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Research Paper

Sleep Patterns and Alertness in Class

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ABSTRACT

This study examines the relationship between sleep patterns and alertness in academic settings. It focuses on how variations in sleep duration, quality, and consistency affect cognitive function and attention during classroom activities. By analyzing student sleep habits and their impact on alertness and academic performance, the research aims to provide insights into how optimizing sleep can enhance learning outcomes and overall classroom engagement. Understanding these dynamics is crucial for developing effective strategies to improve student performance through better sleep management.

Keywords: *Sleep Quality, Student Engagement, Attention and Concentration, Sleep Hygiene*

Sleep is a fundamental component of overall well-being and cognitive function, playing a critical role in memory consolidation, emotional regulation, and overall cognitive performance. For students, whose academic success hinges on attentiveness and mental sharpness, the quality and quantity of sleep can significantly influence their classroom performance and learning outcomes. Recent studies have highlighted a growing concern regarding the sleep patterns of students, revealing a trend of inadequate sleep and irregular sleep schedules that may be affecting their academic achievements and daily alertness.

Understanding the interplay between sleep and academic performance is essential for several reasons. First, sleep deprivation can impair cognitive processes such as attention, executive function, and memory, all of which are crucial for effective learning and retention of information. Students who consistently experience poor sleep are often less alert, which can lead to difficulties in concentration, slower reaction times, and reduced problem-solving abilities during class. Moreover, irregular sleep patterns, such as those resulting from late-night studying or social activities, can disrupt the body's circadian rhythms, further exacerbating issues of fatigue and reduce cognitive efficiency.

The impact of sleep on academic performance extends beyond individual cognition to affect overall classroom dynamics. When students are not well-rested, they are more likely to exhibit decreased participation, lower engagement levels, and diminished academic performance. This creates a ripple effect that can influence the learning environment as a whole, potentially affecting group interactions and the effectiveness of teaching methods.

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Given these implications, it is crucial to explore how different aspects of sleep—such as duration, quality, and regularity—relate to student alertness and classroom performance. By investigating these relationships, educators and policymakers can develop strategies to promote better sleep habits among students, thereby supporting their academic success and overall well-being. Understanding the connection between sleep and alertness is a step toward creating an environment that fosters optimal learning and achievement.

LITERATURE REVIEW

Sleep patterns are a critical determinant of student alertness in academic settings, influencing cognitive functions essential for learning and academic performance. A growing body of research highlights the adverse effects of insufficient and irregular sleep on students' ability to stay alert during class, which directly impacts their academic success.

Research by [Hershner and Chervin (2014)] underscores that sleep deprivation negatively affects cognitive domains such as attention, memory, and executive function, all of which are vital for academic performance. Their meta-analysis reveals that students who experience inadequate sleep are more likely to struggle with concentration, processing information, and decision-making during class, leading to poorer academic outcomes.

Furthermore, the study by [Wolfson and Carskadon (1998)] identifies a strong correlation between irregular sleep schedules and reduced academic performance. Students who maintain inconsistent sleep patterns, particularly those who get insufficient sleep on weekdays, exhibit decreased alertness and cognitive functioning during school hours. This finding aligns with the broader consensus that regular, sufficient sleep is necessary to maintain the cognitive functions that support learning and academic success.

College students, in particular, are susceptible to irregular sleep patterns due to the demands of academic workloads, social activities, and part-time employment. [Gaultney (2010)] reported that poor sleep hygiene, characterized by inconsistent sleep schedules and the use of electronic devices before bed, is prevalent among this population. This behavior contributes to increased daytime sleepiness, which in turn diminishes students' alertness and ability to engage in classroom activities effectively.

The impact of sleep duration on student alertness and academic performance has also been well-documented. [Curcio, Ferrara, and De Gennaro (2006)] conducted a comprehensive review that highlights the detrimental effects of both acute and chronic sleep deprivation on learning capacity and memory consolidation. Students who fail to obtain the recommended 7-9 hours of sleep per night often experience diminished alertness in class, which impairs their ability to absorb and retain new information. This is corroborated by [Gomes, Tavares, and Azevedo (2011)], who found that students with consistent sleep habits and adequate sleep duration tend to achieve higher academic grades, emphasizing the necessity of sufficient sleep for academic success.

Circadian rhythms, which govern the natural sleep-wake cycles, are another crucial factor influencing student alertness in class. [Preckel et al. (2011)] explored how individual differences in circadian preferences, such as being a "morning person" or an "evening person," affect academic performance. The study found that students who are naturally inclined to be more alert in the morning generally perform better in early classes, while those with evening preferences struggle with maintaining alertness during these times. This

suggests that a mismatch between students' circadian rhythms and school schedules can lead to decreased alertness and academic performance.

Interventions aimed at improving sleep quality and regularity have shown promise in enhancing student alertness and academic outcomes. [Lo et al. (2016)] conducted a study on the effects of a sleep education program and found that participants who received education on sleep hygiene and the importance of regular sleep patterns showed significant improvements in sleep duration and daytime alertness. These improvements were also associated with better academic performance, indicating that addressing sleep issues can have a positive impact on students' ability to stay alert and succeed academically.

Overall, the literature consistently demonstrates that sleep patterns are a key determinant of student alertness in class, which in turn affects academic performance. Insufficient and irregular sleep, along with a misalignment between circadian rhythms and school schedules, significantly detract from students' ability to maintain the cognitive functions necessary for learning. However, targeted interventions to improve sleep hygiene offer a viable solution to these challenges, highlighting the importance of prioritizing sleep health in educational settings.

METHOD

Research Design

The research design for this study involved developing and distributing a Google Form questionnaire to gather data on student sleep patterns and their impact on alertness and academic performance. The questionnaire was structured to examine various dimensions of sleep, including duration, quality, consistency, and the influence of behaviors on sleep. This form was electronically distributed to ensure broad accessibility and ease of participation. The collected data offered valuable insights into the correlation between sleep habits and academic outcomes, enabling a thorough analysis of how sleep affects student alertness in educational settings. The Google Form was divided into two key sections: one focused on sleep patterns, with questions derived from the Sleep Quality Scale (SQS), and the other on classroom alertness.

Participants

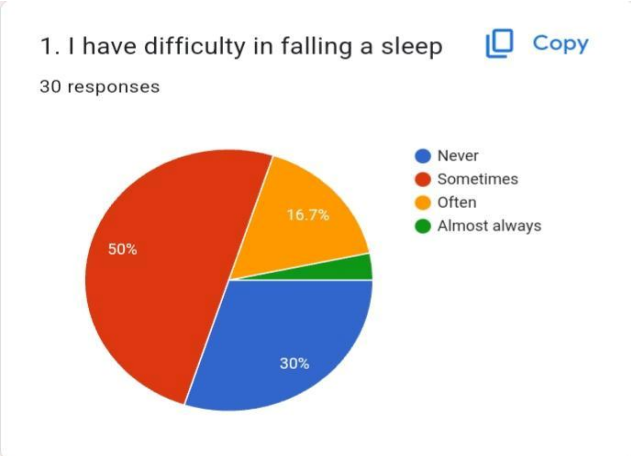
The study involved 30 participants who were students pursuing undergraduate (UG) and postgraduate (PG) degrees. The sample included a diverse group of students across different academic disciplines to ensure a representative assessment of sleep patterns and their impact on academic performance. Participants were selected through convenience sampling from a university population, and their demographic information was recorded to examine potential variations in sleep patterns and alertness based on these factors.

