Scrolling into Sleeplessness:

Exploring the Impact of Social Media on Quality of Sleep

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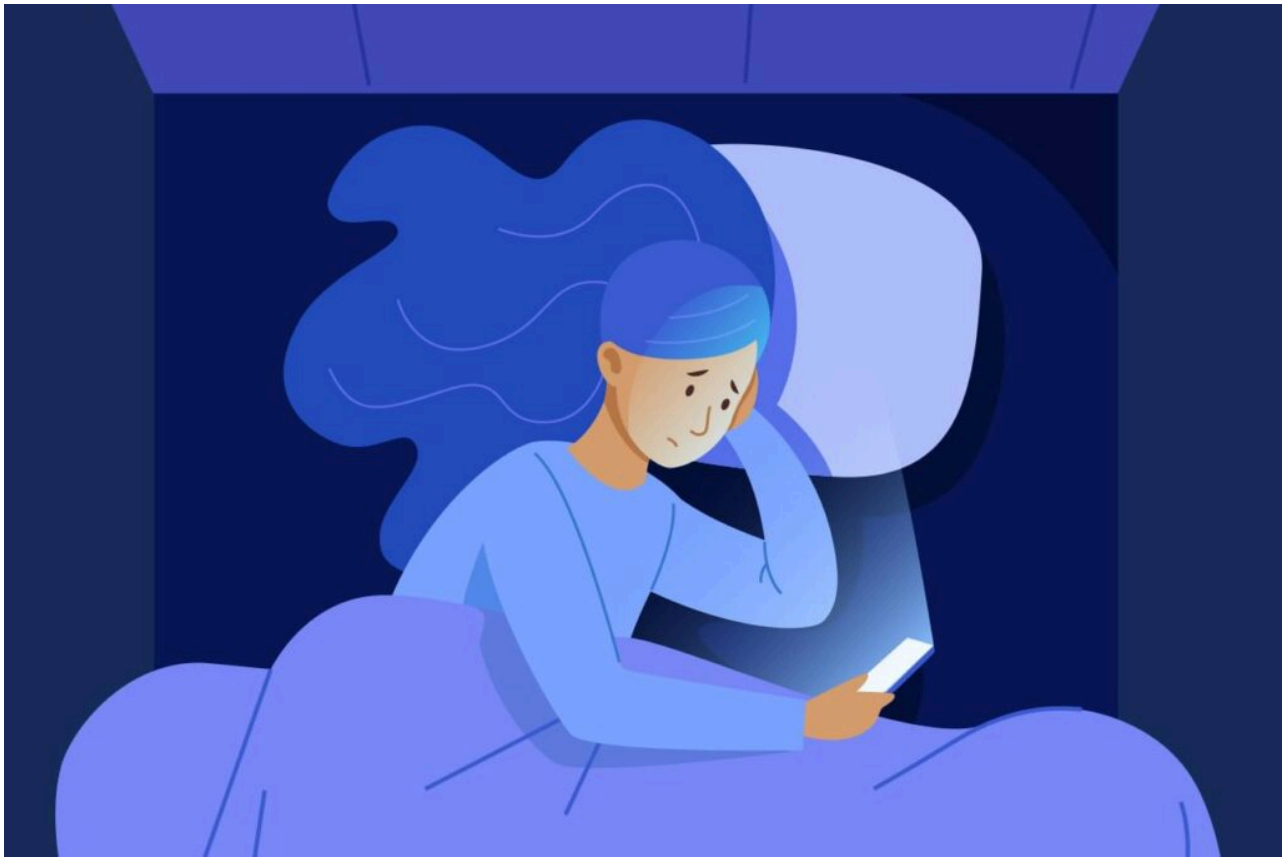


Introduction

It is clear that as a whole, college students do not get enough sleep, and with the recent explosion of social media's relevance in society, screen time before bed is a bigger problem than we are willing to admit. Good sleep is extremely important and is often not prioritized, especially by students. The Sleep Foundation states that, "Most college-aged students need 7–9 hours of sleep in order to avoid daytime drowsiness (inability to concentrate or remember and slowed reaction time), altered mood states (anxiety, irritability, and depression), weight gain, poor health, and low energy." Not only that but good sleep supports brain performance, mood and can decrease your risk for many diseases and disorders, like type 2 diabetes, heart disease, stroke, obesity, and dementia (Person). In other words, sleep is crucial for a healthy, productive, lifestyle.

