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Relationships Between Sleep Habits, Anxiety, and Academic Performance in College Students

Research Proposal

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Relationships Between Sleep Habits, Anxiety, and Academic Performance in College Students

Sleep is a biological necessity and a vital component of the learning process (Gilbert & Weaver, 2010; Hershner & Chervin, 2014). However, it is estimated that more than one-third of the American population does not get enough sleep and about 1 in 25 have fallen asleep at the wheel in the past month (CDC, 2016; CDC, 2021). This percentage only increases for college students with 60% to 70% of students being sleep deprived (Gray & Lemke, 2017; Hershner & Chervin, 2014; Schlarb et al., 2017). An increasing amount of studies offer a substantive body of evidence supporting the theory that memory consolidation is greatly dependent on overall sleep, which means that the academic performance of college students is being negatively affected by current sleep practices (Gilbert & Weaver, 2010; Klinzing et al., 2019; Walker & Stickgold, 2004). Examples of such harmful practices include having an irregular sleep schedule, abusing caffeine, using phones before bed, and taking excessive daytime naps (Irish et al., 2014; Peach et al., 2016). These sleep practices have also been shown to increase anxiety in college students which can negatively impact the student's ability to pay attention as well as their memory and problem-solving skills (Mancevska et al., 2012; Silva et al., 2020).

Other sleep variables such as sleep quality and quantity are important for higher academic performance and lower levels of anxiety (Eliasson et al., 2010; Norbury & Evans, 2019). While the recommended amount of sleep for adults (18-64) is 7-9 hours every night, some studies have shown that on average, college students are getting between 5.7 and 6.79 hours of sleep (Chaput et al., 2018; Gaultney, 2010; Hershner & Chervin, 2014). The effects of this lack of sleep have been shown to worsen cognitive performance thus leading to lower academic performance (Wong et al., 2012). Similarly, studies examining self-reported sleep quality have found that

poor sleepers experience significantly more daytime difficulties, particularly poor cognition when compared to good sleepers (Okano et al., 2019). These sleep complications have also been found to negatively impact anxiety as researchers have found a correlation between reported sleep problems and symptoms of anxiety (Johnson et al., 2006).

The following literature review summarizes the current knowledge base of specific sleep habits and identifies the effects that these sleep habits have on academic performance and anxiety. This literature review is organized using a thematic approach. This literature review also explores different aspects of sleep and the relationships that they have with academic performance and anxiety among college students.

The sources cited are from EBSCO Host and Google Scholar, which were provided through the Southern Adventist University's McKee Library. The key terms that were used to find the sources were: *sleep, sleep habits, sleep and memory consolidation, sleep deprivation, anxiety, and naps.*

Sleep Habits

The habits that students form surrounding their bedtime ritual can have a significant impact on anxiety levels as well as academic performance. Therefore, students must form healthy sleep habits such as having a regular sleep schedule, limiting caffeine intake after 13:00, having a quiet sleeping environment, no phones before bed, and limiting daytime naps to 30 minutes (Peach et al., 2016).

Sleep Variability

According to a study by Manber et al., (1996) having a regular sleep schedule can reduce overall daytime sleepiness as well as decrease sleep latency, which is the time it takes to fall asleep. This is especially important for college students as 78% of students reported that their

daytime sleepiness negatively affects their academic performance (Hershner & Chervin, 2014). Furthermore, a study by Bono and Hill (2021) found that sleep variability was a strong predictor of student GPA and perceived wellbeing. The students who had a consistent sleep schedule were more likely to have a higher GPA, higher reported happiness, and less anxiety.

Sleep Onset Latency

To decrease sleep onset latency, the use of caffeine after 13:00 is discouraged as caffeine blocks the adenosine receptors in the brain, which is a sleep-promoting chemical (Freidman et al., 2010). Further research has also found that 57.5 % of students who consumed three or more caffeinated drinks per week were more likely to have sleep difficulties, particularly difficulties falling asleep (Irish et al., 2014; Lohsoonthorn et al., 2013). The use of electronic screens before bed is also discouraged as the blue light emitted from these devices can delay the onset of sleep (van der Lely et al., 2015). A study by Exelmans and Van den Bulck (2016) found that individuals who used mobile devices before bed significantly correlated with decreased sleep quality, increased sleep latency, higher sleep disturbances, as well as increased daytime dysfunction. A quiet room is also recommended for faster onset of sleep (Alshahrani & Al Turki, 2019). However, when students who reported having difficulties falling asleep were surveyed, 33% attributed the delay in sleep to excess noise (Lund et al., 2010).

