sleep quality and depression in young-adults post-lockdown in India can provide valuable insights into the lasting effects of the pandemic on mental health and sleep patterns (Irwin & Miller, 2007). Moreover, understanding this relationship can inform tailored interventions aimed at improving mental health outcomes in this population.

Sleep quality and depression seem to be intricately linked, with each influencing and being influenced by the other. Understanding this bidirectional relationship is essential for developing comprehensive approaches to mental health care that address both sleep-related issues and underlying psychological conditions. Comprehensive studies examining the relationship between sleep quality and depression, particularly in specific cultural contexts like India, can provide valuable insights into the development and progression of mental health disorders, ultimately leading to improved mental health outcomes among young adults, therefore it is vital to examine and understand the relationship between the two in young adults because they are the future of our nation.

2. Material and methods

2.1. The Research Design

This research employed a quantitative research method to investigate the association between sleep quality and depressive symptoms which includes both descriptive and inferential statistics have been used for this study.

2.2. Statement of the Problem

This study explores the complex relationship between sleep quality and depressive symptoms among young adults in India, aiming to understand how sleep patterns influence the prevalence and severity of depressive symptoms.

Objective of the Study

- To examine the relationship between Sleep Quality and Depressive Symptoms among individuals.

2.3. Hypotheses

- Ho: There will be no significant difference in depressive symptoms between individuals with varying levels of sleep quality.
- H1: Sleep quality will be negatively associated with depressive symptoms, with lower sleep quality correlating with higher levels of depressive symptoms.

2.4. Operational Definitions

2.4.1 Sleep Quality

The independent variable, sleep quality, refers to the subjective evaluation of an individual's sleep patterns, including factors such as sleep duration, latency, efficiency, and disturbances.

2.4.2 Depressive Symptoms

The dependent variable, depressive symptoms, encompasses various cognitive, emotional, and behavioral manifestations associated with depression, including feelings of sadness, hopelessness, and loss of interest or pleasure in activities.

2.4.3 Young Adults

According to Erikson, young adults are ones who follow the years after adolescence that is individuals aged 19- 40 years of age.

2.5. Demographic Details

The demographic details that were collected for the research are age, gender, and nationality.

2.6. Universe of the Study

The population selected for this study is young adults between the age range 18-27. All the genders are included in the study.

2.7. Geographical Area

The country India was selected as the focus area of the study.

2.8. Sample Distribution

The Sample includes the people that fall within the age range of 18-27. A total of 310 young adults have participated in the study.

2.8.1 Inclusion Criteria

- Participants between the ages of 18-27 years.
- Participants must have a proficient understanding of English.
- Participants who have filled the consent form.
- Participants from India

2.8.2 Exclusion Criteria

- Individuals who do not match the age criteria.
- Individuals who do not have proficient understanding of English.
- Individuals who have not filled out the consent form.
- Individuals who are not from India.

2.8.3 Sample and Techniques

The participants in this study were recruited through convenience sampling methods where each member of the population had an equal chance of being included in the sample.

2.9. Research Ethics Followed

- The data was collected from participants who have given and filled the consent form.
- The research aim was clearly briefed to the participants.
- Participants could withdraw from the research anytime they want to.

2.10. Tools for the Study

Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) and Depressive symptoms were assessed using the Beck Depression Inventory, these were the tools that were used for the study.

2.11. Statistical Analysis

The data obtained from the research was scored using the manual and norms were further analyzed using IBM SPSS. The method used was Spearman's Correlation and Regression.

2.12. Descriptive and Inferential Statistics

Descriptive statistics involves frequency distribution, means median and standard deviation of the data of 2 variables. Inferential statistics was analyzed using Spearman's Correlation and Regression.

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3. Results

The aim was to assess whether Sleep quality has an effect on Depressive symptoms and for that purpose the data was obtained and scored using the valid questionnaire manuals and then further analyzed using IBM SPSS 25. The data was analyzed using descriptive statistics and then to know the relation between Pittsburgh Sleep Quality Index (PSQI) and the Beck Depression Inventory (BDI), correlation was done. Regression was done to understand the relationship between sleep quality (PSQI) and depressive symptoms (BDI) and determine if one predicts the other. The test of normality revealed that the data is not normally distributed hence it is non- parametric which led to spearman correlation analysis of the variables.

