Sleep Effect and Academic Performance: An Exploratory Investigation

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Received: 9 January 2024
Accepted: 15 May 2024
Published: 31 May 2024

ABSTRACT

This paper aims to explore the significant role of sleep and how it affects university students' academic performance. The factors investigated were genetic, lifestyle, environment, psychological wellness, and demographics. This exploratory investigation used an online questionnaire survey approach. The target population was university students in Malaysia. The purpose of the study was to determine whether academic achievement and Sleep effect were correlated. Scale reliability and validity, multiple regressions, and compare means (ANOVA) were done to understand the goodness of measures and relationships of the variables. Quality of sleep is important for university students. Future research will have more rigorous methodology to include the quality of sleep and sleep effect for other meaningful dependent variables.

Keywords: *Sleep effect, academic performance, university students*

INTRODUCTION

Quality sleep is crucial in human life. It can impact a person's physical, mental, and cognitive well-being. Its significance for students is particularly notable as it most probably directly influences their academic performance and overall productivity. They need to have healthy lifestyle. Unhealthy lifestyles, as highlighted by Kanerva et al. (2017), cluster together, with poor Sleep effect being a significant contributor. Among the unhealthy lifestyle components are eating habits and heavy usage of ICT devices such as handphones. The use of electronic devices before sleep, especially mobile phones, has been linked to sleep disturbances. Research findings (e.g., Ee & Gan, 2022; Javaid, 2018; Nurismadiana et al., 2018) indicate high percentages of undergraduate students are experiencing unsatisfactory sleep quality and this adversely affecting academic achievement.

Poor sleep contributes to increased absenteeism and tardiness, impacting class attendance, participation, and motivation. This underscores the importance of addressing sleep-related issues among students to promote successful academic development (Kearney & Graczyk, 2020). The research aimed to explore the measurement and importance of sleep as well as investigate its impact on the academic performance of university students.

LITERATURE AND HYPOTHESIS

Sleep, a fundamental biological necessity, plays a crucial role in our daily lives, likened to the importance of food and water for survival. It occupies a significant portion of our existence, contributing to physical, mental, and emotional well-being. Despite its significance, a considerable number of individuals experience sleep disturbances, with approximately one-third reporting some form of insomnia. This underscores the urgent need for greater awareness and prioritization of healthy sleep habits to safeguard overall well-being, as poor sleep quality has been linked to various issues such as academic performance, cardiovascular events, and accidents. Recognizing the importance of sleep quality is key to unlocking our full potential and achieving holistic wellness (Mirghani, 2015; Siraj, 2014; Javaid, 2018).

Genetic

Genetic factors are thought to play a role in many sleep disorders, such as insomnia (Genderson et al., 2013). In this study, genetics serve as the independent variable influencing the Sleep effect. Individuals with a specific genetic variation are more susceptible to poor sleep quality compared to the average person. Approximately 10% to 20% of the population exhibits this genetic condition. The research explores the role and variations in circadian genes, examining their impact on the body's systems and cycles (Medical, 2021). Therefore, it hypothesized that:

H1: Genetic factors will influence the sleep effect.

Lifestyle

Lifestyle factors, such as weight gain, insufficient physical activity, and the consumption of caffeine and alcohol, are examined. Additionally, contemporary lifestyle trends are scientifically linked to the Sleep effect (Shochat, 2012).

H2: Lifestyle will affect the sleep effect.

Environment

The independent variable under investigation is the environment and its impact on Sleep effect. Environmental elements, including inappropriate light exposure, traffic noise, temperature, and humidity, are considered (Johnson, 2018).

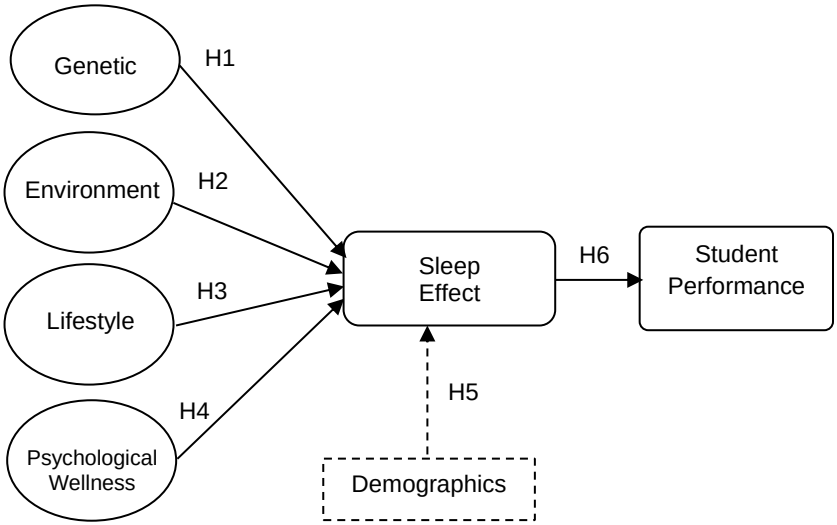
H3: Environment affects the sleep effect.