That being said, social media has the ability to seriously damage a person's quality of sleep. Screen exposure before bedtime impacts melatonin production and circadian rhythm, basically disrupting the body's natural 24 hour cycle. Effects can be seen as more social media use was associated with longer sleep latency, the time between going to bed and falling asleep (NCOA). It is evident that social media use has the potential to be harmful but it is unclear if it is truly the cause for college students troubling sleep schedules.

This study investigates the frequency, duration, and timing of social media use and how it impacts the quality of sleep amongst college students. To accomplish this task, we will use data collected from students in and around the University of Massachusetts Community. This local sample will allow us to evaluate social media use on a smaller scale to examine if it is the primary factor affecting quality of sleep in our campus community. These findings will be a

valuable resource for students to develop a more complete understanding of the harmful impacts of social media use before bed.

This report begins by diving deeper into previously conducted research on the correlation between quality of sleep and social media use, allowing for a more complete understanding of the analysis to follow. The survey is introduced with an elaborate explanation of our methods used throughout the data collection process. Subsequently, we use regression analysis on scaled results, focusing on the relationship between screen time and hours of sleep for weekdays and weekends using ordinal categorical data. The results suggest slight correlation between quality of sleep and social media use, but the results are not entirely clear and more research would need to be conducted to get a definitive result.

Literature Review

Researchers have long since explored the association between sleep and social media. In 2019 a study was conducted by scholars Azar Pirdehghan, Edris Khezmeh, and Sheila Panahi exploring the relationship between. sleep, social media, and depression. This study featured a cross-sectional cluster sample conducted on 576 high school students in Hamadan Iran. In this study, the students were presented with a self-reported questionnaire consisting of four parts. The first part of the questionnaire included the demographic questions. The second part of the questionnaire included the Farsi version of the Pittsburgh Sleep Questionnaire Index (PSQI). This questionnaire assessed an individual's sleeping quality in a more clinical and research setting, in which individuals were asked to answer questions on a 3-level scale (never, sometimes, more than 3 times a week). The third part of the questionnaire recorded the amount of electronic device use before bed on a 1- 5 scale. Finally, the fourth part of the survey used the Beck Depression Inventory questionnaire to measure depression. This study found that among

the high school students, 290 (50.3%) were females who averaged a smart device time use of 4.4 - 7.5 hours daily. Meanwhile, 62.3% of all boys reported significantly higher levels of social media use and poor sleep quality than girls. Furthermore, it was reported that 62.3% of students stated that they had their phones on in their bedroom when they slept. The results showed that adolescents with poor sleep quality averaged 36 minutes more of social media usage than others. Similarly, the results showed that the average use of devices in general was more than 7 hours a day specifically for social media use. This is 2 hours longer than recommended by the American Academy of Pediatrics, a statistic that has been accepted internationally. Through this data, researchers were able to include that there was a statistically significant relationship between high amounts of social media use and sleep quality as well as sleep disorders and moderate-severe daily dysfunction.

Another study was conducted on the impact of social media on sleep by the Center for Research on Media, Technology, and Health. A study was conducted in 2014 in which a nationally representative sample of 1,788 US young adults ages 19-32 were assessed using a self-reported questionnaire. The Center for Research assessed an individual's volume and frequency of social media use with items from the Pew Internet Research Questionnaire. In this study, social media is defined as " a collection of software that enables individuals and communities to gather, communicate, share, and in some cases collaborate or play". To gauge social media use participants were asked to reflect on two different variables. The first variable is the volume of social media use which is measured by the number of total minutes that individuals are using social media per day. The second variable is the frequency, which is measured by the number of visits to each of the most popular social media sites. Participants were asked to fill out text fields and variables were represented through quartiles. They utilized

the Patient Reported Outcomes Measurement Information System (PROMIS) to measure sleep disturbances and quality. Each item in the PROMIS survey was rated using a Likert scale of 1-5. Researchers used logistic regression to analyze any association between social media and sleep. The median number of social media use per day was 61 min and the average frequency was 30 visits per week. The participants were categorized into different levels of sleep disturbance, reporting 42.6% in low, 28% in medium, and 29.4% in high. Overall, there seems to be a correlation between a higher frequency and volume of social media and a higher rate of sleep disturbances. Specifically, higher rates of social media use seemed to have a greater effect on reduced weekday sleep. While the overall consensus of this study seems to be that there is a linear correlation between social media and sleep, the results presented the researchers with new questions. For example, researchers should also look into the psychological and emotional reasoning behind sleep loss or how light affects our circadian rhythms. Researchers concluded that with the increasing growth rate of social media, more research needs to be done on the relationship between an individual's health/wellness and social media.