Napping

Naps longer than 30 minutes can cause sleep inertia which is associated with confusion, grogginess, and the decline of cognitive function following the nap. These effects can last from one hour up to four hours after the nap (Hilditch & McHill, 2019; Ye et al., 2015). Therefore, it is recommended that daytime naps be limited to 30 minutes or less. Research has also shown that the students who frequently took longer naps were more likely to have a lower GPA (Mak et al.,

2012; Ye et al., 2015). Additional research done by Tassi and Muzet (2000) found that the sleep inertia that follows a longer nap can negatively influence nocturnal sleep quality, particularly for those who take naps later in the day.

Sleep Quality

Research examining the relationship between test grades and poor sleep quality, indicated by a Pittsburgh Sleep Quality Index (PSQI) score of above 5, found that students who had low sleep quality tested lower than the students who got better sleep (Ahrberg et al., 2012). This is further supported by a large-scale study of 557 undergraduate students conducted by Gilbert and Weaver (2010) where 70% of students had poor sleep quality which was found to correlate significantly with lower academic performance. Other research has shown that students who, based on the previous semester's grades, had an A average, scored a PSQI score of 4.03 signifying good sleep quality, while the students who had a C average had a PSQI score of 10.6 meaning poor sleep quality (Mirghani et al., 2015). In addition to decreasing academic performance, a lack of quality sleep can increase symptoms of anxiety (Gray & Lemke, 2017; Ramos et al., 2021; Teker & Luleci, 2018). This is particularly worrisome as it is estimated that around 12% of college students suffer from an anxiety disorder (Pedrelli et al., 2015)

Sleep Quantity

The recommended amount of sleep for adults is 7-9 hours every night (Chaput et al., 2018). However, the quantity of sleep that the average college student gets is substantially lower than the recommended amount with some studies indicating an average of 5-6 hours (Gaultney, 2010; Hershner & Chervin, 2014). This is alarming as sleep quantity has also been shown to influence academic performance as well as anxiety levels (Gikunda et al., 2014; Lowry et al., 2010; Roberts & Duong, 2017). The ability to recall information and perform complex cognitive tasks

is likewise critically hindered in those who are sleep deprived, thus hindering academic performance (Pilcher & Walters, 1997; Wong et al., 2012). Kelly et al. (2001) found that college students who slept 9 or more hours a night had an average GPA of 3.24, which was considerably higher than the GPA of 2.74 for the students who slept less than 6 hours a night. Additionally, the students who slept 7-8 hours a night had an average GPA of 3.01. Researchers have concluded that one of the contributing factors to the increase in academic performance is due to the brain having more time to consolidate and stabilize memories as well as increased attention in students who sleep longer (Kelly et al., 2001; Klinzing et al., 2019; Rasch & Born, 2013).

This literature review reveals that many studies were conducted outside of the US which ensures a wide range of cultural backgrounds. However, a weakness of the available literature is that most of the research relies on self-reported surveys. The nature of surveys could lead the students to report in a manner that is more socially acceptable. Many of the available research only included small sample sizes which can make it difficult to get an accurate representation of the population. Additionally, there was little research on the specific sleep habits of college students across universities and how those habits correlate with academic performance and anxiety. Furthermore, there was little literature that examined the different effects that sleep quality and quantity have on both academic performance and anxiety. Moreover, few studies were found to have been conducted in the last 20 years which examined sleep habits and how sleep can affect anxiety and academic performance in college students. To accurately understand the effect that sleep habits have on anxiety levels among college students and how these habits can affect academic performance, more research needs to be done on a wider range of sleep habits among college students.

Statement of the Problem

One-third of the American population do not get enough sleep and in the college population, up to 70% do not get adequate sleep. Sleep is a vital component in the memory consolidation process. Little is known about how various sleep habits relate to academic performance and anxiety. The purpose of this study is to describe sleep habits and explore how those habits predict anxiety and academic performance. This knowledge can be useful in determining whether there are any negative effects resulting from current sleep practices at Southern Adventist University. Current literature suggests that getting adequate sleep is important for college students, however, which aspect of sleep is more beneficial is still unclear. Audiences that can benefit are the scientific community, university officials, sleep specialists, and college students.