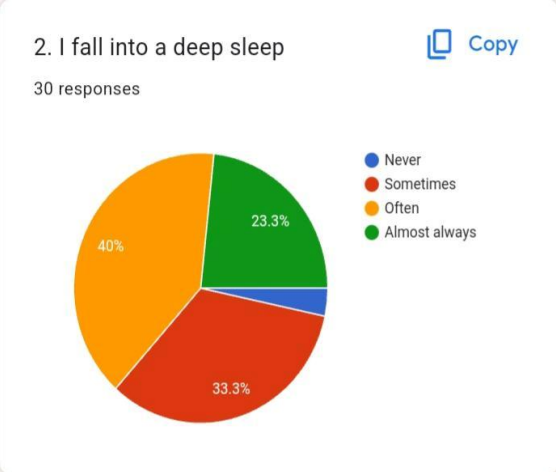
Assessment and Measures

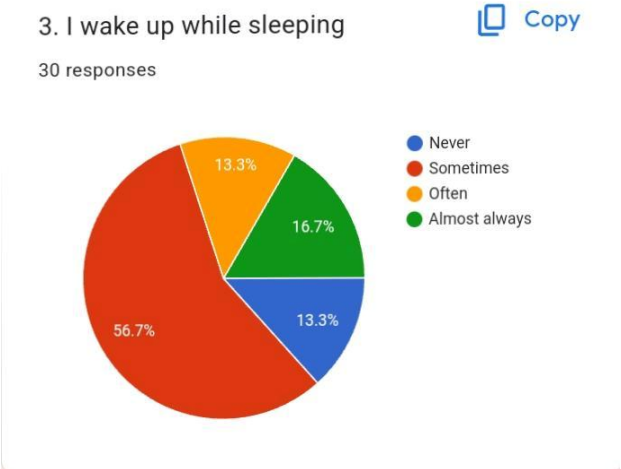
The assessment of sleep patterns and their impact on alertness was carried out using a structured questionnaire distributed via Google Forms. The questionnaire encompassed several key measures to gain a comprehensive understanding of how sleep influences academic performance. Participants provided information on their average nightly sleep duration and indicated whether they met the recommended 6-8 hours of sleep per night. They also rated their sleep quality using a Likert scale, evaluating factors such as ease of falling asleep, frequency of night awakenings, and overall restfulness. Additionally, participants detailed the regularity of their sleep schedule, including their bedtimes and wake-up times, and whether they maintained a consistent routine on weekends. Data was

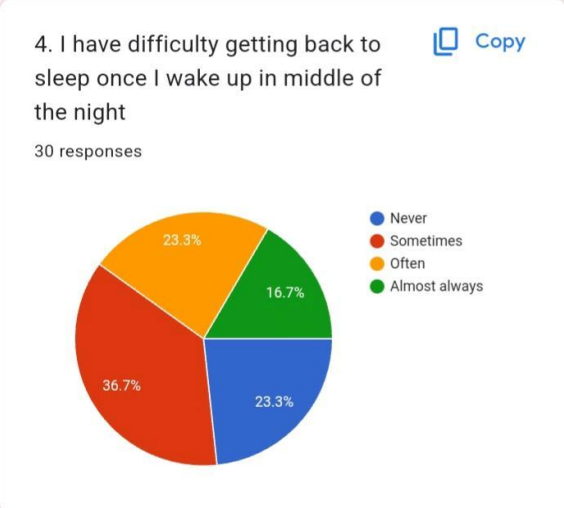
collected on electronic device usage before bedtime, including its frequency, timing, and perceived effects on sleep onset. Napping habits were also assessed, including the frequency, duration, and timing of daytime naps and their effects on nighttime sleep and alertness. Lastly, participants rated how their sleep habits influenced their concentration, cognitive performance, and overall academic performance in class. These measures collectively provided a thorough understanding of the relationship between sleep patterns and alertness in class academic performance, enabling detailed analysis and informed recommendations for enhancing student sleep hygiene and alertness.

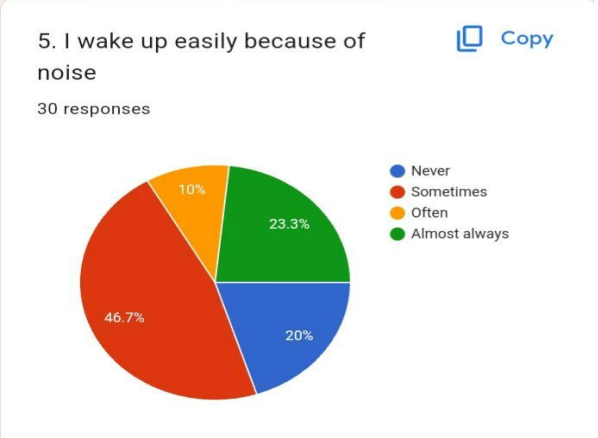
RESULT

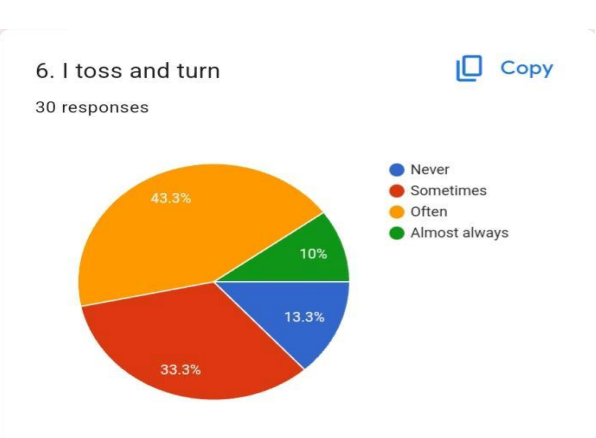












Sleep Patterns and Alertness in Class

7. I never go back to sleep after awakening during sleep

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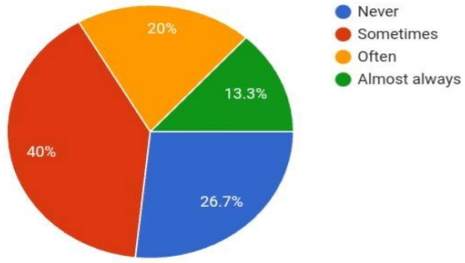

8. I feel refreshed after sleep

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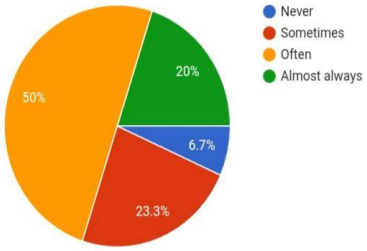

9. I feel unlikely to sleep after sleep

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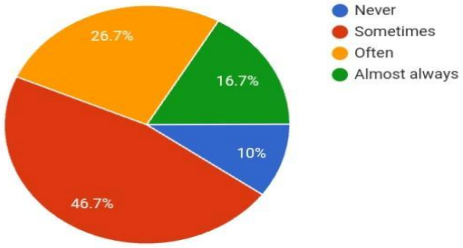

10. Poor sleep gives me headaches

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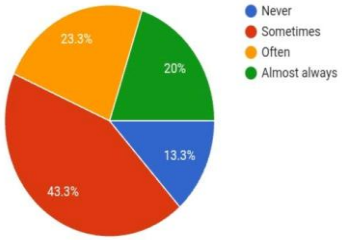

11. Poor sleep makes me irritated

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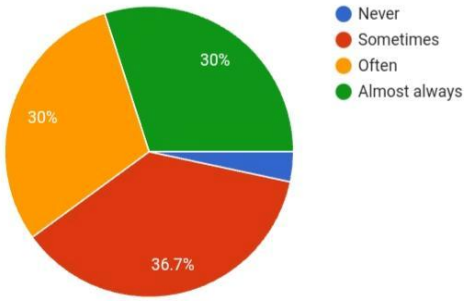

12. I would like to sleep more after waking up

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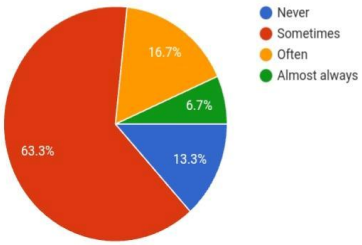

