



UTM

UNIVERSITI TEKNOLOGI MALAYSIA

School of Computing

SECI2143 PROBABILITY & STATISTICAL DATA ANALYSIS

Section 7

IMPACT OF SLEEPING ON ACADEMIC PERFORMANCE

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1. Introduction

Adequate sleep has a crucial role in enhancing cognitive skills especially memory retention. Poor night time sleep quality and consequent daytime sleepiness affect physical and cognitive health of students and their academic performance. Most students probably know that depriving themselves from sleep is bad, but nonetheless they're willing to sacrifice sleep and as a consequence, health, telling themselves it's just for a short time and they can soon start sleeping 12 hours a day once the semester draws to a close. But research shows that sleep is extremely important, not just during finals week but throughout the entire semester.

Besides pulling all-nighters, many students generally don't know what it means to have a good sleeping routine. Due to class schedules that differ on a daily basis, part time jobs, extra-curricular and social activities, students adapt to irregular sleep cycles that can seriously impact their academic performance as well as mental and physical health. Sleepiness and poor sleep quality are prevalent among university students, affecting their academic performance and day time functioning. Students with symptoms of sleep disorders are more likely to receive poor grades in classes such as math, reading and writing than peers without symptoms of sleep disorders. So, having proper sleep is very important. It is the most important health behaviour we engage in.

Consistently getting quality sleep will improve student's mental and emotional performance. It also improves immune system, balance hormones, boosts metabolism and improves brain-function. The main reason sleep is so important for a student's success is because this the time when their brain is 'cleaning' itself. Getting a good night's sleep can make students feel like they can tackle everything on their plate. Students need to process tons of new information daily during their waking hours. That information is then sorted and organized by brain during sleep cycle. So, it is important to have a good sleep cycle.

Therefore, our group had decided to research university students to investigate whether their academic performance will get affected by how much they sleep. To conduct this research successfully, we had the plan to launch a survey that could help us gather the data for our research.

The aim of this survey is to find whether or not poor academic performance is a consequence of poor sleep quality among UTM students.

2. Methodology

To complete our survey, we used a method which was 'Questionnaire'. It is a research instrument that consists of a set of questions or other types of prompt that aims to collect a information from a respondent.

I. Target of survey-

The survey is to investigate the effect of sleeping on the academic performance among the student. Thus, our target of the questionnaire is the university student.

II. Type of question-

The questionnaire is in the form of google form and it consists of 16 questions. We used some multiple-choice questions and some 'short answers' questions.

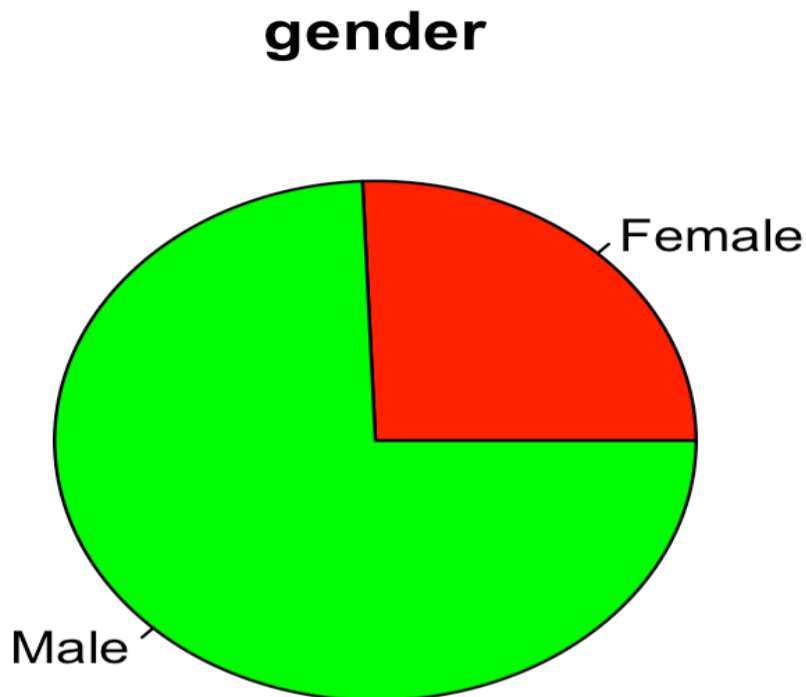
III. Method to get respondent-

To get the response for our survey, the questionnaire was spread out to the social media group which consists most of Universiti Teknologi Malaysia students.

