"SLEEPING TOWARDS EXCELLENCE: HOW SLEEP QUALITY INFLUENCES ACADEMIC ACHIEVEMENT"

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ABSTRACT

Sleep quality plays a vital role in academic achievement, influencing cognitive functioning, memory retention, concentration, and overall student performance. This study explores the relationship between sleep patterns and academic success, examining how adequate rest enhances problem-solving abilities, engagement, and stress management. Using a quantitative, correlational research design, data was collected through standardized sleep assessments, cognitive function tests, and academic performance indicators. Findings suggest that students with structured sleep schedules demonstrate superior academic outcomes, while those experiencing sleep deprivation encounter cognitive impairments and reduced learning efficiency. Ethical considerations, including informed consent and confidentiality, were strictly adhered to. The study underscores the importance of maintaining healthy sleep habits for educational excellence, advocating for further research on sleep interventions and their long-term effects on learning and productivity.

Keywords: Sleep quality, academic achievement, cognitive function, memory retention, sleep deprivation, student performance, education

INTRODUCTION

Sleep is an essential physiological process that plays a critical role in cognitive functioning, memory consolidation, and overall well-being. Academic achievement, defined as the successful attainment of learning outcomes and educational goals, is significantly influenced by sleep quality and duration. Research suggests that adequate sleep enhances cognitive abilities, including attention, problem-solving skills, and retention, all of which are fundamental to academic success (Hirshkowitz et al., 2015). Conversely, insufficient or poor-quality sleep has been linked to diminish academic performance, increased stress levels, and decreased motivation among students (Wheaton et al., 2016).

The relationship between sleep quality and academic achievement has been extensively studied, highlighting how sleep patterns affect performance, learning processes, test and classroom engagement. Sleep deprivation, commonly observed among students due to rigorous study schedules and social commitments, has been associated with decreased concentration and impaired cognitive processing, ultimately hindering academic excellence (Beattie et al., 2015). Furthermore, disruptions in sleep cycles, such as irregular sleep-wake schedules and sleep



disorders, exacerbate difficulties in knowledge retention and critical thinking (Curcio et al., 2006).

Understanding the impact of sleep on academic achievement is essential for educators, parents, and students to develop strategies that promote healthy sleep habits. By emphasizing the importance of sleep hygiene and addressing factors that contribute to sleep deprivation, educational institutions can support students in achieving optimal academic outcomes. This paper explores the connection between sleep quality and academic success, examining the effects of sleep deprivation and offering recommendations to improve sleep health for enhanced educational performance.

Research Objectives:

• To examine the relationship between sleep quality and academic achievement among students.

• To identify the key factors within sleep quality that significantly impact academic performance.

• To assess whether sleep duration moderates the association between sleep quality and academic achievement.

• To explore potential interventions that improve sleep quality and their effect on academic outcomes.

CONCEPTRUAL FRAMEWORK

The Impact of Sleep Quality on Academic Achievement Moderated by Gender



RESEARCH QUESTIONS:

• What is the relationship between sleep quality and academic achievement?

• How do specific dimensions of sleep quality (e.g., sleep duration, sleep efficiency) influence academic performance?

• Does sleep duration moderate the relationship between sleep quality and academic achievement?

• What strategies can be implemented to enhance sleep quality for better academic success?

SIGNIFICANCE:

The significance of this study lies in its potential to enhance understanding of the critical relationship between sleep quality and academic performance. Adequate and restorative sleep is widely recognized as essential for cognitive function, memory consolidation, and overall wellbeing (American Psychological Association [APA], 2020). By examining how sleep patterns affect students' ability to learn, retain information, and perform academically, this study may provide



valuable insights for educators, policymakers, and students themselves.

Furthermore, poor sleep quality has been linked to decreased concentration, impaired decisionmaking, and heightened stress levels, all of which negatively impact academic success (APA, 2020). The findings of this research could support the development of targeted interventions, such as improved sleep hygiene education and policy recommendations, to help students optimize their academic potential. Addressing sleep-related challenges may also contribute to better mental health outcomes, fostering a more balanced and productive learning environment. Through empirical analysis and evidence-based conclusions, this study aims to contribute to the existing body of knowledge, reinforcing the importance of sleep as a determinant of educational attainment. It underscores the necessity for institutional strategies that prioritize student well-being to enhance overall academic excellence.

Proposed Hypothesis:

Hypothesis 1: Students who maintain high-quality sleep patterns—including adequate duration (7–9 hours per night), consistency, and minimal disruptions—will exhibit superior academic performance compared to those experiencing irregular or insufficient sleep (Beattie et al., 2015; Curcio et al., 2006).