Psychological Wellness

Sleep quality was associated with psychological well-being (Zhai et al., 2018). The psychological aspect of the sleep quality was emphasized. The study explored the correlation between depression, anxiety, stress, social support, and sleep quality. Therefore, it is hypothesized that:

H4: Psychological well-being will affect the sleep effect.

Figure 1
The graphical model



METHODOLOGY

This exploratory research used a structured questionnaire survey on university students. This section will focus on the design, measurement, operational definition terms, data collection method, population, and sampling technique used in this research.

The respondents in this research are aged between 18 to 20 years old, 22 to 25 years old, and 26 to 29 years old. The data was collected from 9 different universities across Malaysia.

A total of 300 respondents took part in answering the survey. The sample size is critical because it allows for the collection of complete data. As the controlled characteristic, several demographic charactisctics such as gender, marital status, race, institution, education level, and faculty were used to ensure the representativeness of this sample size. The survey topics and questions were designed to collect important data about each aspect, such as the sleep effect.

Table 1
The multi-item measures

Variables	Dimension/Items	Source
Sleep Effect	Difficulty in thinking due to poor sleep Difficulty in concentrating due to poor sleep Increase of mistakes due to poor sleep Irritated feeling due to poor sleep Decrease of interest in work or others due to poor sleep Getting tired easily at work due to poor sleep Sleepiness interferes with daily life I feel stressed due to poor sleep Lack of desire due to poor sleep Increased forgetfulness due to poor sleep Relief of fatigue after sleep Regaining energy after sleep The clear-headed feeling after sleep	Referring Yi et al. (2006)
Factors affecting Sleep effect	Genetic I have sleep-wake cycle disorder. My family has a history of sleep disorders such as insomnia. Lifestyle I exercise at least 2 times a week. I eat healthy food every day. I consume coffee every day. I take alcohol. Environment Playing phone or watching TV before bed. I am sensitive to light. I am sensitive to noise. Temperature in my room is too hot/too cold. Psychological wellness I often feel stressed. I have an anxiety disorder.	Suen et al. (2010)
Academic Performance	The students' latest CGPA	

Data collection for this research involved creating a questionnaire with multiple-choice and open-ended questions. Google Form was utilized to develop the questionnaire, which was distributed to university students within the specified age range, following the sampling plan. The collected data were analyzed using the IBM Statistical Package for the Social Sciences (SPSS).

ANALYSIS AND DISCUSSION

Table 2
Respondents' profile

Variables	**Sample** (n=300)	**Percentage** %
Gender		
Male	120	40
Female	180	60
Age		
18-21	100	33.3
22-25	167	55.7
26-29	25	8.3
Others	2	0.7
Marital Status		
Single	278	92.7
Married	17	5.7
Others	5	1.7
Race		
Bumiputera	210	70.0
Chinese	60	20.0
Indian	20	6.7
Others	10	2.3
Education Level		
Diploma	132	43.3
Degree	155	50.7
Others	13	6.0
Faculty		
Faculty of Applied Science	10	3.3
Faculty of Architecture & Built Environment	11	3.7
Faculty of Automotive and Aerospace	4	1.3
Faculty of Biomedical	4	1.3
Faculty of Biotechnological	9	3.0
Faculty of Business	70	23.3
Faculty of Dentistry	24	8.0
Faculty of Engineering	52	17.3
Faculty of Humanities & Health Science	10	3.3
Faculty of Law and Humanities	19	6.3
Faculty of Medicine and Health Science	38	12.7
Faculty of Oil and Gas	3	1.0
Faculty of Pharmacy	18	6.0
Faculty of Psychology and Education	13	4.3
Faculty of Syariah and Laws	15	5.0

Table 2 shows the characteristics of the 300 respondents from all over Sarawak, Sabah, and Peninsular Malaysia who voluntarily participated in this survey. The data was collected via Google Form, which was disseminated to the targeted students.

Table 3 shows the reliability test of each variable which is the dimensions that affect the quality of sleep towards students' performance. Cronbach's Alpha values are measures of internal consistency, with higher values indicating strong reliability.

Table 3
Reliability and validity on Sleep effect

Variable	Items	Item Total Correlation	Cronbach Alpha's
Sleep effect	Difficulty in thinking due to poor sleep	.671	.868
	Difficulty in concentrating due to poor sleep	.687	
	Increase of mistakes due to poor sleep	.709	
	Irritated feeling due to poor sleep	.637	
	Decrease of interest in work or others due to poor sleep	.685	
	Getting tired easily at work due to poor sleep	.693	
	Sleepiness interferes with daily life	.701	
	I feel stressed due to poor sleep	.668	
	Lack of desire due to poor sleep	.675	
	Increased forgetfulness due to poor sleep	.643	
	Relief of fatigue after sleep	.510	
	Regaining energy after sleep.	.473	
	The clear-headed feeling after sleep	.473	

The demographic factors (i.e., gender, age, race, educational level) do not seem to influence the Sleep effect of university students (Table 4).

