

Effect of College Major on Sleep Quality

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Abstract

This study explored the relationship between college major and sleep quality. 67 participants ages 15-26 were recruited through social media postings and filled out a Qualtrics survey gathering information on college major, sleep quality according to the Sleep Condition Indicator, and average sleep duration over the past month. Variables explored were sleep quality (DV), college major (IV1), and sleep duration (IV2). There was a slight positive relationship showing that non-tech majors had a higher sleep quality than tech majors, but this was not a significant relationship. There was a significant positive relationship ($r = 0.33$) between sleep quality and sleep duration ($p = 0.006$). A multivariate model showed no effect between sleep duration and the relationship between sleep quality and major. In the multivariate model the significant relationship between sleep quality and sleep duration remained, showing that for both tech and non-tech majors, there was a main effect of sleep duration on sleep quality. An interaction effect was present between major and sleep duration, showing that for tech majors, the relationship between sleep duration and sleep quality was weaker than the relationship between sleep duration and sleep quality for non-tech majors. However, this interaction effect was not significant.

Keywords: College major, sleep quality, sleep duration, college students

Introduction

Sleep is an essential aspect of life and without it, we put ourselves at risk for various chronic conditions such as high blood pressure, obesity, heart disease, and diabetes among other things. It's no secret that sleep deprivation is prevalent on many college campuses with all of the classes and activities students are involved in. Yet not all college students sleep the same—their area of study may have a big impact on their sleeping habits, and the quantity of sleep may affect their quality of sleep.

This study focuses on sleep quality in college students. For adults, as much as 15-35% of the population complains about disturbance of sleep quality, suggesting that many adults may be at risk of sleep and medical disorders (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). In college students specifically, as many as 50% of students experience daytime sleepiness and 70% have insufficient sleep (Hershner & Chervin, 2014). Past research has shown that college students experience poor sleep quality and that perceived stress was the strongest predictor of poor sleep (Lund, Reider, Whiting, & Prichard, 2010). In the past, psychologists have defined sleep quality as the overall measure of sleep including duration, latency, and number of awakenings at night, as well more subjective measures such as satisfaction with one's sleep and how rested one feels after waking up (Pilcher, Ginter, & Sadowsky, 1997). Different types of majors require different types of work, for example a humanities or social science majors may write more essays than a STEM major, and a business major may have more presentations than a STEM major who has more labs. The different types of work required may lead students to have different sleep quality.

Past research has explained that the choice of college major usually determines the courses they take and the types of students and professors they interact with (Porter & Umbach,

2006). In addition, personality scales have been found to be a strong predictor of college major choice—students who are curious may choose more investigative environments (Porter & Umbach, 2006). This may relate to sleep quality because students who have personalities that make them more driven to create things or to lead others may put more time into doing those things well, and thus may have lower sleep quality if their effort leads to more stress and a higher workload.

Another factor that may influence sleep quality is the duration of sleep. Past studies have focused mostly on the impact of sleep duration on overall health. One literature review explained that restricting the hours of sleep at night may result in reduced neurocognitive function as well as excessive daytime sleepiness, and this restriction may cause problems ranging from increased blood pressure to increased risk for coronary heart disease (Alvarez & Ayas, 2004). Sleep duration may change the relationship between college major and sleep quality because it's possible that sleep duration can capture a more concrete measure of sleep than sleep quality, which is subjective.

Present Research

Many studies in the past have focused on sleep quality in college students, but it is rare to find a study which reports college major along with sleep quality data. Past studies have also focused on the effects of sleep duration versus sleep quality on overall health in college students (Pilcher et al., 1997), but did not include information about college major. The present research aims to look at the effect that college major has on sleep quality, and how sleep duration may affect this relationship.

Hypotheses

Hypothesis 1: sleep quality ~ college major + error

The main hypothesis is that sleep quality is dependent on college major. The null hypothesis is that there is no relationship between sleep quality and college major. The alternative hypothesis is that students with a more technical major (STEM or business) have a lower sleep quality than students in non-technical majors (social science and arts & humanities)

Hypothesis 2: sleep quality ~ college major + sleep duration + error

The second hypothesis is that the relationship between sleep quality and college major is explained in part by sleep duration. The null hypothesis is that sleep duration does not explain any part of the relationship between sleep quality and college major. The alternative hypothesis is that sleep duration explains part of the relationship between sleep quality and college major.

