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# RELATIONSHIP BETWEEN SLEEPING QUALITY AND BEHAVIOURAL OUTCOMES OF UiTM SEREMBAN 3 STUDENTS

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**Abstract**

**Purpose**: To examine the relationship between sleeping quality and behavioural outcomes of UiTM Seremban 3 students. **Methods and sample**: A quantitative approach using a modified questionnaire of Pittsburgh Sleep Quality Index Score was employed to examine the sleeping quality and modified version of the Adolescent Behavioral Checklist was used to obtain the response on the behavioural of UiTM Seremban 3, students. 428 respondents from three (3) faculties in the Seremban campus participated in this study. **Findings**: The result shows that there is a significant relationship between sleeping quality and behavioural outcomes of the students ($r=.118$, $p<0.05$). **Discussion and Conclusion**: This study revealed that there is no significant relationship between sleeping quality and positive behavioural outcomes. However, the result indicated that there is a weak relationship between sleep quality and negative behavioural outcomes. The behaviours of the respondents tend to become more negative if they were having poor quality of sleep. The results also suggest that poor sleep quality is not only prevalent among college students but are also associated with negative behavioural outcomes. Therefore, sleeping quality should be considered in the management of students' health and there is a need for an investigation for possible intervention on sleeping quality of the college students.

**Keywords**: sleeping quality, behavioural outcomes, college students

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## Introduction

Sleep is vital in one's daily life to maintain their health. Sleep quality is necessary to fight off infection, support the metabolism of sugar, and to increase the ability to work efficiently and safely (Healthy People, 2015). The key indicators of good sleep quality released by a panel of experts from the National Sleep Foundation (2019) are: (i) sleeping more time while in bed (at least 85 per cent of the total time); (ii) falling asleep in 30 minutes or less; (iii) waking up no more than once per nights; and (iv) being awake for 20 minutes or less after initially falling asleep. The characteristics of sleep include the morning time of waking, the amount of sleep time at night, the activities pattern of the night, the total sleep cycle, daytime nap, the threshold of awakening, and the time of sleeplessness.

Although sleep is essential, lots of studies have shown that sleeping problem was frequent problems among young adults, including university students (Jiang et al., 2015; Lund, Reider, Whiting, & Prichard, 2010). Most adults are having inadequate time of sleep that is caused by work demand and study. They have to finish their work as soon as possible even though they have to sacrifice their time of sleep. The college student hectic schedules, in which they were burden with studies, tests, assignments and, never-ending stress of deadlines to fulfil which may affect their nighttime sleep. The majority of the students are sleep deprived, as shown by one study in which 70.6% of the college students reported sleeping less than 8 hours with mean total sleep time being 7.02 hours (Lund et al., 2010). These college students are prone to sleep-related problems (Peltzer & Pengpid, 2016).

Furthermore, the demands of their job and university assignments make their sleeping pattern inconsistent. The students are only able to enjoy quality sleep during weekends in which, that day they are off but even then some of the students are occupied with projects and faculty's programs over the

weekend. According to Gradisar, Gardner, and Dohnt (2011) adolescent sleep is characterized by a huge discrepancy between weekend and weekdays sleep pattern. To make it worst, secular trends suggest that sleep deficiency and sleep problems increased among adolescents (Matricciani, Olds, & Petkov, 2012). This shows that the problem of inadequate sleep among adults and college students has become worst. As a consequence, adults nowadays suffer from inadequate sleep that makes them slightly unproductive.

The consequences of lack of sleep quality are severe, impacting adolescents' physical and mental health, as well as functioning adequately in the daytime. Furthermore, sleep deprivation may affect the brain's ability to process information and the inability to stay focused (Lee-Chiong, 2005). Another study also found that insomnia and short sleep duration are associated with a wide range of behavioural and emotional problems in adolescents (Liu & Zhou, 2002). Sleeping problem among university students has significantly increased according to Matricciani et al. (2012). According to Lund et al. (2010), past studies have shown that there is a strong association between lack of sleep and anxiety, depression and, somatic pain. Moreover, earlier research indicated that students' poor sleep quality is linked to increased tension, irritability, depression, confusion and, generally lower life satisfaction (Buboltz Jr, Brown, & Soper, 2001).

Sleep studies are relatively new in Malaysia. Electronic media has occupied an indispensable niche in young adults' life today. With its portability and affordability characteristic, it has made these devices available to all. Hence this is also in concern with the effect of the device on their sleep quality. The lifestyle of different ethnicity and culture with past studies findings obtained from one population might not necessarily be true for another population. Therefore, this study aimed to examine the relationship between the sleep quality and behavioural outcomes of UiTM Seremban 3 students in Negeri Sembilan.

