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Matthew M. Ramaly
Parkland College

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Running Head: FACTORS THAT AFFECT DAILY TIREDNESS AND STRESS

Factors that Affect Daily Tiredness and Stress and How to Improve General Sleep Quality

Matthew Ramaly

Parkland College

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Abstract

Today's college students suffer from sleep deprivation, which is affected by many factors such as academics and work. Research has shown that sleep deprivation has contributed to poorer academic ability and job performance. I have performed a case study on myself in a 17-day span to discover what factors affect my daytime tiredness and stress as a college student and hypothesized that academics and hours worked had a strong relation to my daytime tiredness and my level of stress. Results showed that rather the quality of my sleep impacted my level of tiredness and stress. More research indicated that there are several factors that affect a student's quality of sleep and that there were many ways to improve their quality of sleep including decreasing riskier behaviors like drinking and partying. At the end of my study, I found my hypothesis to be incorrect. The quality of sleep was the major factor that affected my daytime tiredness and stress level. Further research and studies to discover what could help my quality of sleep would be beneficial in helping me reduce my daytime tiredness and overall level of stress.

Factors that Affect Daily Tiredness and Stress and How to Improve General Sleep Quality

Of the many psychological disorders examined in today's world, one of the most overlooked is sleep deprivation. This especially impacts college students. With the combination of academic work, employment, and social activities, many college students find little time to sleep on a regular schedule. This can lead to a series of outcomes for college students. I hypothesize that there is a relation between the number of hours worked, tests due, and papers due to one's level of daily tiredness and stress level. I predict that there will be a positive correlation between the hours worked, tests due, and papers due and the level of one's daily tiredness. I also predict that there will be a negative correlation between the hours worked, tests due, and papers due and one's own stress level. Research has shown that sleep deprivation has had effects on a college students' academic and job performance. To further discover if this hypothesis stands correct, I performed a case study on myself to see if these factors affect my daily tiredness and overall level of stress.

The Relationship between Work, Academics, and Stress

Researchers have studied the effects of sleep on work. One of the major factors that contribute to this sleep disturbance is being employed in shift work. In an article by Yu-Chih-Chiang, Susan Arendt, Tianshu Zheng, and Kathy Hanisch (2014), "The Effects of Sleep on Academic Performance and Job Performance", it is stated that shift work impacts one's circadian rhythms and students exhibit lower GPAs, especially if they work more hours. In their study, they found that more students who were employed in the hospitality industry had more difficulty falling asleep at night and staying awake in

class than those who did not work in this industry. More people who were employed woke up more at night than those who were unemployed. Their statistics showed that over 57% of their participants sampled worked between 11 and 20 hours a week, 36% went to bed between 12 and 1 AM, almost 38% got up between 7 and 8AM on weekdays, and over 56% got up between 9 and 11AM on weekends. Based on their statistics, students had a harder time being on time at work, showing up to work, feeling motivated, and working with less accidents when sleep deprived. These results showed that college students did struggle at work and this is partly due to their sleep deprivation. It is also stated that sleep loss had an effect on daytime sleepiness and this was correlated with poor academic performance. And while many students indicated little trouble falling asleep, about a quarter of the sampled students took between 30 and 60 minutes to fall asleep. This was correlated with lower GPAs as well (Chiang et al., 2014). Based on this research, I expect there to be a relation between my academics and jobs and my daily tiredness and stress level.

Factors That Affect Sleep Quality Among College Students

While some have said that the amount of schoolwork and job hours affects sleep, others have said sleep quality does. All college students in some way or another experience sleep deprivation during their school years and there are an incredible amount of factors that affect this, but there are few that are the most common. The article "Relationship between Sleep Quality and Health Risk Behaviors in Undergraduate Students" by Karen Vail-Smith, Michael Felts, and Craig Becker (2009), conducted a survey on 859 undergraduate college students. The survey confirmed that 6.3% reported great sleep quality, 76.6% said they had sleep problems every once in a while, and 11.8%

