Project Report

On

"An investigation on how university students' academic performance is correlated with their sleep duration and study hours"

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Chapter 1: Introduction

1.1 Introduction

University students frequently deal with a range of demands that may have an impact on their academic achievement, such as juggling their obligations to study, socialize, and take care of themselves. The amount of sleep and study time are two of these variables that are commonly mentioned as having a significant impact on student achievement. While study time has historically been associated with academic performance (Credé, Roch, & Kieszczynka, 2010), sleep is essential for cognitive processes like memory consolidation, attention, and problem-solving (Walker, 2017). Even with these established variables, there is still interest in and research being done to determine the precise relationship between university students' academic performance, study habits, and sleep.

The purpose of this study is to investigate the relationship between university students' academic performance, study hours, and sleep duration. The study will attempt to give a better understanding of how these factors interact and affect academic results by examining data from students in various departments and academic years.

1.2 Background

Sleep is essential to a student's general health and academic achievement. Lack of sleep has been shown to have a detrimental effect on cognitive functions such as learning ability, memory recall, and focus (Killgore, 2010). Due to a variety of stressors, such as deadlines, tests, and social obligations, university students in particular are known to suffer from sleep deprivation (Hershner & Chervin, 2014). According to a study by LeBourgeois et al. (2017), students who reported getting too little sleep performed worse academically, indicating that sleep is essential for success.

It has long been known that studying hours, in addition to sleep, are a significant factor in determining academic achievement. According to studies, students who put in more study time typically receive better scores (Credé et al., 2010). The relationship is complicated, though, as time management, study methods, and study quality may all be important factors in determining academic success (Schmidt, 2017).

Few research have looked at the combined effects of sleep and study hours on academic achievement, despite the obvious relevance of both. Thus, by examining sleep and study patterns in connection to university students' academic performance, this study will add to the body of knowledge already in existence.

1.3 Objectives

❖ To investigate the connection between academic performance and sleep length

❖ To examine how study hours affect academic achievement

❖ To look into how study hours and sleep quality affect academic performance together.

❖ To determine how academic achievement varies throughout different disciplines (CSE, STAT, BBA, LAW)

❖ To evaluate how the academic year affects study habits and academic achievement

By achieving these goals, the study will offer important new information on how university students' study habits and sleep patterns affect their academic performance.

Chapter 2: Data Representation

2.1 Dataset

The observed data table is shown here.

Table 1: Dataset of the students

Student ID	Age	Department	Year of Study	Sleep Duration (hours/night)	Sleep Quality (1-5)	Study Hours/Week	Recent Grades (%)
U1	20	CSE	1st Year	5	3	10	65
U2	21	STAT	2nd Year	6	4	15	70
U3	22	BBA	3rd Year	7	5	20	85
U4	23	LAW	4th Year	4	2	8	55
U5	20	CSE	1st Year	6	4	12	75
U6	22	STAT	2nd Year	5	3	14	60
U7	21	BBA	3rd Year	8	5	18	90
U8	23	LAW	4th Year	7	4	10	80
U9	22	CSE	1st Year	6	3	15	72
U10	24	STAT	2nd Year	4	2	9	50
U11	20	BBA	3rd Year	7	5	20	88
U12	21	LAW	4th Year	8	4	22	92
U13	22	CSE	1st Year	5	3	11	68
U14	23	STAT	2nd Year	6	4	16	74
U15	24	BBA	3rd Year	7	5	21	89
U16	20	LAW	4th Year	4	2	7	58
U17	22	CSE	1st Year	8	5	19	87
U18	21	STAT	2nd Year	6	4	13	65
U19	23	BBA	3rd Year	5	3	14	70
U20	24	LAW	4th Year	7	5	18	84

