SLEEP BEHAVIOR AND ACADEMIC PERFORMANCE AMONG PRE-SERVICE TEACHERS: EVIDENCE FROM A PHILIPPINE STATE UNIVERSITY

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Abstract *– Adequate sleep is essential for cognitive functioning, emotional well-being, and academic success. However, many university students experience insufficient sleep because of academic demands, extracurricular activities, and personal responsibilities, potentially affecting their learning outcomes. This study examined the relationship between sleep behavior and academic performance among third-year Bachelor of Technology and Livelihood Education (BTLED) pre-service teachers at the University of Science and Technology of Southern Philippines. A quantitative correlational research design was employed involving 133 respondents selected using Slovin's formula. Data were collected using an adapted sleep behavior questionnaire based on Sygaco's instrument, which was contextualized for pre-service teachers, validated by three experts, and demonstrated good internal consistency (Cronbach's α = 0.81). Descriptive statistics and Spearman's rank correlation coefficient were used to analyze the data. Results revealed that most respondents achieved favorable academic performance while generally reporting reduced weekday sleep because of academic workload. Sleep duration demonstrated a statistically significant but negligible positive association with academic performance (ρ = .198, p = .022), whereas sleep quality was not significantly associated with academic performance (p = .418). These findings suggest that although adequate sleep duration may contribute modestly to academic performance, sleep behavior alone does not fully explain variations in students' academic achievement. Other academic, behavioral, and personal factors should therefore be considered. Higher education institutions are encouraged to promote healthy sleep practices alongside academic support and wellness programs to enhance students' overall well-being and learning outcomes.*

Keywords: academic performance; higher education; pre-service teachers; sleep behavior; sleep duration; sleep quality; university students

INTRODUCTION

Sleep is an essential physiological process that supports cognitive functioning, emotional regulation, physical recovery, and overall health. Adequate sleep promotes attention, memory consolidation, learning, and decision-making, whereas insufficient or poor-quality sleep impairs these functions and adversely affects students' academic performance and psychological well-being [1,2]. Despite widespread awareness of its importance, sleep deprivation remains common among university students because of increasing academic demands, extracurricular involvement, technology use, and social responsibilities [3].

University students are particularly vulnerable to unhealthy sleep behaviors because the transition to higher education often requires them to manage multiple academic and personal responsibilities independently. Studies have consistently shown that college students frequently experience insufficient sleep duration, delayed sleep onset, inconsistent sleep schedules, and poor sleep quality, all of which contribute to daytime sleepiness, reduced concentration, emotional exhaustion, and lower academic engagement [4,5]. Sleep deprivation has likewise been associated with impaired executive functioning, reduced memory retention, slower cognitive processing, and decreased classroom performance [2,6].

Recent empirical evidence suggests that both sleep duration and sleep quality influence learning outcomes among university students. Kim et al. demonstrated that students who maintained longer, higher-quality, and more consistent sleep over several weeks achieved significantly better academic performance than those with irregular sleep schedules [7]. Similarly, Ho et al. reported that frequent nighttime awakenings and inconsistent sleep patterns were associated with lower grade point averages among college students, emphasizing that sleep continuity is an important contributor to academic success [8]. In addition, systematic reviews have shown that chronic sleep restriction negatively affects attention, working memory, emotional regulation, and problem-solving ability, all of which are essential for effective learning in higher education [9,10].

Within teacher education, maintaining healthy sleep behaviors may be particularly important. Pre-service teachers are expected to balance classroom instruction, laboratory activities, teaching demonstrations, lesson preparation, field experiences, and numerous academic requirements. These responsibilities often extend beyond regular class hours, encouraging students to sacrifice sleep to complete coursework. Although doing so may provide temporary academic benefits, persistent sleep deprivation may reduce learning efficiency, impair cognitive functioning, and negatively influence physical and mental well-being [5,9].

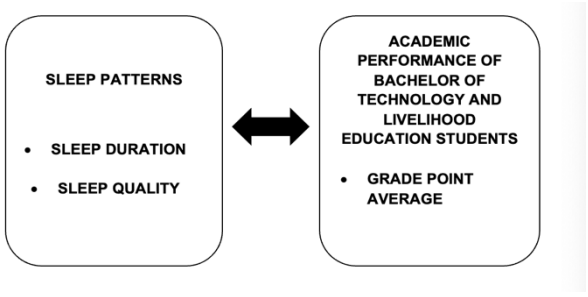
In the Philippine context, studies examining sleep behavior among students have generally reported that inadequate sleep is associated with reduced academic performance, increased stress, and diminished classroom engagement [11]. However, much of the existing local literature has focused on students enrolled in general undergraduate programs, while evidence specifically involving pre-service teachers remains limited. Consequently, findings from previous studies may not fully reflect the experiences of Bachelor of Technology and Livelihood Education (BTLED) students.

