The Impact of Sleep Patterns, Nap Policy, and Stress Levels on Elementary School Students' Academic Achievement in China

Muh Ibnu Sholeh, Himad Ali, Sokip, Asrop Syafii, Sulistyorini, Imam Fuadi, Nur 'Azah, Munif , Mochammad Syafiuddin Shobirin, Sahri

[1]*Sekolah Tinggi Agama Islam KH. Muhammad Ali Shodiq (STAI MAS), Tulungagung, Jawa Timur, Indonesia*
[2]*Northwest University, Xi'an, Shaanxi, China*

[3,4,5,6]*Universitas Islam Negeri Sayyid Ali Rahmatullah Tulungagung, Indonesia*

[7]*Universitas Hasyim Asy'ari Tebuireng Jombang, Jawa Timur, Indonesia*

[8]*Institut Agama Islam Faqih Asy'ari (IAIFA), Kediri, Jawa Timur, Indonesia*

[9]*Universitas KH. A. Wahab Hasbullah (UNWAHA), Jombang, Jawa Timur. Indonesia*

[10]*Universitas Nahdlatul Ulama Sunan Giri Bojonegoro (UNUGIRI), Bojonegoro, Jawa Timur, Indonesia*
e-mail: indocelllular@gmail.com, hmada9406@gmail.com, ardhan6000@gmail.com, asrop796@gmail.com, sulistyorini@uinsatu.ac.id, fuadi_imam@yahoo.com, azahnur31@gmail.com, janoko01.2223@gmail.com, syafiuddinshobirin@unwaha.ac.id, sahriunugiri@gmail.com

ABSTRACT. This study aims to investigate the relationship between students' sleep patterns, nap policies, and stress levels, as well as their impact on academic achievement. The research employs a quantitative method with an observational design, involving 500 students and 50 teachers from five elementary schools in Guangdong Province. The research instrument consists of a validated questionnaire assessed using a Likert scale. Data analysis was conducted using descriptive techniques, linear regression, and multiple regression analysis with SPSS version 25. The findings indicate that students' sleep patterns (SSP) have a positive and significant relationship with academic achievement, with a regression coefficient of 0.42 ($SE = 0.08$, $t = 5.25$, $p < 0.001$). The nap policy (NP) also shows a positive and significant correlation with student achievement, with a regression coefficient of 0.62 ($t = 12.45$, $p < 0.001$). Conversely, students' stress levels (SSL) exhibit a negative and significant relationship with academic achievement, with a regression coefficient of -0.35 ($t = -8.25$, $p < 0.001$). Collectively, these three variables have a significant impact on student achievement, with regression coefficients of 0.35 for sleep patterns, 0.52 for nap policies, and -0.25 for stress levels ($p < 0.001$). This study has limitations, including a sample restricted to a single province and an observational approach that does not fully capture causality. The study's implications for elementary education policy highlight the importance of adjusting school schedules to support healthy sleep patterns and implementing structured nap policies to optimize student achievement. Additionally, interventions to reduce academic stress should be considered to foster a more conducive learning environment.

Keywords: *Nap policy, Sleep patterns, Stress levels, Study achievement*

INTRODUCTION

Education in China has garnered global attention due to its consistently high academic achievements. However, this success comes at a cost, as students often experience significant

pressure and stress, particularly in preparation for highly competitive college entrance exams. To counterbalance this academic pressure, the Chinese education system has long implemented a nap policy in schools. This policy aims to enhance student well-being and improve learning effectiveness by providing scheduled rest periods during school hours. Research has shown that naps contribute to increased concentration, better physical endurance, and overall cognitive function (Wang et al., 2018). Despite the widespread adoption of this policy, there remains a gap in understanding how it can be optimized through decision-management strategies (Liu et al., 2020).

Several previous studies have explored the benefits of napping on academic performance and student well-being. For instance, research conducted by Ming et al. (2011) and Li (2012) highlights the positive effects of short naps on memory retention and concentration (J. Li, 2012). Another study by Sun et al. (2022) discusses the variations in nap policy implementation across different Chinese schools and its impact on student engagement in afternoon classes (Sun et al., 2022). These studies do not sufficiently address how the policy can be fine-tuned for maximum effectiveness. Specifically, factors such as the optimal duration of naps, the most effective timing within the school schedule, and the best implementation methods remain underexplored. This lack of research on decision-making in nap policy implementation represents a key gap that this study seeks to address.