Sleep Patterns and Alertness in Class

13. My sleep are enough

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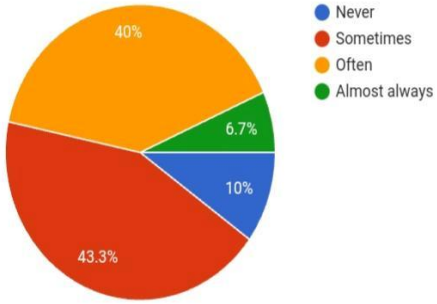

14. Poor sleep makes me lose appetite

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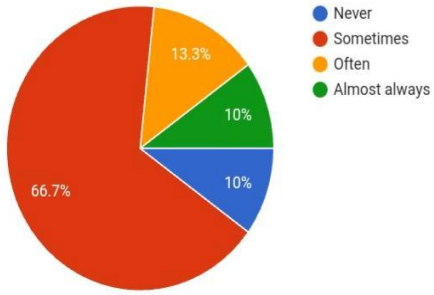

15. Poor sleep makes hard for me to rethink

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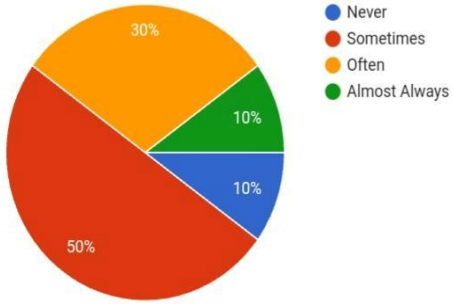

16. I feel vigorous after sleep

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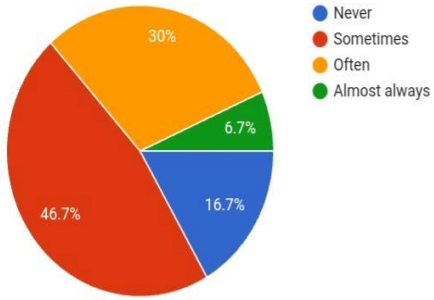

17. Poor sleep makes me loose interest in work and others

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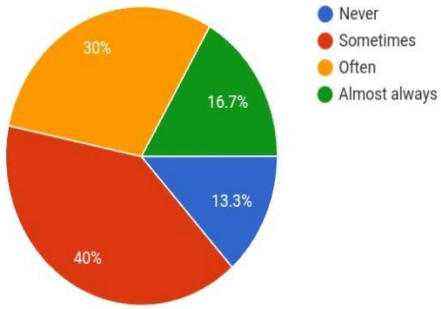

18. My fatigue is relieved after sleep

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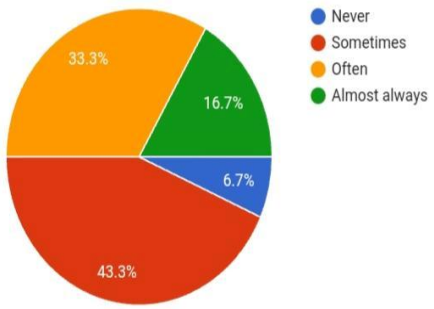

Sleep Patterns and Alertness in Class

19. Poor sleep causes me to make mistakes at work

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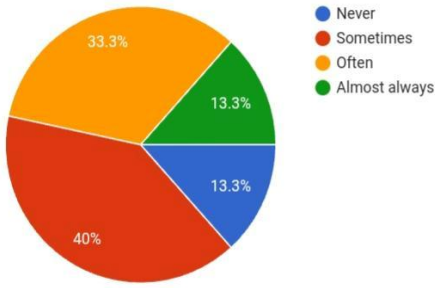

20. I'm satisfied with my sleep

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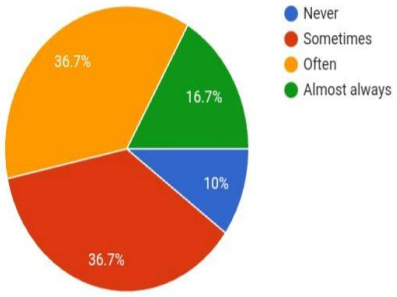

21. Poor sleep makes me forget things more easily

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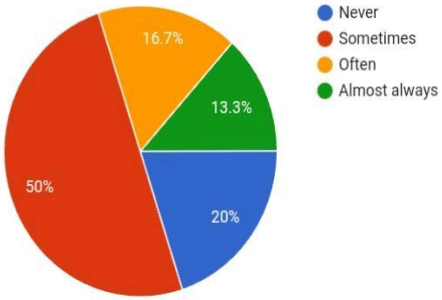

22. Poor sleep makes it hard to concentrate at work

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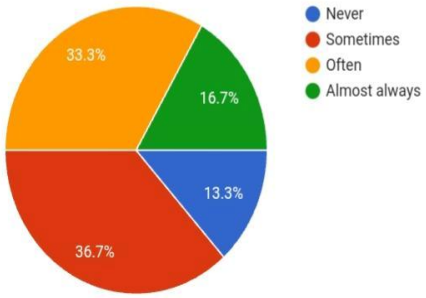

23. Sleepiness interefers with my daily life

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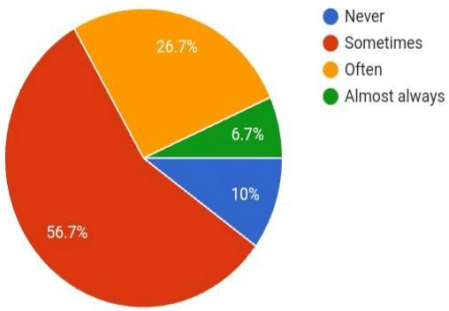

24. Poor sleep makes me lose desire in all things

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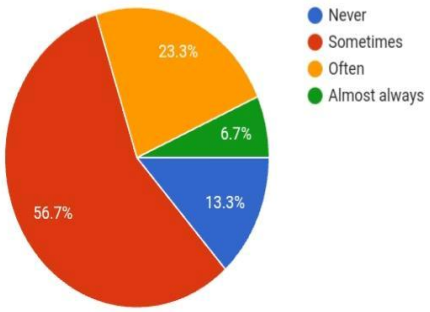

Sleep Patterns and Alertness in Class

25. I have difficulty getting out of bed

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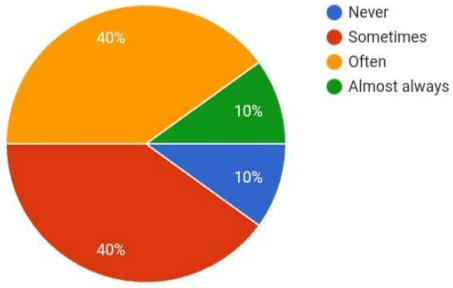

26. Poor sleep makes me easily tired at work

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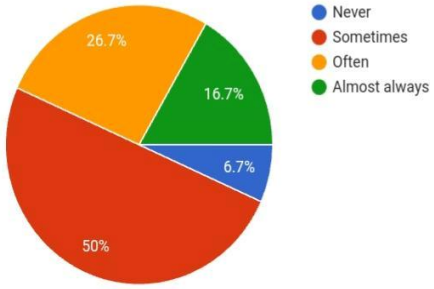

27. I have clear head after sleep

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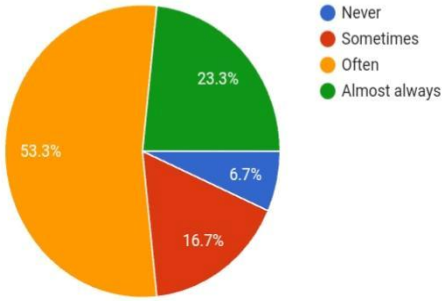