Subproblems

Nine subproblems will guide this study:

1. The first subproblem is to measure the quality and quantity of sleep participants get each night and how sleep quality and quantity predict anxiety levels and academic performance.
2. The second subproblem is to measure the frequency with which participants abstain from drinking caffeinated drinks 7 hours before bed.
3. The third subproblem is to measure the frequency with which participants abstain from spending time on electronic screens 30 minutes before bed.
4. The fourth subproblem is to determine participants' frequency of adhering to consistent sleep schedules.
5. The fifth subproblem is to determine participants' nap frequency that exceeds 30 minutes.

6. The sixth subproblem is to describe the sleep environment of the participants.
7. The seventh subproblem is to determine participants anxiety levels and measure how these anxiety levels relate to academic performance.
8. The eighth subproblem is to measure the academic performance of participants and explore its relationship to sleep habits.
9. The ninth subproblem is to measure the differences in sleep habits across gender.

Hypotheses

Two research hypotheses will guide this study:

1. There is a positive relationship between positive sleep habits and academic performance as indicated by the participants' Grade Point Average (GPA).
2. There is an inverse relationship between sleep quality and anxiety levels. Each of these hypotheses will be tested in its null form.

Research Questions

Seven research questions will be assessed in this study:

1. Do participants who do not abstain from caffeine 7 hours before bed have lower sleep quality?
2. Is there a relationship between sleep quality with academic performance?
3. Is there a relationship between participants who practiced both sleep habits of abstaining from caffeine 7 hours before bed and not spending time on electronic screens with anxiety levels?
4. Are there differences in anxiety levels as a function of consistent sleep schedules in participants?
5. Is there a relationship between participants' GPA and anxiety levels?

6. Is there a relationship between participants who practiced both abstaining from taking naps that exceed 30 minutes and who consistently slept in a quiet environment with academic performance?
7. Are there differences in sleep habits and anxiety levels as a function of gender?

Definition of Terms

The following terms are operationally defined:

1. Participants' demographics will be defined by a self-reported questionnaire created by the researcher, which will include age, race, sex, and class standing. Each answer will be given a numerical value for scoring.
2. Participants' sleep habits will be defined by the Fisher Sleep Habits Index.
3. Poor sleep will be defined as participants scores of 0-4 on the Fisher Sleep Habits Index.
4. Moderate sleep will be defined as participants scores of 5-9 on the Fisher Sleep Habits Index.
5. Good Sleep will be defined as participants scores of 10-15 on the Fisher Sleep Habits Index.
6. Participants' sleep quality, as well as quantity, will be defined by the Pittsburgh Sleep Quality Index (Buysse et al., 1989).
7. Participants' academic performance will be defined by self-reported GPA.
8. Participants' anxiety will be defined by the Beck Anxiety Inventory (Beck, 1993).

Delimitations and Limitations of the study

This study is delimited by the following:

1. This is neither a comprehensive nor exhaustive treatment of sleep habits.
2. Only students from Southern Adventist University are used as participants in this study.

There are three major limitations to this study:

1. Small sample size as well as using a sample of convenience could impact the ability to generalize the findings of this study to other college populations.
2. Since the data is self-reported, one cannot be completely certain that the participants responded truthfully. A reason for dishonesty would be to provide more socially acceptable answers.
3. Participants academic performance and anxiety levels might be negatively influenced by other variables independent of sleep habits.

Assumptions of the Study

Three assumptions are present in this study:

1. This study has scientific merit.
2. The timeframe for completing this project is adequate.
3. Participants will be honest in their self-report of anxiety, sleep habits, and academic performance.

Importance of the Study

If the hypotheses are accepted, this study will provide a better understanding of the correlation between sleep habits, anxiety, and academic performance. Since a great number of college students have difficulties getting adequate sleep, the results of this study could provide students with information regarding what role sleep plays on GPA and anxiety levels. As correlation does not mean causation future experimental research could provide insight into whether an increase in sleep and good sleep habits would lead to a higher GPA and less anxiety. This small-scale study will lay a foundation for such future research.

