Relationships between Facebook Use and Sleep Patterns Among College Students

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Abstract

This study examined the relationship between Facebook use and sleeping habits among 86 college students at a medium-sized southeastern university. Specifically we hypothesized that facebook use would have an effect on sleep quality and quantity. The results showed no significant relationship between Facebook use before bed and sleep quality or quantity. Our research lead to conclusions about the differences in effects, however, the data adds to the growing body of research about social media use among young adults.

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Among young adults ages 19-29, 67% report not getting enough sleep to function properly during the day (Levenson, Shensa, Sidani, Colditz & Primack, 2016). From this statistic we can assume that this data can be directly applied to the average university student, whose age ranges from 18 to 23. What we sought out to understand in this paper was whether this lack of sleep could be connected to social media use, and specifically to Facebook use. Previous studies found there was a relationship between social media use and sleep quality, but we wanted to narrow the general term of "social media" to one platform; Facebook.

Millennials are "the first generation to grow up with social media," and seeing as the majority of this group has more sleep issues than other demographics, we can question whether social media is the culprit for sleep deprivation and lack in quality of sleep (Levenson et al., 2016 p. 39). While many studies show a strong relationship between sleep and social media use (Levenson et al., 2016 ,Exelmans & Van den Bulck, 2016), we did not find any that identified social media as the possible cause of this lack of sleep or as the possible cause of sleep disturbances. The research is also inconclusive on if subjects with preexisting sleep conditions use social media more frequently than subjects without preexisting sleep conditions, or if both hypotheses are significant and somehow linked in a way that they feed into each other.

An estimated 90% of college students use social media, with a majority reporting using it on a daily basis. In a study of two groups of college students who use Facebook from

different universities (Christakis, D. A., Moreno, M. M., Jelenchick, L., Myaing, M. T., & Zhou, C. 2011), researchers found that 4% of respondents exhibited "problematic" or addictive Internet habits. In addition, nine out of ten Americans between the ages of 13 and 64 report social media use before bed (Exelmans & Van den Bulck, 2016). This media consumption specifically facebook use is associated with loss of sleep, irregular sleep-wake patterns, decreased quality of sleep, and increased fatigue during the daytime (Exelmans & Van den Bulck, 2016). In adolescents and young adults, there is also a relationship between social media use, anxiety, depression and low self-esteem (Woods & Scott, 2016).

The purpose of the paper is to determine whether or not social media use significantly affects sleep patterns in college students. The impact social media has on users and the increasing degree to which it is incorporated in the lives of young adults prompted us to test whether Facebook usage before bed affects sleep quality. We also wondered if Facebook usage before bed could be related to fatigue throughout the day. This paper is divided into four sections. First, there is a Literature Review section, then a Method section, a Results section, and a Discussion section.

Literature Review

Research by Exelmans and Van den Bulck (2016) examined a number of factors related to media use before bed and its effect on sleep patterns. The study reported that mobile phone use at bedtime was associated with a negative sleeping experience such as poor sleep quality, insomnia and fatigue. The study also found a relationship between age and bedtime phone use, affecting tiredness, rise time, and sleep duration. Respondents of the study ranged from

18-year-olds to 94-year-olds, and the study found that mobile phone use before bed was associated with more fatigue for younger respondents (Exelmans & Van den Bulck, 2016).

Like Exelmans and Van den Bulck, Orzech, Grandner, Roane, and Carskadon investigated bedtime digital media usage. Rather than focusing on the broad "bedtime" time frame, their study narrowed down the time frame to two hours prior to bedtime and expanded the criteria to include all digital media usage. The study found that using digital media two hours before bed contributed to poor or disrupted sleep and that different types of digital media resulted in a range of different outcomes. The results showed that first-year university students' most frequent activity before bed was computer usage accompanied with texting. The study did not specify what was being done while on the computer, or if any social media platforms were open while using the computer. But the results showed "that for each 15-min block in the last hour involving computer work, students slept about five minutes less, perhaps partially explained by going to bed five and a half minutes later..this would result in about 20 minutes less sleep over the course of a night" (Orzech, et al., 2015). At the same time, surfing the Internet was not associated with a later bedtime, but it was associated with more disrupted sleep.

