The Cause and Effect of Sleep Deprivation in Computer Engineering Students at Bulacan State University

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ABSTRACT

This study investigates the causes and effects of sleep deprivation among Computer Engineering students at Bulacan State University. It examines lifestyle factors, academic workload, and technological habits that influence students' sleep quality, academic performance, and mental well-being. Using a descriptive-correlational design, 120 participants were selected through simple random sampling. Quantitative data were gathered through an online survey and analyzed using descriptive and inferential statistics, including frequency, percentage, mean, and Pearson correlation. Findings revealed that sleep deprivation is highly prevalent and strongly associated with poor sleep hygiene, irregular class schedules, and excessive technology use. Results underscore the need for institutional interventions that promote healthy sleep habits to improve academic performance and student wellness.

Keywords: sleep deprivation, college students, academic performance, health belief model, Bulacan State University, computer engineering, sleep hygiene

INTRODUCTION

College is a critical developmental stage where students build foundational knowledge, skills, and independence. However, the transition into higher education presents demanding academic workloads, tight deadlines, and multiple institutional requirements, which often overwhelm students and cause them to sacrifice sleep in favor of productivity.

Sleep deprivation refers to insufficient or poor-quality sleep, whether acute or chronic (Hershner & Chervin, 2014). Among college students, primary contributors include irregular sleep schedules, excessive technology use, consumption of stimulants, and stress from academic and personal responsibilities (Brown, Buboltz, & Soper, 2006; Hershner & Chervin, 2014).

Poor sleep hygiene—characterized by screen exposure before bed, inconsistent sleep routines, or inadequate rest environments—has been consistently linked to diminished academic functioning and neurobehavioral performance (Owens, Belon, & Moss, 2010). Insufficient sleep negatively affects cognitive capacity, memory retention, learning, and emotional stability, further reducing academic efficiency (Walker, 2017).

Guided by the Health Belief Model (HBM), this study assumes that students' perceptions of risk and perceived benefits influence their sleep-related behaviors.

Understanding the factors associated with sleep deprivation among Computer Engineering students may help in developing institutional initiatives that promote sleep hygiene and overall student well-being.

Methods

This section presents the methodological framework used to investigate the causes and effects of sleep deprivation among Computer Engineering students at Bulacan State University. It outlines the procedures

undertaken to ensure that the data collected are accurate, reliable, and valid. Specifically, it describes the research design, population and sampling method, research instrument, data gathering procedure, and statistical treatments employed in the study. The methods were developed to align with ethical research practices and the provisions of the Data Privacy Act of 2012.

The succeeding subsections provide detailed discussions of each methodological component. The Research Design subsection explains the overall approach and rationale behind the chosen design. The Population and Sample subsection describes the participants and sampling technique used. The Research Instrument subsection details the structure, content, and validation of the survey tool. The Data Gathering Procedure subsection explains how the data were collected ethically and systematically, while the Data Processing and Statistical Treatment subsection presents the methods used to analyze the collected data.

Research Design

This study utilized a descriptive-correlational research design, integrating both quantitative and qualitative approaches to examine the causes and effects of sleep deprivation among Computer Engineering students at Bulacan State University (BulSU). The design allowed for the identification of patterns, relationships, and potential correlations between sleep-related behaviors and academic performance.

Population and Sample

The population of the study consisted of all enrolled Computer Engineering students at BulSU during the academic year 2024–2025. Using Andrew Fisher's formula, the ideal sample size was determined to be 176. From this population, a total of 120 students participated in the survey, exceeding the minimum sample size recommended for representativeness.

The researcher employed simple random sampling to provide equal opportunity for each student to be selected, ensuring unbiased representation across different year levels and sexes.

