

Investigating the Relationship Between Sleep Quality, Adherence to Proper Sleep Hygiene Practices, And Academic Performance Among Students

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Abstract

In this correlational study, the relationship between sleep quality, sleep hygiene, and academic performance among individuals aged 17- 24 years was investigated (200) utilizing correlation. Descriptive statistics showed normal distributions for Academic Performance, Sleep Quality, and Sleep Hygiene scores. Spearman's rho correlation analyses showed a weak negative correlation between Academic Performance and Sleep Quality ($\rho = -0.184$, $p = 0.009$), proposing that higher Sleep Quality is related to slightly lower Academic Performance. Contrarily, no significant correlation was discovered between Academic Performance and Sleep Hygiene ($\rho = -0.060$, $p = 0.393$), suggesting that sleep hygiene practices alone do not affect academic outcomes. A moderate positive correlation was seen between Sleep Quality and Sleep Hygiene ($\rho = 0.484$, $p < 0.001$), underscoring that good sleep hygiene led to higher Sleep Quality. These results emphasize the complex nature of the relation between sleep-related factors and academic performance, proposing the influence of multifaceted variables beyond sleep on academic outcomes. The study suggests comprehensive approaches combine various factors to optimize both academic performance and overall well-being. Future research should explore additional variables and employ longitudinal designs to elucidate causality and refine interventions aimed at advancement of sleep and academic performance.

Keywords: sleep hygiene, sleep quality, academic performance.

Introduction

Sleep quality, sleep hygiene, and academic performance are interconnected factors that significantly impact a pupil's overall well-being and academic success. Sleep quality and sleep hygiene are indispensable components of overall well-being, particularly among university students whose academic success is conditional upon cognitive functioning and emotional regulation. In recent years, the significance of sleep in relation to academic performance has gathered increased recognition from researchers, educators, and healthcare professionals alike. As the demands of academia continue to evolve, understanding the intricate connection between sleep quality, sleep hygiene, and academic performance becomes paramount. The transition to university life often coincides with disturbance or change in sleep patterns and routines, influenced by various factors including academic workload, extracurricular

activities, social engagements, and technological distractions. This change poses unique challenges to keep up optimal sleep habits, potentially compromising both physical and mental health outcomes.

Sleep Quality:

Sleep quality refers to the quality of sleep a person gets, which is told by colourful factors similar as sleep duration, sleep dislocations, and sleep terrain. Poor sleep quality is characterized by difficulty falling asleep, frequent awakenings, and day fatigue. Research has constantly shown that poor sleep quality is associated with lower academic performance, increased cerebral torture, and dropped overall well-being.

Sleep Hygiene:

Sleep hygiene indicates to the practices and habits that help maintain good sleep quality. These include maintaining a harmonious sleep schedule, avoiding stimulating conditioning before bedtime, and creating a sleep-conducive terrain. Maintaining good sleep hygiene is essential for good quality sleep and is negatively identified with unhealthy sleep quality.

Academic Performance:

Academic performance is a critical index of a pupil's academic success. It encompasses colourful measures similar as grade point normal (GPA), tone-reported academic satisfaction, and peer academic comparison. Research has constantly shown that better sleep quality and sleep hygiene are appreciatively identified with advanced academic performance, suggesting that good sleep practices are essential for optimal academic achievement. Interplay Between Sleep Quality, Sleep Hygiene, and Academic Performance. The interplay between sleep quality, sleep hygiene, and academic performance is complex and bidirectional. Poor sleep quality can negatively impact academic performance, while poor sleep hygiene can contribute to poor sleep quality. Again, good sleep hygiene practices can ameliorate sleep quality, which in turn can enhance academic performance. Understanding this interplay is pivotal for developing effective interventions to support pupil health and academic success.

Sleep quality, sleep hygiene, and academic performance are nearly intertwined. Good sleep hygiene practices can ameliorate sleep quality, which is appreciatively identified with advanced academic performance. Again, poor sleep quality and sleep hygiene can negatively impact academic performance. By understanding the interplay between these factors, preceptors and policymakers can develop targeted interventions to support pupil health and academic success.

Theoretical Framework:

Theoretical Framework of sleep Quality:

Biopsychosocial Model

- Biological Factors: Genetics, circadian rhythms, neurotransmitters, and hormones like melatonin and cortisol.
- Psychological Factors: Stress, anxiety, depression, and other mental health conditions.
- Social Factors: Lifestyle, work schedule, family responsibilities, and social support.

Two-Process Model of Sleep Regulation

- Process S (Homeostatic Process): The need for sleep builds up the longer one stays awake and dissipates during sleep.
- Process C (Circadian Process): The internal biological clock that regulates the timing of sleep and wakefulness across the 24-hour day.

Cognitive Behavioural Model

- Cognitive Factors: Worries about sleep, racing thoughts, and sleep-related anxiety.
- Behavioural Factors: Sleep habits, routines, and behaviours that either promote or hinder sleep (e.g., caffeine consumption, screen time before bed).

Theories of Sleep Hygiene:

Cognitive Behavioural Theory

- Cognitive Factors: Focuses on how thoughts and beliefs about sleep impact sleep hygiene. Negative thoughts about sleep or anxiety can lead to poor sleep hygiene practices.
- Behavioural Factors: Emphasizes the role of routines and habits in maintaining good sleep hygiene. Consistent sleep-wake times, avoiding stimulants before bed, and creating a restful environment are key components.

Stimulus Control Theory

- Associative Learning: This theory posits that sleep hygiene can be improved by strengthening the association between the bed and sleep. The bed should be used only for sleep and sex, not for activities like watching TV or working.
- Behavioural Adjustments: Encourages behaviours that promote sleep, such as going to bed only when sleepy, getting out of bed if unable to sleep, and avoiding naps.

