



Effect of Sleep Deprivation on Mental Health among University Students

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Abstract: The present study aimed to assess the effect of sleep deprivation on mental health among university students (23 to 27 Years). The study further assessed the Null Hypothesis (university students' mental health status as determined by the DASS-21, for stress, anxiety, and depression) and (sleep deprivation as determined by the PSQI) do not significantly correlate and alternative hypothesis (university students' mental health status as determined by the DASS-21, for stress, anxiety, and depression) and sleep deprivation (as determined by the PSQI) are significantly correlated. Data were collected from 100 students, belonging to age group of 23-27 years, using volunteer, snowball and purposive sampling technique. Pittsburgh Sleep Quality Index (PSQI) and Depression Anxiety Stress Scales (DASS-21) were used to measure the sleep quality and deprivation and mental health status of the participants respectively. An independent samples t-test is used to compare the scores of both groups (sleep deprived group and non-sleep deprived group). Results of the current study showed that the sleep deprived group ($M=20.3$, $SD=7.1$) reported significantly higher depression scores compared to the non-sleep deprived group ($M=13.8$, $SD=6.3$), the sleep deprived group scored higher ($M=18.6$, $SD=6.8$), while the non-sleep deprived group scored significantly lower ($M=12.4$, $SD=5.7$) on anxiety, and the sleep deprived group ($M=22.1$, $SD=6.9$) reported significantly higher stress scores compared to the non-sleep deprived group ($M=16.2$, $SD=5.4$). A statistically significant relationship exists between sleep deprivation scores and mental health status, which is indicated by the current study's p value (0.001), which is less than the

significance level of 0.05. Therefore, the alternative hypothesis is highly supported and the null hypothesis is rejected.

Keywords: *Sleep Deprivation, Mental Health, University Students, PSQI, DASS-21.*

1. Introduction

Sleep is an essential human requirement that is both natural and inborn, helping the body and brain to continue functioning as intended. It is a universal mammalian behaviour and a multidimensional physiologically organised global state. Sleep allows a person's body and brain to rest and restore.

Common, recurring, and reversible, sleep is characterised by complicated predictable physiological changes as well as a diminished sensitivity to outside stimuli. They include changes in hormones, relaxed muscles, and, internally generated brain activity. The sleep cycle includes 3 phases of NREM sleep and 1 phase of REM sleep, forming a structure known as sleep architecture.

Sleep Deprivation refers to a condition in which an individual doesn't get an adequate amount of sleep, or a good quality of sleep, or fails to obtain the amount of sleep that they need over a period of time.

Numerous factors, including medical conditions, sleep disorders, and deliberate decisions (such staying up late to study or socialize), might contribute to sleep deprivation. Sleep Deprivation can look like in a way that even after getting enough sleep, they are not getting quality sleep and waking up feeling tired.

According to the World Health Organization (WHO), a state of mental health allows people to reach their full potential, manage stress, work well, and give back to their communities. Additionally, it is defined as including social, psychological, and emotional well-being. In a nutshell it's the ability to control emotions, build deep connections, and carry out daily tasks with effectiveness.

Mental Health isn't just the absenteeism of disease, but a positive state where individuals feel good about themselves and their lives.

A healthy mental state allows us to cope with the stresses of life, build resilience, and adapt to change. Mental well-being enables us to realize our full potential, achieve our goals, and contribute to society.

In recent years, as society attitudes have shifted towards recognising and resolving mental health concerns, the importance of mental health has come to be recognised. Mental Health is a challenging topic of study because of the many factors that contribute to it, including

genetics, life experiences, and environmental impacts. So, anxiety, depression, and stress are common mental health issues that can significantly affect an individual's quality of life.

Stress and Sleep Deprivation, lack of sleep impairs the body's capacity to control stress chemicals like cortisol. Long-term sleep deprivation raises stress levels and affects cognitive and decision-making processes. People who don't get enough sleep frequently complain of being more irritable and finding it harder to handle everyday obstacles.

Anxiety and Sleep Deprivation, lack of sleep is closely related to anxiety problems. Lack of sleep affects the brain's amygdala, which handles emotions. This increases the likelihood of experiencing anxiety symptoms, such as a racing heartbeat and excessive worry, as well as an increased vulnerability to stressors. Even a short period of sleep loss can exacerbate anxiety symptoms.

Depression and Sleep Deprivation, lack of sleep is one of the causes of depression as well as one of its symptoms. It causes fatigue, sadness, and unhappiness by interfering with the brain's ability to control mood and emotions. According to studies, people who suffer from insomnia or poor sleep quality are more likely to experience depression.

Research showed a strong positive correlation was identified between sleep deprivation and mental health issues, indicating that higher sleep deprivation is associated with greater challenges in anxiety, depression, and stress (Khair, 2020).

Research showed that a significant positive correlation between PSQI scores and levels of anxiety, stress, and psychological well-being. Medical students with poorer sleep quality and higher daytime sleepiness exhibited elevated levels of anxiety and stress. Additionally, those with low sleep quality reported a decline in their overall psychological well-being (Kumar, 2023).