The multiple regression investigations of the Sleep effect (Table 5) do not show significant relationships between Genetic (HI) and Psychological Wellness (H4). However, the analysis results reveal a considerable and favorably significant association between Lifestyle (H2) and Environment (H4). A p-value less than 0.05 indicates that the factors affecting the Sleep effect which are Lifestyle (H2) and Environment (H4) are clearly significant. To conclude, we reject the null hypothesis.

Table 4
Compare means for Sleep effect by demographic groups

Demographic	**Sleep effect**			**Remark**
	Means	SD	Sig	
Gender			.396	No significant difference between gender groups
Male	4.68	0.73		
Female	4.69	0.80		
Age			.372	No significant difference among age groups
18-21	4.64	0.77		
22-25	4.74	0.79		
26-29	4.65	0.70		
Others	4.29	0.75		
Race			.072	No significant difference among racial groups
Bumiputera	4.62	0.78		
Chinese	4.90	0.74		
Indian	4.80	0.86		
Others	4.54	0.34		
Education			.505	No significant difference among the educational groups
Diploma	4.71	0.79		
Degree	4.69	0.77		
Others	4.44	0.61		

Table 5
Multiple regression analysis on factors affecting Sleep effect

Variable	**Unstandardized Co-efficient**		**Standardized**	**t**	**Sig.**
	B	Std Error	Beta		
Constant	2.688	.229		11.760	.000
Genetic (H1)	.087	.035	.138	2.499	.013
Lifestyle (H2)	.119	.045	.156	2.636	.009
Environment (H3)	.234	.037	.351	6.248	.000
Psychological Wellness (H4)	-.016	.032	-.028	-.485	.628

a.Dependent variable: Sleep effect

b.Predictors: (Constant), Genetic, Lifestyle, Environment, Psychological Wellness

The regression analysis results (Table 6) indicate the relationship between different variables and the dependent variable. The constant term, representing the expected value when all predictors are zero, is statistically significant. However, the Genetic and Lifestyle variables show positive relationships with the dependent variable but are not statistically significant. The Environment has a negative relationship, but it is also not statistically significant. Psychological Wellness exhibits a negative and marginally

significant relationship (p = 0.120). In summary, while the constant term is significant, the individual predictors (Genetic, Lifestyle, Environment) do not have statistically significant associations with the dependent variable. Psychological Wellness, though not strongly significant, shows a potential relationship that might be explored further.

Table 6
Multiple regression analysis on factors affecting students' performance

Variable	**Unstandardized Co-efficient**		**Stand. Beta**	**t value**	**Sig.**
	B	Std Error			
Constant	2.293	.142		16.162	.000
Genetic (H1)	.026	.022	.074	1.186	.237
Lifestyle (H2)	.016	.028	.038	.559	.576
Environment (H3)	-.023	.023	-.063	-.994	.321
Psychological Wellness (H4)	-.031	.020	-.102	-.1.560	.120

a. Dependent variable: Academic Performance
b. Predictors: (Constant), Genetic, Lifestyle, Environment, Psychological Wellness

CONCLUSION AND RECOMMENDATION

This exploratory research found that the proposed measurement for the Sleep effect variable is reliable and has a satisfactory level of internal consistency. It is a good measurement tool to evaluate the Sleep effect and how it might impact the students' academic performance.

According to the findings, it is evident that lifestyle and environment are clearly significant while genetic and psychological wellness are favorably significant in affecting Sleep effect on students. The study revealed due to poor sleep, students tend to make mistakes and sleepiness may interfere with students' daily lives. Nevertheless, there was no significant relationship between student performance and Sleep effect. Furthermore, this study recommends innovative solutions to improve sleep quality, such as promoting healthy lifestyle habits and reducing electronic device usage before sleep. The implications of this study are significant for university students and educational institutions, as it emphasizes the need to prioritize healthy sleep habits to promote successful academic development.

Based on the findings of this study, it is recommended that educational institutions take proactive measures to promote healthy sleep habits among university students (Eliasson, 2009). This can be achieved by providing education on the importance of quality sleep, promoting healthy lifestyle habits, and reducing electronic device usage before sleep. By prioritizing these measures, educational institutions can positively influence students' academic performance and ultimately contribute to their success. Additionally, universities can consider implementing policies that prioritize students' well-being (Gaultney, 2010), such as designated quiet hours in dormitories. Designed quiet hours in dormitories can create a conducive environment for uninterrupted rest, minimizing disturbances that can disrupt sleep patterns and ensuring a peaceful sleeping environment for students. By prioritizing healthy sleep habits, educational institutions can help students achieve academic success and promote overall well-being.

CONTRIBUTION OF AUTHORS

The authors have equally contributed to all facets of this research, publication, and associated editing tasks**.**

FUNDING

This research did not receive any dedicated grant from a particular funding agency.

CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

ACKNOWLEDGEMENT

We would like to express our gratitude to all those who have contributed to the completion of this project. Your support and assistance have been very useful. Thank you.

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