Research Instrument

Data were gathered using a structured online questionnaire developed through Google Forms. The instrument was composed of 16 items distributed across the following sections:

1. Demographic Profile – year level and sex (name optional for confidentiality).
2. Sleep Behavior and Habits – assessed through 5-point Likert scale items (1 = strongly disagree, 5 = strongly agree).
3. Lifestyle and Technological Factors – evaluated through Yes/No and multiple-choice questions.
4. Perceived Effects of Sleep Deprivation – gauged students' self-reported experiences on academic performance, mental health, and productivity.

The instrument underwent expert validation by two faculty members in psychology and computer engineering to ensure content validity. A pilot test was conducted with 15 students not included in the final sample, yielding a Cronbach's alpha coefficient of 0.87, indicating high internal consistency of the questionnaire.

Data Gathering Procedure

The researcher sought permission from the department and coordinated with student leaders for proper dissemination of the survey link. The online questionnaire was accessible exclusively to BulSU students using their institutional Google accounts to uphold respondent authenticity and data integrity.

The survey link was distributed through official online student channels. Given the El Niño conditions that necessitated temporary online learning modalities, all data collection was conducted virtually. The researcher

ensured adherence to the Data Privacy Act of 2012 (Republic Act No. 10173), guaranteeing confidentiality and voluntary participation throughout the study.

Data Processing and Statistical Treatment

All collected responses were screened for completeness and accuracy prior to analysis. Descriptive statistics, including frequency, percentage, and mean, were used to summarize respondent profiles and patterns of sleep behavior.

For inferential analysis, Pearson correlation was applied to determine the relationships between sleep duration, academic performance, and perceived mental health. Data were processed using Microsoft Excel and SPSS version 25.

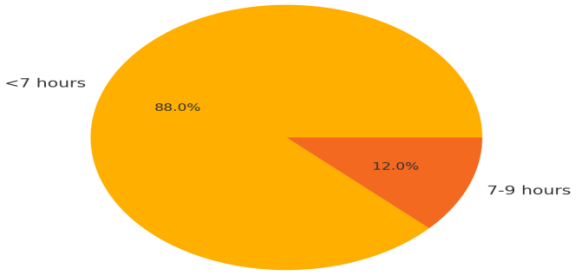
Results

This section presents the analyzed data from 120 Computer Engineering students at Bulacan State University. Descriptive and inferential statistics were used to interpret the data, and visual representations (Figures 1–6) support the findings.

Prevalence of Sleep Deprivation

Figure 1 shows that **88%** of respondents slept fewer than seven hours per night, below the recommended 7–9 hours for young adults (Hirshkowitz et al., 2015).

Figure 1 Average Hours of Sleep Per Night

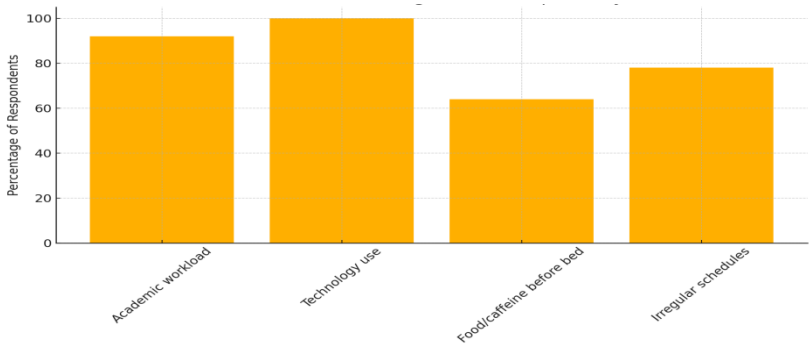


Factors Contributing to Poor Sleep Quality

As shown in Figure 2, the top contributors were:

- Academic workload and tight deadlines (92%)
- Night-time digital device use (100%)
- Consumption of food or caffeine before bed (64%)
- Irregular class schedules (78%)