As mentioned before this research study explores how the frequency, duration, and timing of social media use impacts sleep patterns. We hypothesize that overall higher use of social media will have a negative effect on an individual's sleep patterns. Previous research conducted on the association between these two variables has leaned towards results that indicate a negative impact on sleep patterns. To further break our hypothesis down we can explore how the frequency, timing, and duration of social media can affect sleep. Based on the second research study conducted by the Center for Research on Media, Technology, and Health, we believe that more frequent use of social media in a day will contribute to more negative effects on sleep patterns. Similarly, based on the second study we hypothesize that the longer you use social

media the more it will affect your sleep pattern. In the study conducted by the Center for Research on Media, Technology, and Health, they concluded that there was a correlation between higher levels of social media use and poor sleep quality. Additionally, we believe that individuals who use social media right before bed experience a negative effect on their sleeping patterns. According to the first study, it was reported that 62.3% of students had their phones near their beds when going to sleep. Additionally, students with poor sleep quality averaged 36 more minutes of social media than those who did not have poor sleep quality. While both studies have concluded that more research needs to be done we still believe that our results will imply a negative relationship between our two variables.

Data & Methods

To understand the effects of social media on sleep, we designed a questionnaire for our target audience. Our main goal was to make sure the survey was user-friendly and straightforward. Knowing most people will not complete the survey if it takes up too much time or if we ask too personal of questions we made our survey basic. We asked about their life at UMass, their year at school, and the year they were born. Avoiding questions about race, status, and income helped make our respondents more comfortable. By including fast-paced, easy-to-understand questions, we aimed to maintain participant engagement and reduce survey fatigue. For efficiency, we condensed several related questions into a single response box allowing participants to complete the survey more quickly.

The method of analysis for this research was designed following the principles outlined in *Surveys in Social Research* (Sixth Edition) by David de Vaus. To ensure the reliability and validity of our findings, we employed a structured survey methodology as described in Chapter

3, which discusses the importance of clear and precise operational definitions for variables. Social media use and sleep patterns were operationalized using standardized measures, such as daily screen time found in the settings of everyone's phones. This ensures consistency across respondents and validity. We decided to use cluster sampling for this research because it was going to be the most effective for gathering results. We contacted groups of friends, club groups, sororities, and people who work together to take our survey. Cluster sampling, as described in *Surveys in Social Research* (Sixth Edition) by David de Vaus, is a practical sampling method often used in survey research to manage logistical challenges while maintaining a representative sample. I will preface that our survey is not the most representative though because of only obtaining 85 respondents. To be able to prove our findings completely, much more work would have to be done, and the number of people surveyed would have to be expanded. With most people on campus being hesitant to help strangers and take time out of their busy schedules, turning to people in our circles was how we decided to proceed with our research. In Chapter 5, de Vaus explains that cluster sampling involves dividing the population into naturally occurring groups, or clusters, such as schools, neighborhoods, or organizations, and then selecting a sample of clusters to survey. Within these clusters, researchers may either survey all members or take a random sample of individuals. Using this outline from the chapter, we contacted groups of people or clubs and the ones who wanted to participate took our survey.

When we were studying how social media use affects the sleep of college students, we had to focus on key factors. The Independent variable in this study is social media use. This included how much time students spent on social media each day and weekly, how often they check it before bed, and when they use it. This also involved specific platform use like Instagram and TikTok, and the kind of media they consume or do such as scrolling, posting, or engaging

with their friends. The dependent variable of this study was the students' sleep. This was measured by how many hours they slept on weekends versus weekdays and how the quality of that sleep they mentioned. We also asked a question about naps and how well rested they felt in the mornings in hope to understand this variable more. To make sure our results were accurate, we also considered other factors which were our control variables that could affect sleep quality. This was mentioned in our survey as their age, college of study, gender, and year in school. We also asked about pre-existing factors in their life that could affect our data like stress and environment. We had to take into account these factors and some others that other research has proven to affect sleep like blue light before bed, mental health problems, and experiencing fear of missing out. By understanding our Independent, dependent, and control variables, we were able to make appropriate claims about social media affecting the sleep of college students.