On the other hand, the study by Xanidis and Brignell examined the correlation between social media dependence, sleep quality and cognitive failures during the day. The previous studies concentrated on bed time usage of social networks and excluded usage during the day. This study investigated social media usage throughout the day and sought out to link social media dependance with sleep quality and cognitive failures. Xanidis and Brignell (2016)

excluded texting and phone functions and solely looked at mobile usage related to social networks. The study suggested that social media usage could affect sleep quality and poor sleep quality could lead to cognitive failures (Xanidis & Brignell, 2016).

Similar to our research, we found that a study which was conducted in Peru completed on university students, revealed that Facebook use could lead to different sleep problems and disorders. Over the past 10 years, the Internet has become one of the most prevalent parts of everyday life, especially among college age people. The study revealed that Facebook use and its several advantages could lead to different sleep problems and disorders. Among these advantages, the free access, constant communication and sharing of personal information kept students up all hours of the night (Wolniczak et al., 2013). The study compared Facebook dependent students to non-Facebook dependent students, with dependency being operationalized as the amount of time spent on Facebook. Dependent students reported staying up late to play games, chat with friends or to simply scroll down the endless stream of updates. Research found that the bright light that is projected from one's phone or laptop screen could alter one's circadian rhythm and cause one to become excessively tired or to develop insomnia. This article is relevant to our study because it directly relates to our two variables, Facebook use and sleep.

While the Peruvian study focused on Facebook and its negative effects on sleep, Woods and Scott (2016) investigated the connection between social media use – specifically at night – and sleep quality, self-esteem, anxiety, and depression. They went beyond just studying Facebook to look at social media in general and its effects on not just sleep, rather sleep

quality, anxiety, depression, and low self-esteem. By surveying a group of 467 Scottish students, aged 11 to 17-years-old, the researchers produced two key findings. One finding was that greater social media use overall, social media usage at nighttime and emotional investment in social media were associated with poorer sleep quality. Secondly, the nighttime-specific use and emotional investment were associated with lower self-esteem overall. The research is relevant to our study because older adolescents have been shown to use computers more often, sleep less, and have higher levels of anxiety and depression than young adolescents. However, this study did not establish a clearly directional relationship between self-esteem, quality of sleep and social media use. The research conducted by the study indicates that the variables have a cyclical relationship to one another.

The article "The association between social media use and sleep disturbances among young adults" by Jessica C. Levenson, Ariel Dhena, Jaime E. Sidani, Jason B. Colditz & Brian A. Primack, looks at social media's relationship with sleep disturbances as well. Unlike the previous studies, this study focused solely on social media and sleep disturbances. Researchers looked into whether or not daytime usage of social media affected young adults sleep patterns. The study surveyed young adults (19-29 years old) on their social media usage and sleep disturbances. The survey found that the median volume of social media use per day was 61 minutes and that the median frequency was 30 visits per week. The findings proved that more than half of the young adults reported medium or high levels of sleep disturbances at night. The study also found that, "it is not possible to determine whether SM use contributes to sleep disturbance, sleep disturbance contributes to SM use, or both" (Jessica C. Levenson, Ariel

Dhena, Jaime E. Sidani, Jason B. Colditz & Brian A. Primack, 2016, p. 37). With this being said, the study documented that there is a strong relationship between social media use and sleep disturbances.

In the article "Problematic internet usage in US college students: a pilot study" by Christakis, Moreno, Jelenchick, Myaing and Zhou, researchers looked at problematic internet usage. Unlike the previous studies social media use was expanded to include all problematic internet use. The study found that there was a 4% prevalence of "problematic" internet usage by U.S. college students, making it as common as asthma in a similar population of children. The researchers used an Internet Addiction Test and a Patient Health Questionnaire to find a relationship between, among other things, depression and problematic Internet usage in college students. Because college students typically have unrestricted and unsupervised Internet usage and independent time management, the researchers predicted a portion of the sample – 307 Facebook users from two college campuses – would display some addiction to social media.

