The Impact of Sleep Patterns on Mental Health Outcomes Among Tertiary Students in Ghana: A Correlational Study

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Abstract

Sleep is essential for emotional and mental well-being, yet its influence on university students in Ghana remains underexplored. This study examined how variations in sleep duration and sleep quality relate to stress, anxiety, and depression among tertiary students. A total of 1,000 students from various academic disciplines and year groups participated by completing a questionnaire that assessed their sleep habits and mental health using standard instruments such as the PHQ-9, GAD-7, and the Perceived Stress Scale. The average sleep duration reported was 6.8 hours per night, which falls short of the recommended amount. Many students also indicated moderate sleep quality. The results showed clear associations between inadequate or poor-quality sleep and higher levels of psychological distress. Students who slept fewer hours or experienced disturbed sleep were more likely to report elevated symptoms of stress, anxiety, and depression. These effects were more pronounced among female students, first-year students, and those enrolled in demanding academic programs such as Science and Engineering. The findings emphasize the need for student-focused interventions and campus policies that promote healthy sleep habits. Improving sleep could serve as a practical step toward enhancing mental health and overall academic performance among university students in Ghana.

Introduction

The importance of sleep in maintaining mental health is widely recognized, yet its effects on the mental health of tertiary students remain underexplored in the Ghanaian context. Sleep plays a crucial role in regulating cognitive functioning, mood stability, and emotional well-being (Walker, 2017). However, with the increasing academic demands and social pressures faced by university students, sleep deprivation has become a significant concern (Becker et al., 2018). In Ghana, where tertiary education has seen an upsurge in enrollment, the impact of disrupted sleep patterns on students' mental health has not been sufficiently examined.

Research has consistently demonstrated the link between sleep disturbances and mental health outcomes, with sleep deprivation being associated with higher levels of stress, anxiety, and depression (Alfano & Beidel, 2006; Harvey, 2008). Despite this growing body of evidence globally, there is a gap in studies specifically targeting tertiary students in Ghana, where unique socio-cultural and

academic factors may influence students' sleep habits and mental health. This study, therefore, aims to investigate the correlation between sleep patterns and mental health outcomes among tertiary students in Ghana. Specifically, it seeks to explore how variations in sleep duration, quality, and timing affect students' levels of stress, anxiety, depression, and overall mental health. Understanding this relationship is essential, as it can inform institutional policies, mental health interventions, and student wellness programs aimed at enhancing both academic performance and personal well-being (National Sleep Foundation, 2020).

Methodology

This study employed a quantitative, cross-sectional design to explore the correlation between sleep patterns and mental health outcomes among tertiary students in Ghana. A cross-sectional survey design was chosen due to its ability to provide a snapshot of relationships between variables at a specific point in time, allowing for efficient data collection from a large sample (Creswell, 2014). The methodology section includes information on the participants, data collection instruments, sampling procedures, and data analysis techniques, with relevant citations for each component.

Participants

The study sample consisted of 1,000 tertiary students drawn from universities across Ghana. Participants were selected using stratified random sampling to ensure adequate representation of various academic disciplines, year groups, and socio-economic

backgrounds. Stratified sampling is a robust method for ensuring diversity within the sample and minimizing bias (Creswell, 2014). The demographic breakdown of the participants is provided in Table 1.

The sample was composed of 480 male students (48%) and 520 female students (52%), with the majority (65%) in the 18-21 age range. In terms of academic disciplines, 40% were enrolled in Science and Engineering programs, 30% in Social Sciences, 20% in Arts and Humanities, and 10% in Business and Economics. The year groups of students were as follows: 35% were first-year students, 30% second-year students, 20% third-year students, and 15% final-year students. This demographic composition provided a diverse sample representative of the student population across various fields and stages of academic life.

Data Collection Instruments

The primary data collection instrument for this study was a self-administered questionnaire designed to assess both sleep patterns and mental health outcomes among the participants. The questionnaire was divided into two main sections: (1) sleep patterns and (2) mental health outcomes. The design of the questionnaire was based on existing, validated measures commonly used in sleep and mental health research.

1. **Sleep Patterns**: Sleep duration, quality, and disturbances were measured using a combination of self-reported items adapted from existing sleep scales. Sleep duration was assessed by asking participants to

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report the average number of hours they slept per night. Sleep quality was measured on a 1-5 Likert scale (1 = very poor, 5 = very good), based on subjective sleep satisfaction (Pillai & Mukhopadhyay, 2017). Additionally, students were asked about sleep disturbances such as trouble falling asleep and frequent awakenings, based on common indicators of sleep disruption (Buysse et al., 2008).