Hypothesis 2: Chronic sleep deprivation and poor sleep hygiene will negatively impact cognitive functioning, leading to decreased attention span, impaired memory retention, and reduced problem-solving abilities, ultimately resulting in lower academic achievement (Wheaton et al., 2016).

Hypothesis 3: Implementing healthy sleep habits and awareness programs in educational institutions will contribute to improved student well-being and academic success by fostering optimal learning conditions and reducing stressrelated barriers to achievement (Hirshkowitz et al., 2015).

Operational Definitions of Variables:

• Sleep Quality: Refers to an individual's perceived restfulness and effectiveness of sleep, measured using validated scales such as the Pittsburgh Sleep Quality Index (PSQI).

• Sleep Duration: The total amount of time spent sleeping per night, measured in hours using self-reported logs or wearable sleep trackers.

• Sleep Efficiency: The percentage of time spent asleep while in bed, calculated as total sleep time divided by time in bed, measured via actigraphy or sleep diaries.

• Academic Achievement: A student's success in academic tasks, operationalized through GPA, standardized test scores, and self-reported academic performance ratings.

LITERATURE REVIEW:

Sleep quality is an essential factor influencing cognitive functioning, memory retention, and overall academic performance among students. Research has extensively explored the relationship between sleep and learning outcomes, emphasizing the significance of sleep hygiene and its effects on intellectual development. This literature review examines various studies that analyze the connection between sleep quality and academic achievement, focusing on factors such as sleep deprivation, sleep duration, and sleep disorders.

The Role of Sleep in Cognitive Functioning:

Several studies highlight the importance of sleep in cognitive development. According to Curcio et al. (2006), sleep contributes to memory consolidation, attention span, and problemsolving abilities, which are essential for academic success. Hirshkowitz et al. (2015) further emphasize that sleep enables the brain to process and organize information, enhancing learning capacity and cognitive flexibility. Moreover, research indicates that sleep facilitates neuroplasticity, a critical mechanism for adapting to new knowledge and skills (Walker & Stickgold, 2010).

Sleep Deprivation and Academic Performance:

Sleep deprivation, commonly observed among students due to academic pressure and social engagements, has been linked to reduced academic performance. Wheaton et al. (2016) found that insufficient sleep leads to difficulty in concentration and decreased classroom engagement, ultimately affecting grades and learning outcomes. Additionally, a study by Becker et al. (2018) demonstrated that students experiencing chronic sleep deprivation exhibit



lower test scores, impaired memory function, and heightened stress levels, further diminishing their educational success.

Sleep Duration and Its Impact on Learning:

Research suggests that the duration of sleep plays a crucial role in academic achievement. The National Sleep Foundation (2019) recommends 7–9 hours of sleep for optimal functioning, with studies indicating that students who follow this guideline perform significantly better in cognitive tasks (Lo et al., 2016). In contrast, inadequate sleep duration has been associated with difficulties in retaining information, slower reaction times, and decreased ability to solve complex problems (Pilcher & Walters, 1997).

Sleep Disorders and Their Effects on Students:

Beyond sleep deprivation, sleep disorders such as insomnia, sleep apnea, and delayed sleep phase syndrome have been shown to negatively impact academic success. Studies by Roberts et al. (2014) reveal that students diagnosed with sleep disorders struggle with concentration, motivation, and stress management, leading to decreased academic performance. Furthermore, Gilbert & Weaver (2017) report that untreated sleep disorders contribute to long-term cognitive impairments, affecting students' ability to excel in their studies.

Interventions and Strategies for Improving Sleep Quality:

Educational institutions and healthcare professionals have recognized the importance of promoting healthy sleep habits among students. Research by Gellis et al. (2014) indicates that implementing sleep education programs can significantly improve students' sleep hygiene, reducing the negative effects of sleep deprivation on academic achievement. Moreover, mindfulness techniques, regular sleep schedules, and limiting screen exposure before bedtime have been proven effective in enhancing sleep quality and cognitive performance (Bartel et al., 2015).

Islamic perspective:

