Factors of Sleep Quality of University Students: A Comparison Between Malaysia and India

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ABSTRACT

Good sleep quality has a vital role in enhancing cognitive skills. Poor nighttime sleep quality affects the physical and cognitive health of students. This research examined the factors affecting university students' sleep quality between Malaysia and India. This research is quantitative in nature. A total of 81 University students from Malaysia and 74 University students from India responded. The findings revealed that the sleep quality among students was above average. The findings also showed that lifestyle behavior and environment were the important factors affecting the sleep quality of university students. The conclusion was drawn of the factors affecting the sleep quality of university students.

Keywords: Malaysia, India, Sleep Quality, University Students

INTRODUCTION

Kline (2013) defines sleep quality as one's satisfaction of the sleep experience, integrating aspects of sleep initiation, sleep maintenance, sleep quantity, and refreshment upon awakening. Sleeping is essential for everyone; it is especially important to students because it directly affects their performance. Sleep quality is defined as the satisfaction of the sleeping experience. University students are any individuals enrolled in a college or university who gain knowledge and life experience in tertiary education before entering the work world. This research is conducted to analyze the factors affecting the sleep quality of university students. There is a difference between sleep quantity and sleep quality. Sleep quantity measures how many hours you sleep each night while sleep quality determines how well you sleep at night.

According to a study conducted by Pilcher, Ginter, and Sadowsky (1997), sleep quality is better related to measures of health, well-being, and sleepiness than sleep quantity in a nonclinical population reporting an average of 7-8 hours of sleep at night. Specifically, in two separate groups of college students, one during final exam week (study 1) and

one during the first third of the semester (study 2), poor sleep quality was correlated with increased physical health complaints, as measured by the Cornell Medical Index, and to increased feelings of anxiety, depression, anger, fatigue, and confusion, as measured by the Profile of Mood States (POMS). Furthermore, poor sleepers in study 2 reported a decrease in positive affect and a decrease in satisfaction with life. In addition, poor sleepers in both studies reported increased levels of sleepiness, especially as measured by the Stanford Sleepiness Scale (SSS). Last, the results from the chi-square analysis indicated that, of the two sleep quality measures, the Pittsburgh Sleep Quality Index (PSQI) and daily sleep quality, the relationships between the PSQI and measures of health, well-being, and sleepiness were more significantly different from the sleep quantity relationships. On the contrary, poor sleep quality is defined as having an irregular sleep schedule, being hard to fall asleep after getting into bed, being easily awake in the middle of the night, and feeling sleepy and difficult to concentrate during the daytime.

Some might think sleeping to be a waste of precious time. Nevertheless, sleep is essential and should receive the same level of attention as eating healthy and exercising in the package for good health. Sufficient sleeping hours bring many advantages. Pilcher et al., (1997) argued that sleep itself is a health risk in clinical populations, perhaps due to the physiological changes that occur during sleep. Similarly, poor sleep quality has been linked to increased health complaints in sleep disorders, clinical disorders, and shift work populations. Pilcher et al. also reported that population survey studies have examined sleep habits in nonclinical populations using self-report data on sleep habits and health. Studies concentrating on sleep quantity report that 7-8 hours of sleep at night is positively associated with self-report health status and longevity (Pilcher et al., 1997). Other than that, stress is reduced and mood will be improved with quality sleep.

On the other hand, poor sleep is strongly related to rising body weight. Cappuccio et al. (2008) reported that cross-sectional studies from around the world show a consistently increased risk of obesity amongst short sleepers in children and adults. Enough sleep can maximize brain function and unleash problem-solving skills. During sleep, the brain organizes, sorts, and stores what was have learned and experienced in the day, making it easier to recall at a later time. Sleep also helps take out irrelevant information and helps make connections between your memory and information you learned that day. If you study daily, you can use this natural process of sleep to gain a better understanding of the material and to retain the information more efficiently. At times, when it becomes difficult to cope up with the surrounding, it has been advised to lay down and sleep over it.