2. **Mental Health Outcomes**: Mental health was assessed using standardized scales. Stress levels were measured using the Perceived Stress Scale (PSS), developed by Cohen et al. (1983). This scale includes 10 items designed to measure how unpredictable, uncontrollable, and overloaded participants find their lives. Anxiety was measured using the Generalized Anxiety Disorder-7 (GAD-7) scale, which is a seven-item tool used to assess the severity of generalized anxiety disorder (Spitzer et al., 2006). Finally, depression was measured using the Patient Health Questionnaire-9 (PHQ-9), a widely used instrument to assess the severity of depressive symptoms (Kroenke et al., 2001).

The questionnaire was pre-tested with a small sample of 50 students to ensure clarity and relevance of the items. Minor adjustments were made based on feedback from the pre-test to improve the instrument's validity and reliability.

Sampling Procedure

Stratified random sampling was used to select participants for this study. In stratified sampling, the population is first divided into subgroups or strata that share a common characteristic, such as academic discipline or year of study. From each stratum, participants were randomly selected, ensuring that each subgroup was adequately represented in the final sample (Creswell, 2014). This sampling method was chosen to provide a diverse and representative sample of tertiary students across the various academic disciplines and year groups.

The sampling frame included all tertiary students enrolled at universities in Ghana during the 2024/2025 academic year. After dividing the students into strata based on their year of study and academic discipline, a random selection was made from each stratum to ensure that the final sample accurately reflected the diversity of the student population.

Data Analysis

The data was analyzed using descriptive and inferential statistics to address the research questions. Descriptive statistics, including mean scores, standard deviations, and frequency distributions, were used to summarize the sleep patterns and mental health outcomes of the participants. This allowed for an overview of the participants' sleep habits and mental health statuses (Cohen & Wang, 2020).

To determine the relationships between sleep patterns and mental health outcomes, Pearson's correlation analysis was employed. Pearson's correlation was chosen because it is commonly used to assess the strength and direction of the linear relationship between two continuous variables (Cohen, 1988). This analysis allowed for the identification of significant associations between sleep duration, sleep quality, and mental health outcomes such as stress, anxiety, and depression.

Additionally, independent t-tests were conducted to examine potential differences in sleep patterns and mental health outcomes based on demographic variables such as gender, year of study, and academic discipline. This helped to determine whether specific subgroups exhibited significantly different sleep habits or mental health statuses (Field, 2013).

Ethical Considerations

Ethical approval for the study was obtained from the relevant university ethics committee before data collection. All participants were informed about the purpose of the study, and written informed consent was obtained from each participant. The confidentiality of participants' responses was maintained throughout the study, and all data was anonymized. Participants were also informed that they had the right to withdraw from the study at any time without penalty. To ensure participant well-being, information about available mental health resources was provided in case students experienced distress related to the survey content.

Results

The data collected from 1,000 tertiary students in Ghana was analyzed using both descriptive and inferential statistics. The analysis aimed to explore the relationship between sleep patterns and mental health outcomes, specifically focusing on stress, anxiety, and depression. The analysis was further segmented by demographic variables, such as age, gender, year of study, and academic discipline, to determine whether these factors influenced the relationship between sleep patterns and mental health outcomes.

Table 1: Demographic Variables of the Sample

Demographic Variable	Frequency (N = 1000)	Percentage (%)
Gender		
Male	480	48%
Female	520	52%
Age Group		
18-21	650	65%

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22-25	250	25%
26-30	100	10%
Year of Study		
First Year	350	35%
Second Year	300	30%
Third Year	200	20%
Final Year	150	15%
Academic Discipline		
Science and Engineering	400	40%
Social Sciences	300	30%
Arts and Humanities	200	20%
Business and Economics	100	10%

The sample was well-balanced in terms of gender, with 52% female and 48% male participants. A significant portion of the respondents (65%) were in the 18-21 age range, which is the typical age group for most tertiary students. In terms of academic discipline, the highest proportion of students were in Science and Engineering (40%), followed by Social Sciences (30%), Arts and Humanities (20%), and Business and Economics (10%). Most participants were in their first or second year of study, comprising 65% of the sample.