## Methods

A quantitative approach using survey design was applied in this study. A modified questionnaire of the Pittsburg Sleep Quality Index Score and Adolescent Behavioral Checklist were used to assess the sleeping quality and behavioural of UiTM Seremban students. As part of a larger study concerning the relationship between sleeping quality, sleeping habits and, behavioural outcomes of UiTM Seremban students, for the present paper, this paper only reports on the sleeping quality and behavioural outcomes of the college students.

The populations for this study were 5000 UiTM Seremban students which comprise of degree and diploma students. According to Krejcie and Morgan (1970), if the total number of population is 5000, the number of sample proposed would be 357. However, according to Enders (2003), a missing rate of 15% to 20% was common in educational and psychologies studies. Therefore the researcher has added 20% to the current sample to avoid unreturned questionnaires in this study. Hence the researcher distributed the questionnaire to 428 respondents.

428 respondents in the UiTM Seremban campus participated in this study. The respondents were recruited by simple random sampling. They were recruited from within the campuses such as at the library, cafeteria, classes of the three faculties whenever available during the data collection duration of the study. All the respondents were well informed about the study before the data collection.

The instrument was divided into two sections which measure different variables as stated in the objectives of this study. Section A- Sleeping Quality used modified Pittsburgh Sleep Quality Index (PSQI) Items in this section were adapted and adopted from Buysse, Reynolds Iii, Monk, Berman, and Kupfer (1989). The questionnaire measured the sleeping quality of the respondents. The Cronbach alpha for this instrument was 0.83. This section consists of 18 items that were divided into 7 components. Each component measured different areas of sleeping patterns such as sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication and, daytime dysfunction. The sum of the score of all 7 components comprised the global sleep quality index that was used to identify the person's sleep quality.

Each component may bring a score of minimum 0 and maximum of 3 scores. Each component's score was summed up to obtain the global PSQI, score. According to Buysse et al. (1989) global PSQI, less than 5 indicates that a person having good quality sleep and PSQI of 6 or more indicates that a person having poor quality of sleep.

This section has multiple choice answers where the respondent chose which one best described them. The first component measured in this section was sleep quality. Question 6 in this section asked the respondent on the quality of their sleep. The answer would be 'very good', 'fairly good', 'fairly bad', and 'very bad'. The respondents were given 0 score if they answered 'very good' for this item. They were given 1 score if they answered 'fairly good' for this item. They were given 2 scores if they answered 'fairly bad' for this item and 3 scores if they answered 'very bad'.

In the second component is measured on the sleep latency. Question 2 and question 5(i) asked on how long they took to fall asleep and how frequently they took more than 30 minutes to fall asleep in the past month. Question 2 and question 5(a) in this section were summed up to get the score for component two. The total score of 0 gives them 0 score for component two. The total score of 1 and 2 give them 1 score for component two. A total score of 3 and 4 give them 2 score and total score of 5 and 6 give them 3 score.

As in the third component, sleep duration was measured. Question 4 in this section asked on how long the actual sleep that they get at night. Respondent who gets more than 7 hours of sleep get 0 score. Respondent who gets between 6 and 7 hours of sleep get 1 score. Respondent who gets between 5 and 6 hours of sleep gets 2 scores and respondents who get less than 5 hours of sleep get 3 scores.

The next component focused on the habitual sleep efficiency. It measures how long a person getting an actual sleep after resting in bed. The calculation is the number of hours sleep divide by time spent in bedtime with a hundred times with 100%. Respondents who get more than 85% sleep efficiency get 0 score. Respondents who get between 75% to 84% sleep efficiency get 1 score. Respondents who get between 65% to 74% get 2 scores and respondents who get less than 65% get 3 scores.

The component on sleep disturbances identified sleep disturbances of respondents by summing up the scores for question 5(ii), 5(iii), 5(iv), 5(v), 5(vi), 5(vii), 5(viii), 5(ix) and 5(x). A higher score indicates the frequency of the disturbance occurred. Respondents who get a total of 0 score get 0 score for this component. Respondents who get a total score between 1 to 9 get 1 score. Respondents who get a total score between 10 to 18 get 2 scores and those who get a total score of more than 19 get 3 scores.