Establishing a sleep ritual has become mandatory. Individuals who are regularly getting high-quality sleep often have a definite sleep ritual. Sleep ritual is a maintained routine that helps the body and mind to wind down and feel calm at the end of the day in preparation for a good night's sleep. Sleep rituals include maintaining a regular bed and wake schedule including weekends. Sleeping for more than two hours more on the weekend can wreak havoc on your circadian rhythms, so a regular wake-up schedule is

very important. In a conclusion, sleep is important for several reasons. It boosts our energy, improves health, helps strengthen memory, and produces a more positive mood. Those help better performance throughout the day.

In this research, all the parameters in relation to the quality of sleep are studied. Our research consists of students' quality of sleep based on lifestyle behavior, technological exposure, workload, environment, and health conditions. As sleep is not just a passive activity and something to fill the time when one is inactive, it is an active and dynamic process vital for normal motor and cognitive function. Poor quality of sleep lowers academic performance hence it is critical to understand the sleeping behavior of university students. Inappropriate sleep increases mental health issues, such as depression and anxiety. Sleep and academic performance had been observed to be interlinked. According to a health survey administered at UGA University every two years, 1 in 4 UGA students indicates that lack of sleep has impacted their academic performance in a negative way (Healthpromotion, 2020), not being able to perform well in classrooms or missed a paper/project deadline for instance. Some students prefer staying up most of the night to study but pulling an all-nighter and cramming at the last minute can actually be counterproductive. Staying up late for study and other purposes is very commonly observed. Research has shown that students who get 6 or fewer hours of sleep have majorly lower grades than those who get good grades (Morrison, 2019).

After two weeks of sleeping five-six hours or less during nights, students feel as bad and perform as poorly as someone who has gone without sleep for 48 hours. Rasch and Born (2013) found the importance of sleep in learning and memory. Students getting adequate amounts of sleep performed better on memory and tasks than did students deprived of sleep.

The degree of daytime alertness is the most sensitive measure as to how much sleep is necessary for each individual. If the person is routinely tired or sleepy during the daytime, odds are that he or she is not getting enough sleep. However, important factors affecting sleep quality, such as the major sleep disorders (e.g., obstructive sleep apnea and restless legs syndrome), are very less prevalent in this age group compared to middle-aged or older individuals. The importance of obtaining proper sleep in the student-age population cannot be overemphasized.

Alhola and Polo-Kantola (2007) found that sleep loss leads to learning and memory impairment, as well as decreased attention and vigilance. In the student-age population, studies have found that factors such as self-reported sleep time, erratic sleep/wake schedules, late bed and rise times, and poor sleep quality are negatively associated with school performance for adolescents from middle school through college. Thus, there is ample evidence to indicate that the lack of adequate nighttime sleep can lead to disturbances in brain function, which in turn, can lead to poor academic performance.

There is a general belief that university students do not sleep adequately. It has been reported that the amount and the quality of sleep of university students have been

changed in the past few decades and the sleep disorder has been inclined (Vail-Smith, Felts, & Becker, 2009). Insomnia is the most prevalent problem faced by university students. This is a sign of sleep deprivation. Due to the stress, they have this problem. Insufficiency of sleep not just harms academic performance but also behavioral and emotional problems, negative emotional status (Sari et al., 2015). If the students are unable to handle it, it may go worse leading to alcohol and smoking habits even drug-taking. In another research, it has been found that there is a link between sleep quality and psychological wellbeing; more psychological diseases are observed among university students with low sleep quality (Liu, Zhao, Jia, & Buysse, 2008).

In the way to adapt to the new norm, attending online classes make us easy to feel dizzy and tired compared to the face-to-face classes. On the other hand, university students can only virtually attend school events and meetings, which make them lack face-to-face communication. Because of this, students spend a lot of time using electronic gadgets to accomplish the assignments, typing in the group discussion, planning the events, and attending the meetings. These matter because students are unable to get enough sleep due to the academic workload. The increased pressure faced by university students causes stress, which leads to poor sleep quality. This research will identify the factors affecting the sleep quality. It is much more crucial to determine the sleep quality of the students and the factors affecting it. This research focuses on sleep quality and identifying factor affecting it. There are factors that affect students' sleep quality and research has been done to identify these factors such as lifestyle's behavior, health condition, technology, workload, and environment.