The Chinese educational landscape is shaped by a strong emphasis on academic success, which places immense pressure on students. The competitive nature of college entrance exams, commonly known as Gaokao, has led to an educational culture that prioritizes academic rigor over students' mental and physical well-being (Shi et al., 2019). While high academic performance is a source of national pride, the intense competition often has negative consequences, including increased stress, anxiety, and burnout among students (Clotfelter, 2010). Given these challenges, finding a balance between academic demands and student well-being is crucial, and refining the nap policy could be one potential solution.

The nap policy in Chinese schools typically involves a 30- to 45-minute break after lunch, during which students rest in designated areas or their classrooms. Although this policy has been practiced for years, schools implement it differently, resulting in varying degrees of effectiveness (Liu et al., 2020). Factors influencing nap effectiveness include the duration of sleep, the quality of rest, and environmental conditions such as noise levels and classroom settings. Furthermore, while some schools enforce mandatory nap times, others provide more flexible policies, allowing students to engage in other activities instead of resting (J. Li et al., 2017). The inconsistencies in implementation highlight the need for a well-structured decision-making approach that considers students' specific needs and contextual factors within each school.

To enhance the effectiveness of the nap policy, a decision-management approach is necessary. Decision management involves identifying key variables that influence policy success, gathering relevant data, analyzing decision-making strategies, and evaluating the impact on student outcomes (Subrahmanya et al., 2022). The first step in this process is to assess student needs by analyzing sleep patterns, academic workloads, and psychological stress levels. Schools must also consider the perspectives of stakeholders, including teachers, administrators, and parents, to ensure broad support for the policy.

Once key factors influencing nap effectiveness are identified, schools can collect data on various aspects of the policy's implementation. This includes examining student perceptions of naps, the correlation between napping and academic performance, and overall student well-being. By analyzing this data, educational institutions can make informed decisions about adjusting nap durations, modifying schedules, or creating more conducive sleep environments. A comprehensive evaluation of the nap policy's impact on student performance is also essential. This step involves comparing student outcomes before and after policy adjustments, identifying areas for improvement, and adapting strategies accordingly. Schools that implement a structured decision-making approach are better equipped to address challenges such as teacher resistance, logistical

constraints, and varying student preferences. Moreover, a data-driven approach ensures that the nap policy is not just a tradition but a scientifically backed strategy for enhancing student well-being and academic success.

The significance of this research lies in its potential to contribute to both educational policy and student well-being. While many schools have implemented a nap policy, there is no standardized framework for its optimization. This study aims to bridge this gap by providing evidence-based insights into how decision management strategies can enhance the implementation of nap policy. Given the growing concerns over student mental health and academic stress in China, this research highlights the importance of policies that prioritize well-being without compromising academic excellence. Suppose schools can refine their nap policies based on systematic decision-making. In that case, they could create a healthier learning environment where students perform well academically while maintaining their psychological and physical well-being.

This study aims to examine the relationship between student sleep patterns, nap policies, and stress levels about academic achievement. By employing a quantitative research approach with regression analysis, this research will provide empirical evidence on the effectiveness of naps in improving learning outcomes. The findings are expected to provide policymakers and school administrators with practical recommendations, enabling them to design, implement, and evaluate nap policies more effectively.

METHOD

Research Design

This study employs a quantitative approach with an observational study design (Punch, 2013). This design is chosen to objectively examine the impact of the nap policy on students' academic performance in China. A quantitative approach ensures systematic data collection and analysis to explore relationships between variables.

Sample

The study population includes all students and teachers in primary schools in Guangdong Province, China, where the nap policy is implemented. According to local educational authorities, the population consists of 8,500 students from various public and private primary schools, 850 teachers teaching in these schools. The sample size is determined using Issac & Michael's formula with a 5% error rate, resulting in a sample of 500 students and 50 teachers. The sampling technique follows a stratified random sampling approach to ensure representation from different schools.