Furthermore, previous studies have predominantly examined either sleep duration or sleep quality independently. Although systematic reviews have summarized the relationship between sleep and academic performance among university students, comparatively fewer investigations have simultaneously examined multiple dimensions of sleep behavior within a single population of pre-service teachers [12,13,14]. Understanding these dimensions may provide educators and university administrators with evidence to support student wellness initiatives, time-management interventions, and academic support programs designed to improve both student well-being and educational outcomes.

To address this gap, the present study examined the relationship between sleep behavior, specifically sleep duration and sleep quality, and academic performance among third-year Bachelor of Technology and Livelihood Education (BTLED) pre-service teachers at the University of Science and Technology of Southern Philippines. The findings are expected to contribute to the growing body of evidence on student wellness in higher education and provide empirical information that may assist educational institutions in developing programs that encourage healthy sleep practices while supporting students' academic success.

CONCEPTUAL FRAMEWORK

This study is anchored on the premise that adequate sleep is an essential determinant of students' cognitive functioning, emotional regulation, and academic success. Sleep facilitates memory consolidation, learning, attention, decision-making, and information processing, all of which are necessary for effective academic performance. Conversely, insufficient or poor-quality sleep may impair these cognitive processes, resulting in reduced classroom engagement, lower concentration, diminished learning efficiency, and poorer academic outcomes [1–4].



METHODOLOGY

This study employed a quantitative correlational research design to examine the relationship between sleep behavior and academic performance among pre-service teachers at the University of Science and Technology of Southern Philippines (USTP). A correlational research design is appropriate when the objective is to determine the strength and direction of the relationship between two or more naturally occurring variables without manipulating or controlling them [15]. Unlike experimental research, correlational studies do not establish causal relationships; rather, they determine whether statistically significant associations exist among variables measured within the same population [15,16].

The present investigation focused on determining whether sleep behavior, specifically sleep duration and sleep quality, was significantly associated with students' academic performance, as measured by their Grade Point Average (GPA). Since the study did not involve any intervention or treatment and sought only to examine the relationship among existing variables, the correlational research design was considered the most appropriate methodological approach.

The required sample size was determined using Slovin's formula with a 5% margin of error, yielding a sample of 133 respondents. A stratified random sampling technique was employed to ensure proportional representation of students from the Home Economics and Industrial Arts specializations. Stratified random sampling enhances sample representativeness by ensuring that important subgroups within the population are proportionately included in the study **[17]**.

RESEARCH INSTRUMENT AND VALIDATION

Data were collected using an adapted questionnaire based on the sleep behavior instrument developed by Sygaco [11], originally designed to examine the relationship between sleep behavior and academic performance among undergraduate students in a Philippine higher education institution. The original instrument consisted of 37 items covering two dimensions: sleep duration (19 items) and sleep quality (18 items), together with respondents' academic performance.

For the present study, the questionnaire was adapted for third-year Bachelor of Technology and Livelihood Education (BTLED) pre-service teachers at the University of Science and Technology of Southern Philippines. Contextual modifications included revising institutional terminology, replacing references to general undergraduate students with BTLED pre-service teachers, and simplifying selected instructions while preserving the original constructs and intent of the instrument.

The final questionnaire consisted of three sections. Part I gathered respondents' demographic profile and Grade Point Average (GPA). Part II assessed sleep duration using 19 items. Part III assessed sleep quality using 18 items rated on a 5-point Likert scale ranging from 1 to 5. Responses were scored according to the original instrument, with higher scores indicating more favorable sleep behavior.

Content validity was established through evaluation by three experts specializing in educational research and teacher education. The validators assessed the questionnaire for clarity, relevance, content adequacy, and alignment with the study objectives, and their recommendations were incorporated into the final version.

Prior to the actual data collection, the adapted questionnaire was pilot-tested among 30 students with characteristics similar to the target respondents but excluded from the final sample. The adapted instrument demonstrated good internal consistency (Cronbach's $\alpha = .81$), confirming its reliability for use in the present study.

ACADEMIC PERFORMANCE

Academic performance was measured using the respondents' Grade Point Average (GPA) obtained from the official academic records of the University of Science and Technology of Southern Philippines (USTP). Under the university grading system, a GPA of 1.00 represents the highest academic performance, while higher numerical GPA values indicate comparatively lower academic performance, with 3.00 as the minimum passing grade. The GPA values were analyzed in their original form and were not reverse-coded. Consequently, the direction of the correlation coefficients was interpreted based on the university's grading system. Academic performance categories presented in Table 1 were interpreted according to the *University of Science and Technology of Southern Philippines Student Handbook* (2024 Edition) [24].

DATA ANALYSIS

The collected data were analyzed using both descriptive and inferential statistical techniques.