Woods and Scott (2016) reported that night-time-specific social media use and emotional investment in social media were both more strongly related to poor sleep than overall social media use. They also suggested that social media use in bed (leading to later bedtimes and shorter sleep duration) and anxiety at not being connected to social media (making it difficult to disengage from social interaction and relax at bedtime) may explain the observed link between social media use and poor sleep. Similar findings were reached by another study. Ahmed et al., (2020) concluded that being female, having less sleep a night, and spending more than an hour on social media before sleep to be independent predictors of poor sleep quality, in their study.

Benavente da Silva, Higashi, de Guido, and Costa (2014) conducted a research to analyze the influence of stress factors and socio-demographic characteristics on the sleep quality of nursing students, contending that the stress levels are predominant in time management (27.8%) and professional training (30.5%) and low sleep quality (78.8%). Benavente et al. concluded that factors from the academic environment and some socio-demographic characteristics contributed to the reduction of sleep quality in students. Following this, a study to examine the relationship between psychological variables (stress, anxiety, and depression) and sleep quality of students, the findings indicated there is a statistically significant relationship found between the students' stress levels and sleep quality (Kalyani, Jamshidi, Salami, & Pourjam, 2017).

Demirci, Akgönül, & Akpinar (2015) investigated the relationship between smartphone use severity and sleep quality, depression, and anxiety in university students. They highlighted positive correlations between smartphone addiction scale scores and depression levels, anxiety levels and some sleep quality scores. The study concluded that depression and sleep quality may be associated with smartphone overuse. Such overuse may lead to depression and/or anxiety, which causes sleep problems. Following this, a similar study of the effect of smartphone usage at bedtime on sleep quality among Saudi non-medical staff at King Saud University Medical City reported that employees who used their smartphones more throughout the night tend to be at more risk of being poor sleepers with a more obvious risk when using it for more than 60 minutes (Alshobaili & AlYousefi, 2019).

Workload
Jennifer and Nishanthi (2016) conducted a study to find out the association between heavy academic workload and sleep deprivation among high school students. The study results suggested that out of 100 samples, 54% of students were sleep-deprived and 46% were not, and regarding academic workload, 38% of students have academic workload, 62% of students have no academic workload. They concluded that there is a significant association found between sleep deprivation and additional courses like computer classes and coaching classes.

The sleeping environment contributes to quality sleep. Johnson, Billings, and hale (2019) reviewed recent literature on the environmental determinants of sleep among adults, children and adolescents; and discussed the opportunities and challenges for advancing research on the environment and sleep. The findings of the study reported that social features of environments, family, social cohesion, safety, noise, and neighborhood disorder can shape and/or impact sleep patterns; and physical features such as light, noise, traffic, pollution, and walkability can also influence sleep and is related to sleep disorders among adults and children. Johnson et al. concluded that there is clear evidence that environmental factors are associated with insufficient sleep and sleep disorders.

In conclusion, almost all studies used a common method to evaluate the sleep quality of the participants, which was Pittsburgh Sleep Quality Index (PSQI). The authors pointed out certain factors that cause low sleep quality. The researchers highlighted and identified some factors of which need to be taken into account to avoid poor sleep quality, especially the predominant factors as stress, which is known to be very common among students. This research would help students of this generation identify the factors and be more aware of them while taking preventive measures.

RESEARCH METHOD

Participants
We use a quantitative method to collect the data by distributing the questionnaires to the university students and the targeted respondents were 155 university students who were

18 years old and above. The survey questionnaires were distributed to the students from different universities in Malaysia and India. This survey was carried out to study the factors affecting sleep quality among universities students in Malaysia and India. Throughout the survey, we successfully got 81 university students from Malaysia and 74 from India to complete the survey questionnaires. The number of female respondents who fill up the questionnaires is 96, which carry 61.9% and slightly greater than male respondents (38.1%). Mainly there are 115 respondents are from in the age range of 21 to 25 years old, which carry 74.2 percent out of 100 percent. While 21 respondents from the age range of 18 to 20 and 19 respondents from the age range of 26 to 30. Regarding their living residence, most of the respondents (135) are staying home with their family (87.1%) due to the pandemic while 6.5% of respondents (10) are staying in a dormitory. The rest are staying alone at home, sharing flat, condominium, or with university friends.