indicated poor sleep quality. Other statistics that they found are: 18% took more than 30 minutes to fall asleep, 28% had experienced insomnia within the last 3 months, 11% had trouble falling asleep 3 or more days a week, 11% indicated they had disturbed sleep 3 or more days a week, 13% woke up in the middle of the night 3 or more days a week, 11% woke up too early 3 or more days a week, 82% experienced general morning tiredness, and 2% used sleep medication at least once a week for the past 3 weeks. It is evident that sleep deprivation is a significant issue the American population faces. The article stated that one tenth of the United States suffers from insufficient sleep and over 25% did not get enough sleep often. Such sleep deprivation can cause severe effects such as traffic accidents and occupational problems (Vail-Smith et al., 2009). Factors that have contributed to this, especially in the college population, include parties, living arrangements, stress, drinking, sexual encounters, and other extracurricular activities.

From the data collected in this article, the authors concluded that sleep quality was associated with several health risk behaviors including suicidal thoughts, physical aggression, smoking, drinking, and marijuana use. 74 students of the 859 said they had experienced a physical conflict, 60 students had considered suicide, 180 smoked daily, and the non-drinkers experienced a significantly better sleep quality than the drinkers. This article provides sufficient reasons to these students' poor sleep quality. Students who engaged in riskier behaviors tend to be victims of poorer sleep quality, further leading them to daytime tiredness.

As a college student, I am faced with an incredible amount of responsibilities. The extent of my coursework, holding two jobs, deciding what career path to take, and balancing free time with family and friends all are immense stressors on my daily life and

as a result I have noticed an increase in daytime tiredness throughout the past year. I have therefore decided to perform a case study on myself to understand what factors are associated with this. Whether this daytime tiredness is related directly to one or more of these factors remains questionable, but I predict it is related to the number of tests and papers due and the number of hours I work at my jobs. There have been several studies done on the effects of sleep hygiene among college students. Students across the world struggle with daytime tiredness, which may be linked to hours of sleep, anxiety, alcohol, stress, and hours of work and nature of work students are employed in. Several articles focus on how sleep deprivation can affect a student's performance in the work place and in the classroom. Through the research of articles and experiments and collecting my own data over a 17-day span, I have been able to identify the major factors in my life that contribute to me being tired and stressed throughout the day.

Methods

Participants

The number of participants in this case study was just 1, myself. I am a Caucasian male at the age of 20. During the time the study took place I lived in a middle class family and I attended Parkland College taking 17 credit hours along with holding 2 jobs- one in retail and one in food service. I lived in Mahomet, IL and experienced daily tiredness throughout the semester.

Procedure

For a total of 17 days, I recorded my data in a journal. When I woke up on the first day, November 21, 2014, I recorded what time I woke up and the hours of sleep I acquired. I then wrote what I thought was the overall quality of that night's sleep on a

scale from 1 to 10 (1 being poor quality and 10 being high quality). I then recorded the amount of assignments I had due that day along with the number of tests and papers due that day. The number of tests and papers were recorded together in the same data column. The journal was set aside and I returned to it when I went to sleep that night. Before I fell asleep, I recorded the total number of hours I had worked, both jobs combined in the same data column. I then recorded how tired I felt that day on a scale from 1 to 10 (1 being completely awake and 10 being very tired). My overall stress level was recorded as well on a scale from 1 to 10 (1 being unstressed and 10 being very stressed). When I woke up the next morning, I would repeat this process. The final day the data was collected was the 7th of December 2014. This gave a total of 17 days. A sleep-shifting column was included in the data. It was based on the assumption that 1:00 AM was the typical time I fell asleep on the average day, even outside of this case study. Every hour I fell asleep before, a number -1 was given. Every hour I fell asleep after 1 AM, a number +1 was given. A mean and standard deviation was found for all variables.

Statistical Analysis

The data collected was analyzed via correlations and regressions. These were calculated between the dependent and independent variables. The dependent variables were the level of daily tiredness and stress level. They were correlated and a regression was found with the independent variables being hours of sleep, quality of sleep, sleep shifting, number of assignments due, number of tests and papers due, and hours of work. Each dependent variable was correlated with each independent variable and a correlation coefficient was calculated as well as the correlation line equation. A regression calculated an R^2 value and *p*-value. The level of significance was 95% giving an α value of 0.05.