3. Result & Discussion

The total sample size is 39 UTM students

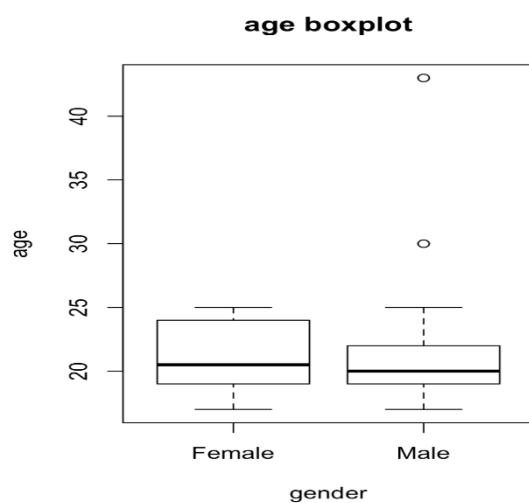
Figure 1. Pie Chart



We have 29 males filled the survey which makes them 74% of the total

And 10 females filled it too and they are 26%

Figure 2. Box Plot



21 is the mean of females' ages with 21.45 years for males'.

The mode for females' ages is 19 which repeated three times with 20 years for males which repeated eight times.

According to figure 2:

I- Female ages have median equal to 20.5,
First quartile =19,
Third quartile =24,

Female box plot ages' have Maximum age =25 and Minimum age= 17 without outliers.

II- Male ages have median equal to 20,
First quartile =18,

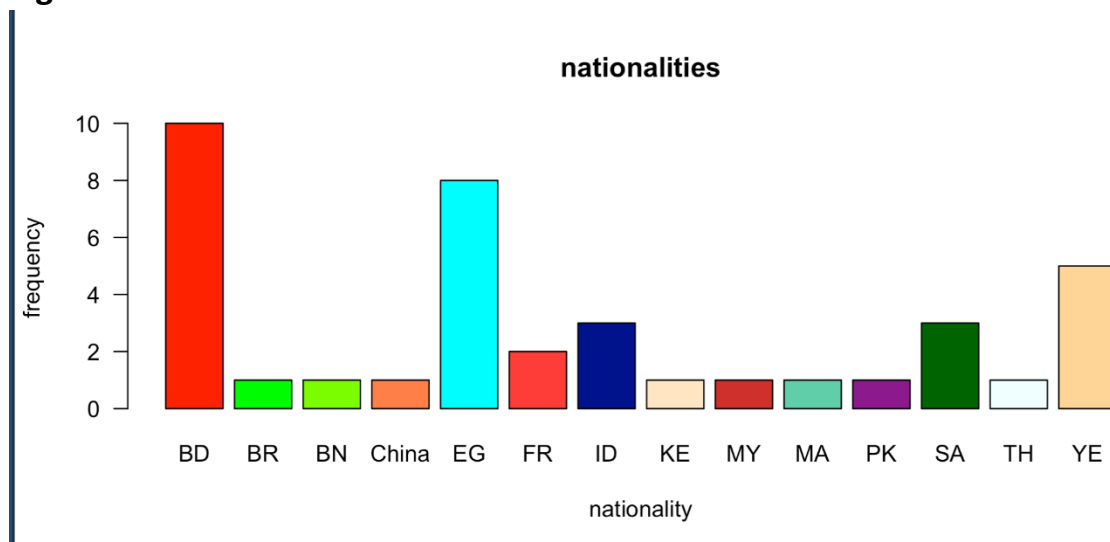
Third quartile =22,

Female box plot ages' have maximum age =25 and minimum age= 17 with two outliers 30 and 43.

In fact, Outliers describe the number of Ph.D. or Master students besides other values.

Toward these data, we can say the participants are seniors which make us able to rely on data.

Figure 3. Bar Chart



So, as we know our university has a lot of international students and here, we will mention some of them the first country is **Bangladesh**, they are the most of the students who filled this survey and they fill 26%.

Second country **Egypt**, Egyptian students in this survey are 7 and they represent 18% of the total.

the third country is **Yemen**, 5 students did this survey and covered 13%.

Fourth country is **Saudi Arabia**, only 3 students from Saudi Arabia filled this survey and they are about 8% of the total.

The fifth country is **Indonesia**, two students filled this survey to cover 5%.