Sleep Restriction Therapy

- Sleep Efficiency: Aims to improve sleep quality by reducing the amount of time spent in bed awake. Initially, it restricts the time in bed to the actual amount of time spent sleeping, then gradually increases it as sleep efficiency improves.
- Consistent Scheduling: Encourages maintaining a regular sleep schedule and avoiding sleeping in or going to bed too early to ensure that time in bed is efficiently used for sleep.

Review of literature:

The Relationship Between Reported Sleep Quality and Sleep Hygiene in Italian and American Adolescents. LeBourgeois, M. K. (2005): The final sample population included 776 Italian and 572 American adolescents aged 12 to 17 years old. Italian adolescents showed much better sleep hygiene and substantially better sleep quality than American adolescents. A moderate-to-strong linear relationship was seen in sleep hygiene and sleep quality in both the samples. Separate hierarchical multiple regression analyses were performed on both samples. A final hierarchical multiple regression analysis with both samples together show results that culture (Italy versus United States) only explained 0.8% of the difference in sleep quality after controlling for sleep hygiene and all other variables.

Relationship of Sleep Hygiene Awareness, Sleep Hygiene Practices, and Sleep Quality in University Students. Behavioural Medicine, 28(1), 33–38. Brown, F. C., Buboltz, W. C., & Soper, B. (2002): The study by Voinescu and Szentagotai-Tatar studied sleep hygiene practices and its connection to sleep quality and diurnal preference among young, middle-aged, and older adults in Romania. Sleep hygiene practices was higher in older age groups, with middle-aged and older adults scoring significantly higher on the Sleep Beliefs Scale contrast to young adults. Women scored more on the Sleep Beliefs Scale than men across all age groups. Sleep quality as estimated by the Sleep Condition Indicator showed no difference between age groups or genders. Older age groups had a higher morning preference on the

Composite Scale of Morning Ness than the younger adults. The study proposed that while sleep hygiene practices increases with age, it is not obligated to translate to better sleep quality.

Association Between Sleep Hygiene and Sleep Quality in Medical Students. *Behavioral Sleep Medicine*, 8(2), 113–121. Brick, C. A., Seely, D. L., & Palermo, T. M. (2010). This study determined whether subjective sleep quality was lower in medical students, and whether demographics and sleep hygiene practices were related with sleep quality. A Web-based survey was conducted on 314 medical students, which contained questions about demographics, sleep habits, exercise, caffeine intake, tobacco use and alcohol use, and sleep quality (using the Pittsburgh Sleep Quality Index). Correlation and regression analyses tested for relation among demographics, sleep hygiene practices, and sleep quality. As the hypothesis suggested, medical students' sleep quality was notably worse than a healthy adult normative sample ($t = 5.13, p < .001$). Poor sleep quality in medical students was speculated by several demographic and sleep hygiene variables, and future research directions are suggested.

Sleep Hygiene Education: Efficacy on Sleep Quality in Working Women. *Journal of Nursing Research* 18(4):p 283-289, December 2010. Chen, Pao-Hui; Kuo, Hung-Yu; Chueh, Ke-Hsin: This pilot study was administered using the quasi-experimental method. A total of 66 adult working women (age > 18 years) with sleep disorders signed up from eight communities in northern Taiwan. Results proposed increased sleep hygiene awareness to improve participant sleep quality significantly ($p < .001$). The sleep quality of all participants advanced over both the 3- and the 5-week education program. The six components of the Pittsburgh Sleep Quality Index (i.e., subjective sleep quality, sleep latency, sleep duration, sleep disturbances, use of sleeping medication, and daytime dysfunction) also advanced.

Voinescu, B.I., Szentagotai-Tatar, A. Sleep hygiene awareness: its relation to sleep quality and diurnal preference. *J Mol Psychiatr* 3, 1 (2015): The study pursued to estimate the sleep hygiene practices and the self-reported quality of sleep between three age groups (young adults, adults and middle-aged adults) and to determine their connection. Sleep hygiene practice was moderate on the whole and significantly poor in young adults (compared to the other age groups) and in those who reported poor sleep (compared to those with good sleep). Sleep quality was average and linked positively with diurnal preference (the more evening-oriented, the poorer the sleep). Diurnal preference had no significant role in sleep hygiene practices.

Effectiveness of sleep education programs to improve sleep hygiene and/or sleep quality in college students: a systematic review. Dietrich SK, Francis-Jimenez CM, Knibbs MD, Umali IL, Truglio-Londrigan M, September 2016: This systematic review studied the effect of sleep education programs in the betterment of sleep hygiene practices and/or sleep quality in college going students. The study included 3 randomized controlled trials and 1 quasi-experimental study with a total of 1,302 participants. Two studies reported outcomes on sleep hygiene knowledge, with one showing a significant improvement. One study found significant betterment in sleep hygiene practices. Two studies estimated sleep quality, with one showing a significant improvement. However, overall, the review concluded there was lack of evidence to determine the effectiveness of sleep education programs in improving sleep hygiene knowledge, practice, or quality in college students. More rigorous research is needed in this area.

Association between sleep hygiene and sleep quality in medical students. *Behavioral Sleep Medicine*, 8(2), 113-121. Brick, C. A., Seely, D. L., & Palermo, T. M. (2010): This study examined the association between sleep hygiene and sleep quality in 314 medical students. Poor sleep quality, as measured using the Pittsburgh Sleep Quality Index (PSQI), was common among the students, with 55% showing a PSQI global score > 5, indicating towards poor sleep quality. Poorer sleep quality indicated towards irregular

sleep schedules due to reasons such as going to bed thirsty, environmental noise, and worry at bedtime. The findings propose that measures to improve sleep in medical students should focus on improving consistent sleep hygiene behaviours.