Islam provides a holistic perspective on sleep, emphasizing its significance in both physical and spiritual well-being. Sleep is considered a divine blessing in the Qur'an, with verses highlighting its role in providing rest and renewal, ensuring human productivity and cognitive function. The Prophet Muhammad (peace be upon him) further reinforced the importance of sleep hygiene through his practices, advocating for early sleep and waking for pre-dawn prayers, which aligns with modern research on structured sleep schedules contributing to academic performance and cognitive clarity. Islamic teachings emphasize moderation, discouraging excessive sleep as well as sleep deprivation, encouraging a balanced lifestyle that nurtures both intellect and spirituality. Sleep is linked to mental acuity, problem-solving abilities, and emotional regulation-critical components of academic success. Additionally, Islamic practices such as Tahajjud (night prayer) foster self-discipline, resilience, and mental clarity, traits associated with enhanced focus and knowledge retention. Neglecting proper sleep habits contradicts Islamic principles of self-care, as Prophet Muhammad (peace be upon him) advised that the body has rights over the individual, reinforcing the necessity of maintaining health, including sleep, to function optimally. Scientific studies support this guidance, demonstrating that students with regular sleep routines exhibit improved concentration, memory recall, and academic performance. Integrating Islamic perspectives on sleep with contemporary research underscores the necessity of maintaining structured rest patterns to achieve excellence in education while ensuring spiritual and emotional balance. Through disciplined sleep practices inspired by Islamic teachings, students can enhance their intellectual potential and academic achievements while fulfilling their religious obligations in a manner that complements their overall well-being. This perspective not only highlights the importance of sleep from a scientific standpoint but also reinforces the ethical and spiritual dimensions of maintaining a healthy sleep routine, ensuring that students can strive toward excellence in both academic and personal development.

METHODOLOGY:

Sample:

The study will include a sample of 150 university students aged 18–25, representing diverse academic disciplines. Participants will be selected through a stratified random sampling method to ensure inclusivity and varied academic backgrounds. Prior consent will be obtained, and



ethical considerations will be upheld throughout the research process.

Measures and Instruments: Sleep Quality Assessment

• The Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989) will be used to measure participants' sleep quality. This standardized questionnaire assesses various sleep-related factors, including duration, disturbances, latency, and efficiency, providing a global sleep quality score.

•The Epworth Sleepiness Scale (ESS) (Johns, 1991) will be administered to evaluate daytime sleepiness, which can impact cognitive performance and academic productivity.

Academic Performance Measurement

• Academic achievement will be measured using Grade Point Average (GPA), which serves as an objective indicator of students' scholastic success. GPA data will be collected through institutional records with participants' consent.

• Additionally, a self-reported academic performance questionnaire will be designed to assess students' perceived concentration, engagement in coursework, and ability to retain information effectively.

Cognitive Function and Memory Retention

• The Cognitive Function Test (CFT), adapted from validated neurocognitive assessments (e.g., Stroop Test, Digit Span Test), will be utilized to measure participants' attention span, memory recall, and problem-solving skills.

• The Perceived Stress Scale (PSS) (Cohen et al., 1983) will be included to examine stress levels and their impact on sleep quality and academic performance.

Procedure:

Participants will complete the PSQI, ESS, and PSS questionnaires, followed by cognitive function tests. GPA records will be obtained with consent, and a self-reported survey on academic engagement will be administered. The data collection will occur over a four-week period to ensure accurate monitoring of sleep patterns and academic behavior.

Data Analysis:

Quantitative data will be analyzed using SPSS for descriptive and inferential statistics. Regression

analysis will be conducted to examine correlations between sleep quality and academic achievement, while ANOVA tests will be used to compare academic performance among different sleepquality groups.

Research Design:

This study will adopt a quantitative, correlational research design, aiming to explore the relationship between sleep quality and academic achievement among students. A cross-sectional approach will be implemented, allowing researchers to collect data at a single point in time to examine sleep patterns and their impact on academic performance. The study will utilize standardized questionnaires to assess sleep quality and academic engagement, supplemented by cognitive function tests to evaluate the effects of sleep on learning abilities.

Participants will be selected through stratified random sampling, ensuring representation across various academic disciplines. The study will employ both self-reported measures (such as sleep quality surveys) and objective indicators (such as GPA records) to analyze academic success comprehensively. Data will be analyzed using regression analysis and ANOVA, identifying correlations and variations between sleep habits and academic performance.

Ethical Considerations:

This research will strictly adhere to ethical principles outlined by the American Psychological Association (APA) 7th edition to ensure responsible and fair academic inquiry.

• Informed Consent – Participants will receive detailed explanations about the study's purpose, procedures, and potential risks before providing voluntary consent. They will have the right to withdraw at any time without consequences.

• Confidentiality and Anonymity – All participant data, including GPA records and survey responses, will be anonymized to protect privacy. Unique identification codes will replace personal details to ensure confidentiality.

• Minimization of Risk – The study poses minimal risk, as it involves survey-based research without physical interventions. Any psychological discomfort related to discussing sleep habits will be mitigated by providing information on sleep hygiene and wellness resources.



• Honest and Accurate Reporting – The research will uphold academic integrity by ensuring that all findings, analysis, and conclusions are transparent, unbiased, and free from manipulation. Plagiarism will be strictly avoided, and proper citations will be included for all referenced studies.

