

To Investigate the Association between Sleep Quality and Mental Health among Students of the University of Hyderabad: A Cross-Sectional Study

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Abstract:-

➤ Introduction:

Sleep is vital for various brain functions and overall well-being, yet its biological purpose remains elusive. Sleep disorders are prevalent, particularly among university students, impacting academic success and emotional well-being. This study explores the relationship between sleep quality and mental health among University of Hyderabad students, aiming to inform interventions for improved well-being and academic success.

➤ Methods:

The study was conducted at the University of Hyderabad campus in Telangana, India, from February 1st, 2024, to March 31st, 2024. Employing a cross-sectional design, data collection involved administering validated questionnaires to assess sleep quality and mental health among students. The sample size was determined using the formula $n = z^2 * p * q / d^2$, with a confidence level of 95% and a margin of error of 6%, resulting in 267 participants. Three validated questionnaires were utilized: the DASS-21, PSQI, and PHQ-9. Convenient sampling ensured representation from both male and female students.

➤ Results:

The mean PSQI score was 6.52 ± 2.75 , indicating variability in sleep quality. The mean anxiety score was approximately 9.77, with a significant proportion experiencing moderate to severe anxiety. Significant associations were observed between poor sleep quality and higher anxiety levels. Prevalence of depression varied, with 71.43% experiencing mild depression, 41.35% moderate, 22.18% moderately severe, and 12.41% severe depression. Loneliness was significantly correlated with moderate to severe depression. Students living with roommates were more likely to experience sleep disturbances.

➤ Conclusion:

The study highlights the complex relationship between sleep quality, anxiety, and mental health outcomes among University of Hyderabad students. Tailored interventions are necessary to address these challenges comprehensively, emphasizing a holistic

approach to support student well-being and academic success.

Keywords:- Mental Health, Sleep Quality, Anxiety, Stress, Depression

I. INTRODUCTION

Sleep plays a vital role in cognitive function, emotional regulation and overall well-being. Sleep affects the quality of life and health, which is also perceived as an important variable (Engin E et al., 2004). Poor sleep quality, especially among University students, has been linked to increased risks of mental health issues such as anxiety, depression and stress. In 2019, 1 in every 8 people, or 970 million people around the world were living with a mental disorder, with anxiety and depressive disorders the most common. Sleep quality and psychological wellbeing, more psychological diseases are observed among university students with low sleep quality (Liu et al., 2008). This study aims to explore the association between sleep quality and mental health among students at the University of Hyderabad, focusing on anxiety, depression, and stress levels.

II. METHODS

A. Study Design and Population

A cross-sectional study was conducted from February to March, 2024 among students who were enrolled at the University of Hyderabad. A total of 267 students were recruited using convenient sampling. All students across different academic programs were included.

B. Inclusion Criteria:

- The participants must be currently enrolled students at the University of Hyderabad
- Participants should provide informed consent to voluntarily participate in the study.
- Participants should not have a known history of diagnosed sleep disorders or medical conditions that significantly affect sleep patterns.
- Participants should not have a current diagnosis of any severe mental health disorder that could significantly confound the study results.

C. Exclusion Criteria:

- Participants with a known history of diagnosed sleep disorders or medical conditions that significantly affect sleep patterns.
- Participants with a current diagnosis of severe mental health disorders.
- Participants who provide incomplete or inaccurate data in the survey responses may be excluded from the final analysis.

D. Data Collection Instruments

➤ Pittsburgh Sleep Quality Index (PSQI)

The Pittsburgh Sleep Quality Index (PSQI) 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. Clinical and clinimetric properties of the PSQI were assessed over an 18-month period with "good" sleepers (healthy subjects, $n = 52$) and "poor" sleepers (depressed patients, $n = 54$; sleep-disorder patients, $n = 62$). Acceptable measures of internal homogeneity, consistency (test-retest reliability), and validity were obtained. A global PSQI score greater than 5 yielded a diagnostic sensitivity of 89.6% and specificity of 86.5% ($\kappa = 0.75$, p less than 0.001) in distinguishing good and poor sleepers. The clinimetric and clinical properties of the PSQI suggest its utility both in psychiatric clinical practice and research activities. (Buysse et al., 1989).