To collect accurate data, we utilized objective metrics such as phone screen time, which participants could easily access and report. This approach provided more reliable results than relying on self-estimated averages, such as "daily screen time use on average per week". The only issue that could happen with this is if people did not read or follow directions. Unfortunately, this is not something we could control or eliminate completely. At the start of the survey, we included a question about pre-existing conditions that might influence sleep patterns like I mentioned previously, helping us account for potential confounding factors. Also, as mentioned previously, we asked demographic questions specific to participants' experiences at UMass, such as their major and college within the university. These details provided insights into how factors like academic workload might impact sleep quantity and quality. This approach gave us a balance between collecting solid data and respecting participants' time and privacy.

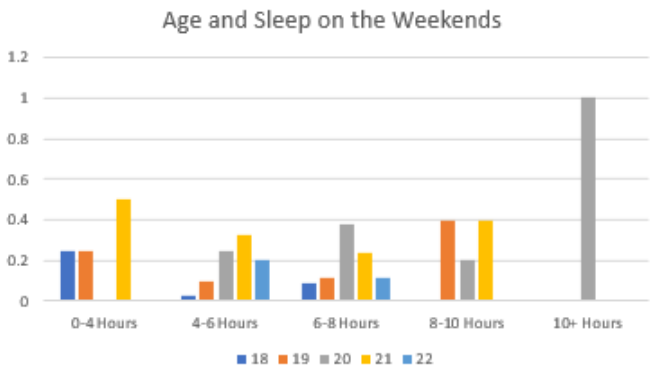
Results

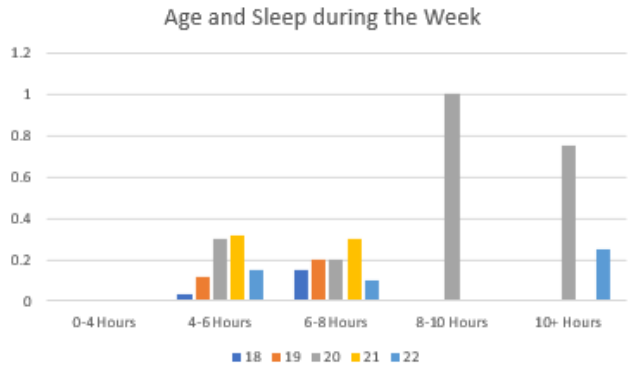
Social Media

Age vs Sleep

Mean	20.37037
Median	20
23+	1
22	12
21	25
20	26
19	11
18	6

Our dataset in our survey focused on the sleep and screen usage habits of 88 college-aged students Our survey showed the college students' average age to be 20.37 years with a median age of 20 years. The majority of students are ages 20 and 21, due to our survey distribution methods of providing friends and fellow similar-aged students our survey. Additionally, all of us who provided the survey were 20 or 21.



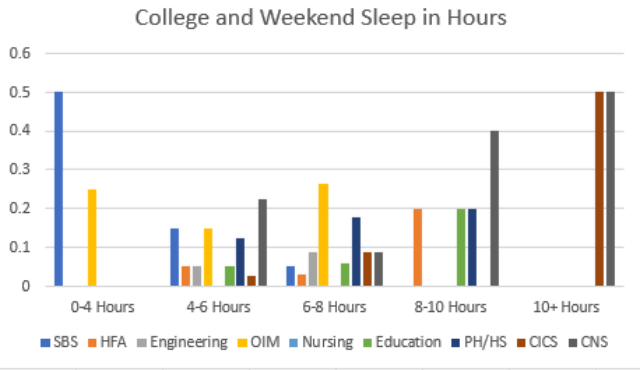


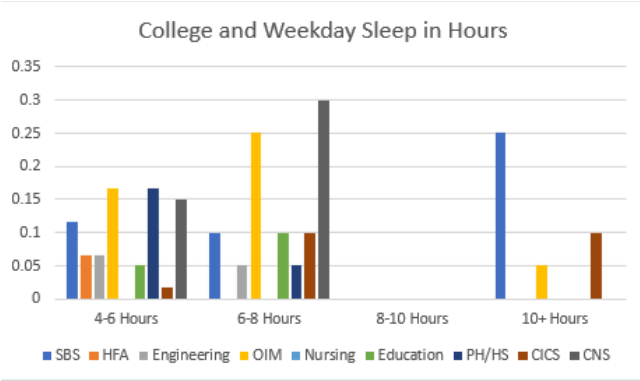
The two charts above show the association between age and sleep in hours. Each different column in the bar chart is scaled so that the different ages within the same amount of sleep add to 1.0. Both bar charts show no association between age and sleep. This backs up the claims from research before surveying. While age might be a factor contributing to sleep on a larger scale; In other words, when comparing a larger range of ages, since the difference in ages is at most 4 years, there is a minimal or no difference in sleep.