The sixth country is **France**, two students to cover 5%.

The rest are **MOROCCO, THILAND, PAKISTAN, CHINA, BRAZIL, BRUNEI** and last but not least **MALAYSIA**.

and that covers the whole 100% of the bar graph

Figure 4. Stem and Leaf

The fourth figure describes students' CGPA which represented the academic achievement

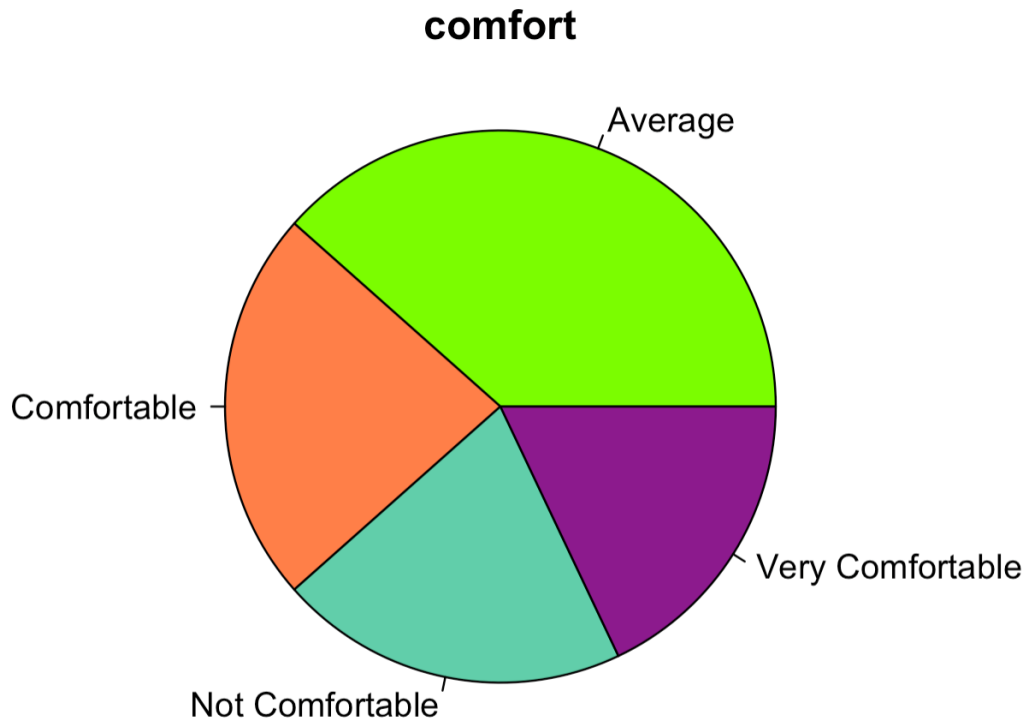
Stem Leaf

20		922
22		36892247
24		746
26		3567
28		916
30		002
32		134
34		51
36		2577778
38		57
40		0

For example, the lowest value is 2.02 and its key is 2.0 | 2,

The stem 2.0 represents the ones beside the fraction of tenth and the leaf 2 represents the fraction of hundredth. In this figure, we focus on the common stems to understand the relationship between CGPA and students' sleeping habits. As shown, the main stem is 2.2 then 3.6 by eight values and seven values respectively.

Figure 5. Pie Chart



So as for the comfort:

the average comfort type of people is 15 out of 39

which are taking 38.5% of the comfort pie chart which is more than the others.

in the other hand 24 person left out of the total which is 39 so what's taking the other 62%?

They are (very comfortable, comfortable, not comfortable).

7 people said it's very comfortable so it's taking 18%. And other 9 people said they are comfortable it's 23.5 %.

And the last type which got chosen by the last 8 people is Not comfortable and it takes 20.5%. so that converts us to the next topic which is how many Sleeping hours do they sleep.

