The Relationship Of Sleep Hours On The Academic Performance And Classroom Participation Of Senior High School Students

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Abstract: Senior high school students often face a multitude of academic responsibilities that make time management a challenging task, particularly when it comes to compromising their sleep. Sleep deprivation has become increasingly prevalent, with a significant number of students receiving less than the recommended six hours of sleep per day. The consequences of insufficient sleep are numerous, including tiredness, mood disorders, memory loss, a diminished attention span, and physical ailments. Although the recommended sleep duration for students aged 13 to 18 is 8 to 10 hours, the transition to senior high school poses difficulties in balancing academic workloads, resulting in shorter sleeping hours and subsequently lower general weighted averages. To shed light on this issue, a study was conducted at NU-Nazareth School during the academic year 2022-2023. The study employed a descriptive-correlational design, utilizing a multi-stage sampling technique to select the participants. The researchers developed a researcher-made questionnaire as the primary research instrument, which was administered to the 312 senior high school students of NU-Nazareth. The collected data was analysed using Spearman's correlation and JASP statistical software, with all tests conducted at a significance level of 5%. Surprisingly, the findings of the study revealed that, on average, senior high school students slept for only 6 hours per night. However, contrary to expectations, no significant relationship was found between sleep hours and academic performance or classroom participation. These results suggest that while sleep deprivation remains a prevalent issue among senior high school students, it may not directly impact their academic performance or classroom engagement. Further research is needed to explore additional factors that may influence academic outcomes in this student population.

Keywords: Academic Performance, Classroom Participation, Correlation, Senior High School Students, Sleeping Hours

1. Introduction

1.1. Background of the Study

With the transition of classroom setup from online to blended learning setup that has two days online class and three days face-to-face class, there is a shift of schedule in terms of sleep that has an effect on the academic performance of students. Senior high school students faced numerous academic responsibilities, including assignments, projects, and exam preparations. However, one significant factor that can affect students' ability to manage their time efficiently is their sleep hours. Sleep is an essential aspect of overall well-being and has a profound impact on cognitive functions, including concentration, memory, and problem-solving skills [6].

Most students experienced sleep deprivation due to lack of sleep that leads to tiredness of students and mood disorders. It was shown that 88% of students were sleep deprived, and they often slept for less than 6 hours a day [15]. They experienced suffering from memory loss, low attention span, and a variety of physical problems. The recommended hours of sleep for students aged 13 to 18 is a minimum of 8 to 10 hours per 24 hours [7], [3]. However due to the transition of classes from online to face-to-face, students having difficulty to manage their time in doing their academic works with the limited time, and they experienced short sleeping hours. Also, with the short sleeping hours they experienced, they experienced to have low general weighted average (GWA).

There is a lot of study that discusses sleeping habits and sleeping hours on academic performance. Moreover, lack of sleep became frequent when students transitioned to blended learning setup and students were having difficulty balancing their schedule on academic performance and their sleep. However, there is a lack of literature that investigates the relationship between sleeping hours, academic performance, and classroom participation among senior high school students on a blended learning setup in Manila, Philippines. Although there are studies that have explored the relationship between sleep habits and academic performance among adolescents, most of them were conducted in other countries. Additionally, there are studies that have investigated the impact of study habits and independence on academic performance among high school students, but there is a lack of research that specifically examines the relationship between sleep hours, academic performance, and classroom participation among senior high school students in Manila, Philippines. By investigating the relationship, the study seeks to identify the students' sleeping hours and how it relates the academic performance and classroom participation.

1.2. Research Questions
This study aims to investigate the relationship of sleep hours on the academic performance and classroom participation of SHS students for the academic year 2022-2023. Specifically, it intends to answer the following research questions:
1. What is the average sleeping hour of SHS students on a blended learning setup?
2. Is there a significant relationship between SHS students' sleeping hours and academic performance?
3. Is there a relationship between sleep hours and classroom participation of SHS students?

1.3. Scope and Delimitations
This study will investigate the relationship of sleep hours on the academic performance and classroom participation of senior high school students in Nazareth School of National University (NU-Nazareth). It will specifically assess their average sleep duration and how this is related with their academic performance, which is measurable by their grades, and their classroom participation which is their performance inside the classroom. The research will be conducted within the school year 2022-2023.