Figure 2 Factors Contributing to Poor Sleep Quality

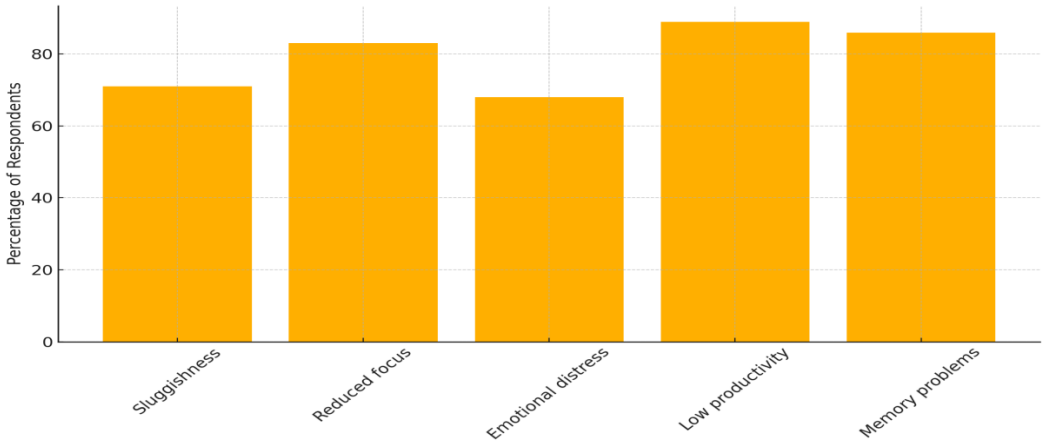


Effects of Sleep Deprivation

Figure 3 illustrates the major consequences reported:

- Sluggishness or fatigue – **71%**
- Reduced focus – **83%**
- Emotional distress – **68%**
- Poor productivity – **89%**
- Memory problems – **86%**

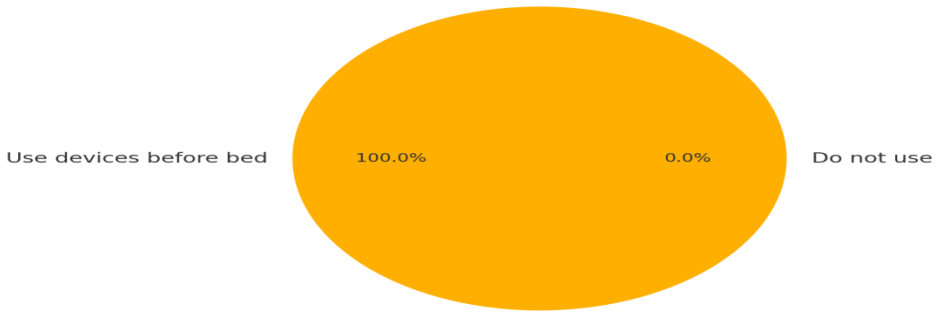
Figure 3 Effects of Sleep Deprivation



Technology Use Before Sleep

All respondents (100%) reported using a smartphone or device before bedtime (Figure 4).

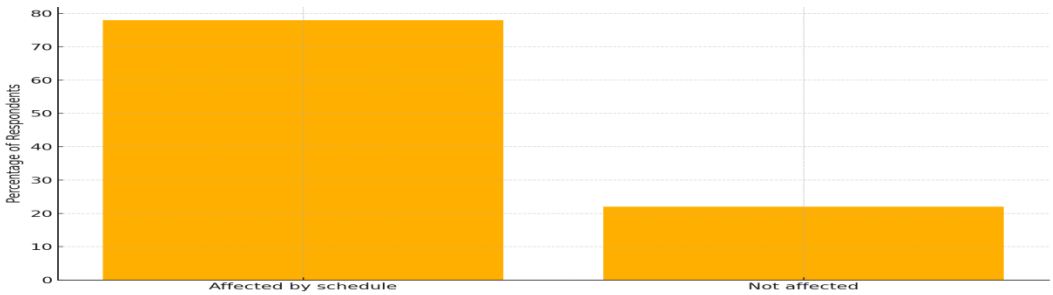
Figure 4 Technology Use Before Bedtime



Impact of Class Schedules

Figure 5 indicates that 78% attributed sleep disruption to early-morning or late-evening classes.