Figure 6. Histogram

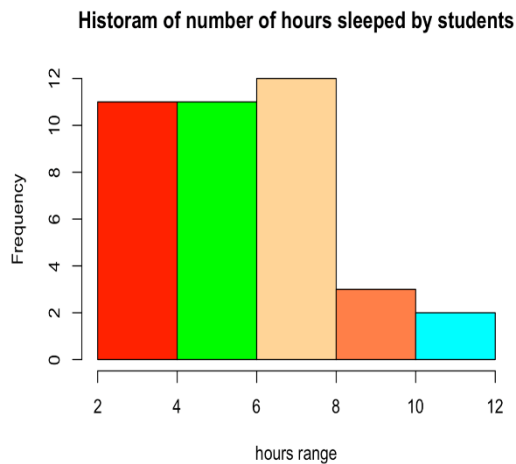
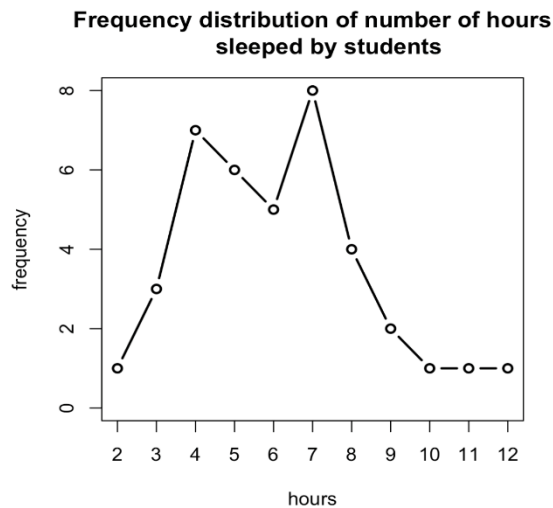


Figure 7. Frequency Distribution



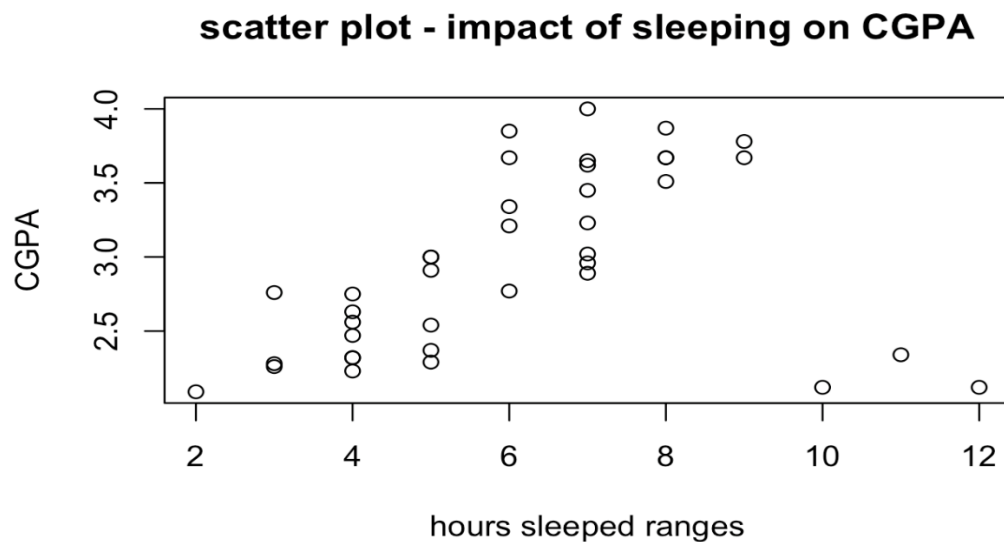
Based on the histogram, in general, we can conclude that the data represented by interval class equal to 2 hours, in addition, the frequency of students' numbers reached the highest point between 6-8 hours range by 12 students then 2-4 and 4-6 by 11 students for each class, we predict that sleeping 4 or less than 4 hours per day means that you are suffering from sleeping disorder.

As we know there is a normal limit to sleep and returning to this data, we can say that students used to sleep more than the normal limit with about 3 students sleeping more than 9 hours based on figure seven.

Frequency distribution used to help us to select a specific number of students sleeping the same amount of time so frequency distribution support histogram by letting the highest number of students focus on 7 hours and 4 hours with 8 and 7 students respectively.

According to question 16, 20 students think that 8 hours is sufficient time to sleep every day however, 9 and 7 hours is considered as an appropriate time for another 9 and 8 students, respectively.