The study will be limited to quantitative data on hours they spent sleeping, and their academic performance that is measured by GWA during blended learning setup that will be used by survey questionnaire. The study will focus on the sleep hours, and it will not involve any activities that students used before they sleep, factors affecting poor sleep hours among senior high school students, their sleep environment, and the strategies they use to improve their sleep quality and its effectiveness. It will only focus on the SHS students in NU-Nazareth. It will not include students from other grade levels, or other universities. Also, the study will only consider the academic performance of the senior high school students as measured by their grades of General Weighted Average (GWA). Other factors that may affect their academic performance, such as socio-economic status, school environment, IQ level, and study habits and behavior will not be examined in this study. Additionally, this study focuses on the classroom participation that students used to engage during classroom discussion. It will only be considered as participation in recitation, group activities, exam, quizzes, written works, and other classroom activities discussion.

1.4. Definition of Terms
The following terms that were used in this study was define accordingly by alphabetical order:

Academic Performance: Steinmayr et al. [14] states that academic performance is the individual's level of achievement in educational settings, such as schools, colleges, and universities. The measurement of student achievement across various academic subjects. It is usually measured by the general weighted average (GWA) or the grades.

Blended Learning Setup: It is an instructional approach that combines traditional face-to-face classroom instruction with digitally enhanced learning possibilities of online learning [13]. In this study, it uses the modality of classes in a setting of NU-Nazareth that has 2 days online class and 3 days face-to-face classes.

Classroom Participation: According to Zhou [16], it refers to the behaviors that students engage in during class. In this study, it is the overall behavior of students' engagement and participation during class discussion, and contribution on group activities.

Sleeping Hours: As defined by Olson [10], sleeping hours is the amount of time of an individual spent sleeping in a 24-hour period. In this study, it is the hours spent by the students on sleeping in a 24-hour period.

2. Methodology

2.1. Research Design
This study utilized quantitative research design to investigate the relationship of sleeping hours on the academic performance of SHS students during blended learning at NU-Nazareth. It aims to describe and analyze the relationship between two or more variables. It is used to determine the degree of association between variables and to identify patterns or trends in data. Hence, it is used to find patterns and correlations between variables without changing any variables or establishing cause-and-effect relationships [8], [3]. This design will determine the population of SHS students that measured their duration on sleep in hours, and their general weighted average (GWA) during blended learning setup.

2.2. Research Setting and Participants
The research setting for this study will be at NU-Nazareth, a university located in Sampaloc, Manila, Philippines. The participants of this study consists of three-hundred and twelve (312) SHS students. Researchers utilized a multi-stage sampling technique to have respondent from huge populations that applies two or more sampling techniques [11], [2].The sampling method enables the researchers to collect contextual data from respondents applying two or more sampling technique such as simple random technique and cluster sampling technique on a population of SHS level with the strands of Accountancy, Business, Management (ABM), General Academic Strand (GAS), Humanities and

Social Sciences (HUMSS), and Science, Technology, Engineering, and Mathematics (STEM) students at NU-Nazareth's sleep hours and academic performance. This additional data can offer quantitative data into the larger context and aid in the interpretation of the study's findings. This method is used to ensure that the sample is representative of the population and to reduce bias in the selection process.

2.3. Research Instrument
This study used a close-ended survey questionnaire as a research instrument to gather quantitative data to determine the relationship of sleeping hours on academic performance of SHS students during blended learning setup. The survey questionnaire was divided into three parts. The first part of the questionnaire is the profile status of the SHS students, which includes grade level and section, gender, age, academic performance. The second part was a researcher made questionnaire which involves the sleep hours of SHS students on online class and face-to-face classes. The last part of the study uses a Likert scale to measure the classroom participation of students. Also, it involves their experiences to determine the difference and relationship between sleeping hours and classroom participation of SHS students during blended learning setup.

The experts on a research field in a health department will check validity of the research questionnaire. Six (6) experts rate the questionnaire from 1 (not relevant) to 4 (highly relevant). The researchers analyzed the ratings from the six (6) experts that have resulted into 0.98 that states that the overall validity of items on the research instrument were accepted. The reliability of the research instrument will depend on the pilot testing to the fifteen (15) respondents on the survey questionnaire. Then, the researchers analyzed the preliminary data that they gathered using Cronbach's Alpha that has a value of 0.93 that states that the data that they gathered was "very reliable".