*Hypothesis 3: sleep quality ~ college major * sleep duration + error*

The third hypothesis is that sleep quality will have an effect on the relationship between sleep quality and college major. The null hypothesis is that the relationship between major and sleep quality will not depend on sleep duration. The alternative hypothesis is that the relationship between major and sleep quality is dependent on sleep duration.

Methods

Participants and Procedures

Participants were students between the ages of 15 and 26, with the average age being 19.27 years. Of the 67 participants, 70.15% identified their gender as female, 29.85% identified as male, and 0% chose other/decline to state. Participants were recruited through online social media posting and sending the link directly to students attending institutions other than UC Berkeley. A link to the survey was posted on my Facebook account, visible to all of my friends. The link was also posted to the Berkeley Phi Beta Lambda Fall 2018 Facebook group. No incentive was given to participate in the survey, and all participation was voluntary. No participants were dropped or excluded.

Participants first clicked on an anonymized link that directed them to a Qualtrics survey, asking a total of 10 questions. Participants were first asked to report their age and gender, then proceeded to answer questions about their sleep habits in the past month. Additionally, participants were asked to report the category of their college major, and finally were asked to report the average number of hours of sleep they got per night in the last month. After clicking an arrow to finish the survey, a thank you message was displayed notifying the participant that their answers had been submitted.

Measures and Manipulations

Sleep Quality:

Sleep quality was measured using a self-report survey, the Sleep Condition Indicator (Espie et al., 2014). All eight items from the scale were used, and all were positively keyed. Examples of questions on the survey are “Thinking about a typical night in the last month, how would you rate your sleep quality?” and “Thinking about the past month, to what extent has poor

sleep affected your concentration, productivity, or ability to stay awake?”. Responses were recorded on a Likert scale from 0 to 4. In general, a score of 0 indicates poor sleep quality, while a score of 4 indicates good sleep quality. The scores corresponded to different responses in different questions—for example, when asked to rate their sleep quality, participants chose from a scale of very poor (0) to very good (4); when asked how sleep affected their concentration, productivity, or ability to stay awake, participants answered on a scale of very much (0) to not at all (4).

College Major:

College major was measured using self-report. Participants selected the best description of their major from 4 categories adapted from a list published by the College Board (Major and Career Search, 2018). The categories used were Arts and Humanities, Business, STEM, and Social Sciences. For ease of analysis, majors were grouped into technical (STEM & Business) and non-technical (Arts and Humanities & social sciences).

Sleep Duration:

Sleep duration was measured by self-report. Participants were asked, “On average, how many hours did you sleep per night during the past month?”. Participants responded with any number between 0-24.

Results, Tables, and Figures

Variables measured in this study included age ($M = 19.27$, $SD = 1.5$, *Range* 15-26) and gender (*Male* = 20, *Female* = 47, $N = 67$) (Figure 1), sleep quality ($M = 2.67$, $SD = 0.76$, *Range* 0.5 – 4.0, $\alpha = 0.81$) (Figure 2), college major (43 *tech*, 24 *non-tech*, $N = 67$) (Figure 3) and sleep duration ($M = 6.51$, $SD = 1.31$, *Range* = 3.0 – 9.0) (Figure 4).

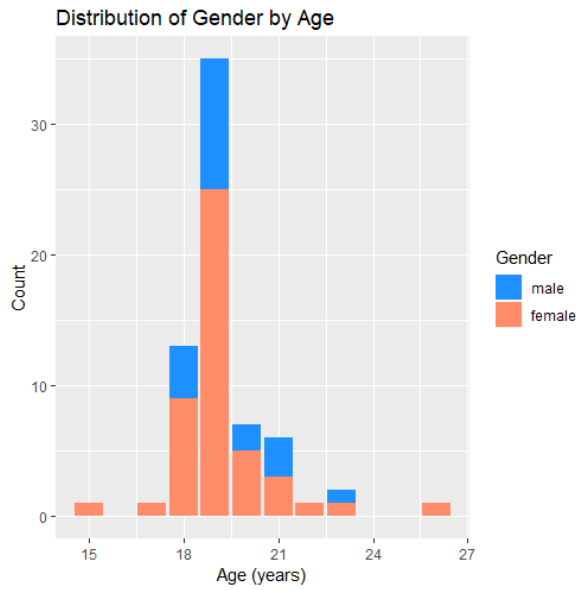


Figure 1. Summary of demographic information of survey participants detailing the distribution of gender by age.