Concerning sleeping medication, it focused on the usage of sleeping medication in the past month. A higher score indicates a high usage of sleeping medication. Respondents who did not use any sleeping medication during the past month get 0 score. Respondents who use sleeping medication less than once a week get 1 score. Respondents who use sleeping medication once or twice a week get 2 scores and respondents who use it more than 3 times a week get 3 scores.

As for the last component, it was on the daytime dysfunction. Question 8 and question 9 in this on whether they have a problem staying stay up during daytime. The total score of question 8 and question 9 indicate if they suffer daytime dysfunction. Respondents who get a total of 0 scores for both questions will get 0 score. Respondents who get a total of 1 to 2 score will get 1 score. Respondents who get 3 to 4 score will get 2 scores and those who get 5 to 6 score will get 3 scores. The score of all components were summed up to obtain the global PSQI score. A total score of less than 5 indicates that the person has a good quality of sleep and total score 6 indicates that the person having a borderline quality of sleep. Meanwhile, a total score of 7 and more indicate that a person having poor quality of sleep.

Section B- Behavioral Outcomes using the modified Adolescent Behavioral Checklist (ABC) This section was used to identify the behavioural outcomes of the respondents. The reliability and internal consistency of this questionnaire was 0.83. This section has 33 items in which the respondent states

which behaviour he experiences in the past months and how frequently did he experience it. There are six scales which rate from the lowest 'Not at all' until the highest 'all of the times'. There are positives and negatives behaviours items that the respondent chose to answer. Examples of questions in this section that look into positive behaviour were "attend class and are making passing grades" and "gets along well with family". Meanwhile, examples of questions that look into negative behaviour were "using drugs or alcohol" and "breaking the law". The researcher later examined the behaviour that the respondents experienced most based on mean and standard deviation.

The data gathered from the questionnaire were analyzed using the Statistical Package for Social Science (SPSS) software version 18. Descriptive statistic was used to examine the sleeping quality of the respondents. All seven components of the Pittsburgh Sleep Quality Index (PSQI) were summed up to obtain the global PSQI scores. PSQI was used to determine the quality of sleep of the respondents. A total score of less than 5 indicates that the person has a good quality of sleep. A total score of 6 indicates that the person having a borderline quality of sleep meanwhile a total score of 7 and more indicates that the person having a poor quality of sleep. Descriptive analysis of frequency and percentage were used to classify the result into good, poor and, borderline quality of sleep. As to examine the relationship between sleeping quality and behavioural outcomes of the respondents, the Pearson Correlation was used to analyze the data to determine the relationship between the two variables.

## Result and Discussion

Table 1 below indicates how the respondents rate their quality of sleep. The result indicates 59.1% (f=253) respondents have *fairly good* sleep. 32.8% (f=136) suffered *fairly bad* sleep and only 7.9% (f=34) respondents had a good quality of sleep. Meanwhile, 1.2% (f=5) respondents suffered a *very bad* quality of sleep. This result indicates that the level of quality of sleep of the college students was still under control. Only some of them may suffer a lack of time of sleep particularly for those who were actively involved with students' club activities such as Students Representative Council, Sports Club and, other non-academic club activities based on the demographic details that they have filled in.

Table 1. Descriptive statistic on the quality of sleep of the respondents

| How do you rate your sleep quality? | Frequency (f) | Percentage (%) |
|---|---|---|
| Very good | 34 | 7.9 |
| Fairly good | 253 | 59.1 |
| Fairly bad | 136 | 31.8 |
| Very bad | 5 | 1.2 |
| Total | 428 | 100.0 |

### Sleep Latency

Table 2 below indicates that 28.3% (f=121) respondents having *fairly good* sleep latency and 28.7% (f=123) of the respondents having *fairly bad* sleep latency. Meanwhile, respondents who were having *very bad* sleep latency was 29.0% (f=124) and only 14.0% (f=60) respondents had *very good* sleep latency.

Table 2. Descriptive statistic for sleep latency of respondents

| Sleep latency | Frequency (f) | Percentage (%) |
|---|---|---|
| Very good | 60 | 14.0 |
| Fairly good | 121 | 28.3 |
| Fairly bad | 123 | 28.7 |
| Very bad | 124 | 29.0 |
| Total | 428 | 100.0 |

### Sleep Duration

As reported in Table 3 below, 53.5% (f=229) respondents sleep 5 to 6 hours and 23.6% (f=101) respondents sleep between 6 to 7 hours. Meanwhile, only 13.8% (f=59) respondents having less than 5 hours of sleep and 9.1% (f=39) having sleep more than 7 hours. The results show that most of the respondents were having less than 6 hours of sleep at night. They usually sleep late at night but need to

wake up early to go to class in the morning.