2.2 Images Related to My Topic

2.2.1 Image 1:

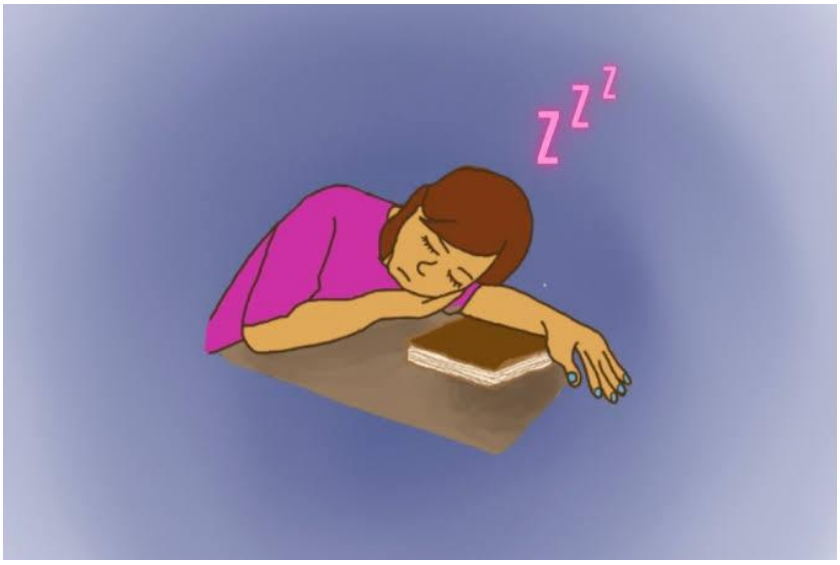

Figure 1: Influence of Sleep on Students (Girls)

2.2.2 Image 2:

Figure 2: Influence of Sleep Habit on Students (Boys)

3.1 Demographic Data:

Twenty students from the CSE, STAT, BBA, and LAW departments make up the dataset, which includes information on their age, academic year, sleep patterns, weekly study hours, and most recent grades. The average age of students throughout all academic years is 21.9 years, with a range of 20 to 24 years. Students typically sleep between 4 and 8 hours per night, for an average of 6.05 hours. On a scale of 1 to 5, sleep quality varies from person to person and is frequently associated with higher grades. Weekly study sessions range from 7 to 22 hours, with students averaging 14.84 hours of study time. Individual results range from 50% to 92%, with the average recent grade being 74.32%. While LAW students show variation in both sleep and academics, BBA students often get higher marks across departments, perhaps as a result of longer study sessions and better sleep. Students in CSE and STAT exhibit balanced habits and modest performance. In general, better sleep, more study hours, and adequate sleep length are linked to higher grades. According to the data, good sleep and study practices have a big impact on academic achievement.

3.1.1 Visualization of Demographic Data

3.1.1.1 Department

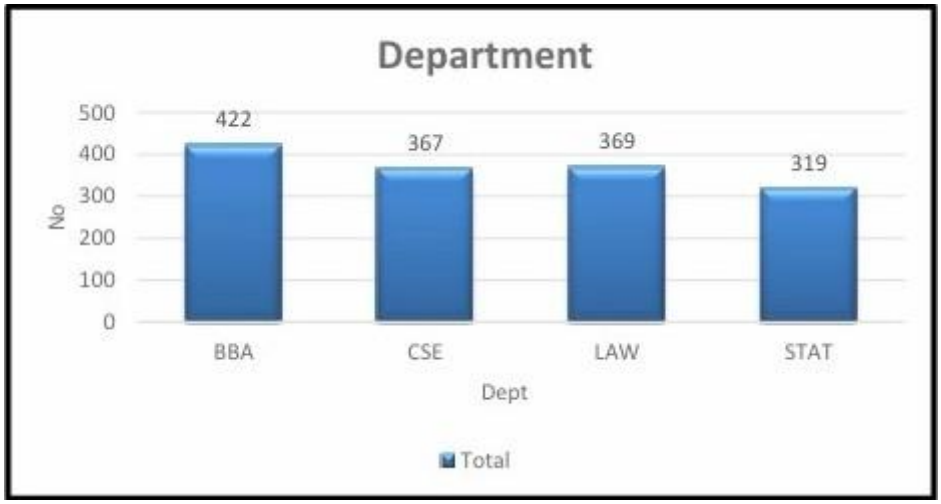

Figure 3: Department

These are the students' departmental demographics that are being monitored.

3.1.1.2 Sleep Duration

Figure 4: Sleep Duration

These are the students' department and sleep duration demographics that are being monitored.

3.1.1.3 Sleep Quality

Figure 5: Sleep quality

These are the students' departmental and sleep quality demographics that are being monitored.