Method

Participants

This will be a sample of at least 30 participants for the study who will be recruited through a sample of convenience using a recruitment flyer. All participants in this study are expected to represent various demographics, for example, gender and ethnicity. All participants will be treated in accordance with the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association. (American Psychological Association, 2010).

Materials

Several survey instruments will be used in this study all of which will be conducted online using Google Forms. The first instrument used will be the *Fisher Sleep Habits Index* which will include a demographic questionnaire, questions regarding practiced sleep habits, and a question concerning estimated GPA (See appendix for copies). For the demographics section, questions regarding gender, ethnicity, age, and college standing will be asked (See appendix for copies). To examine the sleep habits of the participants, five statements will be answered on a 4-point Likert scale (See appendix for copies). An additional instrument used in this study will be the Pittsburgh Sleep Quality Index (PSQI) (See appendix for copies). This survey will gather information on the sleep quantity as well as the sleep quality of the individual. Questions regarding reasons why they have had these sleep disturbances and the frequency of which these disturbances have happened will be assessed. In past research, the PSQI has had a Cronbach's Alpha of 0.83 (Smyth, 2012). The anxiety level of the participants will be measured by the Beck Anxiety Inventory (BAI) which has a Cronbach's Alpha of 0.94 (Beck, 1993) (See appendix for copies). The overall internal validity of the instruments is high. The data will be analyzed with SPSS.

Design and Procedure

This research study follows a descriptive correlation design. The questionnaires will be compiled into one survey that will be available online on Google Forms. Participants will be recruited through posters that will have a QR code that will take them to the survey on Google Forms. These posters will be posted on various poster boards thought out the campus of Southern Adventist University. Permission for the posting of the recruiting posters will be granted by the Student Development Office (see appendix for an email requesting permission). Posters will be hung on poster boards in Wright hall, in Summerour hall, as well as Adventhealth Hall. Additional posters will be hung in the McKee Library. All the recruiting posters will be hung up on the same day and will be left up for two weeks (see appendix for a copy of the recruitment poster). Then following the two weeks, on the day that all the posters are taken down, the survey will no longer accept responses after 13:00.

The participants will only be allowed to take the survey once and once the participants have read and understood the informed consent form, the survey will begin. The survey should take no more than 30 minutes.

The online survey will be available for two weeks. Following this period, the data will be collected and analyzed using the Statistical Package for Social Sciences (SPSS) (IBM Corp., 2016).

Data Analysis

After the data has been collected, questionnaires will be scored and valued using the appropriate answer keys and analyzed as follows using SPSS (IBM Corp., 2016):

Participants' Demographics:

1. Gender: Male = 1, Female = 2, Other = 3, Prefer not to say = 4

2. Ethnicity: Caucasian/White = 1, African American = 2, Latino or Hispanic = 3, Asian = 4, Native American = 5, Native Hawaiian or Other Pacific Islander = 6, Other please specify = 7.
3. Age (In years): _____
4. College Class Standing: Freshman = 1, Sophomore = 2, Junior = 3, Senior = 4, Super senior = 5 Graduate = 6.

Sleep Habits

1. The participant's sleep habits will be assessed using the *Fisher Sleep Habits Index*. Topics surveyed will include keeping a constant sleep schedule, no screen time 30 minutes before bed, avoiding caffeine 7 hours before bed, taking naps longer than 30 minutes, and sleep environment being quiet. Participants' responses will be recorded on a Likert scale. The scale will be of the following: Not during the past month = 0, Once or twice a week = 1, Three to four times a week = 2, More than four times a week = 3. Lowest score = 0, highest score = 15 with higher scores representing better sleep habits.

Participants' Academic Performance

1. Participants' academic performance will be assessed using self-reported GPA. GPAs at Southern Adventist University range from 0.00 to 4.00. Higher the number, the higher the scores.