The information gathered by Christakis, Moreno, Jelenchick, Myaing and Zhou can be used as a foundation for developing a more comprehensive study of Internet addiction, especially among adolescents and young adults who have higher risks of adopting addictive behaviors than adults and are at crucial psychosocial and mental developmental stages. Both Christakis, Moreno, Jelenchick, Myaing and Zhou's study and the study conducted by Woods and Scott (2016), found that excessive social media use, particularly before bed, may be severe for younger generations, and may bring about higher rates of depression and anxiety, lower or more fragile self-esteem, poorer quality of sleep and potentially dangerous addictive behaviors.

Hypotheses

Four hypotheses guided our study. First we predicted:

H1: The more time college students spend using Facebook per day, the fewer hours they sleep per night.

Knowing what we do about the effect of social media use on sleep – including how exposure to a digital screens can obstruct or slow the production of melatonin in the brain, a hormone that controls the body's sleep and wake cycles, and how social media has been linked to shorter sleep periods – we wanted to know if the cumulative use of Facebook throughout the day impacted sleep patterns and sleep quality. We wanted to see if the amount of hours or minutes spent on Facebook could dictate a person's sleep pattern and the quality of sleep they experienced.

H2: The more minutes college students spend on social media before bed, the more tired they feel throughout the day.

Like we did for H1, we linked social media use to shorter sleep periods and poorer quality of sleep, both of which would make users feel more tired in the morning and throughout the day. This connection would be especially prominent when social media use before bed becomes a habit, because the exposure to the variable (social media) could be studied in close proximity to sleep and the effects of it would be felt on a consistent basis (Orzech, et al., 2015,p. 44). Also, 86% of adolescents sleep with their phone in the bedroom, making sleep issues a matter of great generalizability (Orzech, et al., 2015, p 44.). The study

titled “Bedtime mobile phone use and sleep in adults” by Exelmans and Van den Bulck provides data on younger respondents that supports our second hypotheses.

H3: The more time college students spend on Facebook throughout the day, the more likely they are to experience sleep disturbances throughout the night.

As stated above Xanidis and Brignell (2016), examine the correlations between social media dependence and sleep quality or cognitive failures. The researchers looked at the amount of minutes people in their sample used social media per day and how likely they were to experience sleep disturbances. We took this and looked specifically at Facebook instead of all social media platforms. We chose Facebook, in part, because it was the first creation of its kind (arguably the start of social media) and has the most variety of content, from events to friend posts to photo albums and videos. This study is relevant to our H3 because the results support the notion that excessive use of social network sites is related to poor sleep quality. The study suggested that social media use in general affected quality of sleep. We took this a step further when formulating our H3 by narrowing it down and examining the use of the social network site Facebook in relation to sleep patterns.

H4: The more time college students spend on Facebook throughout the day, the more likely they are to nap during the day.

Extending our predictions for the first three hypotheses, we thought that if students are sleeping less hours and experiencing more sleep disturbances that they would try to counteract that by taking naps. Some studies have found that the electromagnetic fields emitted by mobile phones have adverse effects on sleep electroencephalograms (E.G. & Van den Bulck, 2016).

Because Facebook is so easily accessible via smartphones today, we hypothesized that spending more time on Facebook could contribute to mobile phone use and these adverse effects. Furthermore, our rationale was that if college students are spending more of their time on Facebook during the day, they will have to stay up later in order to complete their obligations, such as homework assignments and household chores, causing them to be more tired throughout the day and therefore more inclined to take naps.

Method

Data Collection

In March of 2017, we conducted an online survey, yielding 86 responses from college students from a medium-sized southeastern university and other universities across the country. Based on previous research and strict curiosity, the survey was meant to describe the effects of Facebook use on sleeping habits in the digital age. Although most of these students attended the University of Miami, the online nature of the survey allowed it to reach some other universities as well. To disperse the survey, we sent out a link to the survey via email to classmates and friends, and from there asked for their participation as well as help to disperse the survey amongst their contacts as well. Although, some respondents left one or two questions blank, however most completed the instrument fully.