Sample and Procedure
The questionnaire survey was distributed to university students from Malaysia and India online. We sent a message via WhatsApp to the students and requested their kind cooperation to complete the survey. Overall, the questions in the survey are related to sleep patterns and daytime habits that influence sleep quality. Sleep and Daytime Habits Questionnaire is an instrument that investigates sleep habits and sleep problems in medical students. It is used as a reference to design the structure of the questions in the survey. With the concerns of integrity and ethical values, the universities students are informed that the data collection is used for research purposes only before filling up the questionnaire survey.

Measures
Statistical Packages for the Social Sciences version 23 (SPSS) was used to analyze the data. Sleeping quality was measured with 9 items adapted from 5 different perspectives. This section mainly compares the sleep quality of university students between the semester break and the study semester starts (for example a closed-ended question, "Do you think your sleep quality deteriorates once the semester starts?" with the answer Yes or No). Furthermore, it investigates the frequency of the sleeping problem faced among the university students (for example, "How often have you had trouble sleeping during the past month because you cannot get to sleep within 30 minutes?" with 4 choices of answers which are not during the past month, less than once a week, once or twice a week, three or more times a week.) "During the past month, how many hours of actual sleep did you get a night?" and "What time do you normally sleep most of the time?".

There are five interpretable dimensions to identify the factors affecting the sleeping quality of university students. The five dimensions are lifestyle behavior (6 items), workload (3 items), technology exposure (4 items), environment (3 items), and health conditions (4 items). The measures of the five variables are employed on a 5-point scale. We asked the respondents to indicate the degree of their agreement or disagreement with each statement from 1 to 5 (1 = strongly disagree; 5 = strongly agree). The statements in the first variable (lifestyle behavior) are structured to determine the factor

of lifestyle habits of university students which the habits will affect the sleeping quality like daily diet, sports activity, consumption of coffee, and cigarette taking (for example, "I consume a lot of caffeine to stay awake"). Next, the second variable (workload) is related to the burdens of university students which includes assignments, tutorials and revisions (for instance, "I sacrifice my sleep hours to complete my assignments, tutorial, and study."). The academic workload may reduce the sleeping hours of university students and cause inadequate rest at night. Moreover, the third variable (technology exposure) illustrates the addiction to the modern gadget of high technology as one of the causes of poor sleep quality. This is because nowadays university students found some difficulties to control themselves on the exposure of technology till late at night. The example of the items in this variable is "I check and go through my social media till late at night". In addition, the fourth variable (environment) depicts the surrounding conditions such as room temperature, darkness and quietness of the room (e.g., "I cannot sleep when the light is switched on"). Usually, it is mostly affected when sleeping with roommates, whose sleeping habits are different especially for those who stay in a dormitory. Consequently, the students will have the trouble of lacking sleeping hours. Subsequently, we developed 4 items for the last variable (health conditions) to measure health quality (for example, "Do you take medicine (prescribed or "over the counter") to help you sleep?"). The items include medicine consumption, insomnia problem, and chronic disease. Lastly, we designed an item to indicate the main factor that affects the sleep quality of university students in their perceptions in an open-ended question.

RESULTS AND DISCUSSION

Table 1. Summary of Respondents' Demography

	Malaysia		India	
	Frequency	Percentage	Frequency	Percentage
Gender				
Female	64	79.0	32	43.2
Male	17	21.0	42	56.8
Age group				
18 – 20	16	19.8	5	6.8
21 – 25	60	74.1	55	74.3
26 – 30	5	6.2	14	18.9
Nationality				
India	81	100.0	74	100.0
Area of residence				
Alone at home	4	4.9	1	1.4
In dormitory	9	11.1	1	1.4
With family	63	77.8	72	97.3
Condominium	1	1.2	0	0
Sharing flat	3	3.7	0	0
With university friend	1	1.2	0	0