➤ Depression Anxiety Stress -21 (DASS-21)

Lovibond and Lovibond developed the DASS questionnaire to assess key symptoms of depression, anxiety, and stress and it also has been used to evaluate patient reaction to treatment. The questionnaire has been proven to have adequate psychometric properties and is equivalent to other accurate scales. The DASS-21 is the short form and findings from studies support its validity as an approved instrument for measuring adverse mental states and depression, anxiety, and stress in adults (patients and non-patients). The 21 items on the questionnaire comprise a set of 3 self-reported scales designed to assess DASS. The 7 elements on the scales are graded on a Likert scale from 0 to 3 (0: "Did not apply to me at all," 1: "Applied to me to some degree or some of the time," 2: "Applied to me to a considerable degree or a good part of the time," and 3: "Applied to me very much or most of the time"). Depression, anxiety, and stress scores are measured by summarizing the scores of the related items. Because the DASS-21 is a shorter version of the 42-item original DASS, the score for each subscale must be multiplied by 2 to calculate the final score. According to the manual, the resulting ratings then are classified as: "normal, mild, moderate, severe, or extremely severe" (Marijanović et al., 2021).

➤ Patient Health Questionnaire -9 (PHQ-9)

The PHQ-9 is the 9-item depression module from the full PHQ. Major depression is diagnosed if 5 or more of the 9 depressive symptom criteria have been present at least "more than half the days" in the past 2 weeks, and 1 of the symptoms is depressed mood or anhedonia. Other depression is diagnosed if 2, 3, or 4 depressive symptoms have been present at least "more than half the days" in the past 2 weeks, and 1 of the symptoms is depressed mood or anhedonia. One of the 9 symptom criteria ("thoughts that you would be better off dead or of hurting yourself in some way") counts if present at all, regardless of duration. As with the original PRIME-MD, before making a final diagnosis, the clinician is expected to rule out physical causes of depression, normal bereavement, and history of a manic episode. As a severity measure, the PHQ-9 score can range from 0 to 27, since each of the 9 items can be scored from 0 (not at all) to 3 (nearly every day). An item was also added to the end of the diagnostic portion of the PHQ-9 asking patients who checked off any problems on the questionnaire: "How difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?" (Spitzer, 1999)

E. Statistical Analysis

Data was analysed using Excel 2021 and IBM® SPSS® software (Free Trial Version). Chi-Square tests was employed to assess the relationship between sleep quality and mental health outcomes. A p -value of <0.05 was considered statistically significant.

III. RESULTS

A. Demographics:

Of the 267 total participants, 99 were female (37.1%), 167 were male (62.5%), and one (0.4%) individual chose not to disclose their identity distributed across Bachelor's, Master's and Doctoral programs.

B. Sleep Quality:

Based on the Global PSQI score data provided, the sleep quality of students at the University of Hyderabad appears to be moderately average, with a mean score of 6.52. This suggests that, on average, students experience a moderate level of sleep disturbance across various components assessed by the PSQI. However, there is notable variability in sleep quality among students, as indicated by a standard deviation of approximately 2.75. The distribution of scores is slightly right-skewed with moderately heavy tails, implying that while most students may have moderate sleep quality, there are outliers with either notably poor or exceptionally good sleep quality.

Table 1: Mental Health Outcomes

Serial No.	Anxiety	Female	Male	Total
1	Normal	45(45.4%)	79(47.3%)	124(46.4%)
2	Mild	8(8.0%)	19(11.3%)	27(10.1%)
3	Moderate	20(20.2%)	37(22.1%)	57(21.3%)
4	Severe	9(9.0%)	10(6.0%)	19(7.1%)
5	Extremely Severe	17(17.1%)	22(13.1%)	39(14.6%)
	Grand Total	99	167	266(99.8%)
Serial No.	Depression (PHQ-9)	Female	Male	Total
1	Minimal Depression	28(28.2%)	51(30.5%)	79(29.6%)
2	Mild Depression	33(33.3%)	54(32.3%)	87(32.7%)
3	Moderate Depression	19(19.1%)	36(21.5%)	55(20.6%)
4	Moderately Severe Depression	11(11.1%)	18(10.7%)	29(10.9%)
5	Severe Depression	8(8.0%)	8(4.7%)	16(6.0%)
		99	167	266