The *p*-values were found to be significant if less than the α value and it was considered a trend if just over 0.05, but no more than a *p*-value than 0.15.

Results

To discover if our hypothesis was correct, a negative correlation between the number of tests and papers due and the level of daily tiredness was found. When more tests and papers were due, I became increasingly more tired that day (r=-0.0523; y=-0.0603x + 6.0674). A regression was calculated resulting in a coefficient of determination and *p*-value, which was not significant (r^2 = 0.00274; *p*-value = 0.84185). The number of tests and papers was correlated with the stress level as well. Thus, I became more stressed if I had more tests and papers due that day (*r* = 0.2955; y=0.3895x + 5.6235). The regression indicated that this was insignificant as well (r^2 = 0.08733; *p*-value = 0.2495). The hours of work and the level of daily tiredness resulted in no correlation at all (*r* = 3.0963E-17; y=6). The regression showed an r^2 value of 0 and a *p*-value of 1. This indicated that the variables are not associated with each other. The hours of work correlated with the stress level was calculated as well.

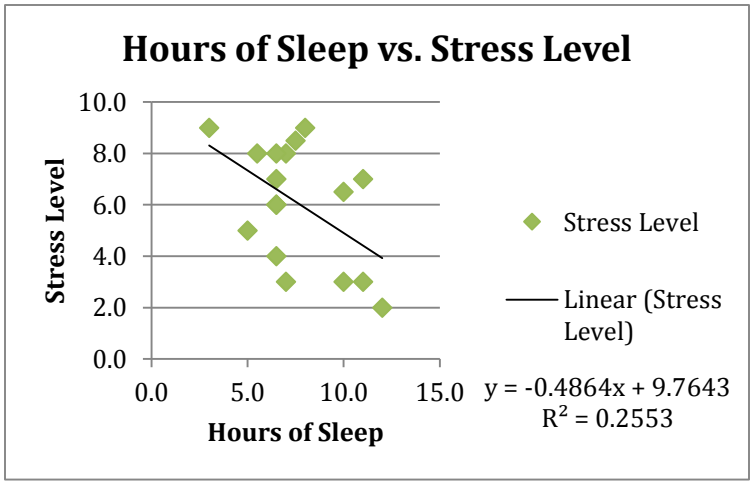

Figure 1. Hours of Sleep vs. Stress Level. A negative correlation was found between the amount of hours slept and the stress level.

The positive correlation showed that the more hours worked resulted in a higher stress level (*r* = 0.26789; y=0.1763x + 5.4727). The regression showed that this correlation was insignificant as well (r^2=0.07176; *p*-value =

0.2985). Next, the hours of sleep was correlated with stress level. Correlated with the stress level, a negative correlation was found. This is shown in Figure 1 (r = -0.50527; y=-0.4864x + 9.7643; r^2=0.2553; p-value=0.03855).

Finally, the quality of sleep was correlated with both dependent variables. With the level of daily tiredness, a negative correlation was found and was significant. This is shown in Figure 2 (r=-0.55772; y=-0.5007x + 8.8276; r^2=0.31105; p-value=0.02000).

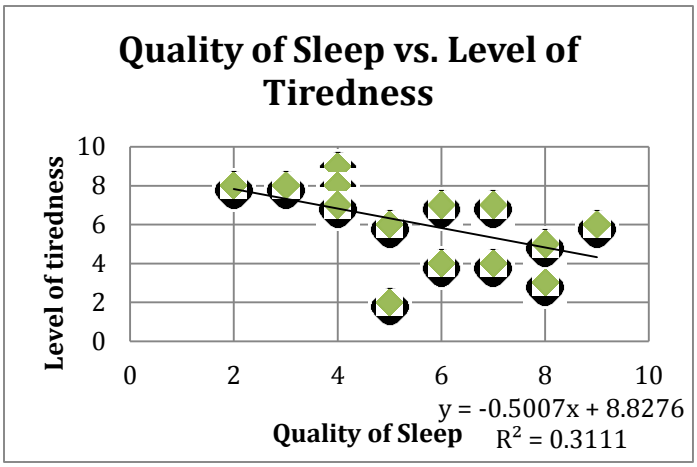

Figure 2. Quality of Sleep vs. Level of Tiredness. A negative correlation was found between the quality of sleep and the level of tiredness.