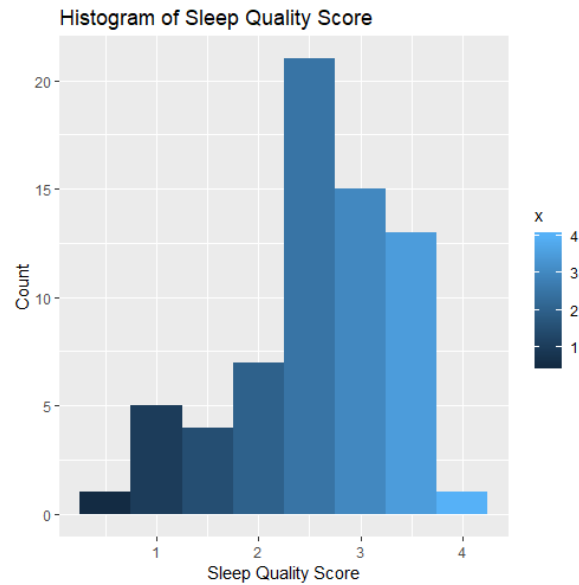


Figure 2. Distribution of sleep quality on a scale from 0 (poor quality) – 4 (good quality)

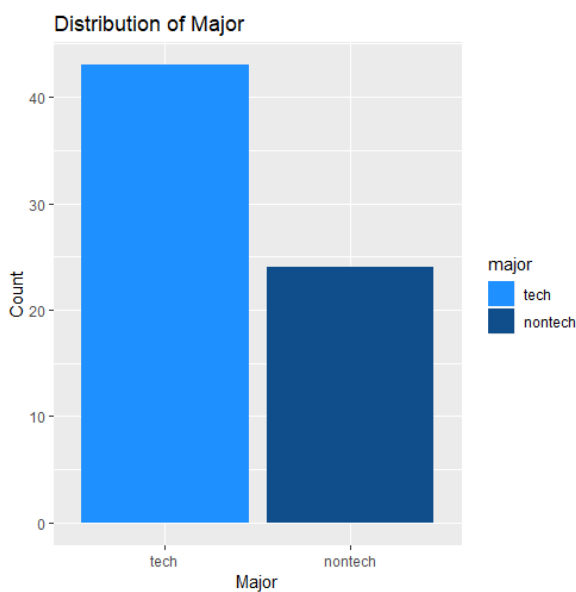


Figure 3. Distribution of major among 67 college students

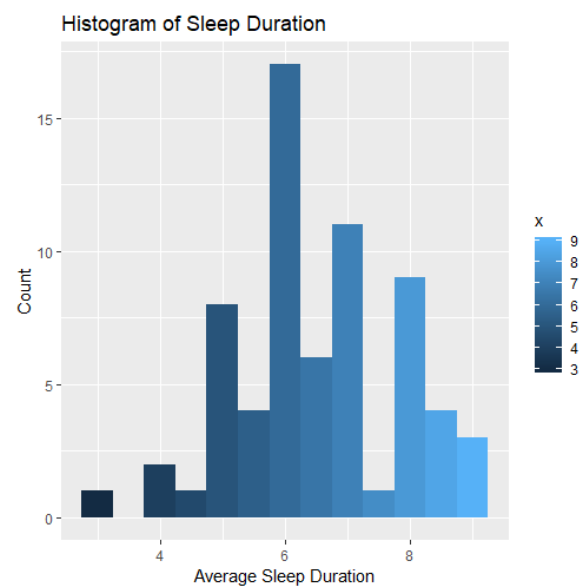


Figure 4. Distribution of sleep duration among 67 college students

Hypothesis 1: Model 1 (sleep quality ~ major)

A bivariate model was used to predict the relationship between sleep quality and college major. This model found that non-tech majors had a higher sleep quality than tech majors ($\beta = 0.03$, $CI = [-0.48, 0.55]$, $t(65) = 0.127$, $p = 0.90$) (Figure 5). This relationship was not significant. Difference in major explained approximately 0.02% of the variation in sleep quality score. There was not significant evidence to conclude that college major is correlated with sleep quality. The power ($P=1.87\%$) was very low.