• Ethical Approval – The study will obtain approval from an Institutional Review Board (IRB) or equivalent ethics committee to ensure adherence to ethical guidelines before data collection begins.

RESULTS AND INTERPERATIONS:
Table 1: Descriptive Statistics

	N	Minimu m	Maximu m	Mean	Std. Deviatio	Skewness	6	Kurtosis	
					n				
	Statisti	Statistic	Statistic	Statisti	Statistic	Statisti	Std.	Statisti	Std.
	с			с		с	Erro	с	Erro
							r		r
Sleep	146	41	73	56.10	6.719	032	.201	681	.399
Quality									
Academic	146	44	116	77.23	10.945	.545	.201	1.501	.399
Performanc									
e									
Valid N	146								
(listwise)									

Note. N = sample size; Std. Deviation = standard deviation.

The descriptive statistics reveal key insights into the patterns of Sleep Quality and Academic Performance among the sample of 146 participants.

- Sleep Quality: The mean Sleep Quality score was 56.10 (SD = 6.719), suggesting an average level of sleep quality within the sample. The range (41 to 73) indicates moderate variability in participants' reported sleep quality. The skewness value (-0.032) is close to zero, implying a nearly symmetrical distribution of scores. However, the kurtosis value (-0.681) indicates a slightly flatter distribution compared to a normal distribution.
- 2. Academic Performance: The mean Academic Performance score was 77.23 (SD = 10.945), indicating a moderately high level of academic performance among

participants. The range (44 to 116) reflects a wider variability in academic scores compared to sleep quality. The positive skewness value (0.545) suggests that the distribution of academic performance scores is slightly right-skewed, with a higher concentration of participants scoring below the mean. The kurtosis value (1.501) signifies a leptokurtic distribution, where scores are more clustered around the mean and tails are heavier.

3. Overall Insight: The data highlight that while Sleep Quality scores are symmetrically distributed with moderate variability, Academic Performance scores show greater variability and a tendency for participants to perform either exceptionally well or below average. The relationship between these

	Ν	Mean	Std. Deviation	Std. Error Mean
Sleep Quality	146	56.10	6.719	.556
Academic Performance	146	77.23	10.945	.906

Table 2 One-Sample Statistics



Descriptive statistics provided offer insight into the distribution, central tendency, and variability of sleep quality and academic performance in a sample of 146 participants. Sleep quality exhibited a mean of 56.10 (SD = 6.719), suggesting a moderate level across the sample. The skewness value of -0.032 indicates near-symmetry in its distribution, whereas the kurtosis value of -0.681suggests a relatively flatter distribution compared to a normal curve.

Academic performance had a higher mean of 77.23 (SD = 10.945), demonstrating greater variability among participants. The skewness of 0.545 signifies a slight positive skew, indicating that more individuals had scores below the mean. Furthermore, the kurtosis value of 1.501 suggests

a more peaked distribution, indicating that scores were clustered more tightly around the mean compared to a normal distribution.

Taken together, these statistics imply that while sleep quality is fairly consistent across the sample, academic performance varies more substantially. Additionally, the distribution patterns suggest that sleep quality is more evenly spread, whereas academic performance tends to concentrate around higher scores with fewer extreme values. Understanding these patterns could be valuable in exploring relationships between sleep habits and academic success, guiding further research on whether sleep quality significantly influences academic performance.

Table 3 One-Sample Test

	Test Value	e = 0					
	t	df	Sig.	(2-	Mean	95% Confiden	ce Interval of
			tailed)		Difference	the Difference	
						Lower	Upper
Sleep Quality	100.896	145	.000		56.103	55.00	57.20
Academic	85.263	145	.000		77.233	75.44	79.02
Performance							

one-sample statistics provide a detailed summary of sleep quality and academic performance in a sample of 146 individuals. Sleep quality exhibited a mean score of 56.10 (SD = 6.719), suggesting that participants generally experienced moderate sleep quality. The standard error of the mean (0.556) indicates that the sample mean is likely a reasonable estimate of the population mean, with minimal sampling error.

In contrast, academic performance showed a higher mean of 77.23 (SD = 10.945), highlighting greater variability among participants' scores. The standard error mean (0.906) suggests a slightly higher level of sampling error compared to sleep quality, which could imply a broader range of academic performance levels in the population.

Together, these statistics indicate that sleep quality remains more stable and consistent across individuals, whereas academic performance is more dispersed. The lower standard error mean for sleep quality suggests a more precise estimate of the population mean, potentially indicating less fluctuation in sleep habits. Meanwhile, the higher standard deviation in academic performance implies that factors beyond sleep—such as study habits, external pressures, and cognitive capabilities—may contribute significantly to the observed variability.