Table 2: Descriptive Statistics for Sleep Patterns and Mental Health Outcomes

Variable	Mean	Standard Deviation	Minimum	Maximum
Sleep Duration (hours)	6.8	1.5	3	9
Sleep Quality (1-5 scale)	3.2	1.1	1	5
Stress (PSS score)	21.5	5.3	8	34
Anxiety (GAD-7 score)	12.3	4.7	0	21
Depression (PHQ-9 score)	11.4	5.1	0	27

The mean sleep duration of the students was 6.8 hours, indicating a slightly inadequate amount of sleep compared to the recommended 7-9 hours. The mean sleep quality score was 3.2 out of 5,

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suggesting moderate sleep quality. The mental health outcomes reflected moderate levels of stress (mean PSS = 21.5), anxiety (mean GAD-7 = 12.3), and depression (mean PHQ-9 = 11.4).

Table 3: Pearson's Correlation Coefficients between Sleep Variables and Mental Health Outcomes

Variable	Stress (PSS)	Anxiety (GAD-7)	Depression (PHQ-9)
Sleep Duration	-0.32**	-0.29**	-0.27**
Sleep Quality	-0.41**	-0.38**	-0.35**

Note: p < 0.01

The results reveal significant negative correlations between both sleep duration and sleep quality with mental health outcomes. Specifically, shorter sleep duration was associated with higher levels of stress (r = -0.32), anxiety (r = -0.29), and depression (r = -0.27). Similarly, poorer sleep quality correlated with higher levels of stress (r = -0.41), anxiety (r = -0.38), and depression (r = -0.35). These findings indicate that both the quantity and quality of sleep play a crucial role in the mental health of students, with poorer sleep patterns contributing to heightened psychological distress.

Demographic Analysis

To examine whether demographic factors influenced the relationships between sleep patterns and mental health outcomes, the data was analyzed by gender, age group, year of study, and academic discipline.

1. **Gender**: Female students reported slightly lower sleep quality (mean = 3.0) compared to males (mean = 3.4), and also had higher mean scores for stress (22.3 vs. 20.5), anxiety (13.1 vs. 11.3), and depression (12.1 vs. 10.7). Correlation analysis within gender groups showed similar trends, with sleep quality being a stronger predictor of mental health outcomes for females than for males.

2. **Age Group**: The 18-21 age group exhibited the weakest correlations between sleep and mental health outcomes compared to older age groups (22-25 and 26-30), which showed stronger negative correlations. This suggests that older students may be more affected by sleep disturbances in terms of mental health than their younger counterparts, possibly due to additional responsibilities such as part-time work or family obligations.

3. **Year of Study**: First-year students showed the highest levels of stress (mean PSS = 23.0) and anxiety (mean GAD-7 = 13.5), with a strong negative correlation between sleep duration and mental health outcomes (r = -0.36). This indicates that freshmen, who may experience greater adjustment challenges, are particularly vulnerable to the effects of poor sleep on mental health.

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4. **Academic Discipline**: Students in Science and Engineering had the lowest sleep quality (mean = 3.0) and the highest levels of stress and anxiety, suggesting that the demands of these programs may lead to poorer sleep and worse mental health. In contrast, Business and Economics students reported the highest sleep quality (mean = 3.6), and their mental health outcomes were less affected by sleep patterns compared to students in other disciplines.

Discussion

The findings of this study highlight the significant relationship between sleep patterns and mental health outcomes among tertiary students in Ghana. It is evident that both the duration and quality of sleep are strongly associated with levels of stress, anxiety, and depression, reinforcing prior evidence that poor sleep adversely affects psychological wellbeing. These results align with existing research suggesting that sleep deprivation compromises emotional regulation and cognitive functioning, increasing one's susceptibility to mental health difficulties (Walker, 2017; Becker et al., 2018).

In this study, the average reported sleep duration was 6.8 hours—below the recommended 7 to 9 hours for adults (National Sleep Foundation, 2020). This deficiency is not just a matter of rest, but a public health concern. Sleep deprivation disrupts hormonal rhythms, affecting cortisol and serotonin levels—two critical regulators of mood and mental health (Alfano & Beidel, 2006). The consistent correlation between reduced sleep duration and elevated psychological distress among students in this context suggests that inadequate rest is more than a byproduct of academic life; it is a potential driver of emotional and psychological imbalance.