Research showed that heavy academic workloads, including high weekly class hours and examination stress, had a significant negative impact on both sleep quality and mental health. Students with heavier schedules, attending 45–50 classes per week, reported notably higher PSQI scores compared to peers with lighter workloads (Li, 2025).

2. Methodology

2.1 Aim

To assess the 'Effect of Sleep Deprivation on Mental Health among University Students.

2.2 Objectives

- To evaluate the quality of sleep among university students using the PSQI.

- To assess the levels of depression, anxiety, and stress among university students using the DASS-21.
- To determine the frequency of inadequate sleep quality among the study population.
- To examine the association between sleep quality (as measured by PSQI) and mental health indicators (depression, anxiety, stress as measured by DASS-21).

2.3 Hypothesis

Null Hypothesis (H₀): University students' mental health status (as determined by the DASS-21) for stress, anxiety, and depression and sleep deprivation (as determined by the PSQI) do not significantly correlate.

Alternative Hypothesis (H₁): University students' mental health status (as determined by the DASS-21) for stress, anxiety, and depression and sleep deprivation (as determined by the PSQI) are significantly correlated.

H₁ (1): There is a significant association between sleep deprivation and depression levels among university students.

H₁ (2): There is a significant association between sleep deprivation and anxiety levels among university students.

H₁ (3): There is a significant association between sleep deprivation and stress levels among university students.

2.4 Research Design

A cross-sectional research approach is used in this study since data from a sample of college students is gathered all at once. It is quantitative in nature as both tools (PSQI & DASS-21) provide numerical data suitable for statistical analysis. Current study is comparative, correlational, and descriptive as it will examine the relationship between sleep quality and mental health outcomes (depression, anxiety, and stress), without manipulating any variables.

2.5 Sampling

A sample of 100 university students, comprising 60 sleep deprived and 40 non sleep deprived, aged between 23-27 years was taken using Volunteer Sampling (consists of participants who have volunteered themselves to take part in a study), Snowball Sampling (process of selecting a small initial set of participants who match the standards and asking them to recommend other people they know who do the same), Purposive Sampling (specifically selecting a sample between 23-27 years of age range).

2.6 Variables

Independent Variable- Sleep Deprivation

Dependent Variable- Mental Health

2.7 Tools

2.7.1 Pittsburgh Sleep Quality Index (PSQI), was made by the University of Pittsburgh's Daniel J. Buysse and associates in 1989. The purpose of the PSQI is to assess sleep quality and assist in distinguishing between people who have good and bad sleep. 7 clinically significant categories of sleep issues are covered by its 19 self-reported items- subjective sleep quality, sleep latency, sleep length, habitual sleep efficiency, sleep disturbances, use of sleeping medicine, and daytime dysfunction. It also includes 5 extra questions that are judged by the respondent's bed partner or roommate; these are not scored and are just provided for clinical purposes. Respondents are asked to rate the general quality of their sleep as well as the frequency with which they have encountered certain sleep issues during the previous month. From 0 (no difficulty) to 3 (severe difficulty), each item has a score; higher scores correspond to more severe sleep disruptions. To get the global PSQI score, which goes from 0 to 21, the 7 component scores are then added together. A score higher than 5 is frequently used to signify poor sleep, as developers have proposed a cut-off value of 5 for the global scale.

2.7.2 Depression Anxiety Stress Scale (DASS-21), was made in 1995 by Peter and Syd Lovibond. The scale, which is a shorter version of the original DASS-42, provides a more effective way to measure emotional states. It's a self-report questionnaire, having 21 items which are used to measure the severity of negative emotions like depression, anxiety, and stress. The DASS-21 is divided into 3 subscales- Depression (DASS-21-D), Anxiety (DASS-21-A), and Stress (DASS-21-S). There are 7 elements in each subscale. Using a 4 point rating system, from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time), participants indicate how much each statement describes them over the previous week. The scores for each factor are added together to determine the scores for stress, anxiety, and depression. Each subscale has a score between 0 and 21. Each subscale's total score (stress, anxiety, and depression) is then multiplied by 2, giving each scale a range of 0 to 42.

3. Results

Of the 100 university students who gave demographic information, 50 were female and 50 were male, and they were all between the ages of 23 to 27 years. Based on PSQI global scores, participants were categorized into two groups- Sleep Deprived Group ($PSQI > 5$) i.e. $n = 58$ and Non Sleep Deprived Group ($PSQI \leq 5$) i.e. $n = 42$. To study differences in mental

health outcomes (depression, anxiety, and stress) between the two groups, independent samples t-tests were conducted for each DASS-21 subscale.