Research Instrument

The main research instrument is a structured questionnaire, validated and tested for reliability (Stockemer et al., 2019). The questionnaire includes: (1) Students' Sleep Patterns – covering nighttime sleep duration and nap habits; (2) Perception of the Nap Policy – students' and teachers' perspectives; (3) Students' Stress Levels – measured using a Likert scale (1-5); and (4) Students'

Figure 1. Research framework

Learning Achievement– based on semester exam scores. Before distribution, the questionnaire was tested for validity using Corrected Item-Total Correlation and for reliability using Cronbach's Alpha to ensure accuracy and consistency.

Data Analysis Techniques

Collected data were analyzed using descriptive and inferential statistics with SPSS Version 25(Field, 2013; Mertens, 2023).
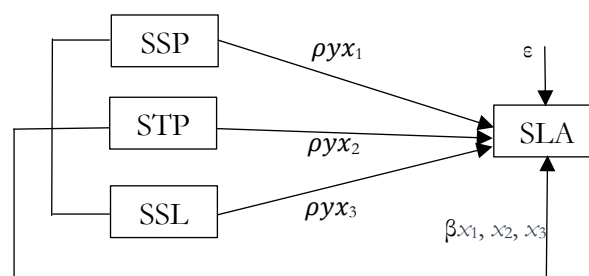
RESULT AND DISCUSSION

Result

Descriptive Statistics

Table 1 presents descriptive statistics for the four main variables that are the focus of this study: students' sleep patterns, students' and teachers' perceptions of learning, students' stress levels, and their academic achievements.

Table 1. Descriptive Statistics

Variable	N	Mean	Std. Deviation	Min	Max
Student Sleep Patterns (SSP)	550	6.92	1.18	4.0	9.2
Student & Teacher Perceptions (STP)	550	7.35	1.05	5.0	9.5
Student Stress Levels (SSL)	550	5.01	1.29	2.3	7.9
Student Learning Achievement (SLA)	550	78.80	8.20	61.0	93.5

Students' sleep patterns showed an average sleep duration of 6.92 hours with a standard deviation of 1.18, indicating moderate variation in students' sleep habits. Students' and teachers' perceptions of learning had an average of 7.35 with a standard deviation of 1.05, reflecting a relatively positive and consistent view. Students' stress levels averaged 5.01, indicating that most students experienced moderate levels of stress, with variations that were still within control. Meanwhile, students' academic achievement had an average value of 78.80 with a standard deviation of 8.20, depicting fairly good learning performance with variations between individuals. These findings provide an important overview in understanding students' conditions from various interrelated aspects.

Normality Test

A normality test using the Kolmogorov-Smirnov method was conducted to determine whether the data followed a normal distribution.

Table 2. Result Normality Test

Variable	Kolmogorov-Smirnov (K-S)	*p*-value
SSP	0.089	0.112
STP	0.076	0.185
SSL	0.102	0.072
SA	0.081	0.149

The normality test results indicate that all variables have p-values greater than 0.05, meaning that they follow a normal distribution. It suggests that parametric statistical analyses, such as regression and correlation tests, are appropriate for this study.

Homogeneity Test

A homogeneity test using Levene's Test was conducted to assess whether the variances across groups were homogeneous. The results are as follows:

Table 3. Result Homogeneity Test (Levene's Test)

Variable	Levene Statistic	*p*-value
SSP	1.85	0.129
STP	2.12	0.092
SSL	1.76	0.143
SA	1.58	0.167

Since all *p*-values are greater than 0.05, the homogeneity assumption is met, indicating that the variances among different groups are equal, which supports the use of parametric tests for further analysis.

Liniear Regression Analysis

Student Sleep Patterns (SSP) and Student Learning Achievement (SLA)

The construct validity test aims to ensure that the measurement instrument used accurately measures the construct in question and aligns with the research objectives. Validity analysis is conducted to assess the extent to which the constructs employed in the research accurately measure the variables in question.