2.4. Procedure
The researchers formulate questions for the survey questionnaire that is based on the research question. Prior to commencing the actual data collection, a pilot study was conducted to evaluate the survey questionnaire and incorporating feedback from the pilot study to refine and enhance their reliability and validity. The data collection phase involved the distribution of consent letters to all SHS students from grade 11 and grade 12. The Respondents filled out and answered the consent form. If the Respondents consent to participate the study, they answered the survey questionnaire. Then, the researchers distributed the surveys face-to-face where they went to every classroom to gather respondents for their study. The researchers ensured that participants are fully informed about the study and that all responses are kept private and confidential. Then, the researchers apply the proper statistical treatment to the data that they gathered to have a valid analysis and interpretation.

2.5. Data Analysis
The profiles and sleeping hours of the respondents were calculated and analyzed using frequency and percentage. The data is not distributed properly according to the Shapiro-Wilk Test because the p-value is less than the significance level which has a value of 0.966 and p-value of 0.001. The

researchers used the used Spearman's rho Correlation formula to analyze the relationship between the sleep hours of SHS students and academic performance. Lastly, the researchers formulate the ordinal data of sleep hours and classroom participation of SHS students. The researchers used JASP statistical software to analyze the data that was gathered by the researchers. All tests were tested in 5% level of significance.

To interpret the values that the researchers got on the Spearman's rho Correlation, they used Dancey and Reidy [6] correlation interpretation table.

Table 1. Dancey and Reidy Spearman's Correlation Interpretation Table

Spearman's rho	Correlation
≥ 0.70	Very strong relationship
0.40-0.69	Strong relationship
0.30-0.39	Moderate relationship
0.20-0.29	Weak relationship
0.01-0.19	No or Negligible Relationship

3. Results and Discussion

3.1. Demographic Profile of Participants
The summary of the demographic profile of respondents included in this study was shown in Table 2. The study was composed of four hundred and nineteen (419) SHS students currently enrolled in NU-Nazareth in the school year 2022-2023. The participants' ages ranged from 16-20 years old, with one-hundred and sixty (160) females and ninety-four (94) males. There are one-hundred nineteen (119) respondents from grade 11, and one hundred thirty-five (135) respondents from grade 12. Also, there are sixty-four (64) from ABM, twenty-three (23) from GAS, sixty-nine (69) from HUMSS, and ninety-nine (99) from STEM. Seventy-seven percent (77%) of the students have a general average of 90-100 which is categorized as "outstanding" in the K-12 grading system.

Table 2. Demographic Characteristics of Participants

Profile Variables	Frequency	Percentage
Age		
16	69	22%
17	112	36%
18	119	38%
19	37	12%
20	9	3%
Total	312	100%
Sex		
Male	115	37%
Female	197	63%
Total	312	100%
Grade		
11	147	47%
12	165	53%
Total	312	100%
Strand		
ABM	78	25%
GAS	28	9%
HUMSS	84	27%
STEM	122	39%
Total	312	100%

General Weighted Average		
75-79	0	0%
80-84	29	9%
85-89	66	21%
90-100	217	70%
Total	312	100%

The researchers will present the analysis of data gathered through a survey questionnaire. The data was analyzed by using proper statistical treatment of Spearman's rho Correlation.

3.2. Sleep Hours of Senior High School Students

As for the sleeping hours of SHS students during blended learning, the findings are presented in Figure 1. The categories of the sleep hours were made by the researchers because there were no accurate categories for the sleeping hours based on the existing literature. According to the data, 67% of SHS students reported sleeping for 4 to 6 hours a day, which falls into the category of "inadequate sleep hours". Additionally, 20% of SHS students reported getting 7 to 9 hours of sleep, categorized as "recommended sleep". However, 10% of SHS students stated that they sleep for 1 to 3 hours a day, categorized as "short sleep hours". Furthermore, 2% of students reported sleeping for 10 to 12 hours a day, falling into the category of "extended sleep hours". Finally, 1% of respondents mentioned sleeping for more than 12 hours, categorized as "excessive sleep hours". Based on the data from this study, the average sleep duration for SHS students was 6 hours.
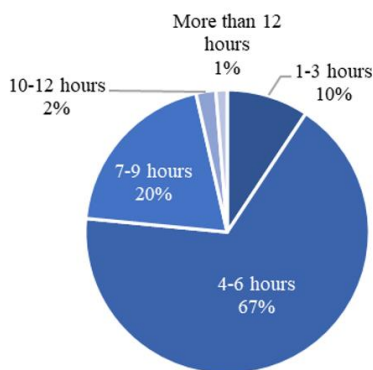

Figure 1. Percentage Sleep Hours of Senior High School Students

This result is consistent with the findings of Toyong [15], who reported that students sleep less than 6 hours a day. Moreover, Amenabar [1], citing Creswell et al. [5], also supports the findings of this study, indicating an average sleep duration of 6 hours for students.