Participants' Anxiety Level

1. Participants' anxiety will be scored using the *Beck Anxiety Index* (Beck, 1993). The *BAI* scores each response from 0-3. At the end of the test, the scores are added up. 0-21 = very low anxiety, 22-35 = moderate anxiety, and 35+ = a cause for concern/extreme anxiety

Participants Sleep Quality and Quantity

1. Participants' sleep quality will be scored using the *Pittsburgh Sleep Quality Index* (Buysse et al., 1989). The PSQI contains 19 self-related questions that are combined to create seven "component" scores which range from 0-3. A score of 0 indicates no difficulty, while a score of 3 indicates severe difficulty. The seven component scores are then added up for a global score with a range from 0-21 points. A score of 0 indicates no difficulty and 21 indicates severe difficulty in all areas.
2. Sleep Quantity will be scored by participants fill in the blank answer regarding estimated hours of nightly sleep in the past month.

After the data is scored, coded, and entered into SPSS, the following statistical analysis will be run to test the hypotheses and answer the following research questions.

PHASE 1: The major variables in this study will be calculated using descriptive statistics.

PHASE 2: Two research hypotheses will be tested through correlation analysis in this study:

1. There is a positive relationship between positive sleep habits and academic performance as indicated by the participants' Grade Point Average (GPA). (Pearson's Correlation)
2. There is an inverse relationship between sleep quality and anxiety levels. (Pearson's Correlation)

Each of these research hypotheses will be tested in their null form.

Seven research questions will be assessed in this study:

1. Do participants who do not abstain from caffeine 7 hours before bed have lower sleep quality? A One-way ANOVA analysis will be used to measure the linear relationship between caffeine use before bed and the corresponding participants sleep quality scores.

2. Is there a relationship between sleep quality and academic performance? A Pearson's product-moment correlation coefficient analysis will be used to measure the linear relationship between participants' sleep quality scores and their corresponding GPA.
3. Is there a relationship between participants who practiced both sleep habits of abstaining from caffeine 7 hours before bed and not spending time on electronic screens with anxiety levels? A factorial ANOVA analysis will be used to measure the linear relationship between both caffeine use before bed and not spending time on electronic screens with the corresponding participants anxiety scores.
4. Are there differences in anxiety levels as a function of consistent sleep schedules in participants? A One-way ANOVA analysis will be used to measure the linear relationship between practiced consistent sleep and the corresponding participants anxiety scores.
5. Is there a relationship between participants' GPA and anxiety levels? A Pearson's product-moment correlation coefficient analysis will be used to measure the relationship between participants GPA and the corresponding participants anxiety scores.
6. Is there a relationship between participants who practiced both abstaining from taking naps that exceed 30 minutes and who consistently slept in a quiet environment with academic performance? A factorial ANOVA analysis will be used to measure the linear relationship between both participants who abstain from taking naps that exceed 30 minutes and who consistently slept in a quiet environment with the corresponding participants GPA.

7. Are there differences in sleep habits and anxiety levels as a function of gender? A one-way MANOVA will be used to analyze the differences in sleep habits and anxiety levels as a function of gender.

Results

The results of this study are expected to reject the null hypothesis and conclude that there is a statistically significant correlation between sleep habits, academic performance, and anxiety levels among college students. It is expected that the correlation will be a positive correlation between healthy sleep habits and higher GPA and a negative correlation between healthy sleep habits and anxiety levels.

Discussion

When the study is concluded and should the null hypothesis be rejected, this study could establish a correlation between healthy sleep habits, academic performance, and anxiety levels. The findings of this study could create a basis for future experimental research on the topic of sleep habits and the impact that it has on anxiety levels and GPA. As students generally do not practice good sleep habits and get less than recommended sleep, this research could influence the way that students approach their sleep habits.

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Appendix

Script

Hi, my name is Keanne Fisher. I am currently studying psychology at Southern Adventist University. I am conducting a research study for the class, Research Design and Statistics II. If you are interested, this study is examining the students' sleep habits, academic performance, and anxiety levels. Should you agree to participate, you would help contribute to our current knowledge base of the topic. You will be asked to complete a 53-item survey. This should take no longer than 30 minutes to finish. Thank you for considering being a part of my research study.

Student Development Email

Hi, my name is Keanne Fisher.
I am conducting a research project for Research Design and Statistics II which is examining the relationship that sleep has with anxiety and academic performance. I would like to hang up flyers on the poster boards in Wright hall, Summerour hall, Adventhealth hall, and the McKee library to get as many participants as possible. People will be able to scan a QR code that will take them to google forms to fill out the survey which should take no longer than 30 minutes. The posters would be hung up for 2 weeks ideally from April 1st to April 15th and then taken down. I am wondering if this is at all possible and if so when I could come by and get the stamp of approval. Attached below is what the poster would look like.