C. Relationship Between Sleep Quality and Anxiety Levels

The crosstabulation of sleep quality and anxiety levels reveals significant findings. Participants were divided into two categories: "Good Sleepers" and "Poor Sleepers," and their anxiety levels were assessed from "Normal" to "Extremely Severe." The results indicate that most good sleepers exhibited normal anxiety levels, while poor sleepers showed a more varied distribution, with a significant number falling into higher anxiety categories, including "Extremely Severe" and "Severe." A chi-square test confirmed a statistically significant association between sleep quality and anxiety levels ($p < 0.05$), suggesting that poorer sleep is linked to increased anxiety.

D. Association Between Gender and Sleep Quality

The crosstabulation between gender and sleep quality showed that of the 99 female participants, 30 were good sleepers and 69 were poor sleepers. Among the 167 male participants, 73 were good sleepers and 94 were poor sleepers. The chi-square test yielded a value of 4.710 with a significance level of 0.030, indicating a statistically significant association between gender and sleep quality. This suggests that sleep quality differs significantly between males and females, with females showing a higher proportion of poor sleepers.

E. Association Between Gender and Depression Severity

Depression severity, categorized as "Normal," "Mild," "Moderate," "Severe," and "Extremely Severe," was examined across genders. Female participants displayed a more balanced distribution across the severity levels, while male participants exhibited higher counts in the "Moderate" and "Normal" categories. However, the chi-square test ($\chi^2 = 5.386$, $p = 0.250$) indicated no significant association between gender and depression severity, suggesting that depression levels were not influenced by gender.

F. Association Between Gender and Anxiety Levels

Anxiety levels were also compared across gender, but no significant differences were observed. Both male and female participants showed similar distributions across anxiety severity levels. The chi-square test ($\chi^2 = 2.337$, $p =$

0.674) confirmed no statistically significant association between gender and anxiety, indicating that gender was not a predictor of anxiety severity in this sample.

G. Association Between Gender and Stress Levels

Similarly, stress levels were assessed across genders. While males and females exhibited varying counts across stress categories, the chi-square test ($\chi^2 = 3.846$, $p = 0.427$) showed no significant association between gender and stress levels. Therefore, gender does not appear to be a significant factor in predicting stress severity.

H. Association Between Loneliness and Depression

A strong relationship was identified between feelings of loneliness and depression severity among University of Hyderabad students. The chi-square test ($\chi^2 = 126.921$, $p < 0.001$) indicated a statistically significant association between these variables, with students reporting frequent loneliness more likely to experience moderate to severe depression. This suggests a dose-response relationship, where increasing loneliness correlates with higher levels of depression.

I. Association Between Living Conditions and Sleep Quality

Living conditions were significantly associated with sleep quality ($p = 0.039$). Students living with roommates had the highest proportion of poor sleepers (101 out of 180), compared to those living alone (35 out of 50) or with family (27 out of 36). This suggests that living with roommates may contribute to sleep disturbances.

J. Prevalence of Depression (PHQ-9)

The prevalence of depression severity, based on PHQ-9 scores, showed that 71.43% of students experienced mild depression. A considerable proportion (41.35%) fell into the moderate depression category, while 22.18% reported moderately severe depression. Severe depression was noted in 12.41% of students, indicating the need for targeted mental health interventions within this population.

IV. DISCUSSION

Research conducted at King Saud Bin Abdul Aziz University for Health Sciences found strong positive correlations between lower sleep quality and higher levels of depression, stress, and anxiety.(Al-Khani et al., 2019) Current study in University of Hyderabad also observed a moderate level of sleep disturbance with a mean PSQI score of 6.52 ± 2.75 . Moreover, it was found that individuals with poor sleep quality are more likely to experience higher levels of anxiety, indicated by a mean anxiety score of 9.77.

In previous study findings showed that female students showed significantly higher scores in psychological distress, anxiety, stress scores and sleep quality, as compared to male students (Vuelas-Olmos et al., 2022). In current study no significant association between gender and depression, anxiety, or stress levels.