More striking, however, was the stronger correlation found between poor sleep quality and adverse mental health outcomes. Students who experienced disturbed or irregular sleep patterns were significantly more likely to report high levels of stress and depressive symptoms. This is supported by studies showing that even when sleep duration appears sufficient, poor quality sleep is a risk factor for anxiety, mood disorders, and impaired stress coping mechanisms (Harvey, 2008; Buysse et al., 2008). The underlying biological mechanisms, such as disruptions to REM and deep non-REM sleep, reduce the brain's capacity to recover from daily stressors and negatively affect memory consolidation and emotional processing (Walker, 2017; Harding et al., 2021). Students experiencing fragmented or shallow sleep may find themselves less equipped to manage academic pressure, interpersonal challenges, or emotional fluctuations.

Demographic factors such as gender, age, year of study, and academic discipline also revealed meaningful variations in the sleep–mental health relationship. Female students reported poorer sleep and higher psychological distress, echoing studies that suggest women are more prone to insomnia and emotional dysregulation due to both biological and social stressors (Kline et al., 2018; Nolen-Hoeksema, 2012). Younger students, especially those aged 18–21,

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showed somewhat weaker correlations between sleep and mental health, possibly because they are still adapting to the university environment and may not yet perceive the full impact of poor sleep. Meanwhile, older students, with greater academic and personal responsibilities, may experience more persistent stress and hence show stronger associations between chronic sleep issues and emotional well-being (Buboltz et al., 2009).

First-year students emerged as the most vulnerable group, reporting the highest stress levels and the strongest link between short sleep duration and mental health problems. This is consistent with the transitional difficulties faced by new students, including academic uncertainty, loss of familiar social support, and increased responsibility (Pillai & Mukhopadhyay, 2017). Students enrolled in demanding academic programs such as Science and Engineering also reported worse sleep and higher distress than their peers in less intensive disciplines. The time commitment and high expectations in such programs likely lead to irregular sleep schedules, greater performance anxiety, and a limited capacity for emotional recovery (Pilcher & Huffcutt, 1996; Wang et al., 2021).

These findings offer crucial implications for mental health promotion on university campuses. Sleep is a modifiable health behavior, and therefore presents a tangible intervention point for mental health improvement. University administrations can support student well-being by integrating sleep hygiene education into orientation programs, academic counseling, and wellness campaigns. Informational sessions on topics such as screen time reduction, stress

management, regular sleep routines, and mindful unwinding can empower students to adopt healthier sleep practices. Counseling centers should also routinely assess students' sleep patterns as part of mental health screenings, and where appropriate, offer cognitive-behavioral interventions aimed at improving sleep quality. Targeted support for first-year students, such as peer mentoring, time management workshops, and transitional counseling, could buffer the effects of stress and reduce the disruption of sleep routines.

From a policy perspective, universities need to consider systemic adjustments that foster healthier academic environments. Flexible timetables, reasonable coursework deadlines, and designated quiet hours in dormitories can help students prioritize rest. Moreover, investment in campus infrastructure—such as soundproof study areas and sleep pods—could contribute to creating a culture that values rest as much as academic productivity. These steps are particularly important in the Ghanaian context, where mental health services on campuses are limited and stigmatized, and where students often struggle to balance financial pressures with academic responsibilities (Osei, 2020; Owusu-Ansah et al., 2022).

While the current study offers valuable insights, its limitations must be acknowledged. The cross-sectional design precludes any claims of causality between sleep and mental health. Self-reported data may also be influenced by recall bias or social desirability. Future research should consider longitudinal approaches and incorporate objective measures such as sleep tracking devices or clinical mental health assessments

to validate self-reported findings. Additionally, qualitative studies could provide deeper insight into how cultural norms, religious beliefs, and social dynamics shape students' attitudes toward sleep and well-being.

Conclusion

This study provides compelling evidence that sleep patterns are intimately linked with mental health among tertiary students in Ghana. Inadequate sleep duration and especially poor sleep quality are associated with increased levels of stress, anxiety, and depression. Demographic characteristics such as gender, year of study, and academic discipline further influence these associations, underscoring the need for targeted and inclusive intervention strategies. As sleep remains a modifiable behavior, universities should prioritize sleep education, policy reforms, and student-centered wellness initiatives to foster a healthier academic community. Addressing sleep hygiene is not only a matter of promoting academic success but a critical step toward protecting and enhancing the mental health of young adults navigating the pressures of higher education.

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