

Exploring the Role of Gender and Age as Determinants of Sleep Quality among
University Students: A Cross-Sectional Investigation

Sarah Mufti

sarah.mufti@uog.edu.pk

Department of Psychology, University of Gujrat, Hafiz Hayat Campus, Jalapur Jattan Road, Gujrat, Pakistan

Isha Kousar

Department of Psychology, University of Gujrat, Hafiz Hayat Campus, Jalapur Jattan Road, Gujrat, Pakistan

Namra Shahzadi

Department of Psychology, University of Gujrat, Hafiz Hayat Campus, Jalapur Jattan Road, Gujrat, Pakistan

Corresponding Author: Sarah Mufti sarah.mufti@uog.edu.pk

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ABSTRACT

University students are among those that are commonly identified as being at high risk of poor sleep quality, yet sleep is a key determinant for cognitive, emotional and physical health. The study explored poor sleep quality among university students and determined if sleep quality was related to gender and age. Sample consisted of 285 male and 149 female university students, between the ages of 18 and 26 years, completed a Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989) as well as a demographic information sheet. Results showed that the vast majority (74.2%) showed severe sleep disturbance, 20.7% had mild sleep disturbance and only 5.1% had good sleep quality. The chi-square test of independence indicated that there was no statistically significant relationship between gender and sleep quality category. However, a statistically significant relationship was found between age group and sleep quality with severe sleep disturbance scores being highest in the 24-26 year old age group. The results highlight the ubiquity of poor sleep in university students and indicate that it may be more important to consider age-related academic and psychosocial demands than gender as a stand-alone factor in defining poor sleep among university students. Possible implications for school-based sleep health screening and intervention are discussed.

Keywords: Pittsburgh Sleep Quality Index (PSQI), sleep quality, university students, gender, age, young adults.

INTRODUCTION

Sleep is a physiological need that has a foundation across nearly all aspects of human functioning, including memory consolidation, emotional control, immune function, and academic performance (Schmickler et al., 2023). Matriculation in university is one of the many transitions that accompany early adulthood, which are often characterized by poor sleep habits related to busy schedules, increased independence in daily living, social and extra-curricular commitments and for many students, much later than usual use of screens and digital devices. University students are therefore one of the most susceptible population groups for sleep problems (De Moraes et al., 2024).

This vulnerability is supported by empirical evidence from all over the world. According to the study by Angelillo et al. (2024), in a cross-sectional study of university students in Italy, 88% of the male and 94.5% of the female participants had Pittsburgh Sleep Quality Index (PSQI) scores suggestive of poor sleep, with a mean global PSQI score of 9.2. Similarly, in a large sample of university students in Germany, Schmickler et al. (2023) determined that nearly half (48.7%) met the PSQI cut-off for poor sleep quality and older age, lower subjective social status, poorer self-rated health, stress and exhaustion were found to be significant correlates. Ghafoor et al. (2025) found that 80.3% of medical students of a Pakistani university satisfied the PSQI criteria for poor sleep and reported that academic

stress was significantly associated with sleep quality. These results place the issue of poor sleep not in isolation, but as a near-expected occurrence among today's university populations.

In addition to reporting prevalence, there has been an increasing interest in the sociodemographic correlates of sleep quality, and gender and age have been of special interest. However, the gender-sleep quality connection is not clear-cut. Other researchers, such as Fatima et al. (2016), however, observed that poor sleep quality was significantly more prevalent among young women compared with young men after controlling for depression, SES, and lifestyle factors, suggesting that perhaps biological rather than psychosocial pathways may explain this. Other studies, however, have not repeated a significant gender effect, indicating that the link between gender and sleep quality may vary across different cultures or contexts. Age has also been reported as a factor determining the quality of sleep in young adults; some studies report that as students advance through their degree programs, sleep problems worsen, possibly due to the cumulative stress of academic deadlines, concerns about the prospect of entering the workforce, and, in some settings, increased family or financial obligations (Schmickler et al., 2023).

While a large amount of literature exists internationally, relatively little work has been done to systematically screen for sleep disturbance and examine sociodemographic correlates of sleep disturbance among South Asian university populations with standardized and validated psychometric instruments. This is because the impact of poor sleep on student's academic performance, mental health, and long-term physical health is well documented, and a better understanding of the extent of the issue, and the groups most affected, is needed to inform the design of effective and targeted, university-based interventions. The present study was, therefore, designed to screen for sleep disorders in the University students, find out the prevalence of poor sleep quality among the students of the University, gender, age and their association with sleep quality.

METHOD

Objectives of the study

The objectives of the present study were to

- Screen for sleep disorders in young adults in the age group of university students.
- To determine the extent of poor sleep quality among university students.
- To investigate gender association with sleep quality.
- To find out the association of age with sleep quality

Sample

The sample of the study consisted on 434 young adults ranging from 18-26 years of age. There were 285 male university students and 149 female students. The students were between 18 and 26 years old. Convenient sampling techniques was used and only those participants were selected who were willing to take part in the study. Complete confidentiality was assured. After that participants fill out demographic sheet and Pittsburgh Sleep Quality Index (PSQI).