Table 3. Descriptive statistic for sleep duration of respondents

| Sleep duration | Frequency (f) | Percentage (%) |
|---|---|---|
| More than 7 hours | 39 | 9.1 |
| 6 to 7 hours | 101 | 23.6 |
| 5 to 6 hours | 229 | 53.5 |
| Less than 5 hours | 59 | 13.8 |
| Total | 428 | 100.0 |

**Habitual Sleep Efficiency**

Table 4 below indicated 30.1% (f=129) respondents having more than 85% sleep efficiency and 30.1% (f=129) having between 65% to 74% sleep efficiency. 21.7% (f=93) respondents having less than 65% sleep efficiency and 19.4% (f=83) respondents having between 75% to 84% sleep efficiency. This shows that most of the college students were having good sleep efficiency which was more than 85%.

Table 4. Descriptive statistic for habitual sleep efficiency of respondents

| Habitual sleep efficiency | Frequency (f) | Percentage (%) |
|---|---|---|
| More than 85% | 123 | 28.8 |
| 75-84% | 83 | 19.4 |
| 65-74% | 129 | 30.1 |
| Less than 65% | 93 | 21.7 |
| Total | 428 | 100.0 |

**Sleep Disturbances**

The result shows in table 5 above indicated that 66.1% (f=283) respondents rarely suffer from sleep disturbances. 32.3% (f=138) respondents sometimes suffer from sleep disturbances. Only 0.9% (f=4) respondents never suffered sleep disturbances and 0.7% (f=3) respondents always suffered sleep disturbances. Most of the respondents reported having no problem during sleep. This shows that sleep disturbances problem of the respondents were in good condition.

Table 5. Descriptive statistic for sleep disturbances of respondents

| Sleep Disturbances | Frequency (f) | Percentage (%) |
|---|---|---|
| Never | 4 | 0.9 |
| Rarely | 283 | 66.1 |
| Sometimes | 138 | 32.3 |
| Always | 3 | 0.7 |
| Total | 428 | 100.0 |

**Use of Sleeping Medicine**

Table 6 below indicated 89.1% (f=381) respondents have not taken any sleeping medicine during the past months. 7.2% (f=31) respondents took less than once a week of sleeping medicine. 2.1% (f=9) respondents took once or twice a week and only 1.6% (f=7) respondents took sleeping medicine three or more times a week. The results show that most of the students did not rely on any sleeping medicine to help them sleep. Only a few of them using sleep medicine to help them sleep.

Table 6. Descriptive statistic for use of sleeping medicine among respondents

| Use of sleeping medicine | Frequency (f) | Percentage (%) |
|---|---|---|
| Not during the past month | 381 | 89.1 |
| Less than once a week | 31 | 7.2 |
| Once or twice a week | 9 | 2.1 |
| Three or more time a week | 7 | 1.6 |
| Total | 428 | 100.0 |

**Daytime Dysfunction**

Table 7 below indicated that most of the respondents or 58.1% (f=249) suffered a slight problem of daytime dysfunction and 29.5% (f=126) suffered somewhat problem of that. Meanwhile, 5.8% (f=25) respondents having a big problem of daytime dysfunction and, only 6.6% (f=28) having no problem with it.

Table 7. Descriptive statistic for daytime dysfunction of respondents

| Daytime dysfunction | Frequency (f) | Percentage (%) |
|---|---|---|
| No problem | 28 | 6.6 |
| Slight problem | 249 | 58.1 |
| Somewhat problem | 126 | 29.5 |
| Big problem | 25 | 5.8 |
| Total | 428 | 100.0 |

**Overall Quality of Sleep**

Overall Quality of sleep is the total score of all seven components in PSQI. The total score determined the quality of sleep of the students. A total score of less than 5 indicates that the students having a good quality of sleep. A total score of 6 indicates that the students having borderline quality of sleep meanwhile total score more than 7 indicates that the students having poor quality of sleep. Table 8 below shows the total global PSQI score which indicated the respondents' quality of sleep.

Table 8. Descriptive statistic for quality of sleep of the respondents

| Quality of Sleep | Frequency (f) | Percentage (%) |
|---|---|---|
| Good | 53 | 12.4 |
| Borderline | 37 | 8.6 |
| Poor | 338 | 79.0 |
| Total | 428 | 100.0 |

Table 8 above indicated that most of the respondents 79.0% (f=338) were having poor quality of sleep. Only 12.4% (f=53) had good quality of sleep and 8.6% (f=37) were on borderline.