3.1.1.4 Study Hour / Week

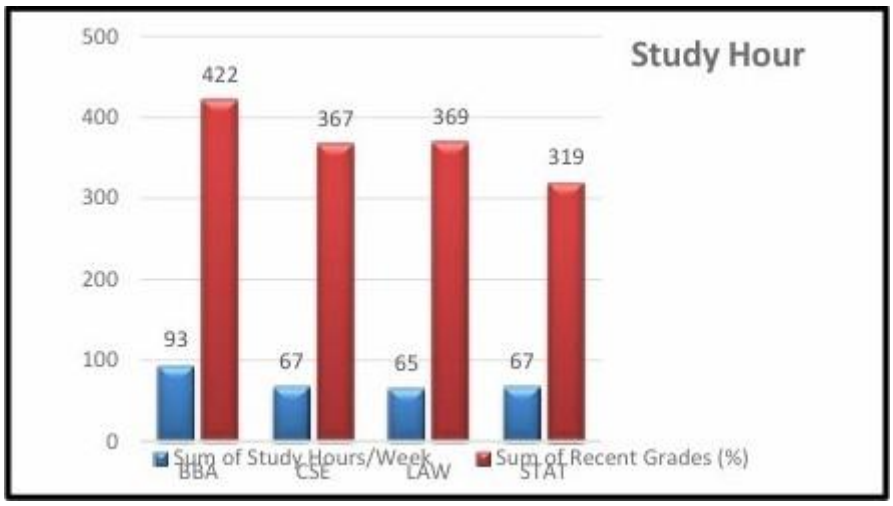

Figure 6: Study Hour / Week and Grades

These are the students' department and study hour/week demographics that are being monitored.

3.2 Correlation

Important information about student performance may be gleaned from the correlation values between sleep patterns, study habits, and recent grades. Students who get more sleep tend to do better academically; the correlation between sleep duration and recent grades is remarkably high at 0.9499, suggesting a significant positive association. Additionally, there is a 0.8978 association between recent grades and sleep quality, indicating that improved sleep quality has a significant impact on academic achievement.Last but not least, there is a strong positive correlation—albeit a little weaker one—between the number of study hours per week and recent grades, at 0.8606. These findings imply that sleep—both quantity and quality—has a greater effect on grades than study time alone. In addition to establishing regular study routines, this emphasizes how important getting good enough sleep is for academic success.

3.3 Trends

3.3.1 Recent Grades and Sleep Duration

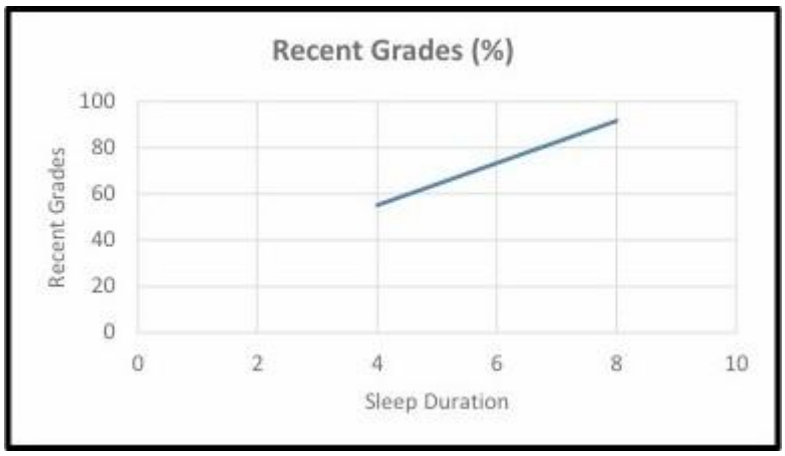

Figure 7: Trends Between Sleep Duration and Grades

The two variables show a positive trend, meaning that grades rise in tandem with an increase in sleep duration.

3.3.2 Recent Grades and Sleep Quality

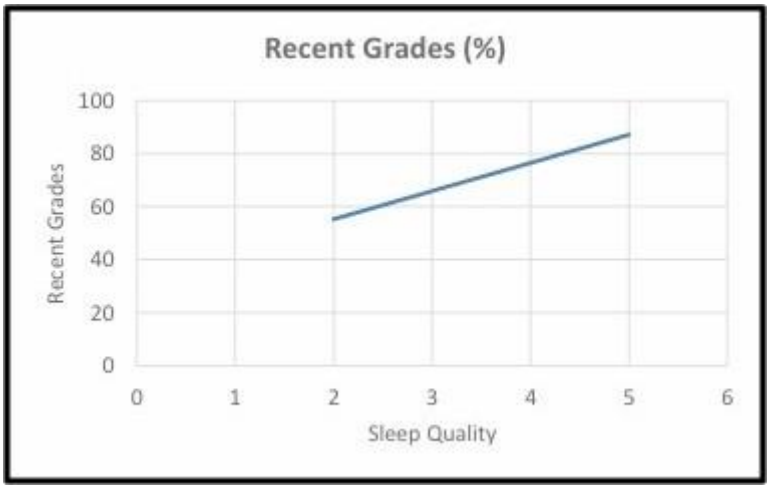

Figure 8: Trends between Sleep Quality and Grades

The two variables show a positive trend, meaning that grades rise in tandem with improved sleep quality.