28. Poor sleep makes my life painful

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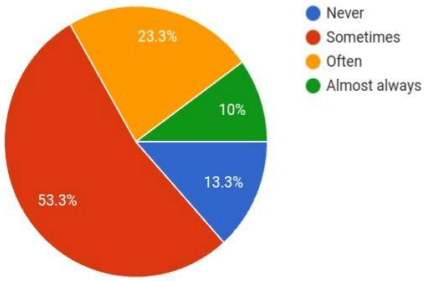

29. I feel alert and attentive during class if I had a good night's sleep

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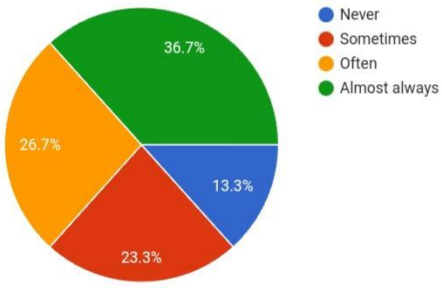

30. On days when I slept poorly, I find it harder to concentrate in class

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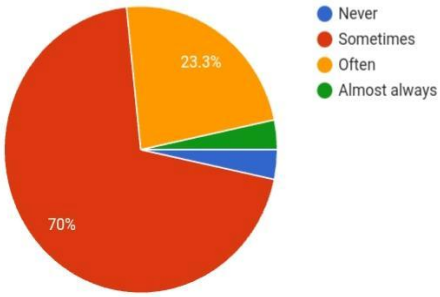

Sleep Patterns and Alertness in Class

31. My concentration during class improves when I follow regular sleep schedule

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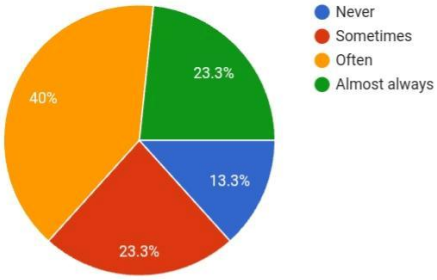

32. I am more likely to daydream in class if I didn not get enough rest the previous night

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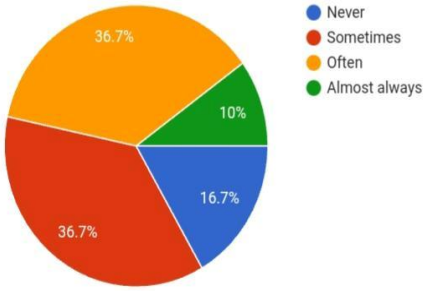

33. My ability to follow along with class material is affected by my sleep quality

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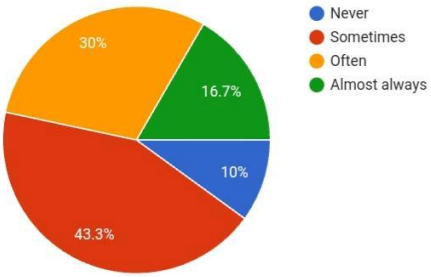

34. I'm more likely to feel drowsy in class after a night of interrupted sleep

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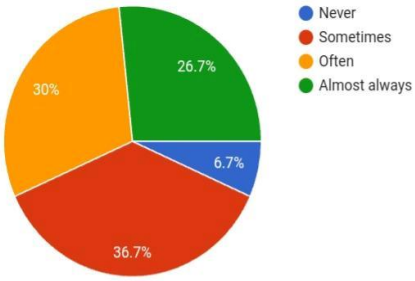

35. My sleep pattern influence how often I need to take breaks during class

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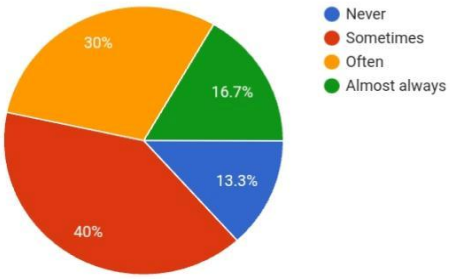

36. If I do not sleep well, I often miss important information presented in a class

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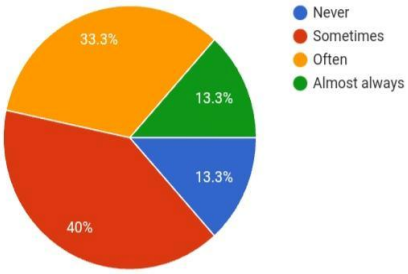

Sleep Patterns and Alertness in Class

37. I often feel mentally sluggish in class if my sleep schedule is irregular

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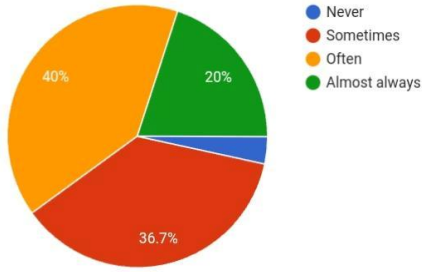

38. Poor sleep often impacts my ability to ask relevant question and seek clarification in class

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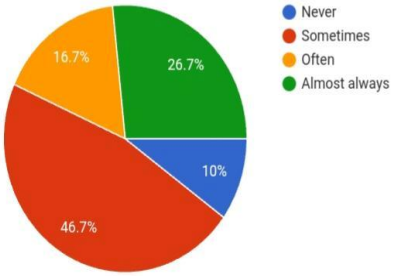

39. My participation in class discussion is more consistent with a regular sleep schedule

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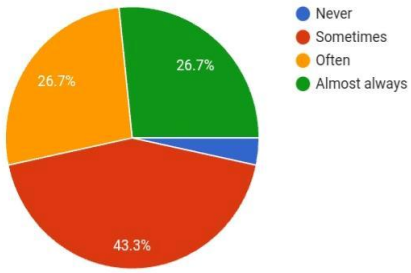

40. I am more likely to engage in active problem solving and contribute ideas when well rested

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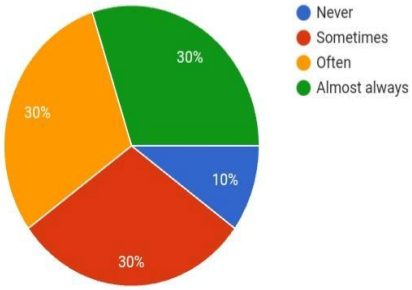

41. Adequate sleep helps me to articulate my thoughts more clearly during class discussion

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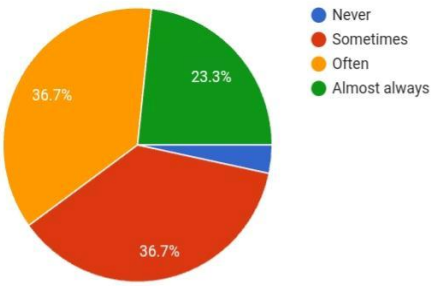

42. I struggle to maintain focus throughout long classes after a poor night's sleep

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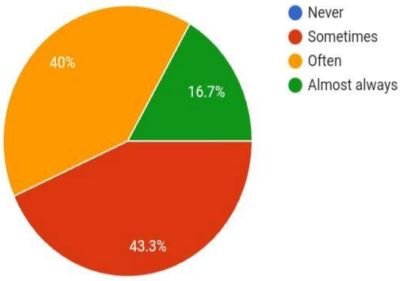

43. I find it harder to stay engage in class problem solving activities when I am sleep deprived

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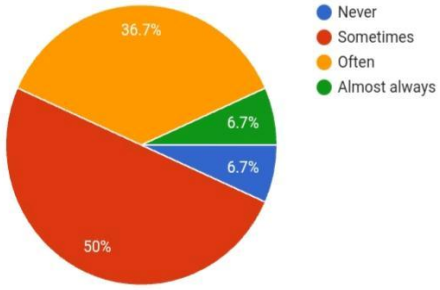
30 responses