Colleges vs sleep

To the right is the distribution of colleges within our survey sample. As you can see, the distribution is roughly uniformly distributed with one gap being the College of Nursing.

Colleges	Counts
SBS	10
HFA	4
College of Engineering	5
Isenberg School of Management	16
College of Nursing	0
College of Education	5
Public Health/Health Sciences	12
Information/Computer Science	5
College of Natural Sciences	15
Other/Not at UMass	13





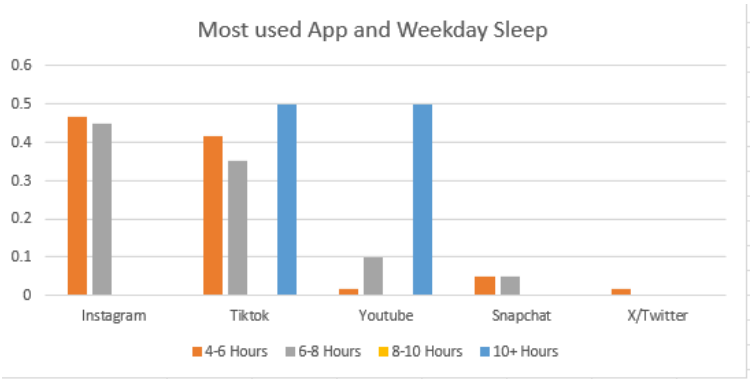
Additionally, the charts above compare the sleep habits of college students across different colleges for both weekends and weekdays. Results are scaled so that each sleep column category sums to 1. On weekends, SBS students have a higher proportion in the 0-4 hours category, indicating less sleep, while students from PH/HS and CNS are more prominent in the 6-8 hours range. In students receiving 10+ hours of sleep on weekends, Other/Not at UMass and CNS students dominate, but this is based on a low number of sample responses and is not a readable statistic. On weekdays, a fair share of PH/HS and CNS students are in the 4-6 hours range; Education and PH/HS students are well-represented in the 6-8 hours category. The SBS students are very outstanding in the 10+ hours range during weekdays, insinuating greater variability in their sleep habits.

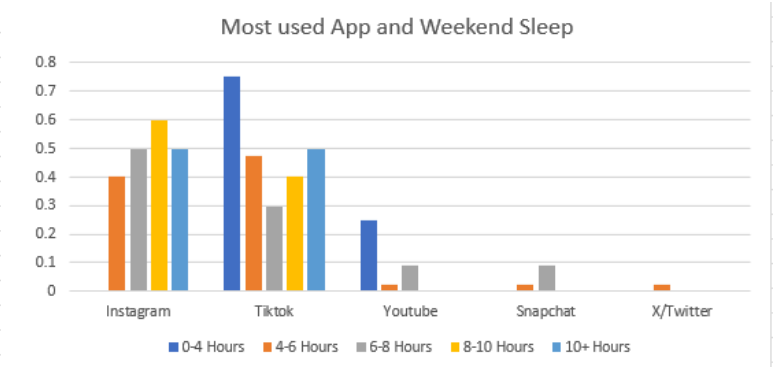
Overall, while there are some emerging trends—such as PH/HS and CNS students across both mid-range and extreme sleep categories—no clear or drastic differences between colleges exist. Students generally sleep more on weekends.

App type vs sleep

Instagram	Tiktok	Youtube	Snapchat	X/Twitter
37	34	5	3	1

Results of the survey indicated that among all the college students, the usage count of Instagram and TikTok is overwhelmingly the highest at 37 and 34 respondents who stated they were their most used social media app. This indicates a strong preference for the use of these platforms over the rest. Compared to YouTube, Snapchat, and X/Twitter, this rate of usage is higher by huge margins, having only 5, 3, and 1 respondents saying it is their most used social media.





The charts above further investigate how the sleep duration varies for the most-used apps, scaled such that each app's proportions sum to one. During weekdays, Instagram and TikTok have a fairly even spread across the categories of sleep, with the majority of the users sleeping 4-8 hours. Unfortunately due to the low responses from the other categories the chart does not do a good job of showing the distribution, and the responses are reliable; They remain balanced out.