Frequency counts and percentages were used to describe the respondents' sleep duration patterns and other categorical variables. Means and standard deviations were computed to summarize the respondents' academic performance and sleep-related variables, where appropriate.

To determine the relationship between sleep behavior and academic performance, Spearman's Rank Correlation Coefficient (ρ) was employed. Spearman's rho is a non-parametric statistical test used to measure the strength and direction of the association between two variables without requiring the assumption of normally distributed data [17]. Correlation coefficients range from −1.00 to +1.00, where values closer to ±1.00 indicate stronger associations and values closer to 0 indicate weaker associations. The strength of the correlation was interpreted based on the guidelines proposed by Schober et al. [18]. Statistical significance was interpreted independently of the magnitude of the correlation coefficient, with a p-value of less than 0.05 considered statistically significant.

DATA PRESENTATION AND ANALYSIS

Problem 1. What is the academic performance of the BTLE students in terms of Grade Point Average?

Table 1 presents the academic performance of the third-year Bachelor of Technology and Livelihood Education (BTLED) pre-service teachers. The findings revealed that the respondents obtained a mean Grade Point Average (GPA) of 1.61 (SD = 0.27). Under the USTP grading system, lower numerical GPA values indicate better academic performance; therefore, the respondents generally demonstrated satisfactory academic achievement.

Table 1: Distribution of Grade Point Average of Third Years Students of Bachelor of Technology and Livelihood Education (n=133)

Description	GPA Category	Frequency (f)	Percent (%)
Excellent	1.00-1.49	38	28.6
Very Good	1.50-1.99	83	62.4
Above Average	2.00- 2.49	10	7.5
Average	2.50-2.99	2	1.5
Passing	3.00	0	-
Total		**133**	**100**
	M	= 1.61	**Very Good**
	SD	= 0.27	

The generally favorable academic performance observed among the respondents may reflect the influence of several academic and personal factors beyond sleep behavior. Previous studies have identified study habits, self-regulated learning, academic motivation, and time management as factors associated with academic achievement [19,20]. However, these variables were not measured in the present study. Consequently, their contribution to the respondents' academic performance cannot be established and should be examined in future investigations. Likewise, Ho *et al*. **[8]** emphasized that academic performance is multidimensional and may be influenced by cognitive ability, psychological well-being, health status, and lifestyle behaviors, including sleep.

Only a small proportion of respondents obtained grades within the "Average" category, suggesting that relatively few students experienced substantial academic difficulties. Nevertheless, these students may require additional academic support because lower academic performance could reflect challenges associated with ineffective study strategies, excessive academic stress, inadequate sleep, or other personal and environmental factors [10,12].

The findings indicate that although the respondents generally performed well academically, maintaining high academic achievement should remain a priority of teacher education institutions through programs that promote healthy lifestyles, effective study habits, and academic wellness.

Problem 2. What are the factors influencing the sleep duration among BTLED students that correlate with the occurrence of sleep patterns?

The findings indicate that most respondents reported sleeping approximately five hours during weekdays, while a greater proportion obtained approximately eight hours of sleep during weekends. This pattern demonstrates that students frequently compensate for insufficient weekday sleep by extending their sleep duration during weekends.

Table 2: Distribution of Factors Influencing Sleep Duration Among Bachelor of Technology and Livelihood Education Students that Correlate with the Occurrence of Sleep Patterns (n=133*)*

Indicators	Frequency	Percentage (%)
1. How many hours of sleep do you have during weekdays?		
1 Hour	0	-
2 Hours	2	1.5
3 Hours	2	1.5
4 Hours	11	8.3
5 Hours	40	30.1
6 Hours	32	24.1
7 Hours	23	17.3
8 Hours	17	12.8
9 Hours	4	3.0
10 Hours	2	1.5
Total	133	100
2. How many hours of sleep do you have during weekends?		
1 Hour	0	-
2 Hours	2	1.5
3 Hours	1	0.8
4 Hours	10	7.5
5 Hours	17	12.8
6 Hours	19	14.3
7 Hours	28	21.1
8 Hours	35	26.3
9 Hours	7	5.3
10 Hours	14	10.5
Total	133	100

regular class days. These findings imply that pre-service teachers experience continuous academic demands that may interfere with achieving the recommended sleep duration [22].

The results likewise revealed that 60.2% of respondents reported sleeping only five to six hours per night during the previous month, which is below the sleep duration recommended for young adults [22,23]. Chronic sleep restriction may negatively affect physical health, emotional well-being, and academic functioning even when students continue achieving satisfactory grades **[10]**.

These findings emphasize the importance of promoting healthy sleep behaviors alongside effective time management strategies within teacher education programs.