3.3.3 Recent Grades and Study Hours/Week

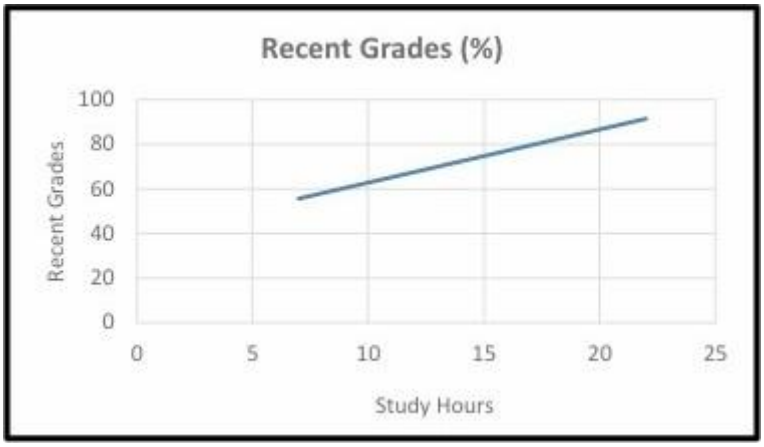

Figure 9: Trends Between Study Hours and Grades

The two variables show a positive trend, meaning that grades will rise in tandem with an increase in study hours per week.

Chapter 4: Result and Conclusion

4.1 Result

The dataset's analysis shows that study hours, sleep patterns, and academic achievement are all strongly positively correlated. The strongest link between sleep duration and recent grades (0.9499) suggests that kids who get more sleep often do better academically. Additionally, there is a significant positive connection (0.8978) between grades and sleep quality, highlighting the need of getting enough good sleep for academic achievement. Weekly study hours show a strong but marginally lesser association (0.8606) with grades, indicating that regular study habits improve performance but have a less noticeable effect than sleep-related factors. Department-wise, BBA students often earn better scores, maybe as a result of better sleep and study habits, whereas LAW students show more variation in their performance and habits. Students in CSE and STAT continue to achieve reasonable outcomes, demonstrating balanced study and sleep habits. All things considered, the research shows that study habits and sleep have a considerable impact on academic achievement, with sleep having a somewhat greater effect.

4.2 Conclusion

The results highlight how crucial it is to balance study, sleep, and general academic practices in order to perform at your best. More important than study hours alone, getting enough good sleep is essential for improving academic performance and cognitive function. This implies that students who want to improve their scores should give equal weight to regular study sessions as well as sufficient relaxation and recuperation. Furthermore, the variation shown among departments emphasizes the necessity of specialized approaches to assist students in striking this equilibrium. In summary, academic success requires a comprehensive strategy that incorporates adequate sleep, restful sleep, and productive study habits. As such, it is critical that students see sleep as an integral part of their study techniques rather than a secondary concern.

References

1. Credé, M., Roch, S. G., & Kieszczynka, U. M. (2010). Class attendance in college: A meta analytic review. *Review of Educational Research, 80*(2), 272–295. https://doi.org/10.3102/0034654319358491

2. Hershner, S. D., & 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

3. Killgore, W. D. S. (2010). Effects of sleep deprivation on cognition. *Progress in Brain Research, 185*, 105–129. https://doi.org/10.1016/B978-0-444-53702-6.00008-3 4. LeBourgeois, M. L., Hale, L., Chang, A. M., & Montgomery-Downs, H. E. (2017). Digital media and sleep in childhood and adolescence. *Pediatrics, 140*(Supplement 2), S78–S81. https://doi.org/10.1542/peds.2016-1758G

5. Schmidt, M. (2017). The impact of study habits on student success: A systematic review. *Journal of Education and Learning, 6*(4), 33–42. https://doi.org/10.5539/jel.v6n4p33

6. Walker, M. P. (2017). *Why we sleep: Unlocking the power of sleep and dreams.* Scribner.