Figure 8. Scatter Plot



As we can see getting well sleep is important and does effect on the CGPA and as we can see also that most of the people who got high CGPA who sleeps as the Dr says which is 8 hours sleeping

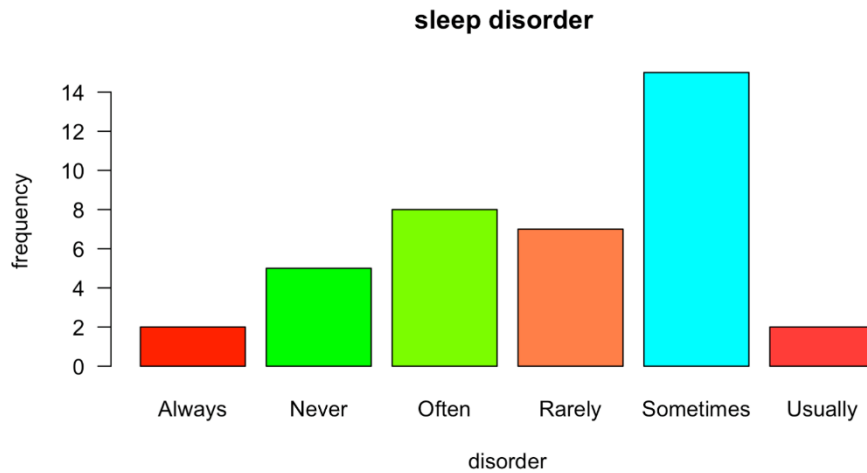
And the people who sleep less hours than the average have the worst CGPA because they don't get enough rest and they exhaust their brains

And at last the people who sleep too many hours and they are divided in to two categories

The first the people who sleep more than average but not that much and they don't get the best CGPA but they are still so close than the people with the 8 hours sleeping

The second type are the people who sleeps a lot more than the average and they get very low CGPA

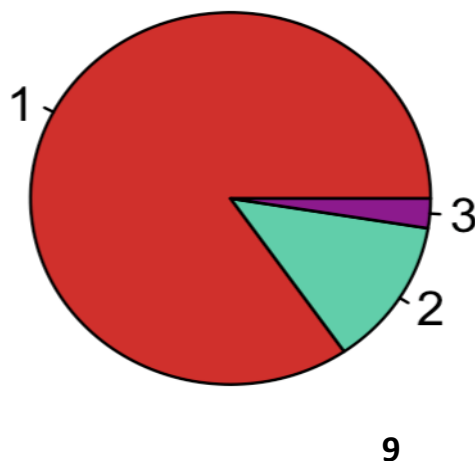
Figure 9. Bar chart



In general, we should consider never, rarely and sometimes as a normal case of sleeping disorder, suffering sometimes from sleeping disorder is the most common condition by 15 students. Extremely cases of sleeping disorder like always, usually and often represented 12 students only with about 31% to the total number of students.

Figure 11. Pie Chart

sleeping frequency pie chart



The main question in this pie chart is How many times do you sleep per day?

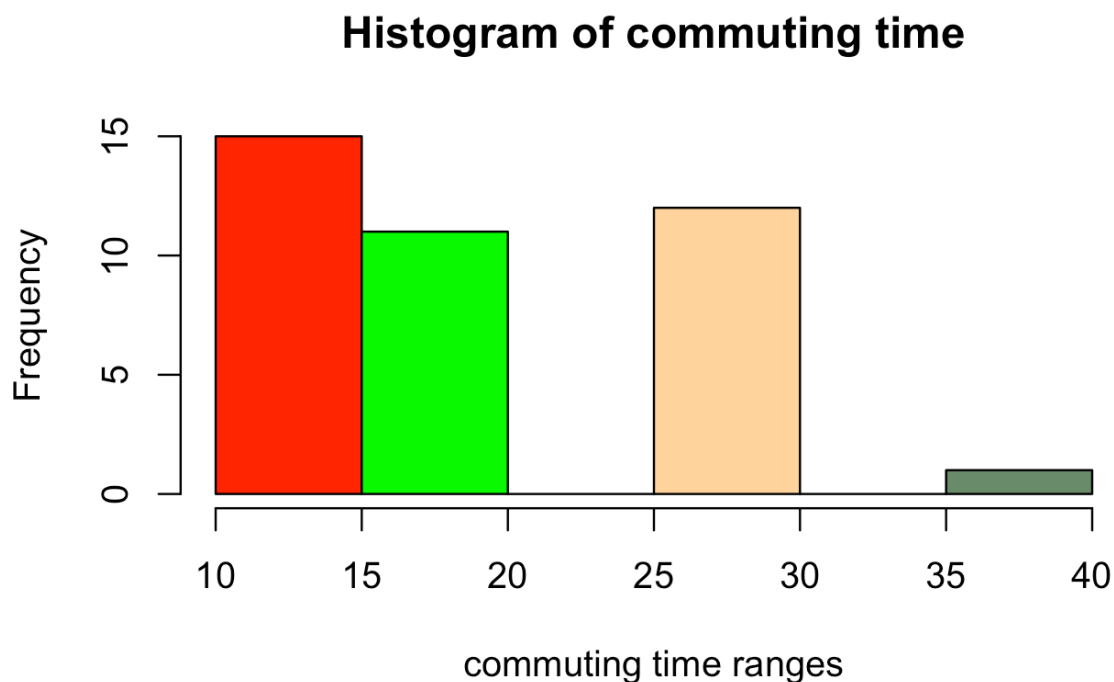
So, we have 3 types here and we will talk about them now