During the weekend, Instagram and TikTok again lead the spread across all sleep categories. TikTok shows a slight increase in the 4-6 hour range, indicating that some users

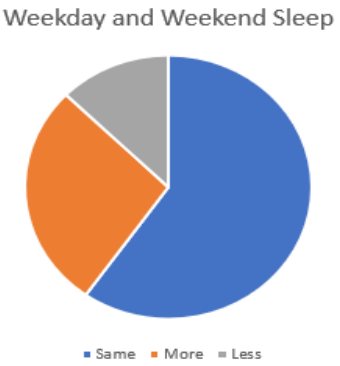
experience shorter sleep during weekends. On the other hand, Instagram leads the category for 6-8 hours when compared to Tiktok, showing that respondents who used Instagram the most out of social media apps typically get more sleep on weekends. YouTube, Snapchat, and X/Twitter remain relatively balanced but with little variation due to their smaller sample sizes.

In all, while Instagram and TikTok are the leading applications among college students, the charts do not show a strong or reliable correlation between the use of any application and sleep duration. Sleep patterns remain relatively evenly distributed across categories in the most-used applications, hence making it difficult to spot a clear trend.

Sleep and Social Media Use

Mean	2.413793103	2.551724138	
Median	2	2	
	Week Sleep	Weekend Sleep	Labels
	0	4	0-4 Hours
	60	40	4-6 Hours
	20	34	6-8 Hours
	1	5	8-10 Hours
	4	2	10+ Hours

Students reported the median amount of sleep to be 4-6 hours on both weekdays and weekends. It's important to note that the average response category was between 4-6 hours and 6-8 hours.

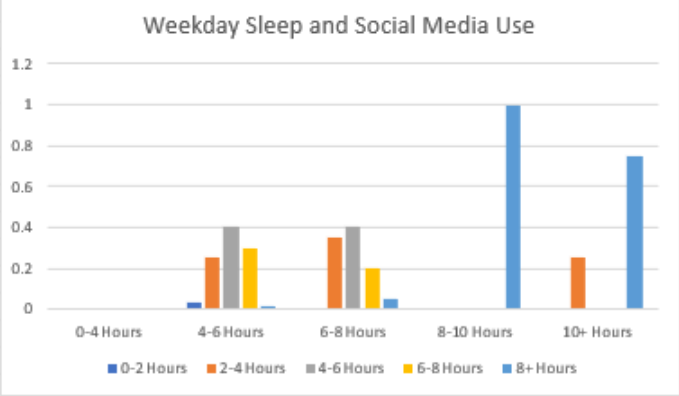


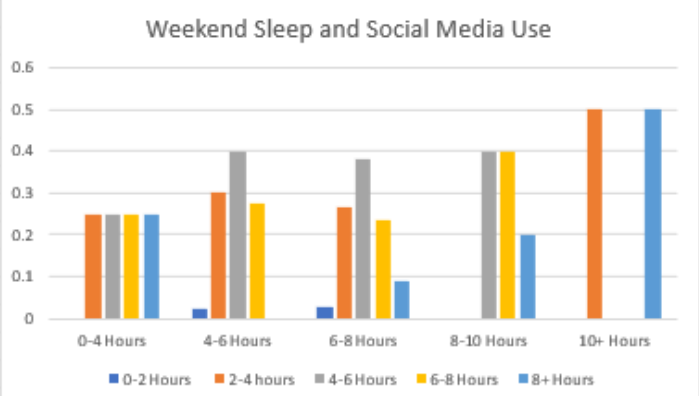
Weekend sleep had a higher categorical average meaning that on average students are sleeping slightly more on weekends. Overall, by far the most popular responses for weekend and weekday sleep of students were 4-6 hours or 6-8 hours. Finally, according to the pie chart, the majority of students recorded the same amount or more sleep on weekends when compared to weekdays.

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	1.805112782	0.265336071	6.803119	1.35E-09
Screen Time	0.197593985	0.082404827	2.397845	0.018681

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	2.2237594	0.284299603	7.821887	1.29E-11
Screen Time	0.10646617	0.088294289	1.20581	0.231236

The statistics above show the regression association between sleep and social media use. The regression analysis focuses on the relationship between the use of social media (screen time) and sleep for weekdays and weekends using ordinal categorical data of the sleep-in-hours group columns. On weekdays, screen time is positively associated with sleep, though small, with a coefficient of 0.1976 and a p-value of 0.0187. This indicates that as screen time increases, the reported sleep scores slightly increase. However, over the weekends, the relationship weakens and becomes statistically insignificant, with a coefficient of 0.1065 and a p-value of 0.2312.