While correlated with the stress level, a negative correlation was displayed. This too, was found to be significant based on the p-value (r= -0.63172; y=-0.6491x + 9.7241; r^2= 0.39907; p-value=0.00652). This can be seen in Figure 3.

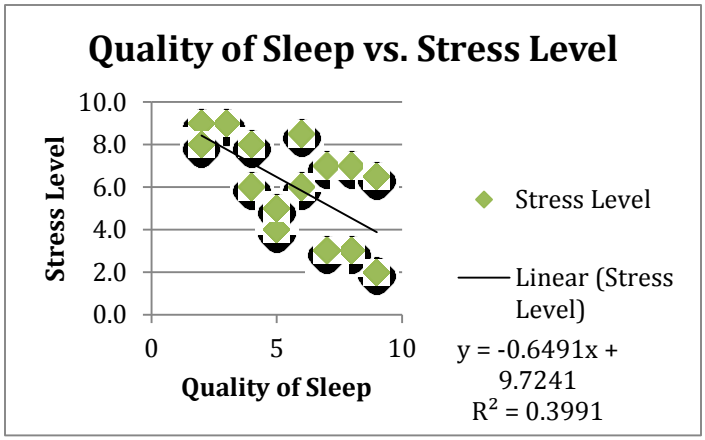

Figure 3. Quality of Sleep vs. Stress Level. A negative correlation was found between the quality of sleep and the stress level.

Discussion

The expectation was that the total number of tests and assignments due as well as hours worked would dictate the overall tiredness and stress level of each day. If this hypothesis were to be supported through the collected data, the p-values would have

indicated significance less than 0.05, but were rather the values 0.25347, 0.84185, 0.24949, 0.29855, and even 1. None of these fit the requirements to support the hypothesis that they affect my tiredness throughout the day and my stress level. There are many reasons why this could be. The number of tests and papers were insignificant possibly due to the inconsistency of the data. There were many days where no tests or papers were due, but I was still stressed and tired due to other factors (confounding variables). The same goes for hours of work. There were several days where no work was done, but other variables not taken into account could have affected my tiredness and stress level those days. These confounding variables could be other troubles in my life including issues between my family and friends and financial trouble, all of which could stress me out. The results of the case study would have been more effective if it was done over a longer period of time as well. 17 days is a poor representation of a participant's average sleep schedule and daily routine. If this were done over a period of 50 days or more, the results could have shown less outliers per data point. Furthermore, the research prior to the data collected is not consistent with the findings of the study. While the results of the data do not support the original hypothesis, it is concluded that the quality of sleep each night determined how tired and stressed I was the next day and that the number of hours slept affected my stress level. The *p*-values of the quality of sleep vs. tiredness (0.02000), quality of sleep vs. stress level (0.006523), and hours of sleep vs. stress level (0.03855) supported this claim since they were less than the level of significance, 0.05. To pinpoint it down even more, a study of what affects sleep quality would help identify the real reasons I am fatigued and stressed the following day. Recording the amount of times I woke up, tossed and turned, dreamed, the level of

intensity of my dreams, and how rested I felt when getting up could help narrow down what I need to do to decrease my tiredness and stress level.

How to Promote Adequate Sleep Hygiene

The article, "Relationship between Sleep Quality and Health Risk Behaviors in Undergraduate Students" by Karen Vail-Smith, Michael Felts, and Craig Becker states that regulating risky behaviors could help their quality of sleep. Reducing smoking habits, the consumption of alcohol, and possibly seeing a counselor are the first steps to improving their quality of sleep (Vail-Smith et al., 2009). There are many other ways college students can help increase their quality of sleep. As my data suggests, this will help them be more efficient and capable of daily activities since they will not be as tired and stressed during the day because of their better quality of sleep.