Table 1 Results of descriptive statistical analysis of the variables.

Variables	Mean	N	Std. deviation
PSQI	6.52	310	3.054
BDI	16.31	310	12.897

Table 1 shows us the central tendency and variability of the data for the Pittsburgh Sleep Quality Index (PSQI) and the Beck Depression Inventory (BDI) scores. PSQI Descriptive Statistics indicate that the average PSQI score is 6.52. This indicates that, on average, participants reported experiencing mild to moderate sleep disturbances. The standard deviation of 3.054 suggests that there is variability in PSQI scores among the participants. A higher standard deviation indicates that the scores are more spread out from the mean. The sample size for both PSQI and BDI scores is 310, indicating the number of participants included in the analysis. BDI Descriptive Statistics suggests that the average BDI score is 16.31. This suggests that, on average, participants reported experiencing mild to moderate depressive symptoms. The standard deviation of 12.897 indicates that there is variability in BDI scores among the participants. A higher standard deviation suggests that the scores are more spread out from the mean.

Table 2 Results of Spearman Correlation between Sleep Quality and depressive symptoms.

Correlations		
PSQI	Correlation Coefficient	1.000
	Sig. (2-Tailed)	0.000
BDI	Correlation Coefficient	0.669**
	Sig. (2-Tailed)	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2 shows the correlations between sleep quality (PSQI) and depressive symptoms (BDI) using Spearman's rho correlation coefficient. The analysis reveals a strong positive correlation between PSQI and BDI, with a correlation coefficient of 0.669** and a significant p-value of 0.000. This indicates that as sleep quality decreases, depressive symptoms tend to increase. The sample size for both PSQI and BDI is 310, providing a robust basis for the statistical analysis. This suggests that as sleep quality decreases, depressive symptoms tend to increase. The sample size for both

PSQI and BDI is 310, providing a robust basis for the statistical analysis. The significance level of 0.01 (2-tailed) underscores the strength and reliability of the observed correlations. The data underscores a statistically significant and clinically relevant association between sleep quality and depressive symptoms. The findings suggest that individuals with poorer sleep quality are more likely to experience higher levels of depressive symptoms, as evidenced by the strong positive correlation.

Table 3 Results of Regression analysis of the variable

Variables	Unstandardized Coefficients		Standardized Coefficients	Model Summary
	B	Std. Error	β (Beta)	
PSQI	2.793	0.180	0.661	F = 239.5
				T = 15.476
				Sig = 0.000
				R = 0.661
				R square = 0.437

Dependent Variable: BDI

Table 3 provides the results of a regression analysis, specifically examining the relationship between two variables: PSQI, which represents sleep quality, and BDI, which represents Beck's depressive symptoms. The "Unstandardized Coefficients" column shows that a one-unit increase in PSQI is associated with a 2.793-unit increase in BDI. The "Standardized Coefficients" column indicates that an increase in PSQI is associated with a 0.661 standard deviation increase in BDI. The "Model Summary" section includes statistics to assess the overall model fit, such as the F-value (which assesses the overall significance of the regression model), the t-value (which measures the significance of the relationship between the variables), and the R square value (which represents the proportion of variance in BDI that can be explained by PSQI).

In simple terms, the table shows the strength and significance of the relationship between sleep quality and depressive symptoms, indicating that higher levels of sleep disturbance are associated with higher levels of depressive symptoms.

4. Discussion

Understanding the intricate relationship between sleep quality and depressive symptoms is paramount in addressing mental health challenges effectively. Our study contributes significantly to this endeavor by elucidating the multifaceted nature of this association through rigorous empirical investigation and comprehensive statistical analyses.

The foundation of our study lies in the utilization of validated assessment tools, namely the Pittsburgh Sleep Quality Index (PSQI) and Beck's Depression Inventory (BDI), which have been widely endorsed for their reliability and validity in assessing sleep quality and depressive symptoms, respectively. This methodological rigor ensures the robustness and credibility of our findings. Consistent with previous research, our study revealed a compelling positive correlation between sleep quality and depressive symptoms. This aligns with seminal work by Buysse et al. (1989), who pioneered the use of the PSQI in identifying individuals at risk for depression based on their sleep disturbances.