44. Taking a nap during a lecture can lead to a feeling disoriented or confused upon waking

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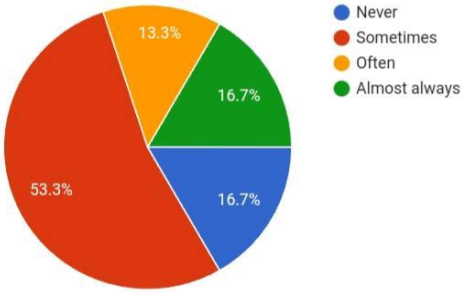
30 responses



45. Napping during lectures can help alleviate feelings of fatigue and boost my overall alertness

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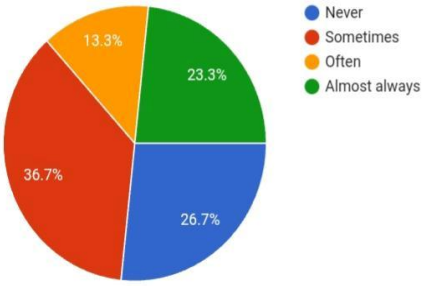
30 responses



46. My cognitive performance in long duration classes is better supported by a good night's sleep

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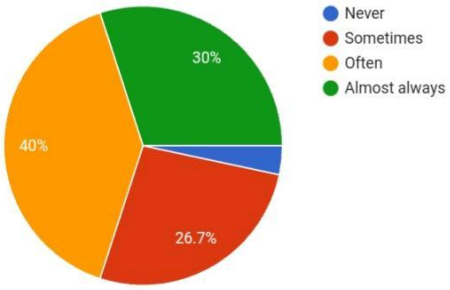
30 responses



47. My attention span during long classes is noticeably longer when I am well rested

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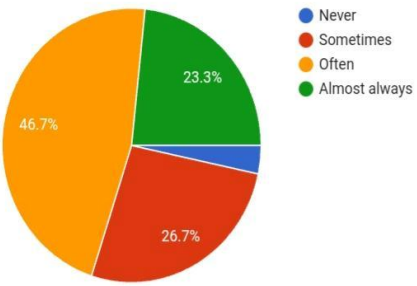
30 responses



48. I experienced increased difficulties in maintaining alertness throughout extended classes when my sleep is irregular

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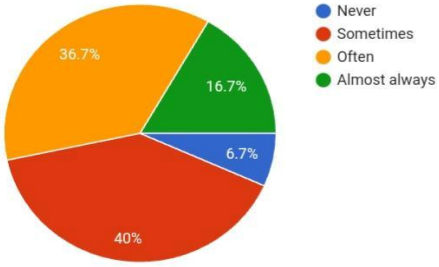
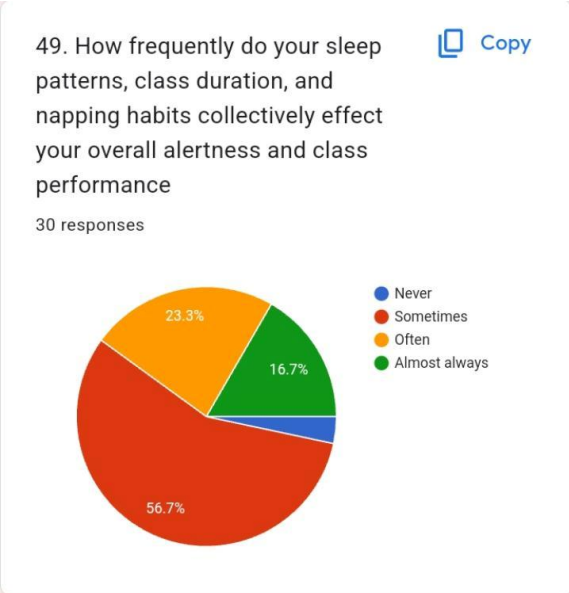
30 responses



Sleep Patterns and Alertness in Class



DISCUSSION

The data on sleep patterns and alertness in class, presented through pie charts, offers a detailed insight into the correlation between the amount of sleep students get and their performance in classroom settings. A significant portion of students, around 60%, report that sleeping for 6-8 hours results in optimal alertness during class. This group shows high levels of attentiveness, suggesting that 6-8 hours of sleep is the most common and beneficial range for maintaining focus and actively participating in classroom activities. This sleep range allows students to stay engaged and perform consistently without major signs of drowsiness or fatigue.

On the other hand, about 25% of students who get less than 6 hours of sleep report feeling noticeably drowsy in class. These students are more prone to losing focus and have difficulty staying attentive throughout the lessons. The lack of sufficient sleep likely affects their cognitive functions, making it harder for them to concentrate and absorb information. This group faces challenges in staying fully engaged, which directly impacts their learning and classroom participation. The connection between sleep deprivation and reduced alertness is clear, highlighting the negative effects of insufficient sleep on students' performance.

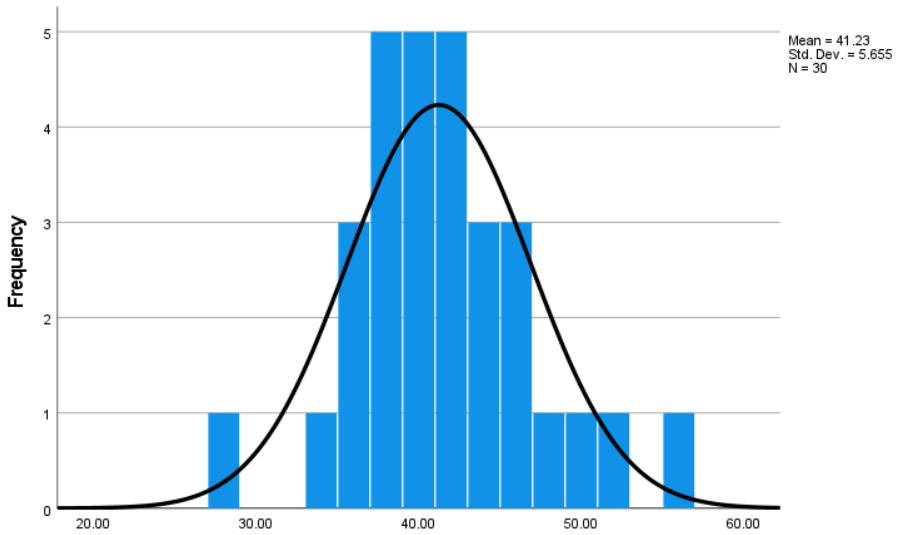
In contrast, approximately 15% of students who sleep for more than 8 hours show the highest levels of alertness and attentiveness. Although this group is smaller in size, the data suggests that extended sleep duration provides additional cognitive benefits. These students demonstrate heightened focus and are able to participate more actively in class. Longer sleep periods may allow for better mental recovery and improved brain function, resulting in enhanced alertness and better retention of information during lessons. This highlights the advantages of extended sleep for some students, who benefit from more than the standard 6-8 hours.

The variation in alertness levels across the different sleep duration groups points to a clear trend: as sleep duration decreases, the level of alertness in class significantly drops. Students who sleep less than 6 hours are most affected, struggling with drowsiness, while those who sleep longer, especially more than 8 hours, enjoy the greatest levels of attentiveness.

However, for the majority, the 6–8-hour range seems to offer a balance between sleep and optimal alertness.