Table 4. Linear regression test results *SSP* against *SLA*

Variable	Coefficient (β)	Standard Error (SE)	*t*-Value	*p*-Value
Intercept (β_0)	25.67	-	-	-
SSP	0.42	0.08	5.25	< 0.001

Linear regression analysis has been conducted to investigate the relationship between *SSP* and *SLA*. Intercept (β_0) at a value of 25.67 is the intersection point of the regression line with the Y axis when there is no observation of students' sleep patterns. The coefficient for Sleep Pattern (*SSP*) of 0.42 indicates that a one-unit increase in student sleep patterns correlates with an average increase of 0.42 in student learning achievement, assuming other variables remain constant. The standard error (*SE*) for the coefficient SSP is 0.08, indicating the level of uncertainty in the estimation of the coefficient. The *t*-value of 5.25 shows the significance of the *SSP* coefficient in predicting student learning achievement. In addition, the very low *p*-value (< 0.001) confirms that the relationship between *SSP* and *SLA* is very statistically significant. Thus, the results of this regression analysis underscore the significance of students' sleep patterns in shaping their learning achievement, highlighting the importance of prioritizing the quality and consistency of sleep patterns as part of efforts to enhance educational quality.

Nap Policy (NP) and Student Learning Achievement (SLA)

Table 5. Linear regression test results *NP* against *SLA*

Variable	Coefficient (β)	Standard Error (SE)	*t*-Value	*p*-Value
Intercept (β0)	45.78	-	-	-
NP (Perception)	0.62	0.05	12.45	< 0.001

Linear regression analysis has been conducted to investigate the relationship between *NP* and *SLA*. Intercept (β_0) shows the initial value of Student Learning Achievement when no nap policy is implemented, with a value of 45.78. It indicates that without the nap policy, the average student learning achievement would be predicted to be at that figure. The coefficient for *NP* is 0.62, indicating that each unit increase in nap policy correlates with an average increase of 0.62 in student achievement, while other factors remain stable. The low standard error (*SE*) of the *NP* coefficient (0.05) shows the accuracy of the coefficient estimate. The high *t*-value value (12.45) confirms the statistical significance of the relationship between the *NP* and *SLA*. In addition, the very low *p*-value value (< 0.001) indicates that this relationship is very statistically significant. Overall, the regression results show that the nap policy has a significant influence on student learning achievement. The more nap policies are implemented, the higher the learning achievement achieved. These findings highlight the importance of paying attention to nap policies in improving the quality of education and academic achievement of students.

Student Stress Level (SSL) and Student Learning Achievement (SLA)

Table 6. Linear regression test results SSL against *SLA*

Variable	Coefficient (β)	Standard Error (SE)	T-Value	P-Value
Intercept (β0)	38.92	-	-	-
SSL (Stress Level)	-0.35	0.04	-8.25	< 0.001

Linear regression analysis was conducted to investigate the relationship between *SSL* and *SLA*. The intercept (β_0) at a value of 38.92 represents the predicted student learning achievement

when the student's stress level is zero, indicating the minimum expected learning achievement value in this situation. The coefficient for *SSL* is -0.35, indicating that each one-unit increase in student stress level correlates with an average decrease of 0.35 in student achievement, assuming other factors are constant. The standard error (SE) for the *SSL* coefficient is 0.04, indicating the level of precision of the coefficient estimate. The T-value has a value of -8.25, indicating the statistical significance of the *SSL* coefficient in predicting student learning achievement. A very low P-value value (<0.001) indicates that the relationship between *SSL* and *SLA* is very statistically significant. Overall, the analysis results indicate that students' stress levels have a significant impact on their learning achievement. The higher the student's stress level, the lower their learning achievement. These findings underscore the importance of managing students' stress in improving the quality of their education and academic achievement.

Multiple Regression Analysis

SSP, NP, SSL on SLA

Hasil analisis hubungan antara Student Sleep Patterns (X1), Nap Policy (X2) and Student Stress Levels (X3) on Student Learning Achievement (Y) dapat dilihat pada Tabel 7 berikut ini.

Table 7. Results of multiple regression tests SSP, NP and SSL on SLA

Variable	Coefficient (β)	Standard Error (SE)	T-Value	P-Value
Intercept (β0)	20.12	-	-	-
SSP	0.35	0.06	5.80	< 0.001
NP	0.52	0.08	6.50	< 0.001
SSL	-0.25	0.05	-5.00	< 0.001

Multiple regression analysis has been conducted to investigate the joint relationship between Student Sleep Patterns (*SSP*), Nap Policy (*NP*), Student Stress Levels (*SSL*), and Student Learning Achievement (SLA). Intercept (β_0) has a value of 20.12, which indicates the prediction of student learning achievement when all independent variables are zero. The coefficient for *SSP* is 0.35, indicating that a one-unit increase in *SSP* correlates with an average increase of 0.35 in Student Achievement. These results indicate that students' sleep patterns have a positive influence on their learning achievement. Furthermore, the coefficient for *NP* is 0.52, indicating that a one-unit increase in nap policy correlates with an average increase of 0.52 in *SLA*. It shows that the nap policy also has a positive impact on *SLA*.