3.3. The Relationship of Sleep Hours on the Academic Performance of Senior High School Students

Figure 2 presents the percentage of sleep hours and Figure 3 shows the percentage of academic performance of SHS students. It shows that 67% of SHS students reported that they sleep for more than 4 to 6 hours a day, and 77% of students mentioned that they have an academic performance of 90 to 100 that is measured by their GWA.
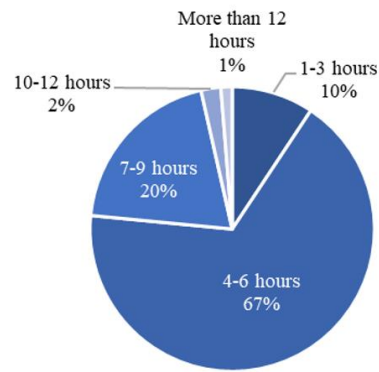

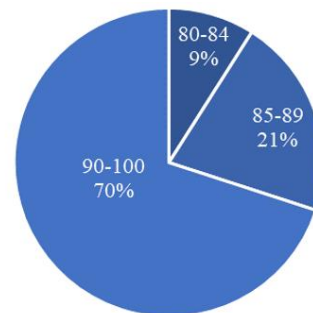**Figure 2.** Percentage Sleep Hours of Senior High School Students

Figure 3. Percentage of Academic Performance of Senior High School Students

Table 3 shows the results for the relationship of sleeping hours on the academic performance of SHS students. Also, Figure 4 presents the scatter plot of the relationship of sleeping hours on the academic performance of SHS students. The researchers used Spearman's rho correlation which has a value of -0.077 and p-value of 0.172. According to Dancey and Reidy 's interpretation table, the data presented that there is no relationship between sleep hours and academic performance.

Table 3. The Relationship of Sleep Hours on the Academic Performance of SHS Students

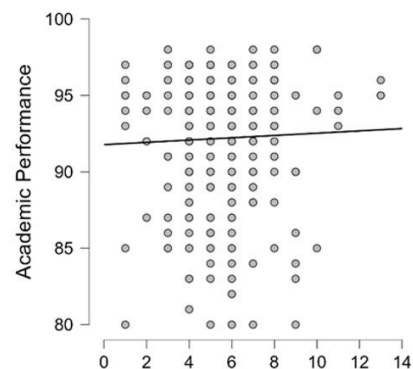| Variables	Spearman's rho	p-value	Interpretation
Sleep Hours and Academic Performance	0.010	0.858	No relationship

Figure 4. Scatter Plot of the Relationship of Sleep Hours on the Academic Performance of SHS Students

The results of this study contradict the existing literature that there is a relationship between sleep hours and academic performance. Among the respondents, an astonishing 67% of SHS students disclosed that their sleep duration falls within the range of more than 4 to 6 hours per day—a period that is often deemed inadequate for optimal cognitive function and scholastic success [12]. Remarkably, despite this ostensibly limited amount of sleep, a majority of 77% of participants indicated that they have achieved exceptional academic performance, as evidenced by attaining grades between 90 to 100 on their General Weighted Average (GWA). The finding states that there is no relationship between sleep hours and academic performance. Hence, sleep hours cannot be the reason for the 90 to 100 GWA of students, there are other factors such as I.Q level, study habits, and the school curriculum, and other factors affecting their academic performance.

3.4. The Relationship of Sleep Hours on the Classroom Participation of Senior High School Students

Figure 5 presents the pie graph of the percentage of classroom participation of SHS students. The data was measured by (1.0-1.79) Never, (1.80-2.59) Rarely, (2.60-3.39) Sometimes, (3.40-4.19) Frequently, and (4.20-5.00) Always. It shows that 49% of the SHS students were "Frequently Active" in classroom participation despite their sleep hours.
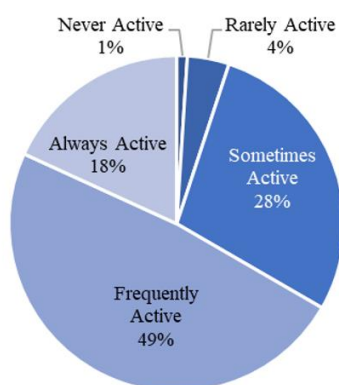

Figure 5. Percentage of the Classroom Participation of Senior High School Students

The results for the relationship of sleep hours on the classroom participation of SHS students was shown in Table 4 and the scatter plot was shown in Figure 6. The data presented are in the form of scale and ordinal data. The researchers used Spearman's correlation with a value of -0.115 and p-value of 0.043. According to Dancey and Reidy's interpretation table, the data presented that there is no relationship between sleep hours and classroom participation.