Sleep hygiene practices and their relation to sleep quality in medical students of Qazvin university of medical sciences. *Journal of caring sciences*, 5(2), 153-158. Yazdi, Z., Loukzadeh, Z., Moghaddam, P., & Jalilolghadr, S. (2016): This study examined the sleep hygiene behaviour and their association to sleep quality in 285 medical students from Qazvin University of Medical Sciences. Overall, 57.5% of students had poor sleep quality. Males, students at senior level, married students, and those with improper sleep hygiene practices had worse sleep quality. Poor sleep hygiene practices like smoking within 2 hours before bedtime, engaging in highly demanding activities near bedtime, and irregular sleep-wake schedules were related with poor sleep quality. The study proposed interventions to improve sleep hygiene behaviour, may help improve sleep quality in medical students.

The interaction between sleep quality and academic performance. *Journal of Psychiatric Research*, 46(12), 1618-1622. Ahrberg, K., Dresler, M., Niedermaier, S., Steiger, A., & Genzel, L. (2012): This study examined the association between sleep quality and academic performance in 144 medical students taking the pre-clinical board exam. Participants answered surveys about their sleep quality (Pittsburgh Sleep Quality Index, PSQI), grades, and stress at three different time points: semester, pre-exam, and post-exam. Academic performance correlated with stress and sleep quality pre-exam ($r = 0.276$, $p < 0.001$ and $r = 0.158$, $p < 0.03$), but not during the semester or post-exam. 59% of participants showed clinically relevant sleep disturbances ($PSQI > 5$) during pre-exam compared to 29% during the semester and 8% post-exam. Students who performed worse on exams reported higher stress and poorer sleep quality pre-exam, suggesting a vicious cycle of poor sleep and test performance. The high rate of sleep disturbances in medical students warrants intervention.

Research Question:

“Investigating the relationship between sleep quality, adherence to proper sleep hygiene practices, and academic performance among students.”

Research Gap:

- Most of the studies have their focus on specific student populations like medical students, rather than examining a broader range of students.
- The relationship between sleep hygiene practices, sleep quality and academic performance has not been directly assessed in a single study.

Methodology:

Aim: Investigating the relationship between sleep quality, adherence to proper sleep hygiene practices, and academic performance among students.

Objective:

- To investigate the effect of sleep quality on academic performance.
- To investigate the effect of sleep hygiene on academic performance.
- To investigate the effect of sleep hygiene on sleep quality

Hypothesis:

H1: There is a significant effect of poor sleep quality and poor sleep hygiene on academic performance.

H1: There is a significant effect of poor sleep hygiene on sleep quality.

H0: There is no significant effect of sleep quality and poor sleep hygiene on academic performance.

H0: There is no significant effect of poor sleep hygiene on sleep quality.

Variable:

Independent variable (IV): Sleep quality and Sleep hygiene

Dependent variable (DV): Academic performance

Sleep Quality: Sleep quality indicates to the quality of sleep a person gets, which is told by different factors such as sleep duration, sleep dislocations, and sleep terrain. Poor sleep quality is defined by difficulty in falling asleep, frequent awakenings, and day fatigue.

Sleep Hygiene: Sleep hygiene indicates to the behaviours and habits that promote good sleep quality. Sleep hygiene includes maintaining a good sleep schedule, avoid stimulating conditions before bedtime, and making a sleep-conducive terrain.

Academic Performance: Academic performance is a critical index of a pupil's academic success. It includes different measures similar as grade point normal (GPA), tone- reported academic satisfaction, and peer academic comparison. It is constantly seen in research that better sleep quality and sleep hygiene are appreciatively seen with advanced academic performance, suggesting that good sleep practices are important for optimal academic achievement.

Sampling:

The study targeted on individuals from age group of 17years to 24years. The size of sample was 200 participants (young adults). This study is cross-sectional study, conducted on 200 students enrolled in higher studies. The participants were recruited through the snowball sampling technique and Google survey form was to collect the data.

Inclusive criteria:

- Participants must be between 17 to 24 years.
- Should be currently enrolled as students for higher studies.
- Participants must be proficient in English, which is used in the questionnaire to ensure they can understand and respond accurately.

Exclusive criteria:

- Individuals who are not currently enrolled in college as a student.
- Individuals younger than 17 years or older than 24 years.
- Individuals who do not have sufficient proficiency in the language (English) used in the Questionnaire.

Tools:

The Sleep Hygiene Index (SHI)

The Sleep Hygiene Index (SHI) was introduced by Dr Charles M. Mastin and colleagues in 2006. It is a self-report measure designed to assess an individual's adherence to principles of good sleep hygiene. It also encompasses behaviours and environmental factors that can influence the quality and quantity of sleep. Overall, the Sleep Hygiene Index is a reliable and valid tool for assessing hygiene practices, providing valuable insights for both clinical and research applications.

Sleep Quality Scale (SQS)

The sleep quality scale was developed by Hyeong-Woo Yi and colleagues in 2006. It consists of 28-items that evaluate six domains of sleep quality. It is a self-report assessment with internal consistency of .92 and test-retest reliability of .81. strong correlation with the Pittsburgh Sleep Quality Index. Which shows good construct validity.

Academic Performance Scale

The academic performance scale was developed by Carson Birchmeier, Emily Grattan, Sara Hornbacher, and Christopher Mc Gregogy. It consists of 8-items which is a self-report questionnaire. A test-retest reliability of .85 and internal consistency of .89. scale scores showed adequate internal consistency, too weak test-retest reliability, and satisfactory concurrent validity.

Result

Table: 1 Descriptive Statistics of sleep quality, sleep hygiene and academic performance.