On the other hand, the coefficient for *SSL* is -0.25, indicating that a one-unit increase in student stress level correlates with an average decrease of 0.25 in *SLA*. These findings highlight the detrimental impact of *SSL* on *SLA*. Overall, this multiple regression analysis provides comprehensive insight into the relationship between sleep patterns, nap policies, stress levels, and student achievement.

Discussion

The relationship between student sleep patterns and student learning achievement has been extensively explored in educational research. This study found a significant positive correlation, with a regression coefficient of 0.42 (*SE* = 0.08), a t-value of 5.25, and a p-value of < 0.001, indicating that better sleep patterns are strongly associated with higher academic performance. These findings align with previous studies demonstrating that adequate and quality sleep enhances cognitive functions such as memory retention, attention span, and problem-solving skills (Astill et al., 2012). Moreover, our research provides new insights into the role of structured nap policies within the Chinese education system, where academic pressure is notably high. While existing literature has highlighted the detrimental effects of sleep deprivation—such as decreased concentration and increased fatigue (Curcio et al., 2006) and reduced classroom engagement and knowledge retention (Moore et al., 2008)—this study underscores how school-based interventions,

such as scheduled nap times, can serve as protective factors that enhance academic outcomes. A unique contribution of this study lies in its consideration of students' perceptions of nap policies and stress levels, shifting the focus from mere sleep duration to the quality and institutional support for rest.

The findings suggest practical implications for educational policy and school management. Schools should prioritize the integration of sleep health into daily routines by implementing structured nap policies and adjusting academic schedules to accommodate adequate rest, particularly in high-pressure learning environments. It is especially pertinent in contexts like China, where students endure long academic hours and intense study demands. By institutionalizing rest periods, schools may help students restore cognitive function and manage academic stress, thereby improving overall learning outcomes. Additionally, sleep education programs for students and parents can raise awareness about the crucial role of healthy sleep habits in academic success. Despite these contributions, the study acknowledges limitations, including the reliance on self-reported sleep data, which may be subject to bias. Future research should utilize objective sleep-tracking tools to enhance data accuracy and expand the study population beyond elementary students in Guangdong Province to ensure broader applicability. By addressing these limitations, future studies can provide a more comprehensive understanding of the complex interplay between sleep, stress, and academic performance, reinforcing the value of sleep-oriented educational reforms to support student well-being and achievement.

Linear regression analysis reveals a positive and statistically significant relationship between students' perceptions of school nap policies and their learning achievement. The regression coefficient of 0.25, with a standard error of 0.06, indicates that for each one-unit increase in positive perception of nap policies, there is an associated 0.25-unit increase in academic achievement, controlling for other variables. The *t*-value of 4.17 and *p*-value of < 0.001 support the statistical robustness of this relationship. These findings are consistent with the Intrinsic and Extrinsic Motivation Theory, which explains that both internal and external factors influence student motivation (Ruzek et al., 2016). When students view nap policies positively, it may enhance their motivation to learn.

Additionally, Bandura's Social Cognitive Theory emphasizes the importance of modeling and reinforcement, suggesting that students who observe peers benefiting from napping are more likely to adopt similar behaviors (Bandura, 1977). Beyond behavioral aspects, the cognitive benefits of napping have also been well-documented. The Information Processing Theory posits that naps aid in consolidating learned information, thereby improving academic performance (Dunlosky et al., 2013). Similarly, Li et al. (2021) emphasize the essential role of physical and mental health in supporting learning outcomes. This study contributes a novel dimension by examining the psychological and perceptual aspects of nap policy, shifting focus from physiological mechanisms to students' subjective experiences within the school environment.