While risky behaviors are a factor of sleep deprivation and decreasing these behaviors are wise, there are several other actions college students should take to assure that they obtain great sleep quality night after night. This starts with decreasing caffeine intake, especially after lunch. Hershner and Chervin's article states that even 2 to 4 cups of coffee at night can double one's sleep latency, the amount of time from being fully awake to fully asleep, from 6.3 to 12.1 minutes (2014). In their study, caffeine's effects lasted from 5.5 to 7.5 hours indicating that if someone consumed caffeine even in the afternoon, its effects would carry through the early portion of the night causing trouble falling asleep. College students also use energy drinks to make up for the sleep they did not get. According to "Causes and Consequences of Sleepiness Among College Students," about 34% of 18 to 24 year-olds have them routinely and over $3.2 billion was spent in America alone over energy drinks (Hershner & Chervin, 2014) The main

ingredient in these drinks is a high amount of caffeine, which can destroy one's sleep cycle and routine sleep patterns.

The research found prior to the case study and the expected outcome was inconsistent with the results of the case study. The number of tests and papers and hours worked did not affect the level of daily tiredness and stress level, but rather the quality of sleep was the only independent variable that showed significance towards both tiredness and stress and hours of sleep to stress level. There were several limitations to this study; one being only a 17-day period for data collection and many possible confounding variables that could have an impact on the results, but were not taken into account; such as, my relationships with my family and peers and any financial trouble during that time. To further understand why the quality of sleep was the major factor, another study should be done to analyze what constitutes as a good night sleep and a poor night sleep. Through this analysis, I will come to understand exactly how to treat my daily tiredness and stress level each day.

References

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Hershner, H., Chervin, R. (2014). Causes and Consequences of Sleepiness among College Students. *Dove Press Journal*. p1-13.

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Appendix

Date	Hours of Sleep	Quality of Sleep	Went to Bed	Woke Up	Sleep shifting	Num Assignments	Tests/ Papers	Hours of Work	Level of Daily Tiredness	Stress Level
21-Nov	6.5	5	2:00 AM	8:30 AM	1.0	0	0	5.0	2	4.0
22-Nov	12.0	9	12:30 AM	2:00 PM	-0.5	0	0	0.0	6	2.0
23-Nov	8.0	3	1:30 AM	10:30 AM	0.5	2	1	0.0	8	9.0
24-Nov	7.0	4	1:30 AM	8:30 AM	0.5	2	1	0.0	9	8.0
25-Nov	6.5	6	1:30 AM	8:00 AM	0.5	3	1	4.0	7	6.0
26-Nov	6.5	7	11:30 PM	8:00 AM	-1.5	0	0	5.5	4	7.0
27-Nov	11.0	8	3:30 AM	10:30 AM	2.5	0	0	7.0	3	7.0
28-Nov	3.0	2	1:00 AM	6:30 AM	0.0	0	0	9.0	8	9.0
29-Nov	10.0	7	1:30 AM	11:00 AM	0.5	2	1	0.0	4	3.0
30-Nov	10.0	9	1:00 AM	11:30	0.0	3	2	0.0	6	6.5
1-Dec	7.5	6	1:00	8:30	0.0	0	7	0.0	4	8.5
2-Dec	7.0	8	1:30 AM	8:00 AM	0.5	2	0	0.0	5	3.0
3-Dec	6.5	4	1:30 AM	8:00 AM	0.5	2	3	0.0	8	6.0
4-Dec	6.5	4	1:00 AM	8:00 AM	0.0	5	1	5.0	7	8.0
5-Dec	11.0	7	3:00 AM	12:00 PM	2.0	0	0	5.0	7	3.0
6-Dec	5.5	2	2:00 AM	8:30 AM	1.0	0	0	10.0	8	8.0
7-Dec	5.0	5	1:30 AM	7:00 AM	0.5	1	2	6.0	6	5.0
Mean	7.7	5.6	-	-	0.5	1.3	1.1	3.3	6	6.1
Standard Deviation	2.3	2.2	-	-	0.9	1.4	1.7	3.4	2.0	2.3