Relationship Between Sleep Behavior and Academic Performance

Sleep Behavior Variable	Spearman's ρ	p-value	Interpretation of Correlation	Decision	Interpretation
Sleep Duration	0.198	0.022*	Negligible Positive Correlation	Reject H_0	There is a statistically significant negligible positive relationship between sleep duration and academic performance.
Sleep Quality	-0.071	0.418	Negligible Negative Correlation	Fail to Reject H_0	There is no statistically significant relationship between sleep quality and academic performance.

The analysis revealed that sleep duration exhibited a statistically significant but negligible positive relationship with academic performance ($\rho = .198$, $p = .022$), whereas sleep quality demonstrated a negligible negative relationship that was not statistically significant ($\rho = –.071$, $p = .418$). The statistically significant but negligible positive correlation indicates that respondents who reported longer sleep duration also tended to have slightly higher numerical GPA values. Because lower GPA values represent better academic performance under the university grading system, this finding should be interpreted cautiously. The small magnitude of the correlation suggests only a minimal association between sleep duration and GPA, and the practical significance of this relationship is limited. Although the observed relationship was modest, it supports the growing body of evidence that adequate sleep contributes to cognitive functioning, learning efficiency, and memory consolidation [3]. Previous investigations have similarly reported that students maintaining longer and more consistent sleep schedules generally perform better academically than those experiencing chronic sleep deprivation [7,8].

However, the relatively small magnitude of the relationship indicates that sleep duration alone does not sufficiently explain variations in students' academic performance. Academic success is a multifaceted outcome influenced by numerous interacting variables, including motivation, study habits, prior academic preparation, self-regulation, learning strategies, and psychological resilience [19,20].

Conversely, the relationship between sleep quality and academic performance was extremely weak and negative, indicating that variations in perceived sleep quality were not substantially associated with differences in Grade Point Average among the respondents. This finding contrasts with previous studies reporting stronger associations between sleep quality and academic achievement [13,21,23].

One possible explanation is that pre-service teachers may employ academic strategies that help them cope with demanding coursework despite experiencing poor sleep quality. Previous studies have suggested that self-regulated learning, effective study habits, and academic motivation may contribute to academic success [19,20]. However, because these variables were not measured in the present study, this interpretation should be regarded as a possible explanation rather than evidence derived from the current findings.

It is likewise possible that the use of self-reported sleep measures influenced the observed relationships. Self-reported sleep behavior may not always accurately reflect actual sleep patterns because respondents may overestimate or underestimate their sleeping habits. Future investigations may therefore benefit from combining validated sleep questionnaires or objective sleep-monitoring devices with academic performance measures to obtain more comprehensive evidence [12].

Overall, the findings suggest that while sleep behavior contributes to students' academic experiences, it represents only one component of a broader set of personal, behavioral, and educational factors influencing academic achievement among pre-service teachers.

CONCLUSION

This study examined the relationship between sleep behavior, specifically sleep duration and sleep quality, and academic performance among third-year Bachelor of Technology and Livelihood Education (BTLED) pre-service teachers at the University of Science and Technology of Southern Philippines.

The findings revealed that the respondents generally demonstrated satisfactory academic performance despite reporting insufficient sleep during weekdays and periods of increased academic workload. Most respondents obtained fewer hours of sleep than the recommended duration for

young adults, suggesting that sleep deprivation remains a common concern among university students **[23]**.

The correlational analysis demonstrated a statistically significant but negligible positive relationship between sleep duration and academic performance. Although the relationship reached statistical significance, its small magnitude indicates that sleep duration had only a limited association with variations in students' academic performance. However, the magnitude of the relationship suggests that sleep duration alone does not substantially explain variations in academic achievement. In contrast, sleep quality was not significantly associated with academic performance, implying that perceived sleep quality had minimal influence on students' Grade Point Average within the present sample. These findings are consistent with previous studies showing that sleep is only one of several factors associated with academic success and that the strength of this relationship varies across student populations **[12,23]**.

The findings further suggest that academic performance among pre-service teachers is influenced by a combination of factors beyond sleep behavior, including study habits, learning motivation, self-regulation, time management, academic engagement, and other personal and environmental characteristics **[19,20]**. Although sleep behavior contributes to students' overall well-being and cognitive functioning, it should be viewed as one component of a broader framework affecting academic success.

This study contributes to the growing body of literature on student wellness by providing empirical evidence from a Philippine state university and highlighting the importance of promoting healthy sleep practices among pre-service teachers. Institutions of higher education may use these findings to strengthen student wellness initiatives, develop time-management and stress-management programs, and encourage healthy lifestyle behaviors that support both academic achievement and overall well-being.

Finally, future researchers are encouraged to investigate additional factors associated with academic performance using larger and more diverse samples from multiple higher education institutions. Future studies may also employ longitudinal designs, validated sleep assessment instruments, or objective sleep-monitoring devices to obtain a more comprehensive understanding of how sleep behavior influences academic performance over time.

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