This research also underscores the significance of nap policies in creating a more supportive and motivational learning environment, as described in the Learning Environment Theory (Lizzio et al., 2002). When implemented thoughtfully, such policies can enhance students' academic engagement and overall performance. School administrators are encouraged to design nap policies that are responsive to students' needs and accompanied by educational programs to raise awareness among teachers, students, and parents about the academic and health benefits of structured rest. However, several limitations must be acknowledged. The reliance on self-reported data introduces the potential for subjective bias, as students' perceptions may not always align with actual outcomes. Future research should employ more objective measures, such as direct observation or physiological assessments, to validate the impact of nap policies.

Furthermore, since this study was conducted within a specific educational and cultural context, caution is needed in generalizing the findings to other settings. Future studies should

investigate how such policies can be adapted across diverse educational systems and examine how cultural perceptions influence students' attitudes toward institutionalized rest. In conclusion, this study highlights the need for a holistic approach to promoting academic success—one that integrates psychological motivation, social behavior, and the quality of the learning environment.

Regression analysis indicates a significant negative relationship between student stress levels and their academic achievement. The regression coefficient (β = -0.35) suggests that each one-unit increase in stress corresponds with a 0.35-unit decrease in academic performance, underscoring the detrimental impact of stress on learning outcomes. This relationship is statistically significant, with a p-value well below the conventional threshold, confirming that stress exerts a measurable effect on students' academic success. The findings are in line with the Stress and Coping Theory, which posits that excessive stress impairs critical cognitive functions such as concentration, memory retention, and problem-solving ability (Suditu & Badea, 2018). Similarly, the Student Well-being Theory emphasizes the negative impact of high stress on students' emotional and psychological well-being, which in turn reduces motivation and classroom engagement (Suldo et al., 2014). Furthermore, according to the Intrinsic and Extrinsic Motivation Theory, stress diminishes intrinsic motivation, thereby weakening students' willingness to participate actively in academic tasks (Ryan & Deci, 2000).

These findings highlight the urgent need for educational institutions to address student stress through well-structured interventions. Schools should consider implementing comprehensive stress management programs, raising awareness about mental health, and offering accessible counseling services. Teachers can contribute by employing flexible instructional strategies that minimize academic pressure and foster a more empathetic and supportive learning environment. Integrating mindfulness activities and relaxation techniques into the curriculum also helps students cope more effectively with academic stress. Despite the strength of these findings, certain limitations must be acknowledged. The study relies on self-reported data for stress levels, which may introduce subjective bias. Future research should incorporate objective physiological indicators, such as cortisol measurements, to enhance data reliability. Additionally, as the study was conducted within a specific educational and cultural context, broader investigations are necessary to determine the generalizability of these results across different settings. Addressing these limitations will be essential for developing targeted, evidence-based strategies that promote student well-being and academic performance in diverse educational environments.

Linear regression analysis revealed a significant relationship between student sleep patterns, perceptions of school nap policy, student stress levels, and academic achievement. Consistent sleep patterns had a positive effect on academic performance, with a regression coefficient of 0.35, indicating that students who maintain regular and sufficient sleep tend to perform better academically. Similarly, positive perceptions of school nap policies were associated with higher academic achievement (β = 0.52), suggesting that favorable attitudes toward structured rest support cognitive functioning. Conversely, student stress levels showed an adverse effect (β = -0.25), with higher stress associated with lower academic performance. These findings emphasize the interconnected roles of sleep, rest policies, and stress management in shaping student achievement. Prior research supports these outcomes: Williams and Aderanti (2014) demonstrated that consistent sleep schedules improve academic results, while Taras and Potts-Datema (2005) reported that sleep deprivation negatively affects cognitive processes. The positive impact of nap policy perceptions builds upon Taras (2005), who found that structured naps enhance concentration and endurance. This study contributes a novel angle by examining students' psychological responses to nap policies rather than merely their physiological benefits.