Furthermore, our findings corroborate longitudinal studies, such as that by Baglioni et al. (2011), which underscore the predictive value of sleep disturbances in the onset and exacerbation of depressive disorders over time. The regression analysis conducted in our study further strengthens the evidence for the predictive nature of sleep quality on depressive symptoms. The significant coefficients obtained highlight the robustness of this relationship, emphasizing the pivotal role of sleep disturbances in influencing mood regulation. This finding resonates with recent advancements in psychotherapy, particularly cognitive-behavioral therapy for insomnia (CBT-I), which has shown promising results in ameliorating both sleep disturbances and depressive symptoms concurrently (Cheng et al., 2016).

Moreover, our study underscores the heterogeneity of experiences within our sample, as evidenced by the variability observed in both PSQI and BDI scores. This underscores the importance of personalized interventions tailored to individual needs and preferences. Integrative approaches that target both sleep and mood disturbances may yield synergistic effects, offering comprehensive support for individuals grappling with these intertwined challenges. While

our study contributes valuable insights into the sleep-depression relationship, it is not without limitations. The cross-sectional design restricts our ability to establish causality, necessitating longitudinal investigations to elucidate the temporal dynamics of this relationship. Additionally, the reliance on self-report measures introduces the possibility of response bias, emphasizing the need for complementary objective assessments in future research endeavors.

In conclusion, our study advances our understanding of the complex interplay between sleep quality and depressive symptoms. By corroborating previous findings and highlighting the therapeutic potential of sleep-focused interventions, we underscore the importance of addressing sleep disturbances in the management of depression. Moving forward, interdisciplinary collaborations and longitudinal investigations are warranted to further unravel the underlying mechanisms driving this relationship and inform evidence-based clinical practices.

5. Conclusion

In conclusion, the findings of this study provide robust evidence supporting the association between sleep quality and depressive symptoms. The significant positive relationship between PSQI and BDI scores underscores the importance of addressing sleep disturbances in the assessment and management of depression. Clinicians should consider screening for sleep disturbances in individuals presenting with depressive symptoms and incorporate interventions targeting sleep quality as part of comprehensive treatment approaches for depression.

Compliance with ethical standards

Disclosure of Conflict of interest

No conflict of interest to report.

Statement of ethical approval

As this study was done for dissertation purpose, approval was taken from the college.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1]   Walker, M. *Why we sleep: The new science of sleep and dreams*. Penguin UK; 2017.

[2]   Grandner MA, Hale L, et al. Mortality associated with short sleep duration: The evidence, the possible mechanisms, and the future. Sleep Medicine Reviews. 2010 14(3), 191–203.

[3] Harvey, A. G. Sleep and circadian functioning: critical mechanisms in the mood disorders?. Annual review of clinical psychology. 2011. 7, 297-319.

[4] Buysse DJ, Reynolds CF, et al. The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. Psychiatry Research. 1989. 28(2), 193-213.

[5] Baglioni C, Battagliese G, et al. Insomnia as a predictor of depression: A meta-analytic evaluation of longitudinal epidemiological studies. Journal of Affective Disorders. 2011. 135(1-3), 10–19.

[6] Cheng P, Kalmbach DA, et al. Examining the link between sleep disturbance and longitudinal aggression in early adolescence. Developmental Psychology. 2016. 52(5), 922–936.

[7] Irwin MR, Miller AH. Depressive disorders and immunity: 20 years of progress and discovery. Brain, Behavior, and Immunity. 2007. 21(4), 374–383.

[8] Neckelmann D, Mykletun A, et al. Chronic insomnia as a risk factor for developing anxiety and depression. Sleep. 2007. 30(7), 873–880.

[9] Krystal AD. Psychiatric disorders and sleep. Neurologic Clinics. 2012. 30(4), 1389–1413.

[10] Harvey AG. Sleep and circadian rhythms in bipolar disorder: Seeking synchrony, harmony, and regulation. The American Journal of Psychiatry. 2008. 165(7), 820–829.

[11] Walker MP, Van Der Helm E. Overnight therapy? The role of sleep in emotional brain processing. Psychological Bulletin. 2009. 135(5), 731–748.

[12] Alvaro PK, Roberts RM, et al. Sleep deprivation and autonomic function. Sleep Medicine Reviews. 2013. 17(6), 471–480.

[13] Killgore WD. Effects of sleep deprivation on cognition. Progress in Brain Research. 2010. 185, 105–129.