		Statistic	Std error
Academic Performance	Mean	28.4851	.34270
	Median	28.5000	
	Variance	23.724	
	Std. Deviation	4.87069	
	Range	28.00	
	Interquartile Range	6.00	
	Skewness	-.124	.171
	Kurtosis	.231	.341
Sleep Quality	Mean	36.1782	.89437
	Median	37.0000	
	Variance	161.580	
	Std. Deviation	12.71141	
	Range	69.00	
	Interquartile Range	15.25	
	Skewness	.065	.171
	Kurtosis	.145	.341
Sleep Hygiene	Mean	21.7772	.47021
	Median	22.0000	
	Variance	44.662	
	Std. Deviation	6.68293	
	Range	30.00	
	Interquartile Range	9.00	
	Skewness	.063	.171
	Kurtosis	-.451	.341

The table presents descriptive statistics for three variables: Academic Performance, Sleep Quality, and Sleep Hygiene.

For **Academic Performance**, the mean score is 28.4851 with a standard error of .34270, showing a moderate level of academic performance in the sample. The median value is very close to the mean at 28.5000, it suggests a relatively symmetric distribution. The variance is 23.724, and the standard deviation is 4.87069, showing some variability around the mean. The range is 28.00, indicating the difference between the highest and lowest scores. The interquartile range (IQR) is 6.00, reflecting the spread of the middle 50% of the data. The skewness is slightly negative (-.124), and the kurtosis is .231, both of which are nearly zero, it indicates that the distribution is approximately normal with a slight tendency towards a left tail and a slightly peaked distribution compared to a normal distribution.

Sleep Quality has a mean score of 36.1782 with a higher standard error of .89437, indicating greater variability in the sample. The median is 37.0000, which is close to the mean, suggesting a relatively symmetrical distribution. The variance is quite high at 161.580, and the standard deviation is 12.71141, indicating a substantial spread around the mean. The range is 69.00, showing a wide spread between the lowest and highest scores. The IQR is 15.25, indicating considerable variability in the middle 50% of the data. The skewness is .065, and the kurtosis is .145, both near zero, indicating a distribution close to normal with a very slight rightward skew and a distribution shape similar to the normal distribution.

For **Sleep Hygiene**, the mean score is 21.7772 with a standard error of .47021, suggesting moderate consistency in the sample. The median value is 22.0000, close to the mean, it indicates symmetry in the data. The variance is 44.662, and the standard deviation is 6.68293, showing moderate variability around the mean. The range is 30.00, and the IQR is 9.00, indicating a moderate spread of scores. The skewness is .063, and the kurtosis is -.451, suggesting a distribution close to normal with a slight rightward skew and a flatter distribution compared to a normal distribution.

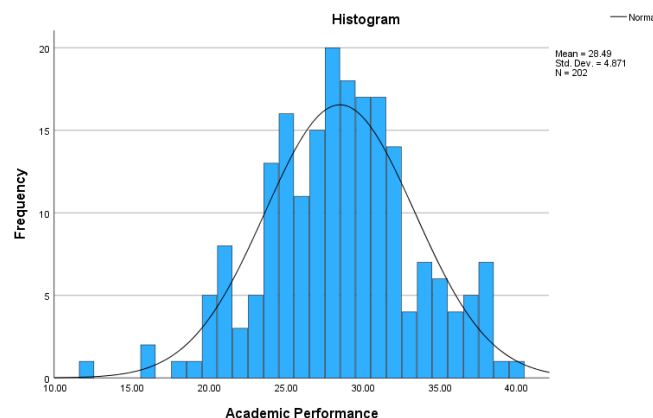
Tests of Normality:

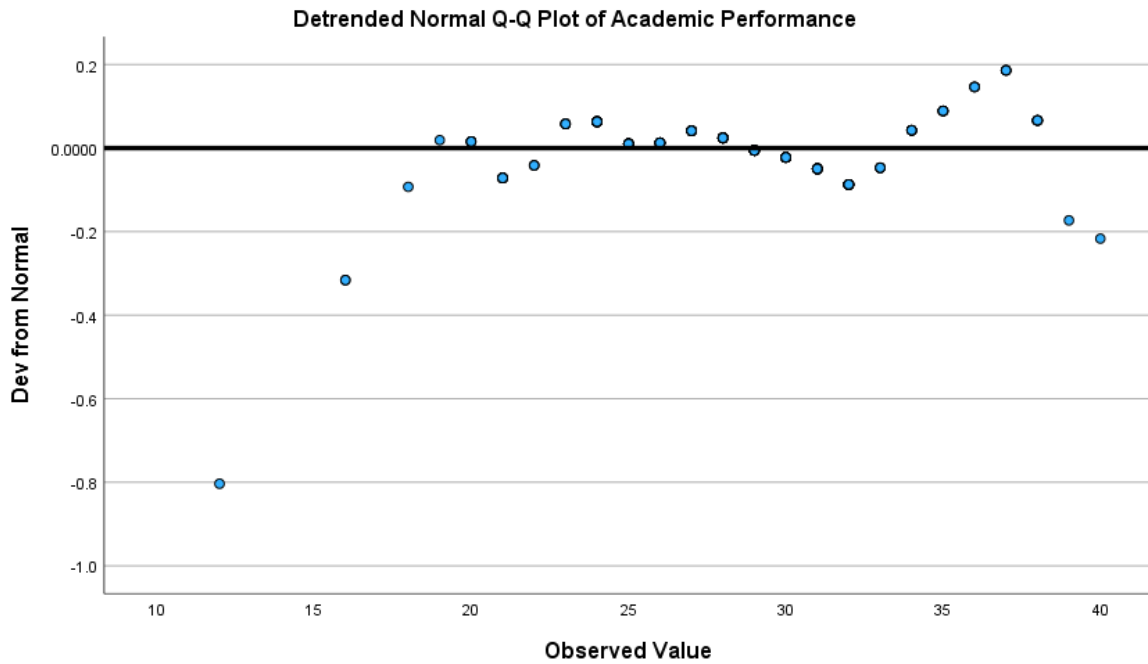
Table: 2 This table shows the Tests of Normality for the data set

	Shapiro-Wilk		
	Statistic	df	Sig.
Academic Performance	.988	202	.095
Sleep Quality	.990	202	.175
Sleep Hygiene	.987	202	.069

The Shapiro-Wilk test results for the variables Academic Performance, Sleep Quality, and Sleep Hygiene are presented in the table. This test assesses the normality of the data distributions.