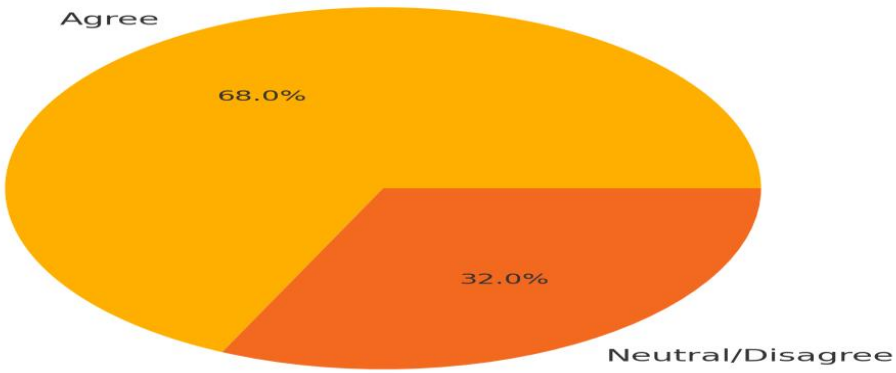
Figure 5 Impact of Class Schedule on Sleep



Emotional and Mental Well-Being

Figure 6 shows that **68%** experienced emotional or mental health decline when sleep-deprived.

Figure 6 Emotional & Mental Impact of Sleep Deprivation



Summary of Key Results

1. Majority of students (88%) experience regular sleep deprivation.
2. Poor sleep hygiene and technology use are leading causes.
3. Early and late class schedules aggravate the issue.
4. Sleep deprivation negatively affects concentration, learning, and emotional well-being.
5. Positive sleep habits correspond with higher academic performance.

DISCUSSION

The findings underscore a pressing need to address the prevalence of sleep deprivation among Computer Engineering students at Bulacan State University. Consistent with previous studies (Owens & Weiss, 2017; Brown et al., 2006), students' lifestyle choices—particularly technology use and poor time management—contribute significantly to irregular sleep patterns.

Anchored in the Health Belief Model, the results suggest that awareness of sleep-related risks influences behavior toward healthier sleep routines. However, the data reveal limited awareness among students regarding the long-term cognitive and psychological consequences of sleep deprivation. The identified effects—such as fatigue, diminished focus, and mood instability—mirror the neurobehavioral impairments highlighted in prior research (Walker, 2017).

Institutional factors, including inflexible class schedules and academic overload, exacerbate these problems. The absence of formal programs promoting sleep health indicates a gap in BulSU's wellness initiatives. Implementing educational interventions on sleep hygiene, adjusting scheduling policies, and encouraging digital detox practices could improve students' overall well-being and academic performance.

CONCLUSIONS

Based on the results and discussion, the following conclusions were drawn:

1. Sleep deprivation is widespread among Computer Engineering students, with most sleeping less than the recommended 7 hours per night.
2. Primary causes include demanding academic workloads, excessive use of technology before bedtime, and irregular class schedules.
3. Sleep deprivation significantly impairs learning, memory, focus, and emotional stability.

4. Students lack awareness of the long-term risks of sleep deprivation and the importance of good sleep hygiene.
5. A positive relationship exists between adequate sleep and academic performance, validating the relevance of behavioral awareness and self-regulation theories like the Health Belief Model.

RECOMMENDATIONS

In light of the findings and limitations, the following recommendations are proposed:

1. Broaden the study population to include students from other departments to achieve more comprehensive university-wide representation.
2. Conduct further research using experimental or longitudinal designs to establish causal relationships between sleep behavior and academic outcomes.
3. Integrate sleep health education into student orientation or wellness programs to increase awareness of proper sleep practices.
4. Revisit academic scheduling to minimize early morning or late evening classes that disrupt students' sleep patterns.
5. Enhance the research instrument by incorporating validated psychological scales to assess stress, fatigue, and mental health more precisely.
6. Promote institutional interventions such as mindfulness workshops, time management seminars, and digital detox campaigns.
7. Conduct future studies during stable academic periods with favorable conditions for face-to-face interventions to strengthen data reliability.