Table 1 shows a total of 155 (N=155) respondents were involved in the survey and the data had been collected by using a questionnaire created by Google Form. The present study presents the result on the factors affecting university students' sleep quality between Malaysia and India. Table 1 shows the analysis of demographic profiles of the respondents with 52% of the respondents were from Malaysia and 48% from India. In Malaysia, a majority of the respondents were female (79%) and 21% were male. The age catchment is in three groups which are 18 to 20 years old (19.8%), 21 to 25 years old (74.1%), and 26 to 30 years old (6.2%). Other than that, the result showed that the highest percentage of the students who live with family is 77.8%, 3.7% in sharing flat, 11.1% in a dormitory, 4.9% staying alone at home, and 1.2% students are staying with university friend and condominium each. In India, a majority of the respondents were male (56.8%) and 43.2% were female. The age catchment is in three groups which are 18 to 20 years old (6.8%), 21 to 25 years old (74.3%), and 26 to 30 years old (18.9%). In addition, the results indicate that the students from India live in three areas of residence, which are with family (97.3%), in dormitory (1.4%), alone at home (1.4%).

Table 2. Descriptive Statistics, Cronbach's Coefficient Alpha, And Zero-Order Correlations of all Study variables For University Students in Malaysia

Variables	1	2	3	4	5	6
Lifestyle behavior	**0.52**					
Workload	0.31**	**0.74**				
Technology exposure	0.33**	0.23**	**0.69**			
Environment	0.09	-0.05	0.04	**0.51**		
Health conditions	0.24*	0.04	0.23*	0.25*	**0.66**	
Sleep quality	0.45**	0.18	0.28*	0.28*	0.31**	**0.67**
M	2.58	4.10	3.58	3.23	1.21	2.48
SD	0.65	0.78	0.80	0.91	0.61	0.70

Note: N = 81; *$p < 0.05$; ** < 0.01; ***$p < 0.001$

Table 3. Descriptive Statistics, Cronbach's Coefficient Alpha, And Zero-Order Correlations of all Study variables For University Students in India

Variables	1	2	3	4	5	6
Lifestyle behavior	**0.52**					
Workload	0.50**	**0.75**				
Technology exposure	0.18	0.17	**0.51**			
Environment	0.26*	0.27*	0.35**	**0.60**		
Health conditions	-0.09	-0.02	-0.03	-0.01	**0.56**	
Sleep quality	0.52**	0.51**	0.09	0.26*	0.06	**0.77**
M	3.00	3.89	3.47	3.11	1.14	2.71

SD		0.86	0.87	0.77	1.01	0.61	0.79

Note: N = 74; *p < 0.05; ** < 0.01; ***p < 0.001

Table 2 indicates that in Malaysia, there is a significant relationship between sleep quality with lifestyles behavior and health conditions, with r = 0.45, p < 0.01; and r = 0.31, p < 0.01. In addition, the result of the analysis shows a significant moderate relationship between technology exposure with lifestyle behavior and workload (r = 0.33 and r = 0.23, respectively). Nevertheless, there is a weak significant relationship between health conditions with technology exposure, lifestyles behaviour, and environment, with r = 0.23, p < 0.05; r = 0.24, p < 0.05; and r = 0.25, p < 0.05 respectively. As for India, Table 3 reveals a statistically significant correlation between sleep quality and all the other factors. Among the variables, lifestyle behaviour and workload are having the strong relationship with sleep quality, with r = 0.52, p < 0.01; and r = 0.51, p < 0.01 respectively. This positive relationship shows that university students from India, due to sleep quality, will also have a problem with lifestyle behavior and workload. Besides, the analysis result also reveals that there is a significant relationship between environment and technology exposure (r = 0.35, p < 0.01), followed by workload (r = 0.27, p < 0.05), and lifestyle behavior (r = 0.26, p < 0.05). Above all, the analysis underlines that the factors affecting university students' sleep quality between Malaysia and India are interrelated, although they are separate factors.

Table 4. Summary of Regression Analysis for University Students in India and Malaysia

Sleeping Quality		
	Malaysia	India
Variable entered	Beta	Beta
		(R^2 change = 0.37**)
Lifestyle behaviour	0.35**	0.35*
Workload	0.05	0.32
Technology exposure	0.11	0.06
Environment	0.21*	0.10
Health conditions	0.15	0.09

Note: Dependent variable = Sleeping quality; N = 81 (Malaysia), N = 74 (India); *p < 0.05; ** < 0.01; ***p < 0.001

Table 5. Hypotheses

No	Hypotheses	Findings	
		Malaysia	**India**
H1	lifestyle behavior affects the sleep quality of university students	Accepted	Accepted
H2	Workload affects the sleep quality of university students	Rejected	Rejected

H3	Technology exposure affects the sleep quality of university students	Rejected	Rejected
H4	Environment affects the sleep quality of university students	Accepted	Rejected
H5	Health condition affects the sleep quality of university students	Rejected	Rejected

The findings covered results derived from empirical analysis. From the hypotheses above, lifestyles behavior is the main influential factor that affects the university student's sleep quality in Malaysia and the environment is the weak significant with the sleep quality. Besides, the results of the present study confirm that lifestyles behavior is the main influential factor affecting University students' sleep quality in India.