The values of the intercept suggest that overall sleep is higher over the weekend compared to the weekdays, agreeing with the pie chart above. These results suggest that social media use may play a more significant role in influencing sleep during weekdays, while other factors could have a greater impact on sleep patterns during weekends. Overall, while there is some evidence of

this, I believe that the sample size of our study contributes to the difference in conclusions between weekends and weekdays.

These charts compare sleep duration to social media use for both weekdays and weekends. The results are scaled so that each sleep category (e.g., 0-4 hours, 4-6 hours, etc.) sums to 1. As you can see from the charts the proportions are relatively uniform again showing little association between weekday and weekend sleep with social media use. Overall, in each of the categories that have responses, they are pretty uniform. It's important to note that the 10+ hours and 8-10 hours categories look to be significantly different from one social media category; these columns have only 7 respondents combined, which makes these results unreliable.

Other Research Questions

	Mean
All	5.035294
Instagram	4.702703
Tiktok	5
Youtube	6.4
Snapchat	6.25
X/twitter	6
Other	5.333333

The last part of our survey asked individual questions related to sleep. The first of those questions being: How well rested do you feel in the morning? Scale (1-10). On the right side represents the statistics for the question. It can be seen that the average scores for feeling well-rested in the morning are lower for people who primarily use Instagram and TikTok, rather than the other apps. The mean scores are lowest for Instagram users, with 4.7, and are closely followed by TikTok users with a score of 5. At the same time, users from YouTube (6.4), Snapchat (6.25), and X/Twitter (6) report substantially higher averages, meaning they may feel more rested. These findings hint that heavier use of Instagram and TikTok might be associated with poorer-quality sleep, thereby contributing to users feeling less rested in the morning.

Another question asked was: If you have trouble sleeping, do you go on your phone? (scale from Strongly agree to Strongly disagree). Instagram and TikTok have average responses of 2.94 and 2.64 respectively, which are lower compared to the other categories. This suggests that users of these platforms tend to agree more with using their phones when they have trouble sleeping. By contrast, YouTube, Snapchat, X/Twitter, and Other categories have higher averages that range between 3.0 and 3.6, indicating that users in those categories are less likely to agree with the statement. Overall it seems like users of Instagram and Tiktok drift towards their phone late at night, vs the other categories.

	Mean
All	2.878049
Instagram	2.942857
Tiktok	2.636364
Youtube	3.6
Snapchat	3
X/twitter	3
Other	3.25

The final part of our survey was a matrix between statements, and a scale of Strongly Agree to strongly disagree. 3 of the statements are as follows: My phone might be one of the main reasons contributing to my poor sleep? I find social media to be addicting? and I find it hard to put down my phone? While in the previous paragraph, we noted that Instagram and TikTok users tend to agree more with using their phones when they have trouble sleeping, thus probably indicating poorer sleep, the self-reported responses to statements like "My phone might be one of the main reasons contributing to my poor sleep?" do not significantly differ across platforms. Averages on Instagram and TikTok remain similar to others, insinuating that most users may be unaware of the dangers of social media's effects on sleep. This disconnect highlights a lack of awareness regarding how social media habits could contribute to disrupted sleep patterns.

Bad Sleep	Mean
All	2.49383
Instagram	2.38235
Tiktok	2.54545
Youtube	2.2
Snapchat	2
X/twitter	5
Other	3.25

Addicted	Mean
All	1.5122
Instagram	1.51429
Tiktok	1.51515
Youtube	1.6
Snapchat	1.5
X/twitter	2
Other	1.25

Put down	Mean
All	2.39506
Instagram	2.38235
Tiktok	2.45455
Youtube	2.4
Snapchat	1.5
X/twitter	2
Other	3

Discussion

After analyzing our data the conclusion we have come to is that there is not a clear correlation between sleep and social media. In our hypothesis, we state that overall social media use will have a negative impact on an individual's sleep patterns. However, while the results indicate that there may be a cause-and-effect relationship between the two variables there is not a clear concise correlation between the two. In our hypothesis breakdown, we hypothesized that more frequent and longer use of social media will affect your sleep patterns. Our hypothesis aligned with the research done by the Center for Research on Media, Technology, and Health. However, while this research study found that more frequent use did affect sleep patterns our results did not reflect this. Our results did show that among college students the most popular social media apps are TikTok and Instagram. TikTok shows a higher usage rate on the weekends with college students getting around 4-6 hours of sleep. At the same time, participants who use Instagram on the weekends are averaging 6-8 hours of sleep. These levels of sleep are similar to the hours of sleep that college students are getting on weekdays. A strong reliable correlation between the use of any one application and social media is absent and the data seems to be evenly spread out. There seems to only be a small correlation between more frequent use of social media and sleep on the weekday with a coefficient of 0.1976 and a p-value of 0.0187. Unfortunately, this is not enough evidence to provide a conclusive answer to our hypothesis.