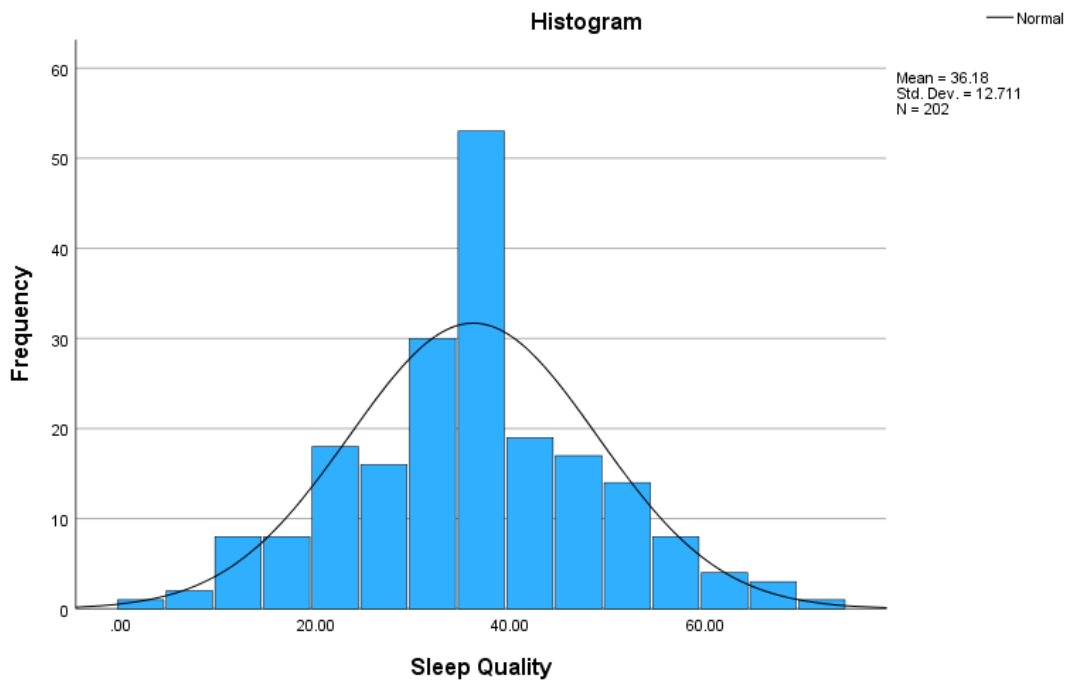
Academic Performance

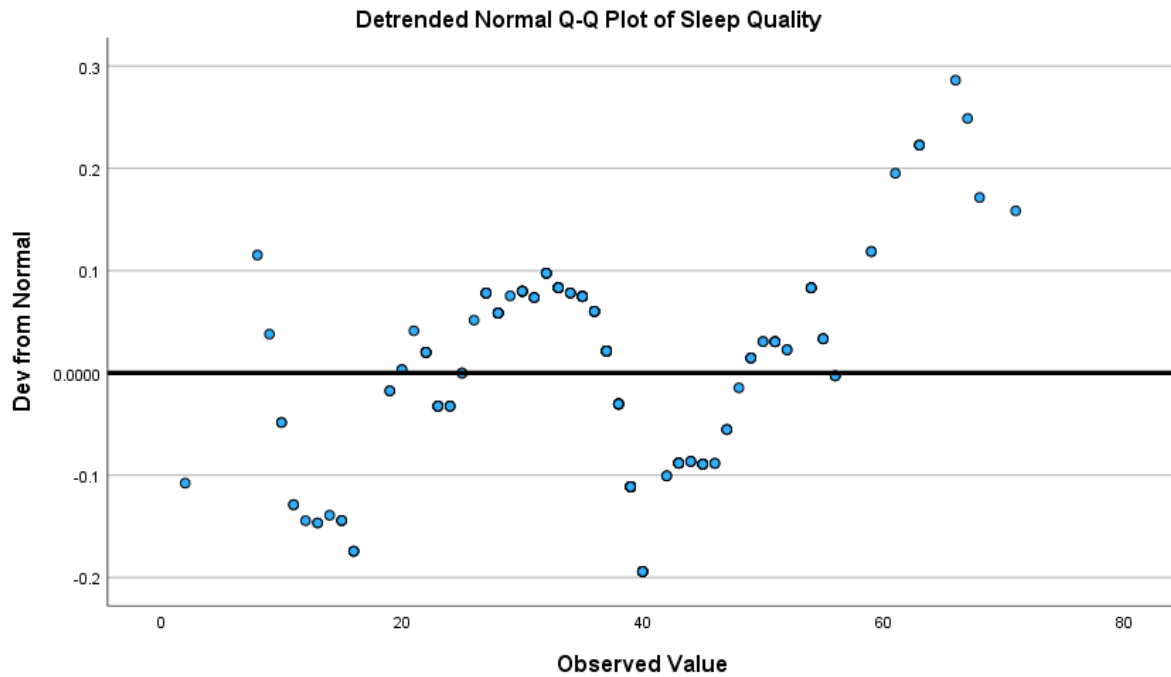




For **Academic Performance**, the Shapiro-Wilk test yields a statistic of .988 with a significance level (Sig.) of .095. Since the significance value is greater than the conventional alpha level of .05, we fail to reject the null hypothesis that the data is normally distributed. This indicates that the distribution of Academic Performance scores does not significantly deviate from normality.