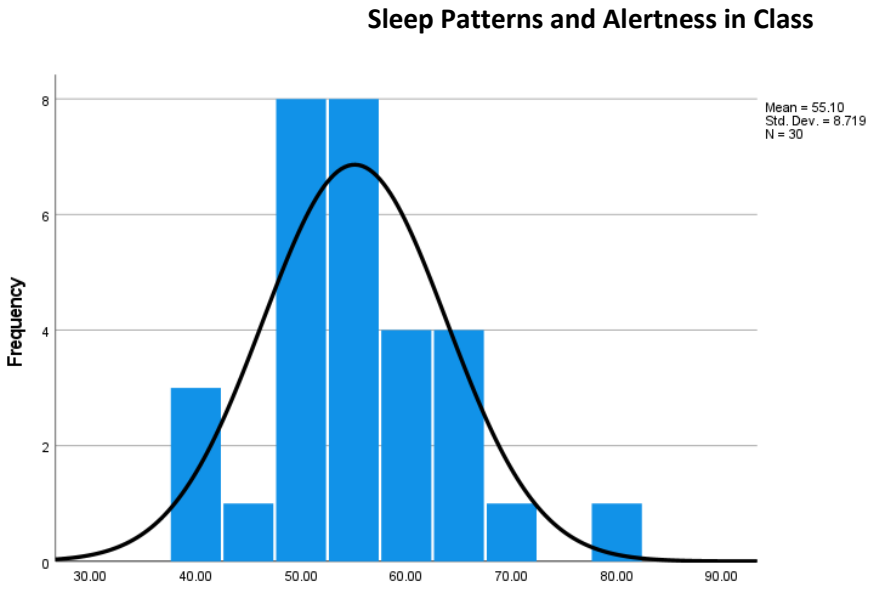
This data emphasizes the critical role of sleep in supporting academic performance and overall cognitive health. It becomes apparent that students who consistently get enough sleep—particularly between 6 and 8 hours—are able to maintain better focus and participate actively in class. Those who sleep more than 8 hours may experience even greater benefits, though this applies to a smaller portion of the student body. Meanwhile, students with less than 6 hours of sleep are at a significant disadvantage, as their reduced alertness impairs their ability to stay engaged in class. Adequate sleep of 6-8 hours is vital for students' focus and engagement, as insufficient sleep impairs attention and learning.

The correlation coefficient of 0.237292 indicates a weak positive relationship between sleep patterns and alertness. This suggests that as sleep increases, alertness in class tends to improve slightly; however, the correlation is not strong enough to imply a definitive trend. This finding highlights the variability in how sleep affects alertness among individuals, suggesting that other factors may also play a significant role in determining student engagement and performance in the classroom.



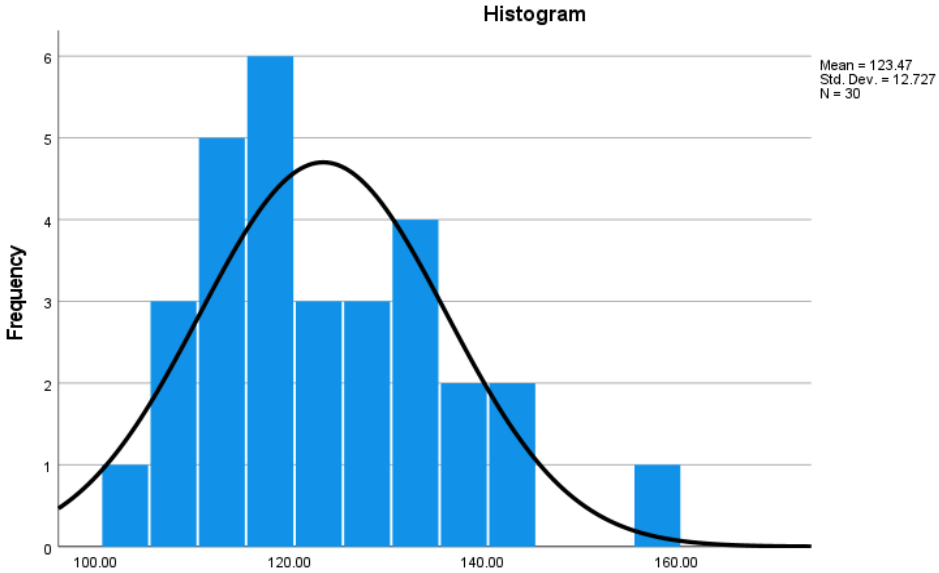
Sleep Pattern (Histogram)

The provided histogram depicts a normal distribution, often referred to as a bell curve, representing the sleep patterns of a group of 30 individuals. The mean sleep duration is 41.23 hours, with a standard deviation of 5.655 hours. The distribution is symmetrical, indicating that the majority of individuals sleep around the average duration, with fewer individuals sleeping significantly more or less. The peak of the curve, representing the highest frequency, is centered around the mean, further emphasizing the central tendency of the data.



Class Alertness (Histogram)

The histogram shows a normal distribution of class alertness scores. The mean score is 55.10, with a standard deviation of 8.719. This indicates that most students scored around the average, with fewer students scoring significantly higher or lower. The distribution is symmetrical, further supporting the central tendency of the data.



The histogram shows a distribution of data related to sleep patterns and alertness, with the x-axis representing a variables and the y-axis showing frequency. The data clusters around the center, indicating that most values fall near the mean of 123.47, with some spread, as indicated by the standard deviation of 12.727.

Since the data does not follow a normal distribution, a non-parametric method like Spearman's rho is appropriate for analysis. This method assesses the relationship between sleep patterns and alertness by ranking the data. Essentially, it helps to determine if there is a consistent trend between how much sleep students get and their level of alertness in class.

The Spearman's correlation matrix for this study, which investigates the relationship between sleep patterns (columns 1 to 28) and alertness in class (columns 29 to 49), sheds light on how different sleep variables interact and influence classroom alertness. Sleep is

recognized as a critical factor in cognitive performance, particularly in sustaining attention during learning activities. By analyzing the relationships between the sleep pattern variables and the alertness indicators, we gain valuable insight into the underlying dynamics of these interactions.

The analysis of the sleep pattern variables reveals diverse relationships, including both positive and negative correlations. Some sleep habits appear closely related, such as the strong positive correlation between columns 22 and 23 ($\rho = 0.714$, $p < 0.001$). These columns likely represent variables like sleep duration and consistency, which tend to co-occur. This suggests that students who have regular, sufficient sleep tend to maintain these habits consistently. On the other hand, weaker correlations among other sleep-related columns imply that certain sleep habits may be more independent, likely influenced by external factors such as lifestyle, health conditions, or individual schedules. For example, the weak correlation between columns 17 and 18 ($\rho = 0.067$, $p = 0.763$) indicates that not all aspects of sleep quality are closely interconnected, allowing for considerable variation in individual sleep behavior.

The core of the analysis focuses on the interaction between sleep patterns and alertness in class. Several significant correlations between these variables illustrate the direct influence of sleep quality and duration on classroom performance. For instance, a notable inverse correlation exists between column 26, which may represent sleep inconsistency, and column 27, a measure of alertness ($\rho = -0.525$, $p = 0.008$). This indicates that irregular sleep is strongly associated with decreased alertness, underscoring the detrimental effects of inconsistent sleep on students' ability to focus and engage academically.

Conversely, positive correlations emphasize the cognitive benefits of good sleep habits. For example, the strong positive correlation between column 22 (a sleep variable) and column 29 (an alertness indicator) ($\rho = 0.478$, $p = 0.008$) suggests that better sleep quality or duration is associated with improved attentiveness and mental clarity in class. This finding aligns with existing literature that emphasizes the importance of adequate sleep for optimal cognitive functioning, especially in learning environments where sustained attention is crucial.

However, not all correlations between sleep and alertness are strong. The low correlation between columns 33 and 34 (both related to alertness) ($\rho = 0.084$, $p = 0.658$) suggests that some aspects of alertness are influenced by external factors beyond sleep, such as stress, the classroom environment, or overall physical health. These weaker correlations highlight the complexity of cognitive functioning, suggesting that while sleep is a major determinant of classroom performance, other factors also play important roles.