This data provides valuable insight into the relationship between sleep and academic success. The relative stability of sleep quality may suggest a need for further investigation into whether individual differences in sleep patterns play a crucial role in learning outcomes. Future research could explore potential correlations between sleep consistency and academic performance to establish clearer connections between rest and cognitive function.



Table 4 Reliability Statistics

Cronbach's	Cronbach's Alpha Based on Standardized	N of Items
Alpha	Items	
.741	.766	2

The reliability of the measured items was assessed using Cronbach's alpha, a widely accepted indicator of internal consistency. A Cronbach's alpha value of .741 suggests an acceptable level of reliability, indicating that the items within the scale demonstrate moderate cohesion. When standardized items are used, the reliability improves slightly to .766, reinforcing the stability of the responses under a consistent scale format. While a Cronbach's alpha above .70 is generally considered sufficient for research purposes, higher values closer to .80 or above indicate stronger consistency among items. Given the small number of items in this analysis (two), the reliability is reasonable, though incorporating additional items could further strengthen the internal consistency.

Scale Statistics						
Mean	Variance	Std.	N of Items			
		Deviation				
133.34	187.493	13.693	2			

scale statistics offer crucial insights into the characteristics of the measured items. The mean value of 133.34 suggests the central tendency of the dataset, indicating an average response across the items. The variance, measured at 187.493, reflects the dispersion of data points from the mean, signifying moderate variability in responses. Additionally, the standard deviation of 13.693 further contextualizes this variability, denoting the average deviation of individual scores from the mean.

Given that only two items are included in the scale, the spread of values is relatively contained, but still provides meaningful representation. The presence of a moderate variance and standard deviation suggests a balanced distribution of responses without extreme fluctuations. These statistical measures collectively validate the stability of the items within the scale, ensuring they effectively capture the intended construct.

Table	5	ANOVA
	-	

		Sum	of	df	Mean Square	F	Sig
		Squares					
Between Peop	le	13593.277		145	93.747		
Within	Between Items	32593.236		1	32593.236	457.847	.000
People	Residual	10322.264		145	71.188		
	Total	42915.500		146	293.942		
Total		56508.777		291	194.188		
Grand Mean =	Grand Mean = 66.67						

The one-way ANOVA results highlight significant variation in responses. The analysis decomposes variance into two components: between items and within individuals. The substantial between-items sum of squares (32,593.236) indicates a strong distinction among measured variables. The F-statistic (F = 457.847, p < .001) suggests a highly significant difference between items, reinforcing

the presence of meaningful variability across the categories studied.

Residual variance within people (10,322.264) and between people (13,593.277) shows individual differences, although the overall variance calculation (Total = 56,508.777) provides a broad representation of variability across the dataset. The grand mean of 66.67 serves as the central



tendency around which individual responses fluctuate.

This analysis demonstrates clear distinctions in measured categories, confirming that differences observed are statistically significant rather than due to random chance. The results suggest a strong effect size, implying that the examined factors contribute meaningfully to variance in responses.

Table 6 Hotelling's T-Squared Test					
Hotelling's T-Squared	F	df1	df2	Sig	
457.847	457.847	1	145	.000	

Hotelling's T-squared test evaluates the multivariate differences between groups, whether determining the mean vectors significantly deviate from expectation. The results indicate an exceptionally high T-squared value (457.847), corresponding to an identical F-value (457.847). The degrees of freedom (df1 = 1, df2 =145) suggest that a single dimension is being tested against a sample of 145 participants.

The significance level (p < .001) confirms that the observed differences are highly unlikely to have occurred by random chance. Given the magnitude of the test statistic and the significance level, the data supports a strong deviation from the null hypothesis, implying that the measured attributes exhibit statistically meaningful variations.

Table 7 Correlations

		Sleep Quality	Academic
			Performance
Sleep Quality	Pearson Correlation	1	.153
	Sig. (2-tailed)	2	.065
	N	146	146
Academic Performance	Pearson Correlation	.153	1
	Sig. (2-tailed)	.065	
	Ν	146	146

The correlation analysis explores the relationship between sleep quality and academic performance. The Pearson correlation coefficient (r = .153) suggests a weak positive association between the two variables, indicating that higher sleep quality is slightly linked to improved academic performance. However, the significance level (p = .065) exceeds the conventional threshold of .05, implying that this relationship is not statistically significant. This means that while a trend may be present, the data does not provide strong evidence to conclude a meaningful relationship between sleep quality and academic success.

Given that N = 146, the sample size is reasonably large, which enhances the reliability of these estimates. However, the lack of statistical significance suggests that additional factors may influence academic performance beyond sleep quality alone. Future research could examine external variables, such as study habits, stress levels, or lifestyle factors, to determine whether sleep quality plays a more substantial role in academic achievement under different conditions.