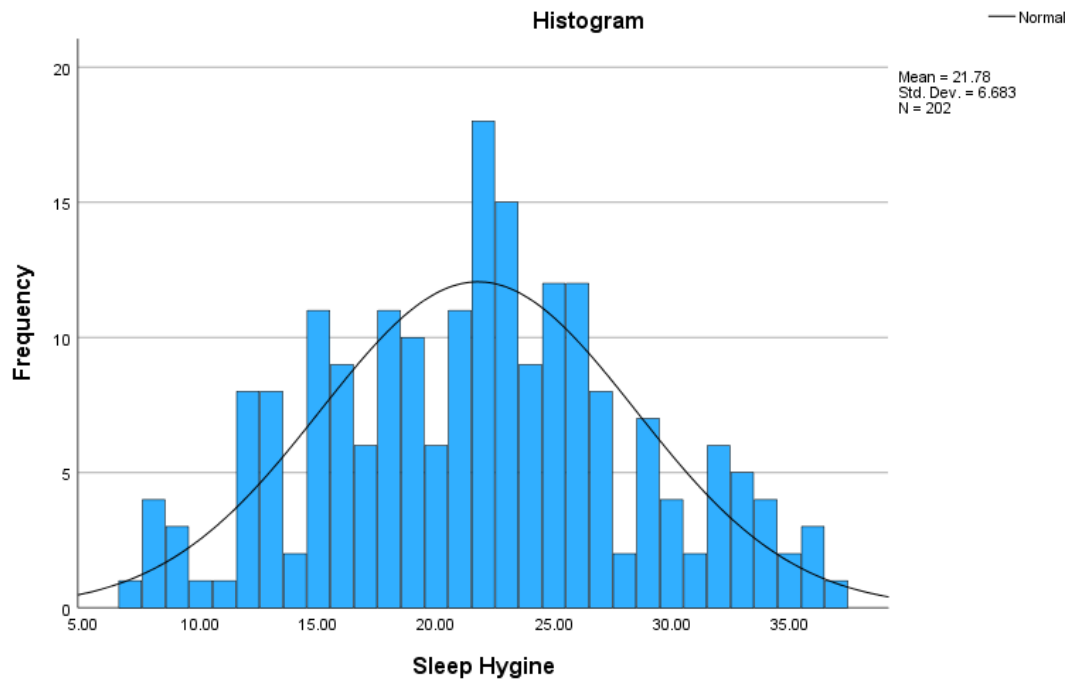
Sleep Quality

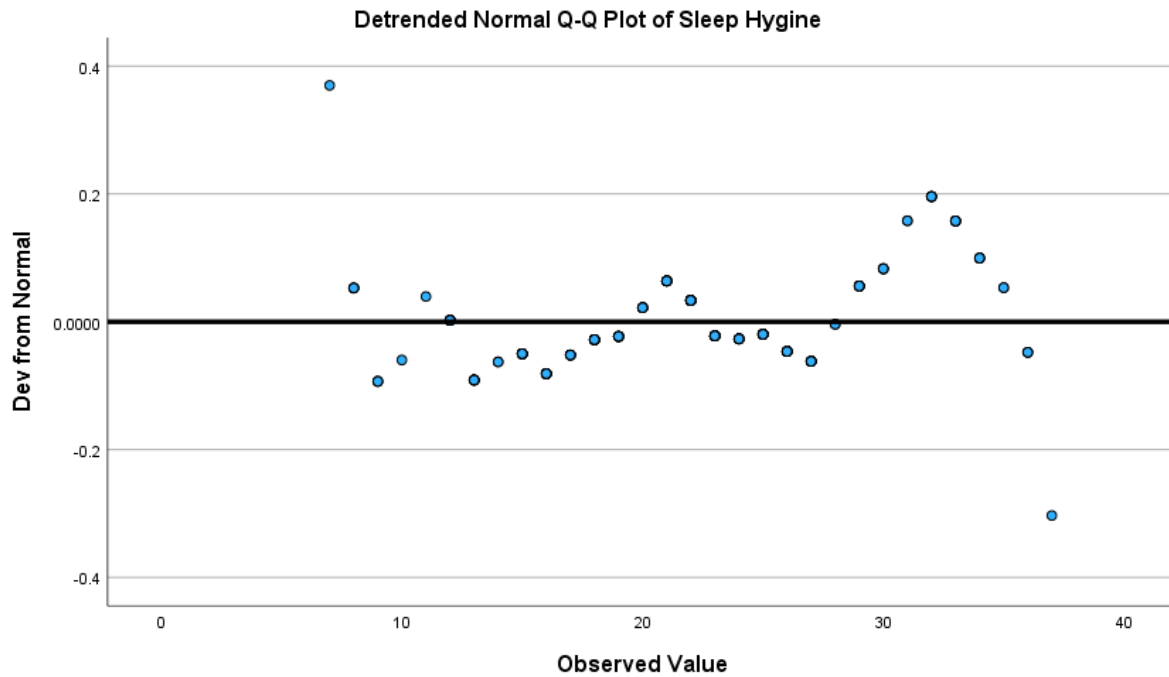




Sleep Quality has a Shapiro-Wilk test statistic of .990 with a significance level of .175. Similar to Academic Performance, the significance value exceeds .05, suggesting that we fail to reject the null hypothesis of normality. Therefore, the distribution of Sleep Quality scores is also consistent with a normal distribution.

Sleep Hygiene





For **Sleep Hygiene**, the Shapiro-Wilk test results show a statistic of .987 with a significance level of .069. Again, the significance value is above .05, indicating that we fail to reject the null hypothesis of normality. This implies that the distribution of Sleep Hygiene scores does not significantly deviate from a normal distribution.

Correlations:

Table: 3 Correlation between sleep quality, sleep hygiene, and academic performance.