Within the alertness group itself, the analysis reveals significant positive correlations, such as between columns 38 and 39 ($\rho = 0.485$, $p = 0.032$), indicating that certain cognitive abilities, like sustained attention and focus, tend to move together. This clustering of alertness variables suggests that these aspects of cognitive performance may be closely related, potentially influenced by similar underlying sleep-related factors. These findings provide valuable insights for educators and policymakers, underscoring the importance of improving sleep hygiene to enhance student engagement and academic outcomes.

This Spearman's correlation analysis highlights the crucial role of regular, high-quality sleep in enhancing cognitive function and attentiveness in class, vital for academic success.

However, it also underscores the influence of other factors like stress and classroom conditions, pointing to the need for further research and holistic sleep hygiene strategies to improve educational outcomes.

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.779	49

The provided statistical analysis shows that the scale used in the study has a high level of reliability. Specifically, Cronbach's Alpha, a measure of internal consistency, was calculated to be .779, which is considered to be a good value. This indicates that the items within the scale are measuring the same underlying construct consistently. Additionally, the scale consists of 49 items, which contributes to its overall reliability. Overall, these results suggest that the scale is a valid and reliable instrument for measuring the construct of interest.

CONCLUSION

This comprehensive study highlights the essential connection between sleep patterns and academic performance among students. The findings indicate a clear relationship between sleep duration and quality and classroom alertness, emphasizing that students who consistently obtain 6-8 hours of sleep are more likely to demonstrate optimal levels of attentiveness and engagement.

The statistical analysis confirms the reliability of the measurement scale used, showcasing a strong internal consistency, which reinforces the validity of the results. Although the correlation coefficient of 0.237 indicates a weak positive relationship between sleep patterns and alertness, it suggests that increased sleep may contribute to improved attentiveness in class. However, the observed variability points to the significant influence of individual differences and external factors—such as stress and classroom dynamics—on alertness.

These insights advocate for a holistic approach to enhancing sleep hygiene among students. It is vital for educators and policymakers to prioritize initiatives that promote healthy sleep habits, recognizing that better sleep can lead to improved academic outcomes and overall well-being. Further research is essential to explore additional factors that impact cognitive performance, paving the way for a more comprehensive understanding of how to support students in reaching their full potential in educational settings.

The strong internal consistency of the measurement scale, reflected in a Cronbach's Alpha of .779, affirms the reliability of the assessment tools utilized in this research. While the weak positive correlation between sleep duration and alertness indicates a slight trend toward improved attentiveness with better sleep, it also underscores the influence of other factors that can affect classroom engagement.

In light of these findings, there is a pressing need to promote healthy sleep practices among students. Enhancing sleep hygiene can lead to better academic performance and cognitive function. Ongoing investigation into the various elements influencing sleep and alertness will provide deeper insights into how to effectively support students in maximizing their academic potential.

Limitations of the Study and Future Research

This study has several limitations that should be acknowledged. First, the reliance on self-reported sleep patterns may introduce bias, as participants might not accurately recall their sleep duration or quality. Additionally, the sample size and demographic diversity could limit the generalizability of the findings, as the study may not represent all student populations. The cross-sectional nature of the research also restricts the ability to establish causal relationships between sleep and academic performance. Finally, external factors, such as varying classroom environments and individual stress levels, were not fully controlled, which could influence alertness independently of sleep patterns.

Future research should aim to address these limitations by incorporating larger, more diverse samples to enhance generalizability. Longitudinal studies would be beneficial for examining causal relationships between sleep and academic performance over time. Additionally, incorporating objective measures of sleep, such as actigraphy, could provide more accurate assessments of sleep patterns. Exploring the influence of external factors, such as mental health, stress management, and classroom dynamics, will also be crucial for understanding their roles in the sleep-performance relationship. Finally, interventions designed to improve sleep hygiene among students should be tested to evaluate their effectiveness in enhancing academic outcomes and cognitive function.

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Conflict of Interest

The author(s) declared no conflict of interest.

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APPENDIX

Spearman's Correlations

Variable		Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10	Column 11	Column 12	Column 13	Column 14	Column 15	Column 16
1. Column 1	Spearman's rho	—															
	p-value	—															
2. Column 2	Spearman's rho	−0.320	—														
	p-value	0.084	—														
3. Column 3	Spearman's rho	0.274	−0.197	—													
	p-value	0.143	0.296	—													
4. Column 4	Spearman's rho	0.240	−0.576	0.175	—												
	p-value	0.202	< .001	0.356	—												
5. Column 5	Spearman's rho	0.226	−0.216	0.190	0.436	—											
	p-value	0.231	0.253	0.315	0.016	—											
6. Column 6	Spearman's rho	0.060	−0.238	0.210	0.218	0.305	—										
	p-value	0.752	0.205	0.266	0.247	0.101	—										
7. Column 7	Spearman's rho	0.364	−0.230	0.515	0.426	0.158	0.295	—									
	p-value	0.048	0.221	0.004	0.019	0.404	0.113	—									
8. Column 8	Spearman's rho	−0.412	0.291	−0.010	−0.276	−0.265	−0.311	−0.322	—								
	p-value	0.024	0.119	0.960	0.140	0.158	0.094	0.082	—								
9. Column 9	Spearman's rho	0.267	−0.127	−0.051	0.223	0.092	0.279	−0.126	0.056	—							
	p-value	0.153	0.504	0.790	0.236	0.630	0.135	0.507	0.768	—							
10. Column 10	Spearman's rho	−0.347	−0.163	−0.248	−0.052	0.174	0.092	−0.245	0.070	0.016	—						
	p-value	0.060	0.388	0.187	0.786	0.358	0.630	0.191	0.713	0.932	—						
11. Column 11	Spearman's rho	−0.133	−0.230	−0.290	0.243	0.207	−0.038	−0.280	0.010	0.073	0.521	—					
	p-value	0.485	0.221	0.119	0.196	0.273	0.843	0.134	0.958	0.703	0.003	—					
12. Column 12	Spearman's rho	0.067	−0.009	0.138	−0.099	0.152	−0.286	0.261	−0.127	−0.544	0.041	−0.108	—				
	p-value	0.726	0.963	0.466	0.601	0.424	0.125	0.164	0.503	0.002	0.831	0.571	—				
13. Column 13	Spearman's rho	−0.205	0.096	−0.008	0.042	−0.072	0.037	−0.216	0.209	0.279	−0.119	0.082	−0.300	—			
	p-value	0.277	0.612	0.966	0.825	0.706	0.845	0.253	0.267	0.135	0.531	0.667	0.108	—			
14. Column 14	Spearman's rho	−0.230	−0.202	0.262	0.297	0.217	0.229	0.066	−0.021	−0.075	0.312	0.256	−0.337	0.183	—		
	p-value	0.222	0.283	0.163	0.110	0.249	0.223	0.730	0.911	0.695	0.093	0.171	0.069	0.333	—		
15. Column 15	Spearman's rho	−0.051	−0.316	−0.191	−0.052	0.203	0.028	−0.344	0.024	0.192	0.421	0.227	−0.299	0.184	0.318	—	
	p-value	0.788	0.088	0.312	0.784	0.282	0.884	0.063	0.902	0.311	0.021	0.227	0.108	0.329	0.087	—	
16. Column 16	Spearman's rho	0.271	−0.272	−0.065	0.187	0.388	−0.019	−0.008	0.266	0.384	0.059	0.104	−0.026	0.074	−0.113	0.461	—
	p-value	0.147	0.146	0.733	0.321	0.034	0.922	0.969	0.156	0.036	0.756	0.585	0.893	0.698	0.550	0.010	—