Variables	Group	Mean	Standard Deviation	t score (98)	p value
Depression	Sleep Deprived	20.3	7.1	5.01	<0.001
	Non Sleep Deprived	13.8	6.3		
Anxiety	Sleep Deprived	18.6	6.8	4.97	< 0.001
	Non Sleep Deprived	12.4	5.7		
Stress	Sleep Deprived	22.1	6.9	4.85	< 0.001
	Non Sleep Deprived	16.2	5.4		

Depression: The sleep deprived group ($M=20.3$, $SD=7.1$) reported significantly higher depression scores compared to the non-sleep deprived group ($M=13.8$, $SD=6.3$). The difference was statistically significant, $t(98) = 5.01$, $p < 0.001$, indicating that sleep deprived students showed greater symptoms of depression.

Anxiety: The sleep deprived group scored higher ($M=18.6$, $SD=6.8$), while the non-sleep deprived group scored significantly lower ($M=12.4$, $SD=5.7$) on anxiety. The difference was statistically significant, $t(98) = 4.97$, $p < 0.001$, suggesting higher anxiety levels among students with poor sleep quality.

Stress: The sleep deprived group ($M=22.1$, $SD=6.9$) reported significantly higher stress scores compared to the non-sleep deprived group ($M=16.2$, $SD=5.4$). The difference was statistically significant, $t(98) = 4.85$, $p < 0.001$, indicating that insufficient sleep is associated with elevated stress.

The results thus indicate statistically significant variations in stress, anxiety, and depression levels between sleep deprived and non-sleep deprived pupils. In all 3 areas, students who had poorer sleep quality were consistently more psychologically distressed.

The concept that sleep deprivation negatively impacts university students' mental health is supported by these studies. Therefore, the alternative hypothesis is highly supported and the null hypothesis is rejected.

4. Discussion

The aim of the present study was to assess the 'Effect of Sleep Deprivation on Mental Health among University Students' (23 to 27 years), further examining significant difference in mental health scores between the Sleep Deprived Group and Non Sleep Deprived Group.

Sleep Deprivation refers to a condition in which an individual doesn't get an adequate amount of sleep, or a good quality of sleep, or fails to obtain the amount of sleep that they need over a period of time. Sleep Deprivation can look like in a way that even after getting enough sleep, they are not getting quality sleep and waking up feeling tired.

According to the World Health Organization (WHO), a state of mental health allows people to reach their full potential, manage stress, work well, and give back to their communities. Additionally, it is defined as including social, psychological, and emotional well-being. In a nutshell it's the ability to control emotions, build deep connections, and carry out daily tasks with effectiveness.

Studies also indicates that there is a relationship between sleep deprivation and mental health. If a person is sleep deprived, he/she will be having difficulty with mental health. Consistent with the previous researches like a research conducted by Khir, S. M. et al. (2020) showed that students' mental health (stress, anxiety, and depression) and sleep deprivation are significantly positively correlated and a research conducted by Kumar, S. et al. (2023) showed that a significant positive correlation was found between anxiety, stress and psychological well-being and PSQI score. The study revealed higher levels of anxiety and stress in medical undergraduates who had poorer sleep quality and excessive daytime sleepiness. Also, students with poor quality of sleep had lower psychological general well-being.

The descriptive and inferential statistics were conducted to examine the relationship between sleep quality and mental health outcomes (depression, anxiety, and stress) among university students. Of the 100 university students who gave demographic information, participants were categorized into two groups, based on PSQI global scores, where sleep deprived group ($PSQI > 5$) i.e. $n = 58$ and non-sleep deprived group ($PSQI \leq 5$) i.e. $n = 42$.

The results thus indicate statistically significant variations in stress, anxiety, and depression levels between sleep deprived and non-sleep deprived pupils.

A statistically significant difference between sleep deprivation scores and mental health status is indicated by the current study's p value (0.001), which is less than the significance level of 0.05. The poor sleep quality was consistently associated with higher psychological distress across students in all 3 dimensions.

The concept that sleep deprivation negatively impacts university students' mental health is supported by these studies. Therefore, the alternative hypothesis is highly supported and the null hypothesis is rejected.

The impact of inadequate sleep on mental health may be made worse by the particular stressors that university students may experience, such as financial worries, social pressures, and academic pressure. It's possible that students who are already sleep deprived lack the inner strength necessary to handle these difficulties.

5. Conclusion

Overall, this study highlights the significant association between sleep deprivation and mental health difficulties among university students.

According to their DASS-21 ratings, students who had higher levels of stress, anxiety, and depression also had lower sleep quality as determined by the PSQI. An association between mental health and sleep deprivation has been shown.

The results highlight the significance of encouraging sound sleeping practices as a fundamental element of university campus mental health interventions. The psychological burden brought on by inadequate sleep may be lessened if students have access to stress management classes, sleep instruction, and mental health support services.

With p values less than the significance level of 0.05 for both groups and dimensions, the current study's results demonstrated a statistically significant relationship between sleep deprivation and mental health, rejecting the null hypothesis and supporting the alternative hypothesis.

Future studies should examine potential moderating factors including academic workload, lifestyle choices, or social support, as well as evaluate causation using longitudinal designs. Further understanding of the lived experiences and coping mechanisms of students who are sleep deprived may also be possible through qualitative research.

In conclusion, improving sleep quality among university students may be a valuable target for enhancing mental health and academic success.

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