The observed negative relationship between stress and academic achievement aligns with Baqutayan's (2015) Stress and Coping Theory, which posits that high stress impairs learning and mental performance. While previous studies confirm the adverse impact of stress, this research extends those findings by comparing stress with other key variables such as sleep and nap policy

perceptions. Based on these insights, educational institutions should prioritize health-promoting policies. Raising awareness about healthy sleep habits, adjusting school start times, and limiting homework could help regulate students' rest. The strong correlation between positive nap policy perceptions and academic success suggests schools should explore structured nap opportunities, especially for students under academic strain. Moreover, implementing stress management programs—including counseling, mindfulness training, and time management workshops—can mitigate academic pressure and enhance learning outcomes. A comprehensive and integrated approach is needed, combining flexible schedules, mental health support, and policies that balance academic demands with student well-being. However, the study's limitations must be acknowledged. The sample was drawn from a specific school context, limiting generalizability. Future research should involve more diverse samples, objective measures (e.g., sleep tracking, academic records, stress biomarkers), and longitudinal designs to assess causality. Additionally, external factors such as socioeconomic status, parental involvement, diet, and extracurricular activities warrant further exploration. In conclusion, this study affirms the critical influence of sleep patterns, stress levels, and perceptions of school policies on academic achievement and calls for strategic, evidence-based interventions to support student success.

CONCLUSION

Adequate sleep patterns and positive perceptions of the nap policy have a significant positive effect on academic achievement, while students' stress levels have a significant adverse effect. These findings confirm that good sleep quality can improve cognitive functions such as concentration, memory, and problem-solving, while high stress hinders the learning process. Theoretically, this study strengthens the Stress and Coping Theory and the Intrinsic and Extrinsic Motivation Theory, which highlight the importance of stress management and motivation in academic achievement. From a practical perspective, these results provide an empirical basis for the development of educational policies that support student well-being through education on healthy sleep patterns, implementation of nap policies in elementary schools, and implementation of stress management programs such as counseling and mindfulness training. The implication is that schools need to work together with parents to maintain consistent student bedtimes at home and consider adjusting school start times to match students' natural sleep rhythms. However, this study has limitations, including a narrow coverage area, the use of self-reported data that is prone to bias, and a cross-sectional design that cannot reveal causal relationships in their entirety. Therefore, further research is recommended to use a larger and more diverse sample, involve objective measurements such as sleep trackers and physiological indicators of stress, and implement a longitudinal design to observe the long-term effects of sleep patterns, nap policies, and stress levels on student achievement.

ACKNOWLEDGMENT

BIBLIOGRAPHY

Astill, R. G., Van der Heijden, K. B., Van IJzendoorn, M. H., & Van Someren, E. J. (2012). Sleep, cognition, and behavioral problems in school-age children: a century of research meta-analyzed. *Psychological bulletin*, *138*(6), 1109–1138. https://doi.org/10.1037/a0028204.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs.

Baqutayan, S. M. S. (2015). Stress and coping mechanisms: A historical overview. *Mediterranean Journal of Social Sciences*, *6*(2), 479-488. https://doi.org/10.5901/mjss.2015.v6n2s1p479

Clotfelter, C. T. (Ed.). (2010). *American universities in a global market*. University of Chicago Press.

Curcio, G., Ferrara, M., & De Gennaro, L. (2006). Sleep loss, learning capacity and academic performance. *Sleep medicine reviews*, *10*(5), 323-337. https://doi.org/10.1016/j.smrv.2005.11.001

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public interest*, *14*(1), 4-58. https://doi.org/10.1177/1529100612453266

Field, A. (2024). *Discovering statistics using IBM SPSS statistics*. Sage publications limited.

Li, J. (2012). World-class higher education and the emerging Chinese model of the university. *Prospects*, *42*, 319-339. https://doi.org/10.1007/s11125-012-9241-y

Li, J., Cacchione, P. Z., Hodgson, N., Riegel, B., Keenan, B. T., Scharf, M. T., ... & Gooneratne, N. S. (2017). Afternoon napping and cognition in Chinese older adults: findings from the China health and retirement longitudinal study baseline assessment. *Journal of the American Geriatrics Society*, *65*(2), 373-380. https://doi.org/10.1111/jgs.14368

Li, W., Taskin, T., Gautam, P., Gamber, M., & Sun, W. (2021). Is there an association among sleep duration, nap, and stroke? Findings from the China Health and Retirement Longitudinal Study. *Sleep and Breathing*, *25*, 315-323. https://doi.org/10.1007/s11325-020-02118-w