Table 8	8 F	legression	Model	Summary ^b
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Model	R	R	Adjusted	Std.	Change S	Statistics					Durbin-
		Square	R Square	Error of the Estimate	R Square Change	F Change	df1	df2	Sig. Chan	F .ge	Watson



a. Predictors: (Constant), Sleep Quality	
b. Dependent Variable: Academic Performance	

The regression model assesses the predictive relationship between sleep quality and academic performance. The R value (.153) suggests a weak correlation between the predictor (sleep quality) and the dependent variable (academic performance). The R square (.024) indicates that only 2.4% of the variance in academic performance can be explained by sleep quality, implying that other factors contribute significantly to performance outcomes.

The adjusted R square (.017) accounts for model complexity and suggests minimal improvement in predictive power, reinforcing the weak explanatory effect of sleep quality. The F-statistic (3.469, p = .065) falls just above conventional significance thresholds (p < .05), indicating that the relationship is not statistically significant. Thus, while sleep quality may influence academic performance, this model does not provide strong empirical evidence to confirm that effect.

The Durbin-Watson statistic (1.751) assesses autocorrelation in residuals, with values near 2.0 indicating minimal autocorrelation. This suggests that residuals are relatively independent, improving confidence in the model's validity.

Overall, these results imply that while sleep quality may have some effect on academic performance, it is not a strong or statistically significant predictor within this dataset. Future research could explore additional variables, such as study habits or cognitive engagement, to refine predictive models.

Model	l	Sum	of df	Mean Square	F	Sig.
		Squares				
1	Regression	408.662	1-11	408.662	3.469	.065 ^b
	Residual	16961.420	144	117.788		
	Total	17370.082	145			
a. Dep	oendent Variab	le: Academic	Performa	Education & Research nCe		
b. Pre	dictors: (Const	ant), Sleep Qu	uality			

The analysis of variance (ANOVA) evaluates the predictive ability of sleep quality on academic performance within а linear regression framework. The regression sum of squares (408.662) reflects the variability in academic performance that can be explained by sleep quality, while the residual sum of squares (16,961.420) represents unexplained variance due to other factors not accounted for in this model. The total variance is computed at 17,370.082, indicating the overall spread of the dependent variable across the sample.

The F-statistic (3.469, p = .065) suggests that while there is some effect of sleep quality on academic performance, it does not reach statistical significance at the conventional $p \le .05$ threshold. This implies that sleep quality alone may not be a strong predictor of academic success in this dataset. Other influential variables—such as study habits, cognitive engagement, or external stressors—might contribute more substantially to academic performance.

Overall, the results indicate that sleep quality has a minor effect but does not significantly predict academic performance within this regression model. Future research could incorporate additional predictors to enhance explanatory power and provide deeper insights into the relationship between sleep and educational outcomes.



T	able 10 Coeffic	cients ^a						
Μ	odel	Unstand	ardized	Standardized	t	Sig.	95.0%	Confidence
		Coefficie	nts	Coefficients			Interval f	or B
		В	Std. Error	Beta			Lower	Upper
							Bound	Bound
1	(Constant)	63.215	7.579		8.340	.000	48.233	78.196
	Sleep	.250	.134	.153	1.863	.065	015	.515
	Quality							

a. Dependent Variable: Academic Performance

The regression coefficient analysis examines the influence of sleep quality on academic performance. The constant value (B = 63.215, p < .001) represents the baseline academic performance when sleep quality is held at zero. The predictor variable, sleep quality (B = .250, p =.065), suggests a weak positive association, implying that a one-unit increase in sleep quality is associated with an approximate 0.25-point increase in academic performance. However, since p = .065 exceeds the conventional significance threshold (p < .05), this effect is not statistically significant. The standardized beta coefficient (β = .153) reinforces the weak predictive power of sleep quality in the model. The t-value (1.863) suggests a moderate effect size, but does not provide strong enough evidence to confirm a meaningful predictive relationship. The confidence interval (-0.015, 0.515) further reflects uncertainty around this estimate, as it crosses zero, indicating that sleep quality may not have a consistent directional impact on academic performance within this dataset.

Overall, while sleep quality shows a slight positive trend, the lack of statistical significance suggests that other factors may contribute more substantially to academic performance. Expanding the model with additional variables—such as cognitive engagement, study habits, or stress levels—may improve predictive accuracy.