Model 2 (sleep quality ~ duration)

Another bivariate model was used to test the relationship between sleep quality and sleep duration. Sleep quality and sleep duration were positively related ($\beta = 0.33$, $CI = [0.10, 0.56]$, $t(65) = 2.82$, $p = 0.006$) (Figure 6). While this model was not part of an original hypothesis, it shows that there is a significant positive relationship between sleep duration and sleep quality.

Hypothesis 2: Model 3 (sleep quality ~ major + duration)

A multivariate linear regression model was used to look at sleep quality predicted from both college major and sleep duration (sleep quality ~ college major + sleep duration). The relationship between sleep quality score and major decreased when accounting for sleep duration, showing that non-tech majors had the lower sleep quality score ($\beta = -0.01$, $CI = [-0.50, 0.48]$, $t(64) = -0.05$, $p = 0.96$). This relationship failed to be significant and there was not enough evidence to conclude that sleep duration has an effect on the relationship between sleep quality and college major. Since this relationship is not significant, there is not a suppressor effect even though the slope changed direction. The relationship between sleep quality and duration was still significant when including college major.

*Hypothesis 3: Model 4 (sleep quality ~ major * duration)*

A fourth model was run to test interaction effects between sleep quality, major, and sleep duration. There was an interaction effect, but it was not significant ($\beta = 0.41$, $CI = [-0.10, 0.92]$, $t(63) = 1.61$, $p = 0.11$) (Figure 7). For tech majors, the relationship between sleep duration and sleep quality was weaker than the relationship between sleep duration and sleep quality for non-tech majors. Table 1 summarizes the results of all 4 models.