Based on the result of Table 4, the most influential factor that affects the university students' sleep quality in India among lifestyles behavior was identified. However, the influential very significant is lifestyles behavior and the significant is the environment for the students from Malaysia. Table 5 proposes the six variables including lifestyles behavior, workload, technology exposure, environment, health conditions, and sleep quality. Based on the overall analysis, the six variables will be discussed.

Lifestyle Behaviour
According to the results of this research, lifestyle behavior has the highest influential level on university students' sleep quality. Some lifestyle factors that affect the sleep regulation of university students include excessive use of modern technology late at night, caffeine consumption affecting sleep arousal and physiological regulation, and cultural norms, which pay little attention to sleep (Reut, 2013). Students who use any device at bedtime are significantly associated with a static increase in the use of multiple forms of technology at bedtime and late at night, thereby reducing the amount and quality of sleep. A similar study on the impact of the use of smartphones by Saudi non-medical staff at bedtime on sleep quality at the King Saud University Medical City in Saudi Arabia showed that employees who often use smartphones throughout the night tend to be at high possibility of insufficient sleep. It will be even worst if they use it for more than 60 minutes (Alshobaili & AlYousefi, 2019). Besides, consuming caffeine beverages can disrupt their sleep as well. A study found that caffeine delays the time on the body internal clock. These effects will reduce total sleeping hours. Therefore, lifestyle habits composed of repetitive daily behaviors may have a positive or negative impact on students' ability to obtain adequate quality sleep.

Environment
Environmental conditions such as room temperature, noise, light, and electrical interference play an important role in a person's ability to get proper sleep. According to the research results, the environment is considered to be the second influencing factor. This is explainable. According to Indian respondents, there is a strong significance between environmental and technological exposure, $r = 0.35$, $p < 0.01$.

Nowadays, many students have electronic media in their bedrooms and use these modern technologies, such as mobile phones and laptops, late at night. Therefore, it will be difficult for students to control and avoid playing smartphones late at night. Students who use electronic media devices in the bedroom will have shorter sleep times. Using electronic devices before going to bed can disrupt sleep: not only will it slow to fall asleep, but it will also cause wake up frequently at night.

Workload
Nowadays, most university students face a big problem. The students' sleep is reduced and they are not getting enough health. The Centres for Disease Control and Prevention (CDC) estimates that as a country, 35% of adults do not get enough sleep. The reality is that many students are overworked. Many people bear heavy curriculum burdens and engage in part-time jobs. However, lack of sleep can seriously affect performance. Mental health problems can lead and contribute to a lack of sleep. According to the relevant results, there is significant correlation between workload and the lifestyle behavior, which is $r = 0.50$, $p < 0.01$ (India); $r = 0.31$, $p < 0.01$ (Malaysia).

At midnight, college students always start to study or complete tasks or tasks given by lecturers. Therefore, students need to start changing their lifestyles and sleeping habits to achieve good academic performance. Since the negative effects of lack of sleep outweigh the benefits of a few hours of study, until that day, sleepy students will continue to perform poorly academically and fall asleep in class. Therefore, the workload is related to lifestyle behavior. If students prepare a timetable to manage their time, they may not need to work during sleep time.