The first type are the people who sleep only once and they are represented by number 1 in the pie chart and as you can see, they are in the lead by 33 people which is more than the half by a lot it's actually 84.5%.

The second type are the people who sleep twice a day and it takes the second place with 5 people and 13%.

As for the last type and the third place which sleeps three times per day and got chosen by 1 person and it's only 2.5%.

Figure 11. Histogram



Commuting time is the lowest effective factor in this study but when it became more the 30 minutes it will have a strong impact on both sleeping and academic achievement.

Referring to figure 11, one student suffering from an extremely commuting class from 35-40 by compressed his working day and sleeping time. The majority of students are lower than 20 min by 15 students take 10- 15 min and 12 students take 20-25.

Referring to question 11, UTM university offers 7 or 6 courses per semester which depended on the study field. This question asked to show any student take lower than 6 or higher than 7 so only 2 students break survey conditions by 5 and 9 courses for each student.

4. Appendix

	Question	Answer
1	How old are you? (Ratio)	Age ≥ 0
2	Gender (Nominal)	<ul style="list-style-type: none"> • Male • Female
3	Where are you from? (Nominal)	Countries
4	what's your faculty? (Nominal)	<ul style="list-style-type: none"> • Engineering ex (computing, civil...) • Science ex (physics, chemistry) • Business administration • Social science • Built environment & surveying, etc
5	How many hours do you sleep per day? (Interval)	2-12 hours
6	How comfortable you are after waking up? (Ordinal)	<ul style="list-style-type: none"> • Very Comfortable • Comfortable • Average • Not Comfortable • Not Comfortable at all
7	Can you control your sleep? (Nominal)	<ul style="list-style-type: none"> • Yes • No
8	How often do you suffer from sleep disorder (Insomnia)? (Ordinal)	<ul style="list-style-type: none"> • Always • Usually • Often • Sometimes • Rarely • Never
9	Which of those cases describes you? (Nominal)	<ul style="list-style-type: none"> • Smoking • Overeating • Drinking a lot of caffeine • Other
10	What is your CGPA (except first year students)? (Ratio)	0 – 4.0 CGPA
11	How many courses you are taking this semester? (Ratio)	1 – 9 courses

12	How many times do you sleep in 24 h? (Ratio)	<ul style="list-style-type: none"> • 1 • 2 • 3
13	How much time do you spend commuting to your faculty? (Ratio)	5 – 60 minutes
14	How much time do you consider is sufficient for you to sleep? (Ratio)	5 – 10 hours

5. Conclusion

All in all, the above study found that bad sleeping patterns contribute significantly to poor academic performance.

So, it is obvious that to have a great academic result, it's very important to have a good sleeping schedule. Our brain is better than a smart phone, so it's important to recharge it regularly for optimal performance and to allow students' academic talent to shine. Rest and recovery are just as important as sleep. If students haven't had a good night's sleep, finding time during their day, whether its 10 minutes during lunch or between classes, would enhance student performance during the day. Furthermore, ignoring technology and just relaxing, will help the body feel rested even without actually sleeping. Students should go to bed early enough to have the opportunity for a full night of sleep. Adults need roughly seven to eight hours of sleep each night.

Finally, we can say that sleeping has a great impact on academic performances. This survey successfully achieved our motive.

6. Reference

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<https://doaj.org/article/789ec256e4ab4be9a2b139663e82c4f0>

5- Questionnaire Link:

https://docs.google.com/forms/d/e/1FAIpQLSdJub7GtkOG4dVhBQQvnSAI_zl6n5jzPMWSBUsh-AtPsItQg/viewform?entry.884417591=Comfortable