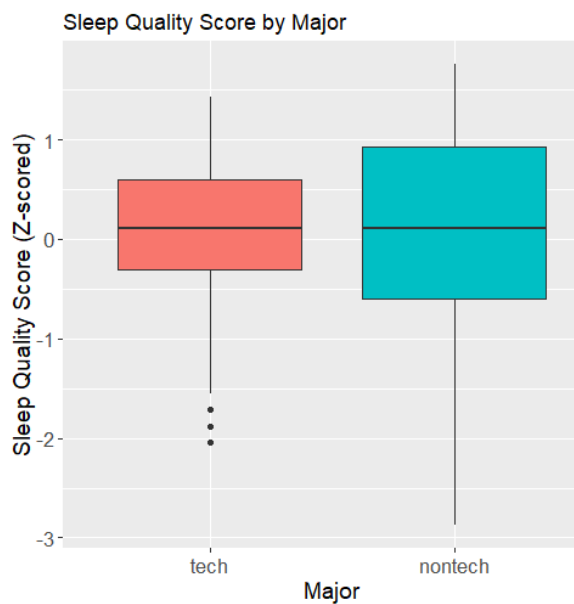


Figure 5. Model 1: Sleep Quality Score by
Major

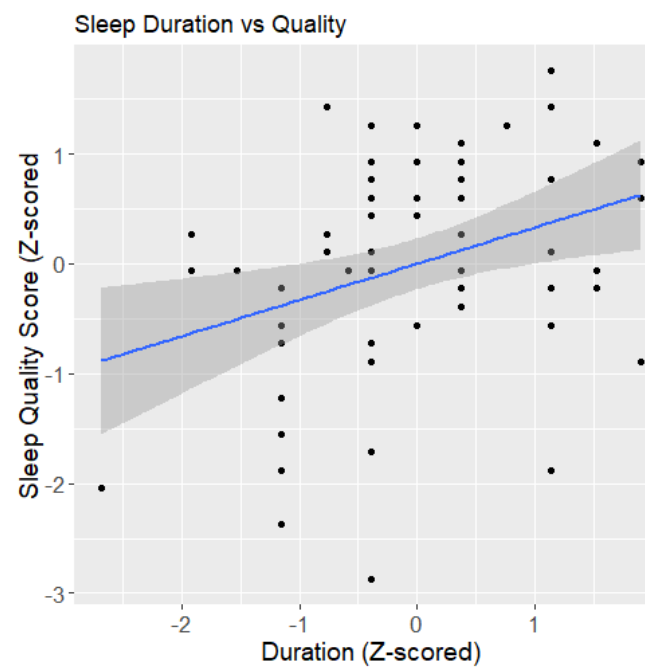


Figure 6. Model 2: Sleep Duration vs. Quality

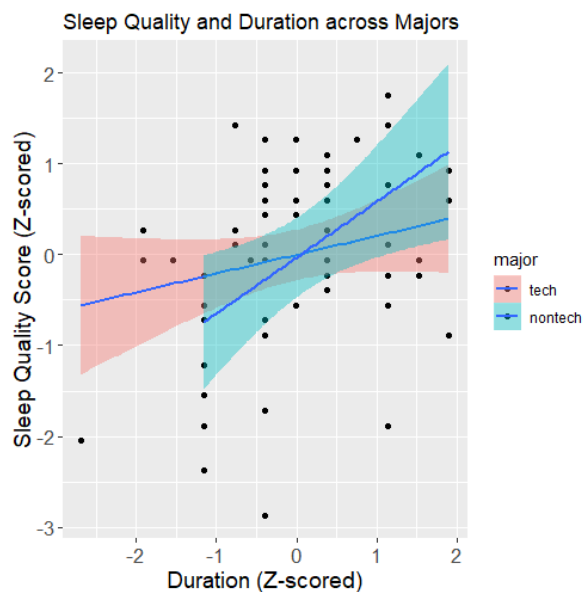


Figure 7. Model 4: Interaction effect

Table 1. Standardized Betas of All Models

Estimated Effects	Model 1	Model 2	Model 3	Model 4
Major	0.03 [-0.48, 0.55]	--	-0.01 [-0.50, 0.48]	-0.03 [-0.51, 0.45]
Sleep Duration	--	0.33* [0.10, 0.56]	0.33* [0.10, 0.57]	0.21 [-0.07, 0.49]
Major * Duration	--	--	--	0.41 [-0.10, 0.92]
Model Summary				
R ²	0.0002	0.11	0.11	0.14

Note: * $p < .05$. 95% Confidence Intervals are reported in brackets.

Discussion

This study failed to find a significant relationship between college major and sleep quality. Findings showed that in this sample, technical majors had a slightly worse sleep quality than non-technical majors, but this effect was very small and not significant. There was a significant positive relationship between sleep quality and sleep duration, but this was not the main focus of the study and thus was not proposed as a hypothesis. Sleep duration did not show an effect on the relationship between sleep quality and major in a multivariate model. An interaction effect was present, showing that tech majors had a weaker relationship between sleep duration and sleep quality than non-tech majors, but this interaction effect was not significant. One interesting result is that the relationship between sleep quality and sleep duration remained significant in the multivariate model.

Much of past research on sleep quality in college students neglected to include data on students' major, instead focusing on other aspects of student life such as health and well-being. Based on the results of this study, there may be a reason that sleep studies do not report college major. There was no significant relationship between college major and sleep quality, so this explains why researchers seem to have focused on variables where there may be more significant findings.

While a relationship between major and sleep quality was expected, it can be understood why there may not be a significant effect. There are many different factors related to sleep quality, and all college students regardless of major must work hard to do well in their classes. In the sample used, all students in general may have had similar sleep quality due to similar amounts of work for classes and involvement in extracurriculars. There may not be a significant difference in the amount of homework and stress related to one major category versus another, rather it's possible that the type of stress and work is just different.

There were various limitations to this study as it was conducted electronically and through social media. Selection bias existed in that only Facebook users and friends at other institutions who were asked to participate were able to fill out the survey. This excluded a subset of college students that do not use Facebook. This study was not representative of college students in general, because I am not Facebook friends with all college students, so not all college students had an opportunity to participate. This study also had a relatively small sample size compared to the population of college students, and in future research a larger sample size could allow for more powerful results. Another limitation was that the majority of responses were from females. It is possible that there are differences in sleep quality between males and females, and that the uneven distribution of gender affect results of the study.

Major was originally reported as one of four categories, then later narrowed down to two for ease of analysis. Rather than combining the categories into tech and non-tech after data collection, future studies can collect data on major using only 2 categories. Majors were grouped into technical (STEM & business) and non-technical (arts and humanities & social science), but this grouping does not adequately reflect the technical nature of majors, since it is possible that social science majors must take technical classes as well. Future research can focus on using 2

categories, such as STEM and non-stem, which will also hopefully lead to a more even distribution of majors since STEM majors were the most frequent in this study. Future research can also expand on these findings by using a larger sample size, which will hopefully also account for the uneven distribution of gender. Overall, this study showed many limitations, but future research can expand on these limitations and allow for a better understanding of the relationship between sleep quality and college major.

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