		Academic Performance	Sleep Quality	Sleep Hygiene	
Spearman's rho	Academic Performance	Correlation Coefficient	1.000	-.184**	-.060
		Sig. (2-tailed)	.	.009	.393
		N	202	202	202
	Sleep Quality	Correlation Coefficient	-.184**	1.000	.484**
		Sig. (2-tailed)	.009	.	<.001
		N	202	202	202
	Sleep Hygiene	Correlation Coefficient	-.060	.484**	1.000
		Sig. (2-tailed)	.393	<.001	.
		N	202	202	202

** . Correlation is significant at the 0.01 level (2-tailed).

The above table presents the Spearman’s rank order correlation coefficients among Academic Performance, Sleep Quality, and Sleep Hygiene.

The correlation between **Academic Performance** and **Sleep Quality** is $\rho = -0.184$, with a p-value of 0.009, and the sample size is 202. The correlation coefficient is indicating a weak negative relationship

between Academic Performance and Sleep Quality, it suggests that higher Sleep Quality is related with slightly lower Academic Performance. The p-value is less than 0.01, this indicates that the correlation is statistically significant at the 0.01 level. This means that there is a negative relationship between these two variables. We can reject the null hypothesis (H_0 : There is no relationship between Academic Performance and Sleep Quality in the population).

The correlation between **Academic Performance** and **Sleep Hygiene** is $\rho = -0.060$, with a p-value of 0.393, and the sample size is 202. The correlation coefficient indicates there is no meaningful relationship between the variables, Academic Performance and Sleep Hygiene. The p-value is greater than 0.05, this indicates that the correlation is not statistically significant. Therefore, we fail to reject the null hypothesis (H_0 : There is no relationship between Academic Performance and Sleep Hygiene in the population), suggesting that the observed correlation in the sample might be due to random chance.

The correlation between **Sleep Quality** and **Sleep Hygiene** is $\rho = 0.484$, with a p-value of less than 0.001, and the sample size is 202. The correlation coefficient indicates a moderate positive relationship between Sleep Quality and Sleep Hygiene, suggesting that betterment of Sleep Hygiene is associated with increasing Sleep Quality. The p-value is less than 0.01, this indicated that the correlation is statistically significant at the 0.01 level. This means that there is a significantly positive relationship between Sleep Quality and Sleep Hygiene. We can reject the null hypothesis (H_0 : There is no relationship between Sleep Quality and Sleep Hygiene in the population).

Discussion

The study was directed to investigate the relationships between Academic Performance, Sleep Quality, and Sleep Hygiene with a sample of 202 participants. The descriptive statistics showed that the distributions of Academic Performance, Sleep Quality, and Sleep Hygiene scores were roughly normal, as established by the Shapiro-Wilk test. Notably, the mean scores of Academic Performance, Sleep Quality, and Sleep Hygiene were 28.4851, 36.1782, and 21.7772, respectively, and with standard errors indicated the varying degrees of consistency within the sample. The relatively normal distributions of these variables suggest that they are appropriate for further parametric analyses. The correlation analysis exposed different notable relationships. Significantly, there was a weak but statistically notable negative correlation between Academic Performance and Sleep Quality ($\rho = -0.184$, $p = 0.009$). This implies that higher Sleep Quality is associated with slightly lower Academic Performance, a finding that might seem counterintuitive and warrants further investigation into the underlying causes. One possible explanation is that students who give importance to sleep might be spending less time on academic activities resulting in less focus on academics, thereby slightly impacting their performance poorly in academics. However, there is weak strength in this correlation which means it is clear that other factors are also affecting Academic Performance.

On the contrary, the relation between Academic Performance and Sleep Hygiene was not notable ($\rho = -0.060$, $p = 0.393$), this indicates no meaningful correlation between these variables. This indicates that Sleep Hygiene practices, while sleep hygiene is important for overall well-being, do not have a direct effect on academic performance in this sample.

A notable moderate positive correlation is noticed between Sleep Quality and Sleep Hygiene ($\rho = 0.484$, $p < 0.001$), suggesting that the betterment of Sleep Hygiene is related to an increase in Sleep Quality. This is consistent with existing literature that emphasizes the importance of good sleep practices in achieving

quality sleep. This relationship highlights the potential benefits of interventions aimed at improving sleep hygiene to enhance overall sleep quality.

The implications of these findings are essential for both educational and health-related fields. The weak negative correlation between Sleep Quality and Academic Performance suggests that while sleep is important, its effect on academic performance may be more difficult and affected by different factors. Professionals from educational and health-related fields should consider comprehensive strategies that balance academic demands with proper sleep.

Despite these insights, the study has several limitations. The cross-sectional design limits the ability to infer causality between the variables. The sample size, while adequate for detecting moderate correlations, might not be sufficient to uncover smaller effect sizes. Additionally, self-reported measures of sleep quality and hygiene may introduce bias, as participants might not accurately recall or report their behaviours. Future research should employ longitudinal designs to track changes over time and use objective measures of sleep to validate the findings.

In conclusion, while the study provides valuable insights into the relationships between Academic Performance, Sleep Quality, and Sleep Hygiene, it also highlights the need for further research. Future studies should aim to explore the mechanisms underlying these relationships, consider additional variables that might influence academic outcomes, and examine the effectiveness of interventions designed to improve sleep hygiene and quality.