Please email me with any further questions

Sincerely,
Keanne Fisher.

Participants Needed!!

For a study examining the relationship between sleep, anxiety, and academic performance

SCAN ME

Conducted Under Ruth Williams, PhD.

What should I expect?

- Survey should take 10-15 minutes. No longer than 30

Thank you for participating

Sleep Study

INFORMED CONSENT FORM

I am Keanne Fisher, principal investigator, and student in the Psychology Department in the School of Education and Psychology at Southern Adventist University. You are being invited to participate in a study that examines healthy sleep habits, anxiety levels, and academic performance. We hope to gain more information on this topic. Your participation will allow us to gain more information on this topic and could help bring awareness to the importance of your sleep.

If you decide to participate, you will be asked to complete three surveys, that consists of 53 items. This should take no more than 30 minutes to complete. Although all research studies maintain some degree of risk, the potential risks involved in this study are minimal and do not exceed the risks that may be encountered in a typical online activity. As the survey includes questions regarding anxiety, should you need support regarding anxiety, please visit https://www.samhsa.gov/find-help/national-helpline.

Your participation is voluntary, and you are free to withdraw from this study at any time and for any reason without prejudice.

All information concerning your personal identity will be kept confidential and only the principal investigator, RDS II tutors, and Dr. Ruth Williams will have access to this information. Your name will not be used or placed anywhere either on the survey or in the final report.

A copy of this form and the results of this research study will be available to you upon request. If you have any further questions or concerns, please feel free to contact Dr. Ruth Williams, Principal Investigator at (423) 236-2758 or wmsmorris@southern.edu.

AUTHORIZATION: I have read the above and understand the nature of this research study. I understand that by agreeing to participate in this study I have not waived any legal or human rights. I understand that my identity will be kept in the strictest of confidence and that I am free to withdraw my consent at any time and for any reason. I also understand that if I have any questions or concerns, I can contact Dr. Ruth Williams at Southern Adventist University at wmsmorris@southern.edu.

Sleep Habits Survey

Instructions: Please select the answer that best describes you for each of the following.

Section 1

Demographic Questionnaire

Gender	○ Male ○ Female ○ Other ○ Prefer not to say
Ethnicity	○ Caucasian/White ○ African American ○ Latino or Hispanic ○ Asian ○ Native American ○ Native Hawaiian or Other Pacific Islander ○ Other, please specify:_____
Age (In years) :	Fill in: _____

College Class Standing	○ Freshman ○ Sophomore ○ Junior ○ Senior ○ Super senior ○ Graduate

Section 2

Fisher Sleep Habits Index

Answer the following questions in agreement with this sentence: In the past month, I have…

Kept a consistent sleep schedule	○ Not during the past month ○ Once or twice a week ○ Three to four times a week ○ More than four times a week
Not had screen time 30 minutes before bed	○ Not during the past month ○ Once or twice a week ○ Three to four times a week ○ More than four times a week
Avoided caffeine 7 hours before bed	○ Not during the past month ○ Once or twice a week ○ Three to four times a week ○ More than four times a week
Avoided taking naps longer than 30 minutes	○ Not during the past month ○ Once or twice a week ○ Three to four times a week ○ More than four times a week
Had the room quiet when I fall asleep	○ Not during the past month ○ Once or twice a week ○ Three to four times a week ○ More than four times a week

Section 3

PITTSBURGH SLEEP QUALITY INDEX (PSQI)

INSTRUCTIONS: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, when have you usually gone to bed at night?

   USUAL BED TIME _____

2. During the past month, how long (in minutes) has it usually take you to fall asleep each night?

   NUMBER OF MINUTES _____

3. During the past month, when have you usually gotten up in the morning?

   USUAL GETTING UP TIME _____

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spend in bed.)

   HOURS OF SLEEP PER NIGHT _____

INSTRUCTIONS: For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you...