Table 4. The Relationship of Sleep Hours on the Classroom Participation of SHS Students

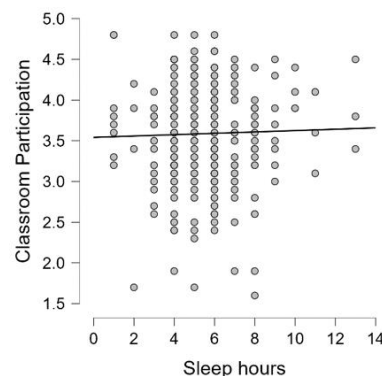| Variables	Spearman's rho	p-value	Interpretation
Sleep Hours and Classroom Participation	0.008	0.890	No relationship

Figure 6. Scatter Plot of the Relationship of Sleep Hours on the Classroom Participation of SHS Students

The result of this data shows that there is no relationship between sleep hours and classroom participation of SHS students. It is a new finding and contribution to the body of knowledge that sleep hours cannot be affected by classroom participation. Even though students sleep for 4 to 6 hours a day, 28% were sometimes active, 49% were frequently active, and 18% were always active when they participate during classroom discussion. Hence, this result is a new finding that there is no literature to support the result of the study.

4. Conclusion, Limitations, and Recommendations

4.1. Conclusion

The results of the study enabled the researchers to arrive at the following significant findings and conclusions. 67% of SHS students reported that they sleep for more than 4 to 6 hours a day, and 70% of students mentioned that they have an academic performance of 90 to 100 that is measured by their GWA. Also, the study found that the average sleeping hours of students is 6 hours. The researchers have concluded that the data that they gather has no relationship between sleep hours and academic performance. Also, they found out that there is no relationship between sleep hours and classroom participation of students. Hence, the findings states that academic performance and classroom participation cannot be affected by their sleep hours. It indicates that there are factors other than sleep, such as motivation, interest in the subject matter, teaching methods, classroom environment, and individual learning styles, may have a greater impact on students' participation level.

4.2. Limitations

The researchers encountered several limitations that affect the results of their study. Firstly, the study had a limited sample size, focusing on a specific population, namely a particular age group or academic institution. This limited scope may hinder the generalizability of the findings to a broader population. In this case, the study was conducted in NU-Nazareth, where only two sections from grades 11 and 12 GAS were included, while there were a significant number of students in grades 11 and 12 STEM. Consequently, the findings may not accurately represent the wider population. Furthermore, the study was influenced by cultural or contextual factors inherent to the population under investigation. Sleep patterns, academic expectations, and classroom dynamics can vary considerably across different

cultures or educational systems, potentially influencing the relationship between sleep hours and academic outcomes. Additionally, the setting of this study is limited at NU-Nazareth which means that the sample of participants or data collected may not be representative of the entire community or city. Lastly, the study was constrained by the limited time allocated for data gathering, which may not have been sufficient to fully capture the target population desired by the researchers. Insufficient data collection time can compromise the representativeness and comprehensiveness of the study, potentially impacting the accuracy and reliability of the findings.

4.3. Recommendations

Based on the findings of the study indicating no relationship between sleep hours and academic performance or classroom participation, it is important to consider a holistic approach to student success. While sleep is undoubtedly crucial for overall health and well-being, it may not be the sole determinant of academic performance or classroom engagement. Implementing policies and intervention about sleep hours to the NU-Nazareth will fail because sleep hours are not a determining factor why students fail or passed. Given the findings of this study, the researchers strongly recommend that the school administration carefully assess and evaluate the existing academic schedule of the school while operating under the blended learning system. The researchers recommend students to have their timetable organized in order to balance their schedule during their blended learning setup. Thus, the study emphasizes the need for further research on this topic, particularly on the relationship of sleep on the human behavior and cognitive ability of the SHS students in the schools of Manila. Additionally, future researchers can explore both quantitative and qualitative factors that contribute to high academic performance and active participation in classroom discussions among sleep-deprived students. They can use the data that the researchers have collected as a guide in terms of sleep hours, academic performance, and classroom participation.

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