**RELATIONSHIP BETWEEN SLEEPING QUALITY AND POSITIVE BEHAVIOURAL OUTCOMES**

Pearson's correlation analysis was conducted to examine the relationship between sleeping habits and positive behavioural outcomes among college students. The result yielded that there was no correlation between the two variables [r = -.019, n =428, p = .693.

Table 9. Relationship between sleeping quality and positive behavioural outcomes

| | | Quality of Sleeps |
|---|---|---|
| Positive Behavioral outcomes | Pearson's correlation | -.019* |
| | Sig (2-tailed) | .693 |
| | N | 428 |

*correlation is significant at the 0.05 level (2-tailed)

**RELATIONSHIP BETWEEN SLEEPING QUALITY AND NEGATIVE BEHAVIORAL OUTCOMES**

Pearson's correlation analysis was conducted to examine the relationship between sleeping quality and negative behavioural outcomes among college students. The correlation between sleeping quality and negative behavioural outcomes was found to be statistically significant but with a weak relationship as $r(.152)$, $p < .002$.

Table 10. Relationship between sleeping quality and negative behavioural outcomes

| | | **Quality of Sleeps** |
|---|---|---|
| Negative Behavioral outcomes | Pearson's correlation | .153* |
| | Sig (2-tailed) | .002 |
| | N | 428 |

*correlation is significant at the 0.05 level (2-tailed)

In this study, the researcher found that the majority of the respondents in the UiTM Seremban campus suffer poor quality sleep. The results indicated only less than a quarter of the students having a good quality of sleep. This indicated that the majority of the respondents suffer from sleep disorders. This could be due to assignment workload and also non- academic activities which most of the respondents need to be actively involved.

This result was consistent with the study done by Lund et al. (2010) in which he reported that students in urban Midwestern University mostly suffer poor quality of sleep. Only 34.1% of the students in urban Midwestern University had a good quality of sleep as indicated by PSQI scores. According to Lund et al. (2010), the college lifestyle creates unpredictable sleeping patterns especially during high-stress periods such as final exams. This is similarly the same scenario of what is happening to our Malaysian college students too.

However, this study is inconsistent with one particular study done by Sweileh et al. (2011) who reported that 72% of students from An-Najah National University/Nablus in Arabic countries were having a good quality of sleep. This result differed probably due to the different environmental factors and cultural lifestyle. In Europe, there are lots of entertainments and shops open until late midnight in which the students may spend their time outing and socially after lectures. Meanwhile, vice versa for Palestine, there is less entertainment available so the students probably stayed in to focus on their study.

Nevertheless, many studies supported that majority students having poor quality of sleep except for a study done by Pallos, Gergely, Yamada, Miyazaki, and Okawa (2007) where they reported results in which only quarter percentile students having poor quality of sleep. In other words, the majority of the University students in Kyoto having a good quality of sleep. This happens because, sleeping in situations not usually meant for sleep (work, lectures, social events) is socially accepted in Japan Pallos et al. (2007). So, the students may get enough rest during the day and may only need a few hours of sleep during the night to enjoy a good quality of sleep.

In terms of behavioural outcomes, the researchers found that most of the respondents reported having positive behaviour outcomes such as "attend class and is making passing grades", "gets along well with family" and "gets along well with friends". The result shows that some of the respondents were able to manage their time well and possess a positive attitude. They are less likely to involve in behavioural problems even some might have a poor quality of sleep. It does affect or jeopardize the mood or behavioural outcomes of these students. Probably the quality of their sleep was a mild one.

Meanwhile, negative behaviour such as "using drugs or alcohol", "incident with law enforcement", and "self- destruct behaviour" were less likely to be committed by the respondents. This shows that the behaviour of the respondents was still under controlled and rarely caused any problem to the university authorities. This could also be due to the majority of these students are Muslim. Probably Islam religion prohibits consuming alcohol and self- destruct behaviour that leads to the reasons of well-behaved respondents.

As for the relationship between sleeping quality and behavioural outcomes of the respondents, this study revealed that there is no significant relationship between sleeping quality and positive behavioural outcomes. However, the result indicated that there is a positive weak relationship between sleep quality and negative behavioural outcomes. The behaviours of the respondents tend to become more negative

if they were having poor quality of sleep.