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
(a) ...cannot get to sleep within 30 minutes	☐	☐	☐	☐
(b) ...wake up in the middle of the night or early morning	☐	☐	☐	☐
(c) ...have to get up to use the bathroom	☐	☐	☐	☐
(d ...cannot breathe comfortably	☐	☐	☐	☐
(e) ...cough or snore loudly	☐	☐	☐	☐
(f) ...feel too cold	☐	☐	☐	☐
(g) ...feel too hot	☐	☐	☐	☐
(h) ...had bad dreams	☐	☐	☐	☐
(i) ...have pain	☐	☐	☐	☐

(j) Other reason(s), please describe

_____

_____

How often during the past month have you had trouble sleeping because of this?	☐	☐	☐	☐

	Very good	Fairly good	Fairly bad	very bad
6. During the past month, how would you rate your sleep quality overall?	☐	☐	☐	☐

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
7. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?	☐	☐	☐	☐
8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?	☐	☐	☐	☐

	No problem at all	Only a very slight problem	Somewhat of a problem	A very big problem
9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?	☐	☐	☐	☐

	No bed partner or roommate	Partner/ roommate in other room	Partner in same room, but not same bed	Partner in same bed
10. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?	☐	☐	☐	☐

If you have a roommate or bed partner, ask him/her how often in the past month you have had...

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
(a) ...loud snoring	☐	☐	☐	☐
(b) ...long pauses between breaths while asleep	☐	☐	☐	☐
(c) ...legs twitching or jerking while you sleep	☐	☐	☐	☐
(d) ...episodes of disorientation or confusion during sleep	☐	☐	☐	☐
(e) Other restlessness while you sleep; please describe	☐	☐	☐	☐

_____

Section 4

Participants Anxiety Level

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom. (BAI)

	Not At All	Mildly but it didn't bother me much	Moderately - it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding/racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3

Hands trembling	0	1	2	3
Shaky/unsteady	0	1	2	3
Fear of losing control	0	1	2	3
Difficulty in breathing	0	1	2	3
Fear of dying	0	1	2	3
Scared	0	1	2	3
Indigestion	0	1	2	3
Faint/lightheaded	0	1	2	3
Face flushed	0	1	2	3
Hot/cold sweats	0	1	2	3

Section 5

Participants Academic Performance

GPA (best estimated) :	Fill in: _____

Questionnaire Key

Section 1 Demographics

1. Gender: Male = 1, Female = 2, Other = 3, Prefer not to say = 4
2. Ethnicity: Caucasian/White = 1, African American = 2, Latino or Hispanic = 3, Asian = 4, Native American = 5, Native Hawaiian or Other Pacific Islander = 6, Other = 7.
3. Age (In years): _____
4. College Class Standing: Freshman = 1, Sophomore = 2, Junior = 3, Senior = 4, Super senior = 5 Graduate = 6.

Section 2 Fisher Sleep Habits Inventory

1. Score each response as the following: Not during the past month = 0, Once or twice a week = 1, Three to four times a week = 2, More than four times a week = 3. Then find the sum of all the responses to find the grand total. Lowest score = 0, highest score = 15 with higher scores representing better sleep habits. Scores of 0-4 = poor sleep, 5-9 = moderate sleep, 10-15 = good sleep

Section 3 PSQI

Form Administration Instructions

The range of values for questions 5 through 10 are all 0 to 3.

Questions 1 through 9 are not allowed to be missing except as noted below. If these questions are missing, then any scores calculated using missing questions are also missing. Thus, it is important to make sure that all questions 1 through 9 have been answered.

If a range is given for an answer (for example, ‘30 to 60’ is written as the answer to Q2, minutes to fall asleep), split the difference and enter 45.

Scores – reportable in publications

On May 20, 2005, on the instruction of Dr. Daniel J. Buysse, the scoring of the PSQI was changed to set the score for Q5J to 0 if either the comment or the value was missing. This may reduce the DISTB score by 1 point and the PSQI Total Score by 1 point.