REFERENCES

1. Alamir, Y., Zullig, K. J., Kristjánsson, Á. L., Wen, S., Misra, R., & Montgomery-Downs, H. E. (2022). A theoretical model of college students' sleep quality and health-related quality of life. Journal of Behavioral Medicine, 45(6), 925–934. https://doi.org/10.1007/s10865-022-00291-0
2. Bandyopadhyay, A., & Sigua, N. L. (2019). What is sleep deprivation? American Journal of Respiratory and Critical Care Medicine, 199(6), P11–P12. https://doi.org/10.1164/rccm.1996P11
3. Bishir, M., Bhat, A., Essa, M. M., Ekpo, O., Ihunwo, A. O., Veeraraghavan, V. P., Mohan, S. K., Mahalakshmi, A. M., Ray, B., Tuladhar, S., Chang, S., Chidambaram, S. B., Sakharkar, M. K., Guillemin, G. J., Qoronfleh, M. W., & Ojcius, D. M. (2020). Sleep deprivation and neurological disorders. BioMed Research International, 2020, 1–19. https://doi.org/10.1155/2020/5764017
4. Brown, F. C., Buboltz, W. C., Jr., & Soper, B. (2002). Relationship of sleep hygiene awareness, sleep hygiene practices, and sleep quality in university students. Behavioral Medicine, 28(1), 33–38. https://doi.org/10.1080/08964280209596396
5. Brown, F. C., Buboltz, W. C., Jr., & Soper, B. (2006). Development and evaluation of the Sleep Treatment and Education Program for Students (STEPS). Journal of American College Health, 54(4), 231–237. https://doi.org/10.3200/JACH.54.4.231-237
6. Buysse, D. J., Angst, J., Gamma, A., Ajdacic, V., Eich, D., & Rössler, W. (2008). Prevalence, course, and comorbidity of insomnia and depression in young adults. Sleep, 31(4), 473–480. https://doi.org/10.1093/sleep/31.4.473
7. Dowdell, E. B., & Clayton, B. Q. (2018). Interrupted sleep: College students sleeping with technology. Journal of American College Health, 67(7), 640–646. https://doi.org/10.1080/07448481.2018.1499655
8. Grandner, M. A. (2017). Sleep, health, and society. Sleep Medicine Clinics, 12(1), 1–22. https://doi.org/10.1016/j.jsmc.2016.10.012
9. Hershner, S., & Chervin, R. D. (2014). Causes and consequences of sleepiness among college students. Nature and Science of Sleep, 6, 73–84. https://doi.org/10.2147/NSS.S62907
10. Hirshkowitz, M., Whiton, K., Albert, S. M., Alessi, C., Bruni, O., DonCarlos, L., Ware, J. C., et al. (2015). National Sleep Foundation's updated sleep duration recommendations. Sleep Health, 1(4), 233–243. https://doi.org/10.1016/j.sleh.2015.10.004

11. Owens, J. A., Belon, K., & Moss, P. (2010). Impact of delaying school start time on adolescent sleep, mood, and behavior. Archives of Pediatrics & Adolescent Medicine, 164(7), 608–614. https://doi.org/10.1001/archpediatrics.2010.96
12. Taylor, D. J., & McFatter, R. (2003). Cognitive performance after sleep deprivation: Does personality make a difference? Personality and Individual Differences, 34(7), 1179–1192. https://doi.org/10.1016/S0191-8869(02)00106-2
13. Wagner, U., Gais, S., Haider, H., Verleger, R., & Born, J. (2004). Sleep inspires insight. Nature, 427(6972), 352–355. https://doi.org/10.1038/nature02223
14. Walker, M. (2017). Why we sleep: Unlocking the power of sleep and dreams. Scribner.