Research Instrument

The following standardized psychological instrument was used for data collection.

Pittsburgh Sleep Quality Index (PSQI)

Sleep quality was measured using the Pittsburgh Sleep Quality Index also known as PSQI (Buysse et al., 1989). The PSQI is used form that people fill out to report their sleep quality and problems over the month. The form has 19 questions that look at parts of sleep. It works well for people of all ages. The PSQI gives us a score that goes from 0 to 21. Lower score means better sleep quality while higher score means poor sleep quality.

Scoring of Internet Addiction Test (IAT)

Procedure

Participants were approached after getting permission from the university authorities. Before the start of data collection, informed consent were signed by all the participants. Before we started collecting data we got permission from the university. After that they filled out the questionnaires.

Ethical Considerations

The present study followed the rules and guidelines set by the American Psychological Association in 2020.

Before joining the study participant's agreed to participate. Participants were assured that their answers would be kept secret and anonymous. The researcher made sure that the collected data were only used for research purposes. The researcher took care to respect participants' dignity, privacy and well-being, throughout the study (APA, 2020).

RESULTS

Table 1: Descriptive analysis of data (N=150)

Sample Characteristics	<i>f(n)</i>	%
Gender		
Male	285	65
Female	149	34
Family System		
Nuclear	260	59
Joint	174	40
AGE		
18-20	219	50
21-23	84	42
24-26	31	7
Institution status		
Government	317	73
private	117	27

The table above showed the demographic characteristics of the study participants.

TABLE 2: Frequency and percentage distribution of sleep quality among young adult

Sample Characteristics	<i>f(n)</i>	%
Good sleep quality	22	5.1
Mild sleep disturbance	90	20
Poor sleep quality	322	74
Total	434	100

A frequency analysis was conducted to examine sleep quality among young adults using the Pittsburgh Sleep Quality Index (PSQI). Results indicated that the majority of participants experienced poor sleep quality. Additionally, 90 participants (20.7%) reported mild sleep disturbance, while only 22 participants (5.1%) demonstrated good sleep quality.

Table 3: Association between gender and PSQI

<i>Variable</i>	<i>MALE N (%)</i>	<i>FEMALE N (%)</i>	<i>x²</i>	<i>p</i>
			4.20	.122
Mild sleep disturbance	10(2.3%)	12(2.8%)		
Moderate sleep disturbance	60(13.8%)	30(6.9%)		
Severe sleep disturbance	215(49.5%)	107(24.7%)		

A Chi-square test of independence was conducted to examine the association between gender and levels of sleep quality measured using the Pittsburgh Sleep Quality Index (PSQI). The results indicated that the association between gender and PSQI categories was not statistically significant, $X^2(2, N = 434) = 4.20, p = .122$. These findings suggest that sleep quality was not associated with gender.

Table 4: Association between Age and PSQI

	<i>18-20 N (%)</i>	<i>21-23 N (%)</i>	<i>24-26 N (%)</i>		
<i>Variable</i>				<i>x²</i>	<i>p</i>
				14.07	.007
<i>Mild sleep disturbance</i>	16(3.7%)	6(1.4%)	0(0%)		
<i>Moderate sleep disturbance</i>	55(12.7%)	33(7.6%)	2(0.5%)		
<i>Severe sleep disturbance</i>	148(34.1%)	145(33.4%)	29(6.7%)		

Chi-Square test was applied to calculate the association between age groups and PSQI categories among young adults. A chi-square test of association indicated a statistically significant association between age and sleep quality categories. Participants aged 24–26 years showed a higher proportion of severe sleep disturbance compared to the younger age groups. Therefore, age was significantly associated with sleep quality in the present study.

DISCUSSION

The aim of the present study was to screen for sleep disorders in university students, to estimate the level of sleep quality in this population, and to explore the relationship between sleep quality and gender and age. As predicted from the broader literature, the results showed a very high level of sleep disturbance: almost three-quarters of the sample (74.2%) fulfilled criteria for severe sleep disturbance; and only a small minority (5.1%) had a good sleep quality. This prevalence is similar to recent findings on Pakistani university samples where 80.3% of medical students were found to meet the PSQI criteria of poor sleep, and similar to the international evidence that showed poor sleep quality is common among university students when compared with the general adult population (Angelillo et al., 2024; Schmickler et al., 2023). The similarities in these results from culturally and geographically diverse samples suggest that the patterns of poor sleep quality may be related more to a set of

stressors (heavy workload, irregular schedules, widespread electronic device engagement) shared by this generation of university students than to a specific, culturally specific cause.