Technology Exposure
According to the results in Table 4, according to Malaysian respondents, there is a significant correlation between technology exposure and lifestyle and workload. However, there is no significant correlation of technology exposure from respondents in India. In Malaysia, most students have bad habits, such as using mobile phones, tablets, laptops, or other devices to go to bed. The result may be that the light from these devices prompts prolonged awareness, as well as the stimulating mental activities required to play games, watch movies, or process the latest work-related emails before going to work. As discovered by Woods and Scott (2016), the use of social media in bed (resulting in longer bedtime and shorter sleep time) and anxiety when not connecting with social media (making it difficult to disconnect from social interactions and relax at bedtime) may explain the observed link between social media use and lack of sleep. In addition, Ahmed et al., (2020) found that a person who sleeps less at night and spends more than an hour on social media before sleep is an independent predictor of poor sleep quality in their study.

Health Conditions
Health problems can have a negative impact on sleep quality. The relationship between sleep and overall physical health is well documented. Sleep can restore the body and brain at night. A good night's sleep will ensure that you wake up refreshed and alert in

the morning. Insufficient sleep not only makes people feel tired but also increases the risk of various diseases and health problems. These include obesity, heart disease, high blood pressure, diabetes, and stroke. Insufficient sleep increases the risk of health problems.

In our research results, there is no obvious health condition related to sleep quality. However, based on correlation analysis, there are three weakly significant differences between health status and lifestyle, technology exposure, and environment. These three variables are related to health. For example, lack of sleep due to wanting to play with a smartphone increases your risk of becoming obese. In addition, people with insufficient sleep may have difficulty controlling their emotions, making informed decisions, and coping with all aspects of daily life. Lack of sleep can also lead to mental health problems, such as depression and an increased risk of suicide. A similar study on the relationship between psychological variables (stress, anxiety, and depression) and students' sleep quality also showed that there is a statistically significant relationship between students' stress levels and sleep quality (Kalyani et al., 2017).

Sleep Quality
In our reserach, the results of the present five factors that affect the university students' sleep quality are lifestyles behavior, workload, technology exposure, and health conditions. Besides, the study confirms that lifestyles behavior is the main influential factor affecting university students' sleep quality in India. However, lifestyles behavior is the main influential factor that affects the university student's sleep quality in Malaysia and the environment is the weak significant with the sleep quality. The result as shown in Table 3 (India) reveals that there is a statistically significant between sleep quality and all the other factors. Among the variables, lifestyle behaviour and workload are having the strong relationship with sleep quality, with $r = 0.52$, $p < 0.01$; and $r = 0.51$, $p < 0.01$ respectively. According to regression analysis, the ultimate factor affecting Indian college students is lifestyle behavior (0.35, $p<0.05$). However, two important factors affecting Malaysian students are lifestyle behavior (0.35, $p <0.01$) and environmental behavior (0.21, $p <0.05$). According to the overall results, the variables of lifestyle behavior are closely related to sleep quality. Lifestyle behavior is the main factor affecting the sleep quality of college students between India and Malaysia.

CONCLUSIONS

The research conducted amongst 155 university students from India and Malaysia studies five dimensions to identify the factors affecting the sleeping quality. The five factors are lifestyle behavior, workload, technology exposure, environment, and health conditions. Lifestyle such as many students have modern electronic media at their home and tend to use it late at night results in insufficient sleeping hours. Also, consumption of caffeine beverage during the night often tend to disrupt their sleep. Environmental factors such as noise, room temperature, light are considered to be the second influential factor affecting sleep. The use of electronic devices during nighttime will slow down to fall asleep as well as cause to wake up frequently at night. There is a significant correlation

between workload and lifestyle behavior. Students are burdened with a heavy curriculum and some also choose to engage in part-time jobs. However, lack of sleep can affect the quality of performance. According to Malaysian respondents in Table 4, there is a significant correlation between technology exposure and lifestyle and workload. However, there is no significant correlation of technology exposure from respondents in India. The research analysis shows it's due to habits of using laptops, tablets, mobile devices during bedtime. The light from these devices prompts prolonged awareness. Insufficient sleep also increases the risk of health problems such as obesity, heart disease, high blood pressure, diabetes, stroke whereas a good night's sleep ensures alertness and freshness in your morning routine. In our research results, there is no obvious health condition is determined related to sleep quality. However, based on analysis, there are three weakly significant differences between health status and lifestyle, technology exposure, and environment. These three variables are related to health. Among the variables, lifestyle behavior and workload are having a strong relationship with sleep quality. According to research results, the concluding factor affecting the sleep quality of university students is lifestyle behavior followed by environmental behavior. Less use of electronic gadgets during nighttime will better the lifestyle of students resulting in a good sleep that will increase productivity and academic performance.