Liu, B., Gao, F., Zhang, J., Zhou, H., Sun, N., Li, L., ... & Zhao, M. (2020). Sleep quality of students from elementary school to university: a cross-sectional study. *Nature and science of sleep*, 855-864. https://doi.org/10.2147/NSS.S266493

Lizzio, A., Wilson, K., & Simons, R. (2002). University students' perceptions of the learning environment and academic outcomes: implications for theory and practice. *Studies in Higher education*, *27*(1), 27-52. https://doi.org/10.1080/03075070120099359

Moore, S., Armstrong, C., & Pearson, J. (2008). Lecture absenteeism among students in higher education: A valuable route to understanding student motivation. *Journal of Higher Education Policy and Management*, *30*(1), 15-24. https://doi.org/10.1080/13600800701457848

Punch, K. F. (2013). *Introduction to social research: Quantitative and qualitative approaches*. Sage Publications.

Ruzek, E. A., Hafen, C. A., Allen, J. P., Gregory, A., Mikami, A. Y., & Pianta, R. C. (2016). How teacher emotional support motivates students: The mediating roles of perceived peer relatedness, autonomy support, and competence. *Learning and instruction*, *42*, 95-103. https://doi.org/10.1016/j.learninstruc.2016.01.004

Ryan, R. M., & Deci, E. L. (2000). *When rewards compete with nature: The undermining of intrinsic motivation and self-regulation. In Intrinsic and extrinsic motivation*. (pp. 13-54). Academic Press.

Shi, R., Wang, K. T., Xie, Z., Zhang, R., & Liu, C. (2019). The mediating role of friendship quality in the relationship between anger coping styles and mental health in Chinese adolescents. *Journal of Social and Personal Relationships*, *36*(11-12), 3796-3813. https://doi.org/10.1177/0265407519839146

Stockemer, D., Stockemer, G., & Glaeser, J. (2019). *Quantitative methods for the social sciences* (Vol. 50, p. 185). Cham, Switzerland: Springer International Publishing.

Subrahmanya, S. V. G., Shetty, D. K., Patil, V., Hameed, B. Z., Paul, R., Smriti, K., ... & Somani, B. K. (2022). The role of data science in healthcare advancements: applications, benefits, and

future prospects. *Irish Journal of Medical Science*, *191*(4), 1473-1483. https://doi.org/10.1007/s11845-021-02730-z

Suditu, M., & Badea, M. (2018). Comparative Analysis of Codes of Conduct Meant to Promote Non-Violent Behavior in the Academic Romanian Space. In *Violence Prevention and Safety Promotion in Higher Education Settings* (pp. 1-19). IGI Global Scientific Publishing. https://doi.org/10.4018/978-1-5225-2960-6.ch001

Suldo, S. M., Gormley, M. J., DuPaul, G. J., & Anderson-Butcher, D. (2014). The impact of school mental health on student and school-level academic outcomes: Current status of the research and future directions. *School Mental Health*, *6*, 84-98. https://doi.org/10.1007/s12310-013-9116-2

Sun, Y., Wang, H., Jin, T., Qiu, F., & Wang, X. (2022). Prevalence of sleep problems among Chinese medical students: a systematic review and meta-analysis. *Frontiers in Psychiatry*, *13*, 753419. https://doi.org/10.3389/fpsyt.2022.753419

Taras, H., & Potts-Datema, W. (2005). Sleep and student performance at school. *Journal of school health*, *75*(7), 248-254. https://doi.org/10.1111/j.1746-1561.2005.tb06685.x

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. SAGE Publications.

Wang, H., Hu, R., Du, H., Fiona, B., Zhong, J., & Yu, M. (2018). The relationship between sleep duration and obesity risk among school students: a cross-sectional study in Zhejiang, China. *Nutrition & metabolism*, *15*, 1-9. https://doi.org/10.1186/s12986-018-0285-8

Williams, T. M., & Aderanti, R. A. (2014). Sleep as a determinant of academic performance of university students in Ogun state, South west, Nigeria. *European Scientific Journal*, *10*(13), 657-664

.

Muh Ibnu Sholeh, Himad Ali, Sokip, Asrop Syafii, Sulistyorini, Imam Fuadi, Nur 'Azah, Munif , Mochammad Syafiuddin Shobirin, Sahri