The article "Social Network and Mental Health Among Older Adults in Rural Uttar Pradesh, India: A Cross-Sectional Study" provides significant insights into the intricate relationship between social networks and mental health among older adults in rural India. (Singh et al., 2016)

In a similar study investigating sleep quality and psychological factors among Health Professions students or the correlation between adolescent mental health and sleep quality during the COVID-19 pandemic in Indonesian rural areas. (Moeis et al., 2023)

These studies collectively highlight the multifaceted nature of mental health determinants, emphasizing the pivotal role of social connections, physical activity, and sleep quality in shaping mental well-being across diverse demographic groups. While the findings underscore the importance of addressing sleep disturbances and psychological issues to promote overall well-being, they also reveal the complexity of these relationships and the need for nuanced interventions tailored to specific populations and contextual factors. Moreover, the limitations identified in these studies, such as cross-sectional designs and reliance on self-reported data, underscore the necessity for robust longitudinal research methodologies to establish causal relationships and inform targeted interventions effectively. Overall, these discussions contribute to a deeper understanding of the interplay between social, environmental, and individual factors in shaping mental health outcomes, underscoring the imperative of comprehensive approaches to promote mental well-being across diverse populations. In this study, the analysis of sleep quality distribution based on the Pittsburgh Sleep Quality Index (PSQI) reveals a significant association between gender and sleep quality, indicating potential gender-specific factors influencing sleep outcomes. However, the study finds no statistically significant association between gender and depression severity levels, as measured by the PHQ-9 scale, suggesting that other factors may play a more prominent role in determining mental health outcomes. In summary, the study's findings offer valuable insights into the complex interplay of demographic factors, sleep habits, and mental health among University of Hyderabad students. By

understanding these intricacies, public health practitioners can develop targeted interventions and create supportive environments that promote holistic well-being and student success.

➤ Limitations:

- Some participants were reluctant to spend 35 minutes filling out the questionnaire due to its length.
- The University of Hyderabad students as a study sample across multiple research projects this year have contributed to participant disinterest, affecting the overall engagement and representation in this study.

V. CONCLUSION

Based on the comprehensive assessment conducted on the sleep quality, anxiety levels, and mental health outcomes among students at the University of Hyderabad, a deeper understanding of the challenges they face emerges. Sleep quality among students appears to be moderately average, with a mean PSQI score of 6.52, suggesting a moderate level of sleep disturbance. However, this moderate average masks significant variability among students, as indicated by a standard deviation of approximately 2.75. This variability implies that while some students may experience relatively undisturbed sleep, others grapple with more severe sleep disturbances. Particularly noteworthy is the influence of living conditions on sleep quality, with students sharing accommodation with roommates reporting a higher prevalence of poor sleep quality compared to those living alone or with family members. Anxiety levels among students also present a complex picture. The mean anxiety score of approximately 9.77 indicates a prevalent experience of anxiety, with a wide range of reported levels. While some students report minimal anxiety, a significant proportion faces moderate to severe anxiety, suggesting varying degrees of psychological distress within the student population. This variability underscores the need for tailored interventions to address individual needs effectively. The association between sleep quality and anxiety levels further highlights the intricate interplay between these factors. Statistically significant findings indicate that individuals with poor sleep quality are more likely to experience higher levels of anxiety, emphasizing the importance of addressing both sleep disturbances and anxiety in promoting overall well-being. Mental health outcomes among University of Hyderabad students reveal a concerning prevalence of depression. The majority of students report experiencing mild depression (71.43%), with significant proportions also falling into the categories of moderate

(41.35%) and moderately severe (22.18%) depression. Additionally, a notable subset of students faces severe depression (12.41%), indicating a considerable proportion grappling with significant emotional distress that may impact their academic performance and overall quality of life. The observed association between feelings of loneliness and depression further underscores the complex nature of mental health challenges among students. Students reporting frequent feelings of loneliness tend to have higher counts in

the moderate to severe depression categories, highlighting the importance of addressing social connectedness and support networks as part of mental health initiatives. In conclusion, these findings provide valuable insights into the multifaceted nature of sleep quality, anxiety, and mental health outcomes among University of Hyderabad students. Effective interventions should adopt a holistic approach that considers environmental, social, and psychological factors to promote overall well-being within the university community. By prioritizing mental health resources and support services, the university can create a nurturing environment that fosters resilience and empowers students to thrive academically and personally.

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