These findings were supported by Lund et al. (2010) who stated that there is a strong association between deficiency of sleep and anxiety, depression and, somatic pain. This means that if the person was having poor quality of sleep, they tend to be more stressed compare to those who had a good quality of sleep. Lund et al. (2010) also reported that poor quality of sleep leads to many negative behavioural outcomes such as higher alcohol consumption and more frequent use of drugs to regulate their sleep and wake schedule.

Furthermore, a study carried out by Komada et al. (2011) also concludes that lack of quality sleep contributes to a high score of aggressive behaviour among students. Those who had poor quality of sleep were easier to get angry and commit aggressive behaviour such as fighting with other people over a simple reason. This could be due to feeling stressed that they suffered lead them to do something out of their mind. Lund et al. (2010) stated that college students have not yet to be able to handle stressful events, and subsequently experience more internalizing, rumination and worry. Stress that the students suffer because of poor sleep quality forced them to do something negative to reduce their stress level.

## Conclusion

The researchers found that the majority of the respondents do suffer poor quality of sleep. It shows that issue of poor quality of sleep is common among university students in Seremban. Thus, it is important to identify the reason behind students' poor quality of sleep and, university authorities may take corrective action to solve or minimize the problem. This helps to control the situation and prevent problems caused by poor quality of sleep such as absenteeism, poor academic and, poor academic performance from occurring. For future studies, it would be recommended to look into the non-academic activities and their sleeping quality. This would assist future researchers to examine the involvement in clubs, associations, and sports activities that do affect their quality of sleep. Thus, it may help the relevant authorities to carefully plan the activities on the campus to avoid the sleeping problem and burden imposed on the students.

## References

Buboltz Jr, W. C., Brown, F., & Soper, B. (2001). Sleep habits and patterns of college students: a preliminary study. *Journal of American college health, 50*(3), 131-135.

Buysse, D. J., Reynolds Iii, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatry Research, 28*(2), 193-213. doi:http://dx.doi.org/10.1016/0165-1781(89)90047-4

Enders, C. K. (2003). Using the expectation maximization algorithm to estimate coefficient alpha for scales with item-level missing data. *Psychological methods, 8*(3), 322.

Gradisar, M., Gardner, G., & Dohnt, H. (2011). Recent worldwide sleep patterns and problems during adolescence: a review and meta-analysis of age, region, and sleep. *Sleep medicine, 12*(2), 110-118.

Healthy People. (2015). 2020 Topics & Objectives. Sleep Health. . Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/sleep-health

Jiang, X.-L., Zheng, X.-Y., Yang, J., Ye, C.-P., Chen, Y.-y., Zhang, Z.-G., & Xiao, Z.-j. (2015). A systematic review of studies on the prevalence of insomnia in university students. *Public health, 129*(12), 1579-1584.

Komada, Y., Abe, T., Okajima, I., Asaoka, S., Matsuura, N., Usui, A., . . . Inoue, Y. (2011). Short sleep duration and irregular bedtime are associated with increased behavioral problems among Japanese preschool-age children. *The Tohoku journal of experimental medicine, 224*(2), 127-136.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement, 30*(3), 607-610.

Lee-Chiong, T. L. (2005). *Sleep: a comprehensive handbook*: John Wiley & Sons.

Liu, X., & Zhou, H. (2002). Sleep duration, insomnia and behavioral problems among Chinese adolescents. *Psychiatry Research, 111*(1), 75-85.

Lund, H. G., Reider, B. D., Whiting, A. B., & Prichard, J. R. (2010). Sleep patterns and predictors of disturbed sleep in a large population of college students. *Journal of adolescent health, 46*(2), 124-132.

Matricciani, L., Olds, T., & Petkov, J. (2012). In search of lost sleep: secular trends in the sleep time of school-aged children and adolescents. *Sleep medicine reviews, 16*(3), 203-211.

National Sleep Foundation. (2019). *What is Good Quality Sleep?* Retrieved from https://www.sleepfoundation.org/press-release/what-good-quality-sleep

Pallos, H., Gergely, V., Yamada, N., Miyazaki, S., & Okawa, M. (2007). The quality of sleep and factors associated with poor sleep in Japanese graduate students. *Sleep and Biological Rhythms, 5*(4), 234-238.

Peltzer, K., & Pengpid, S. (2016). Sleep duration and health correlates among university students in 26 countries. *Psychology, health & medicine, 21*(2), 208-220.

Sweileh, W. M., Ali, I. A., Sawalha, A. F., Abu-Taha, A. S., Sa'ed, H. Z., & Al-Jabi, S. W. (2011). Sleep habits and sleep problems among Palestinian students. *Child and adolescent psychiatry and mental health, 5*(1), 25.