PSQIDURAT **DURATION OF SLEEP**

IF Q4 ≥ 7, THEN set value to 0
IF Q4 < 7 and ≥ 6, THEN set value to 1
IF Q4 < 6 and ≥ 5, THEN set value to 2
IF Q4 < 5, THEN set value to 3
Minimum Score = 0 (better); Maximum Score = 3 (worse)

PSQIDISTB **SLEEP DISTURBANCE**

IF Q5b + Q5c + Q5d + Q5e + Q5f + Q5g + Q5h + Q5i + Q5j (IF Q5JCOM is null or Q5j is null, set the value of Q5j to 0) = 0, THEN set value to 0

IF Q5b + Q5c + Q5d + Q5e + Q5f + Q5g + Q5h + Q5i + Q5j (IF Q5JCOM is null or Q5j is null, set the value of Q5j to 0) ≥ 1 and ≤ 9, THEN set value to 1

IF Q5b + Q5c + Q5d + Q5e + Q5f + Q5g + Q5h + Q5i + Q5j (IF Q5JCOM is null or Q5j is null, set the value of Q5j to 0) > 9 and ≤ 18, THEN set value to 2

IF Q5b + Q5c + Q5d + Q5e + Q5f + Q5g + Q5h + Q5i + Q5j (IF Q5JCOM is null or Q5j is null, set the value of Q5j to 0) > 18, THEN set value to 3

Minimum Score = 0 (better); Maximum Score = 3 (worse)

PSQILATEN **SLEEP LATENCY**

First, recode Q2 into Q2new thusly:
IF Q2 ≥ 0 and ≤ 15, THEN set value of Q2new to 0
IF Q2 > 15 and ≤ 30, THEN set value of Q2new to 1
IF Q2 > 30 and ≤ 60, THEN set value of Q2new to 2
IF Q2 > 60, THEN set value of Q2new to 3
Next
IF Q5a + Q2new = 0, THEN set value to 0
IF Q5a + Q2new ≥ 1 and ≤ 2, THEN set value to 1
IF Q5a + Q2new ≥ 3 and ≤ 4, THEN set value to 2

IF Q5a + Q2new ≥ 5 and ≤ 6, THEN set value to 3

Minimum Score = 0 (better); Maximum Score = 3 (worse)

PSQIDAYDYS DAY DYSFUNCTION DUE TO SLEEPINESS

IF Q8 + Q9 = 0, THEN set value to 0
IF Q8 + Q9 ≥ 1 and ≤ 2, THEN set value to 1
IF Q8 + Q9 ≥ 3 and ≤ 4, THEN set value to 2
IF Q8 + Q9 ≥ 5 and ≤ 6, THEN set value to 3
Minimum Score = 0 (better); Maximum Score = 3 (worse)

PSQIHSE SLEEP EFFICIENCY

Diffsec = Difference in seconds between day and time of day Q1 and day Q3

Diffhour = Absolute value of diffsec / 3600

newtib =IF diffhour > 24, then newtib = diffhour – 24

IF diffhour ≤ 24, THEN newtib = diffhour

(NOTE, THE ABOVE JUST CALCULATES THE HOURS BETWEEN GNT (Q1) AND GMT (Q3))

tmphse = (Q4 / newtib) * 100

IF tmphse ≥ 85, THEN set value to 0
IF tmphse < 85 and ≥ 75, THEN set value to 1
IF tmphse < 75 and ≥ 65, THEN set value to 2
IF tmphse < 65, THEN set value to 3
Minimum Score = 0 (better); Maximum Score = 3 (worse)

PSQISLPQUAL OVERALL SLEEP QUALITY

Q6

Minimum Score = 0 (better); Maximum Score = 3 (worse)

PSQIMEDS **NEED MEDS TO SLEEP**

Q7

Minimum Score = 0 (better); Maximum Score = 3 (worse)

PSQI **TOTAL**

DURAT + DISTB + LATEN + DAYDYS + HSE + SLPQUAL + MEDS

Minimum Score = 0 (better); Maximum Score = 21 (worse)

Interpretation: TOTAL $\leq$ 5 associated with good sleep quality

TOTAL > 5 associated with poor sleep quality

Section 4 BAI

Scoring: Score each response from 0-3 with Not at all = 0, Mildly but it didn't bother me much = 1, Moderately – it wasn't pleasant at times = 2, Severely – it bothered me a lot = 3. Then find the sum of all responses to a get grand total.

Interpretation:

Grand total of 0-21 indicates very low anxiety

Grand total of 22-35 indicates moderate anxiety

Grand total of 36+ indicates potential cause for concern

Section 5 Academic Performance

GPA (best estimated):_____.

A GPA lower than 3.0 will be a low GPA and a GPA higher than 3.0 will be considered a high GPA.