REFERENCES

Ahmed, M. S., Khan, S., Hsan, K., Sen, L. C., Yunus, F. M., & Griffiths, M. D. (2020). Factors affecting sleep quality among the university students in Bangladesh: A cross-sectional structured interview study. *Sleep and Vigilance 4,* 177–184. https://doi.org/10.1007/s41782-020-00106-4

Alhola, P., & Polo-Kantola, P. (2007). Sleep deprivation: Impact on cognitive performance. *Neuropsychiatr Dis Treat, 3*(5), 553–567.

Alshobaili, F., & AlYousefi, N. (2019). The effect of smartphone usage at bedtime on sleep quality among Saudi non-medical staff at King Saud University Medical City. *Journal of Family Medicine and Primary Care*, *8*(6), 1953-1957.

Benavente, S. B. T., da Silva, R. M., Higashi, A. B., de Guido, L. A., & Costa, A. L. S. (2014). Influence of stress factors and socio-demographic characteristics on the sleep quality of nursing students. *Revista Da Escola de Enfermagem Da USP*, *48*(3), 514–520.

Cappuccio, F. P., Taggart, F. M., Kandala, N.-B., Currie, A., Peile, E., Stranges, S., & Miller, M. A. (2008). Meta-analysis of short sleep duration and obesity in children and adults. *Sleep*, *31*(5), 619–626.

Demirci, K., Akgönül, M., & Akpinar, A. (2015). Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students. *Journal of Behavioral Addictions*, *4*(2), 85–92.

Healthpromotion. (2020). *Sleep rocks! ...Get more of it!.* Retrieved from https://healthpromotion.uga.edu/sleep/

Jennifer, R., & Nishanthi R, N. (2016, April). *A study to assess the association between heavy academic workload and sleep deprivation among high school students, 7*(4),

10546-10550.

Johnson, D. A., Billings, M. E., & Hale, L. (2018). Environmental Determinants of Insufficient Sleep and Sleep Disorders: Implications for Population Health. *Current Epidemiology Reports*, *5*(2), 61–69.

Kalyani, M. N., Jamshidi, N., Salami, J., & Pourjam, E. (2017). Investigation of the Relationship between Psychological Variables and Sleep Quality in Students of Medical Sciences. *Depression Research and Treatment, 2017*, 1-7.

Kline, C. (2013). Sleep Quality. *Encyclopedia of Behavioral Medicine*, 1811–1813.

Liu, X., Zhao, Z., Jia, C., & Buysse, D. J. (2008). Sleep Patterns and Problems Among Chinese Adolescents. *Pediatrics*, *121*(6), 1165–1173.

Morison, N/ (2019). *More sleep means better grades for students*. Retrieved from https://www.forbes.com/sites/nickmorrison/2019/02/11/more-sleep-means-better-grades-for-students/?sh=2465c92f5015

Pilcher, J. J., Ginter, D. R., & Sadowsky, B. (1997). Sleep quality versus sleep quantity: Relationships between sleep and measures of health, well-being and sleepiness in college students. *Journal of Psychosomatic Research*, *42*(6), 583–596.

Rasch, B., & Born, J. (2013). About sleep's role in memory. *Physiological Reviews, 93*(2), 681-766.

Reut, G. (2013). Lifestyle Factors that Affect Youth's Sleep and Strategies for Guiding Patients and Families Toward Healthy Sleeping. *Journal of Sleep Disorders & Therapy*, *02*(05). https://doi.org/10.4172/2167-0277.1000130

Sari O. Y., Uner, S., Buyukakkus, B., Bostanci, E. O., Celiksoz, A. H., Budak, M. (2015).Sleep quality and some factors affecting sleep quality in the students living in the residence hall of a university, *TAF Preventive Medicine Bulletin,14*(2):93-100.

Vail-Smith, K., Felts, M., & Becker, C. M. (2009). Relationship between sleep quality and health risk behaviors in undergraduate college students. *College Student Journal, 43*(4), 835-844.

Woods, H. C., & Scott, H. (2016). #Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of Adolescence*, *51*(51), 41–49.