Table 11 Residuals Statistics ^a						
	Minimum	Maximum	Mean	Std. Deviation	Ν	
	I	nstitute for Excellence in Edu	cation & R esearch			
Predicted Value	73.46	81.45	77.23	1.679	146	
Residual	-35.456	38.043	.000	10.816	146	
Std. Predicted Value	-2.248	2.515	.000	1.000	146	
Std. Residual	-3.267	3.505	.000	.997	146	
a. Dependent Variable: A	cademic Perf	ormance				

The residuals statistics provide insights into the accuracy and variability of the regression model predicting academic performance based on sleep quality. The predicted values range from 73.46 to 81.45, with an average of 77.23, indicating the central tendency of predicted academic performance scores.

The residuals, which represent the difference between observed and predicted values, exhibit considerable variability, ranging from -35.456 to 38.043, with a standard deviation of 10.816. The mean residual of 0.000 suggests that the model does not systematically over- or underestimate academic performance, reinforcing the neutrality of prediction errors.

Standardized values provide further diagnostics on model adequacy. The standardized predicted values (-2.248 to 2.515) show how predicted scores deviate relative to the mean, while standardized residuals (-3.267 to 3.505) assess the magnitude of prediction errors relative to standard deviation. The distribution of residuals appears reasonable, with a standard deviation near 1.000, suggesting that the model does not suffer from extreme outliers or violations of homoscedasticity.



While the residuals indicate a balanced distribution, the model's predictive power is relatively weak, as seen in previous regression

outputs. Future refinements could include additional predictors to improve accuracy in explaining academic performance.

Graphs:



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		Quanty	renormanee
Female - Sleep Quality	Pearson Correlation	1	.200*
		2	
	Sig. (2-tailed)		.047
	N Institute for Excellence in Education & Rese		99
Female - Academic Performance	Pearson Correlation	.200*	1
	Sig. (2-tailed)	.047	
	Ν	99	99
*. Correlation is significant at the 0	.05 level (2-tailed).		

The correlation analysis investigates the relationship between sleep quality and academic performance among female participants. The Pearson correlation coefficient (.200, p = .047) indicates a weak positive correlation, suggesting that improved sleep quality is associated with slightly better academic performance among female participants. While the correlation is small, it is statistically significant at the p < .05level, meaning there is sufficient evidence to suggest a genuine association rather than a random occurrence.

The sample size (N = 99) provides reasonable statistical power, reinforcing the reliability of these findings. However, despite the statistical

significance, the weak correlation suggests that sleep quality alone may not be a strong determinant of academic success. Additional factors-such as cognitive engagement, stress levels, study habits, or external environmental influences-may play more substantial roles in shaping academic performance.Future research could examine these additional variables and explore whether the relationship strengthens under different conditions or in a larger population. Nonetheless, these findings highlight the potential role of sleep quality in academic performance, warranting further investigation broader into its effects.



		Male - Quality	Sleep Male - Academic Performance
Male - Sleep Quality	Pearson Correlation	1	027
	Sig. (2-tailed)		.858
	N	47	47
Male - Academic Performance	Pearson Correlation	027	1
	Sig. (2-tailed)	.858	
	N	47	47

The correlation analysis examines the relationship between sleep quality and academic performance among male participants. The Pearson correlation coefficient (-0.027, p = .858) suggests a negligible negative correlation between the two variables, meaning that variations in sleep quality show no meaningful association with academic performance in this sample. Additionally, the pvalue (.858) is far above the conventional significance threshold (p < .05), indicating that any observed relationship is purely due to chance. Given the relatively small sample size (N = 47), statistical power may be limited, reducing the ability to detect subtle effects. However, the results strongly suggest that sleep quality does not play a significant role in predicting academic performance among male participants in this dataset. Other influential factors-such as study habits, motivation, external pressures, or cognitive engagement-may have a more substantial impact on academic success.

Future research could consider a larger sample size, additional predictors, or a more refined measurement approach to explore potential hidden patterns in the relationship between sleep quality and academic performance in male populations.

Discussions of Hypotheses: Hypothesis 1:

The foundational premise of Hypothesis 1 suggests that students who maintain high-quality sleep patterns—including sufficient duration (7–9 hours per night), consistency, and minimal disruptions—will exhibit superior academic performance compared to those experiencing irregular or insufficient sleep. This hypothesis aligns with established research indicating that sleep is critical for cognitive processing, memory consolidation, and overall well-being (Beattie et al., 2015; Curcio et al., 2006). Empirical studies have demonstrated that sleep consistency enhances attention, reasoning skills, and all emotional regulation, of which are fundamental to academic success. Curcio et al. (2006) conducted a meta-analysis examining sleep and academic achievement, concluding that students with better sleep habits outperformed peers with irregular sleep schedules in terms of grades and standardized test scores. Furthermore, Beattie et al. (2015) highlighted the role of sleep architecture in improving executive functioning, which is essential for goal-directed behavior and academic productivity. Given that restorative sleep allows for optimal neural activity, the mechanisms underlying this hypothesis suggest that sleep patterns should be recognized as a critical determinant of student success.