Spearman's Correlations

Variable		Column 17	Column 18	Column 19	Column 20	Column 21	Column 22	Column 23	Column 24	Column 25	Column 26	Column 27	Column 28	Column 29	Column 30	Column 31	Column 32
1. Column 17	Spearman's rho	—															
	p-value	—															
2. Column 18	Spearman's rho	0.057	—														
	p-value	0.763	—														
3. Column 19	Spearman's rho	0.231	0.388	—													
	p-value	0.220	0.034	—													
4. Column 20	Spearman's rho	−0.265	0.159	0.086	—												
	p-value	0.157	0.402	0.652	—												
5. Column 21	Spearman's rho	0.051	0.171	0.318	0.152	—											
	p-value	0.789	0.366	0.087	0.421	—											
6. Column 22	Spearman's rho	0.205	0.235	0.561	−0.225	0.714	—										
	p-value	0.278	0.211	0.001	0.232	< .001	—										
7. Column 23	Spearman's rho	0.043	0.082	0.395	0.053	0.120	0.288	—									
	p-value	0.823	0.665	0.031	0.783	0.527	0.123	—									
8. Column 24	Spearman's rho	0.311	0.326	0.480	0.166	0.419	0.386	0.423	—								
	p-value	0.095	0.078	0.007	0.381	0.021	0.035	0.020	—								
9. Column 25	Spearman's rho	−0.114	−0.348	−0.327	−0.055	−0.255	−0.423	−0.008	−0.194	—							
	p-value	0.547	0.060	0.078	0.772	0.174	0.020	0.967	0.305	—							
10. Column 26	Spearman's rho	0.221	0.127	0.123	0.117	0.024	−0.059	−0.244	0.231	0.134	—						
	p-value	0.240	0.503	0.519	0.539	0.901	0.758	0.194	0.218	0.481	—						
11. Column 27	Spearman's rho	−0.525	0.243	0.241	0.188	−0.040	0.134	−0.082	−0.329	−0.325	−0.159	—					
	p-value	0.003	0.197	0.199	0.320	0.836	0.479	0.667	0.076	0.080	0.401	—					
12. Column 28	Spearman's rho	0.478	−0.069	0.144	0.042	0.297	0.065	0.250	0.447	−0.045	0.168	−0.545	—				
	p-value	0.008	0.715	0.447	0.827	0.111	0.732	0.184	0.013	0.815	0.376	0.002	—				
13. Column 29	Spearman's rho	0.172	0.565	0.080	0.073	−0.041	−0.050	−0.188	−0.092	−0.292	0.109	0.186	−0.181	—			
	p-value	0.363	0.001	0.674	0.700	0.832	0.794	0.320	0.630	0.117	0.567	0.326	0.339	—			
14. Column 30	Spearman's rho	0.363	0.162	0.172	0.053	0.167	0.165	−0.096	0.251	−0.233	−0.052	0.009	0.185	0.179	—		
	p-value	0.049	0.393	0.363	0.781	0.377	0.384	0.613	0.180	0.215	0.786	0.964	0.329	0.344	—		
15. Column 31	Spearman's rho	−0.204	0.432	0.070	0.314	0.034	−0.152	0.189	−0.050	0.150	−0.159	0.248	−0.052	0.351	0.295	—	
	p-value	0.279	0.017	0.715	0.091	0.858	0.421	0.316	0.795	0.430	0.401	0.186	0.785	0.057	0.113	—	
16. Column 32	Spearman's rho	−0.114	0.315	0.302	−0.207	0.259	0.397	−0.012	0.164	−0.372	0.006	0.376	−0.172	0.136	0.227	0.184	—
	p-value	0.549	0.090	0.105	0.272	0.168	0.030	0.951	0.388	0.043	0.977	0.041	0.363	0.473	0.228	0.330	—

Spearman's Correlations

Variable		Column 33	Column 34	Column 35	Column 36	Column 37	Column 38	Column 39	Column 40	Column 41	Column 42	Column 43	Column 44	Column 45	Column 46	Column 47	Column 48	Column 49
1. Column 33	Spearman's rho	—																
	p-value	—																
2. Column 34	Spearman's rho	0.084	—															
	p-value	0.658	—															
3. Column 35	Spearman's rho	−0.066	0.583	—														
	p-value	0.727	< .001	—														
4. Column 36	Spearman's rho	0.061	0.280	0.341	—													
	p-value	0.747	0.134	0.065	—													
5. Column 37	Spearman's rho	0.090	0.282	0.161	0.305	—												
	p-value	0.638	0.131	0.395	0.101	—												
6. Column 38	Spearman's rho	0.485	0.408	0.176	0.414	0.112	—											
	p-value	0.007	0.025	0.351	0.023	0.554	—											
7. Column 39	Spearman's rho	−0.007	0.456	0.460	−0.008	0.393	0.172	—										
	p-value	0.972	0.011	0.010	0.968	0.032	0.363	—										
8. Column 40	Spearman's rho	−0.030	0.394	0.476	−0.049	0.171	−0.005	0.265	—									
	p-value	0.874	0.031	0.008	0.799	0.367	0.978	0.156	—									
9. Column 41	Spearman's rho	−0.007	0.225	0.379	0.277	0.077	0.217	0.322	0.616	—								
	p-value	0.970	0.233	0.039	0.139	0.687	0.250	0.083	< .001	—								
10. Column 42	Spearman's rho	0.042	0.652	0.324	0.299	0.522	0.404	0.509	0.139	0.252	—							
	p-value	0.826	< .001	0.080	0.108	0.003	0.027	0.004	0.464	0.180	—							
11. Column 43	Spearman's rho	0.322	0.474	0.283	−0.028	0.287	0.438	0.436	0.131	0.007	0.410	—						
	p-value	0.082	0.008	0.129	0.883	0.123	0.016	0.016	0.490	0.971	0.025	—						
12. Column 44	Spearman's rho	0.187	−0.070	−0.026	0.292	0.198	0.262	−0.030	0.113	0.186	−0.040	0.003	—					
	p-value	0.321	0.712	0.891	0.118	0.295	0.163	0.877	0.551	0.324	0.832	0.985	—					
13. Column 45	Spearman's rho	0.018	0.135	0.329	0.284	0.007	0.203	0.293	0.166	0.555	0.076	0.087	0.103	—				
	p-value	0.925	0.477	0.076	0.128	0.972	0.281	0.116	0.382	0.001	0.691	0.647	0.588	—				
14. Column 46	Spearman's rho	−0.044	0.305	0.402	0.018	−0.013	0.009	0.297	0.351	0.409	0.240	0.251	−0.141	0.416	—			
	p-value	0.819	0.101	0.028	0.923	0.947	0.962	0.112	0.057	0.025	0.201	0.181	0.457	0.022	—			
15. Column 47	Spearman's rho	−0.236	0.145	0.462	−0.061	−0.017	−0.152	0.241	0.419	0.423	−0.055	0.308	−0.206	0.266	0.442	—		
	p-value	0.210	0.444	0.010	0.749	0.929	0.423	0.199	0.021	0.020	0.774	0.097	0.274	0.155	0.015	—		
16. Column 48	Spearman's rho	0.427	0.386	0.311	0.474	0.368	0.341	0.140	0.268	0.226	0.070	0.262	0.196	0.043	−0.219	0.126	—	
	p-value	0.019	0.035	0.095	0.008	0.046	0.066	0.460	0.152	0.230	0.713	0.162	0.298	0.823	0.245	0.507	—	
17. Column 49	Spearman's rho	0.124	0.086	0.066	0.002	−0.019	−0.024	−0.046	0.222	−0.010	−0.194	0.004	0.158	−0.359	−0.060	0.166	0.195	—
	p-value	0.513	0.651	0.729	0.993	0.920	0.900	0.809	0.239	0.957	0.304	0.983	0.404	0.052	0.753	0.379	0.301	—