Conclusion

This study shows findings that underscore the difficult correlation between Academic Performance, Sleep Quality, and Sleep Hygiene. While Sleep Quality and Sleep Hygiene are moderately positively associated, proving that better sleep hygiene practices are associated with an increase in sleep quality, their impact on Academic Performance is less straightforward. There is a weak negative correlation between Sleep Quality and Academic Performance suggesting that higher sleep quality is correlated with slightly lower academic performance, but this relationship is not strong enough to be a major factor of influence. Also, there is no notable correlation between Academic Performance and Sleep Hygiene, indicating that sleep hygiene practices alone do not have a meaningful effect on academic performance in this sample. These results show that while sleep-related factors have a vital role in academic performance, they are not the sole factors that affect academic performance. Other variables, such as studying habits, mental health issues, and external factors, likely contribute notably to academic outcomes. The study suggests the need for a holistic approach when addressing academic performance, considering multiple factors beyond sleep practices. Future research should investigate additional variables and contextual factors that influence academic performance, as well as explore strategies to enhance both sleep quality and academic outcomes. Comprehensive interventions that address a range of influences on academic performance are essential for fostering both academic success and overall well-being. This study shows findings that underscore the difficult correlation between Academic Performance, Sleep Quality, and Sleep Hygiene. While Sleep Quality and Sleep Hygiene are moderately positively associated, proving that better sleep hygiene practices are associated with an increase in sleep quality, their impact on Academic Performance is less straightforward. There is a weak negative correlation between Sleep Quality and Academic Performance suggesting that higher sleep quality is correlated with slightly lower academic performance, but this relationship is not strong enough to be a major factor of influence. Also, there is no notable correlation

between Academic Performance and Sleep Hygiene, indicating that sleep hygiene practices alone do not have a meaningful effect on academic performance in this sample.

These results show that while sleep-related factors have a vital role in academic performance, they are not the sole factors that affect academic performance. Other variables, such as studying habits, mental health issues, and external factors, likely contribute notably to academic outcomes. The study suggests the need for a holistic approach when addressing academic performance, considering multiple factors beyond sleep practices.

Future research should investigate additional variables and contextual factors that influence academic performance, as well as explore strategies to enhance both sleep quality and academic outcomes. Comprehensive interventions that address a range of influences on academic performance are essential for fostering both academic success and overall well-being.

References

1. Ahrberg, K., Dresler, M., Niedermaier, S., Steiger, A., & Genzel, L. (2012). The interaction between sleep quality and academic performance. *Journal of Psychiatric Research*, 46(12), 1618–1622. <https://doi.org/10.1016/j.jpsychires.2012.09.008>
2. Buboltz, W. C., Brown, F., & Soper, B. (2001). Sleep Habits and Patterns of College Students: A Preliminary Study. *Journal of American College Health*, 50(3), 131–135. <https://doi.org/10.1080/07448480109596017>
3. Brown, F. C., Buboltz, W. C., & Soper, B. (2002). Relationship of Sleep Hygiene Awareness, Sleep Hygiene Practices, and Sleep Quality in University Students. *Behavioral Medicine*, 28(1), 33–38. <https://doi.org/10.1080/08964280209596396>
4. Brick, C. A., Seely, D. L., & Palermo, T. M. (2010). Association Between Sleep Hygiene and Sleep Quality in Medical Students. *Behavioral Sleep Medicine*, 8(2), 113–121. <https://doi.org/10.1080/15402001003622925>
5. Chen, P.-H., Kuo, H.-Y., & Chueh, K.-H. (2010). Sleep hygiene education: Efficacy on sleep quality in working women. *Journal of Nursing Research*, 18(4)(283–289). <https://doi.org/10.1097/JNR.0b013e3181f8e7a4>
6. Dietrich, S. K., Francis-Jimenez, C. M., Knibbs, M. D., Umali, I. L., & Truglio-Londrigan, M. (2016). Effectiveness of sleep education programs to improve sleep hygiene and/or sleep quality in college students: A systematic review. *Journal of Sleep Research*, 25(2), 131–138. <https://doi.org/10.1111/jsr.12347>
7. Gaultney, J. F. (2010). The prevalence of sleep disorders in college students: Impact on academic performance. *Journal of American College Health*, 59(2), 91–97. <https://doi.org/10.1080/07448481.2010.483708>
8. LeBourgeois, M. K. (2005). The relationship between reported sleep quality and sleep hygiene in Italian and American adolescents. *Journal of Sleep Research*, 14(4), 349–356. <https://doi.org/10.1111/j.1365-2869.2005.00480.x>
9. Lund, H. G., Reider, B. D., Whiting, A. B., & Prichard, J. R. (2010). Sleep Patterns and Predictors of Disturbed Sleep in a Large Population of College Students. *Journal of Adolescent Health*, 46(2), 124–132. <https://doi.org/10.1016/j.jadohealth.2009.06.016>

10. Mastin, D. F., Bryson, J., & Corwyn, R. (2006). Assessment of Sleep Hygiene Using the Sleep Hygiene Index. *Journal of Behavioral Medicine*, 29(3), 223–227. <https://doi.org/10.1007/s10865-006-9047-6>
11. Tsai, L. L., & Li, S. P. (2004). Sleep patterns in college students: Gender and grade differences. *Journal of Psychosomatic Research*, 56(2), 231-237. [https://doi.org/10.1016/S0022-3999\(03\)00607-5](https://doi.org/10.1016/S0022-3999(03)00607-5)
12. Voinescu, B. I., & Szentagotai-Tatar, A. (2015). Sleep hygiene awareness: Its relation to sleep quality and diurnal preference. *Journal of Molecular Psychiatry*, 3(1),1. <https://doi.org/10.1186/s40303-015-0009-8>
13. Yazdi, Z., Loukzadeh, Z., Moghaddam, P., & Jalilolghadr, S. (2016). Sleep Hygiene Practices and Their Relation to Sleep Quality in Medical Students of Qazvin University of Medical Sciences. *Journal of Caring Sciences*, 5(2), 153–160. <https://doi.org/10.15171/jcs.2016.016>
14. Yi, H. W., Shin, K., Shin, C., & Kim, J. (2006). Development of the Sleep Quality Scale. *Psychiatry Investigation*, 3(2), 155-163. <https://doi.org/10.4306/pi.2006.3.2.155>