One of the questions in our survey asked college students " How well rested do you feel in the mornings?". Respondents who primarily used TikTok and Instagram seemed to report poor sleep quality than any of the other social media platforms. This could imply that heavier use of Instagram and TikTok is contributing to poor sleep quality. Additionally, participants were asked, " If you have trouble sleeping, do you go on your phone?". The results indicate that

respondents who use Instagram and TikTok are more likely to reach for their phones when having trouble sleeping. In our hypothesis breakdown, we stated that individuals who use social media before bed will have more negative sleeping patterns. This data could support our hypothesis because. it seems that regardless of whether they are on social media because they are unable to sleep they are still on it before sleeping. The data shows that Instagram and TikTok users are more likely to reach for social media when they are unable to sleep and are also experiencing poorer sleep quality. This data could be related to the research done in Hamadan, Iran in which 62.3% of participants reported having their phone in their bedroom with them. This statistic was not expanded on in the study, but with our research, we could imply that those participants might also either use their phone before bed or reach for it when they have trouble sleeping.

Previous research studies were able to conclude that there was a statistically significant correlation between sleep and social media. However, this is probably because the range of types of respondents was much larger (ie.age) as well as the number of responses gathered. Our survey focused on college students and due to our distribution methods the majority of responses were 20-21 year olds. This is not nearly enough of a demographic to be able to make any conclusive decisions about our study. Studies in the past despite having some sort of correlation have also concluded that more research needs to be conducted. However, we believe that our work still expands and reinforces past research somewhat. In our study, we explore which social media platform seems to have the biggest effect on sleep patterns. As previously mentioned we seem to see poor sleep patterns with Instagram and TikTok users, both of which are platforms with short-form content. This could be something interesting for researchers to focus on especially since short-form content is quite popular and people are more prone to mindlessly scrolling.

Additionally, researchers should emphasize studying weekend and weekday sleep instead of looking at it as a whole. This is because sleeping patterns are typically different between the two, especially for working individuals. Studying them separately will help researchers come to a more conclusive conclusion. Overall, while our work has not added anything more to the field than what has already been found, we opened up new areas of study that could be interesting to further explore.

Conclusion

Whether or not the data can prove that there is a strong correlation, it is clear that technology, social media, and screen time as a whole are eminently impactful on the productivity of our society. We spend hours of our time glued to our devices, ignoring reality around us. It is impossible to ignore the potential bias of respondents' answers to the survey questions. Just because you were not on your phone doom scrolling right before bed, does not mean that the three hours spent earlier that day procrastinating is not partially to blame for the six hours of sleep you got. Saying that your phone is not impacting your sleep is easy, but the results from our survey lead us to question if social media really does have an impact and we just don't see it or don't want to admit it.

In conclusion, although our data did not support our projected hypothesis, it opened the door for further discussion and taught potential lessons about the habits of college students. Sleep is crucial to a person's health and wellbeing and whether or not it is social media causing interruptions in sleep schedules it is key to address these issues before they start to take a toll on daily activities. College as a whole is a stressful time with students balancing social lives, work, financial responsibilities, sports, clubs, and self care, all well trying to get a good education. For

many students the new found freedom away from home can lead to some questionable decisions where sleepless nights are something to brag about. The culture around sleep amongst college students is unhealthy as it diminishes the importance of sleep and it is crucial that students become more aware of the negative effects of sleep deprivation. Breaking these unhealthy sleep habits is essential to ensure your brain is able to keep up with the chaotic lifestyle.

College students as a whole need to work on balancing their sleep schedules with all the other chaos in their overpacked schedules. It is crucial that sleep is prioritized so that all other functions can follow. Both sleep and social media are topics that have been heavily researched and it is clear that as a society we need to be more self aware of our conceptions of social media, whether or not you believe it is impacting your sleep, it probably is. Four to six hours of sleep a night is not enough, and if social media is not keeping you up at night something must be.

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