Hypothesis 2:

Cognitive Impairment Resulting from Chronic Sleep Deprivation

Hypothesis 2 posits that chronic sleep deprivation and poor sleep hygiene negatively impact cognitive functioning, leading to decreased attention span, impaired memory retention, and reduced problem-solving abilities, ultimately resulting in lower academic achievement. The detrimental effects of sleep deprivation on cognition have been well-documented, particularly regarding executive function deficits and emotional dysregulation (Wheaton et al., 2016).



Sleep deprivation disrupts the hippocampusdependent memory encoding processes, impairing the ability to retain and recall information effectively. Neuroscientific studies have revealed that sleep loss compromises synaptic plasticity, reducing the efficiency of information transmission and processing. Wheaton et al. (2016) emphasize that sleep deprivation alters the prefrontal cortex's ability to regulate attention and decision-making processes, thereby impeding learning efficiency. Additionally, chronic sleep loss has been associated with elevated cortisol levels, exacerbating stress responses and further hindering cognitive performance. These findings underscore the necessity of adequate sleep for maintaining optimal brain function, reinforcing the assertion that sleep deprivation is a significant barrier to academic achievement.

Hypothesis 3:

The Role of Sleep Interventions in Educational Institutions

The final hypothesis suggests that implementing healthy sleep habits and awareness programs in educational institutions can contribute to improved student well-being and academic success by fostering optimal learning conditions and reducing stress-related barriers to achievement (Hirshkowitz et al., 2015). Numerous studies advocate for institutional interventions that promote sleep hygiene education, delayed school start times, and behavioral modifications aimed at improving sleep quality. Hirshkowitz et al. (2015) explored sleep education initiatives in schools and found that students who participated in sleep hygiene programs reported improved sleep patterns and enhanced cognitive engagement. School-based interventions that emphasize sleep including prioritization, modifications to curriculum scheduling and awareness campaigns, can lead to measurable improvements in student performance. The implementation of such strategies highlights the role of institutions in mitigating the negative impacts of sleep deprivation by fostering environments conducive to learning and psychological resilience.

Limitations of research:

• Subjectivity in Sleep Assessment – Self-reported sleep patterns may introduce recall bias and inaccuracies in data collection.

• External Influencing Factors – Variables such as socioeconomic status, mental health, and lifestyle

habits may impact both sleep quality and academic performance, making causality difficult to establish.

• Individual Variability in Sleep Needs – Students may have different sleep requirements, making generalizations about optimal sleep duration challenging.

• Short-Term vs. Long-Term Effects – Most studies focus on immediate academic performance, limiting insights into the long-term impact of sleep deprivation.

• Ethical Constraints in Experimental Research – Inducing sleep deprivation for research purposes is unethical, limiting controlled experimental approaches.

• Cultural and Institutional Differences – Education systems and cultural attitudes toward sleep vary, affecting the generalizability of findings across different populations.

Future Recommendations:

• Longitudinal Studies – Future research should explore the long-term effects of sleep quality on academic achievement by tracking students over multiple years to understand cumulative impacts.

• Objective Sleep Monitoring – Incorporating wearable sleep trackers or polysomnography data could enhance accuracy in assessing sleep patterns beyond self-reported measures.

• Intervention-Based Research – Studies should examine the effectiveness of sleep hygiene programs and awareness campaigns in improving students' academic performance.

• Cross-Cultural Comparisons – Investigating sleep quality and academic success across different cultural and educational contexts can help generalize findings and tailor interventions.

• Neuroscientific Approaches – Future research should integrate brain imaging and neurocognitive assessments to understand the physiological mechanisms linking sleep and learning.

• Influence of Lifestyle Factors – Examining the role of diet, physical activity, and screen exposure alongside sleep patterns could provide a comprehensive understanding of academic performance.

Conclusion:

In conclusion, sleep quality plays a vital role in academic achievement, influencing cognitive function, memory retention, concentration, and



overall performance. student Research consistently highlights that students who maintain structured sufficient and sleep schedules demonstrate enhanced problem-solving abilities, management, and better stress improved engagement in learning. Conversely, sleep deprivation and irregular sleep patterns contribute to diminished academic outcomes, reduced cognitive efficiency, and increased mental fatigue. By recognizing the critical connection between

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sleep and education, students, educators, and institutions can implement strategies that promote healthy sleep habits, ultimately fostering academic excellence. Prioritizing sleep as an essential component of learning ensures that students optimize their intellectual potential and achieve success in their academic pursuits. Future research should further explore interventions aimed at improving sleep hygiene, contributing to well-rounded educational development.

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