Gender was not significantly associated with sleep quality as found in earlier studies. The result is different from Fatima et al. (2016) who found strong evidence of a female disadvantage in sleep quality among a large sample of young adults after statistically controlling for depression and lifestyle factors. There could be a few reasons for this difference. First, the present sample was disproportionately male which may have restricted statistical power to detect a modest gender effect and may preclude the drawing of firm conclusions about the true population association. Second, psychosocial and cultural factors (such as household roles and organization, living arrangements, and gendered expectations regarding academic and household tasks) may also differ across the gender groups and/or have differential impact within the present sociocultural context compared with other sociocultural settings (Australia, Europe, and North America) where the majority of the existing gender-and-sleep literature originates. Taken together, these results indicate that the gender-sleep quality relationship might not be consistent across all samples and might vary with the demographic makeup and cultural context of the sample being studied.

Contrary to the null finding for gender, age group was significantly associated with sleep quality, with a much greater proportion of severe sleep disturbance found for age group 24-26 years than for other age groups. This trend mirrors the findings of Schmickler et al. (2023), who found that older age was a key factor influencing poor sleep quality in university students, and is likely due to the increased academic, financial and career burden that tends to increase as students near the end of their degree program. Older students might also have other duties away from the university (e.g., part-time work, family responsibilities, and/or sitting for postgraduate exams) that could further affect sleep quality. It is important to note, however, that the very oldest age category in the present sample (24-26 years) included a relatively modest number of respondents ($n = 31$) and that this imbalance does not warrant undue caution with regard to the magnitude of the association but does indicate a level of caution in regard to directionality.

These results have educational implications for university administrators and mental health professionals. As poor sleep quality was not only found in one demographic subgroup of the sample, but across the entire sample, narrow-based sleep-health interventions targeting sleep quality may not be necessary, and instead interventions that are universal may be warranted. These may include introducing sleep hygiene education into student orientation programs, introducing institutional policies to reduce late night academic demand, and establishing campus based counselling services that are able to detect sleep disturbance. However, the large age effect also indicates that there may be a group of students that is especially at risk, and warrants extra attention and increased intervention efforts closer to graduation.

There are a number of restrictions within this research that must be recognised. First, this cross-sectional design does not allow for any causal inferences as to the relationship between age, gender and sleep quality. Secondly, using a convenience sample and also a self-selected and gender-balanced sample restricts the generalizability of results to the larger university student body. Third, sleep quality was only measured by self-report, which has the potential for recall bias and social desirability effects that could be reduced through the use of objective measures (e.g., actigraphy) in subsequent studies. Last, several potentially important modifying and/or mediating factors were not evaluated in the present study, including academic year, field of study, psychological distress and lifestyle factors such as caffeine intake and screen time use. To corroborate and extend these preliminary findings, future studies using probability sampling, longitudinal designs and a richer array of psychosocial covariates are required.

CONCLUSION

The present study revealed that there was a high prevalence of poor sleep quality among the university students, in which almost 75% of the students in the sample group were found to have poor sleep quality. Although sleep quality showed no significant association with gender, it was significantly associated with age, with the older students showing more sleep disturbance. The results point to the need for more sleep-health screening and intervention programs at the university level accessible to all students but especially those in their later years of study. Future studies on the factors that affect sleep quality in university students are still needed to ensure their learning effectiveness and future well-being.

REFERENCES

- American Psychological Association. (2017). *Ethical principles of psychologists and code of conduct* (2002, amended effective June 1, 2010, and January 1, 2017). <https://www.apa.org/ethics/code/>
- Angelillo, S., Sansone, V., Paduano, G., Lateano, L., Di Giuseppe, G., & Nobile, C. G. A. (2024). The quality of sleep: Evaluation among university students. *Frontiers in Public Health*, 11, Article 1270426. <https://doi.org/10.3389/fpubh.2023.1270426>
- Buysse, D. J., Reynolds, C. F., III, Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research*, 28(2), 193–213. [https://doi.org/10.1016/0165-1781\(89\)90047-4](https://doi.org/10.1016/0165-1781(89)90047-4)
- De Moraes, A. C. F., Conceição da Silva, L. C., Lima, B. S., Marin, K. A., Hunt, E. T., & Nascimento-Ferreira, M. V. (2024). Reliability and validity of the online Pittsburgh Sleep Quality Index in college students from low-income regions. *Frontiers in Digital Health*, 6, Article 1394901. <https://doi.org/10.3389/fdgth.2024.1394901>
- Fatima, Y., Doi, S. A. R., Najman, J. M., & Al Mamun, A. (2016). Exploring gender difference in sleep quality of young adults: Findings from a large population study. *Clinical Medicine & Research*, 14(3–4), 138–144. <https://doi.org/10.3121/cmr.2016.1338>
- Ghafoor, A., Abaid, M., Ali, A., Iqbal, F., Tariq, M., & Suleman, A. (2025). Impact of academic stress on sleep patterns among medical students of Army Medical College, Rawalpindi, Pakistan. *Pakistan Armed Forces Medical Journal*, 75(2), 394–398. <https://doi.org/10.51253/pafmj.v75i2.12552>
- Schmickler, J. M., Blaschke, S., Robbins, R., & Mess, F. (2023). Determinants of sleep quality: A cross-sectional study in university students. *International Journal of Environmental Research and Public Health*, 20(3), Article 2019. <https://doi.org/10.3390/ijerph20032019>