Measurement/Questionnaire design

Facebook use. Among the independent variables Facebook use on a given day at a given time was the primary variable. As a result, respondents were asked a series of questions related to Facebook usage to provide an overall idea of said media consumption. Questions

included how often do they check Facebook on a given day and just before bed. The response options ranged on a five-point scale from 1 (*very often*) to 5 (*never*). Respondents were also asked to report how many minutes they spend on Facebook throughout the day and how many minutes just before going to bed. To complete the Facebook use questions, respondents were finally asked to report when most of their consumption occurs based on parts of the day. To record information regarding the time of day Facebook use occurred, respondents were given a scale of different parts of the day, beginning at right after waking up and ending at before going to bed, and finally how much time is spent on the website or app when they log on. Respondents were asked to estimate based on 15-minute increments starting at 1 (*less than 15 minutes)* until 5 (*45 minutes or more)*.

Sleep. Four questions were asked regarding respondents' sleep patterns, napping, and disturbances. First, they were asked to report approximately how many hours of sleep they get each night, followed by a question looking to determine how tired they feel generally on a given day. Respondents' tiredness was rated using a ten-point scale with zero being (*extremely lively*) and ten being (*extremely tired*). Two more questions regarding sleep were proposed looking for respondents to record how often they nap during a normal week and how likely they are to experience sleep disturbances. These questions were both rated on a five-point scale from 1 (*very often*) to 5 (*never*).

Demographics. Data was taken on four demographic measures: gender, race, age and, whether or not the respondent lives on campus.

Analysis.

The hypotheses tested included variables that were ratio in nature so a Pearson *r* correlation test was used to analyze each one. Each hypothesis tested an association between Facebook use and sleep.

Results

Description of the Sample

Of the respondents 65% were female, while 32% were males and 2% reported themselves as other. Out of the 86 responses the mean age came out to be 19.74, while the median and mode were both 22. When asked about their race and ethnicity, 67 respondents or 77% of them reported being white. Another 12.64% selected Hispanic or Latino, and 5.75% were African American.

Concerning Facebook use, most respondents recorded using Facebook at least once a day ($M = 55.06$, $SD = 42.45$) as well as just before going to bed ($M = 13.67$, $SD = 12.13$). Our data also revealed that each time the user checked Facebook he or she spent a shorter amount of time on the app ($M = 1.44$, $SD = .73$). The variable sleep also left us with some interesting data as well. Respondents reported sleeping little each night ($M = 6.89$, $SD = 1.06$) and napping more often than we thought ($M = 3.49$, $SD = 1.13$).

Hypotheses

Our first hypothesis tested the relationship between amount of time spent on Facebook throughout the day and amount of sleep per night. We predicted that more Facebook use would lead to less hours of sleep per night. The Pearson $\underline{r}$ correlation test was not statistically significant, $\underline{r}\ (82) = -.03$, $\underline{p} = .776$. Therefore, H1 was not supported.

The second hypothesis we tested was meant to determine that if students spend more minutes on Facebook before bed, they will feel more tired throughout the following. We again tested this using a correlation test between a question allowing students to answer on a scale from 1-10 how tired they feel throughout the day, and how many minutes they spend on Facebook before going to bed. The Pearson r correlation test was not statistically significant, r (81) = -.087, p = .437. Therefore, H2 was not supported.

Thirdly, we predicted that the more time college students spend on Facebook throughout the day, the more likely they are to experience sleep disturbances throughout the night. To test this we used a correlation test that paired the question on average how often do you check Facebook per day and how likely they were to experience sleep disturbances. The Pearson r correlation test was not statistically significant, r (84) = -.019, p = .863. Therefore, H2 was not supported indicated by an extremely high p value.

Finally, our last hypothesis explored whether students spend more time on Facebook throughout the day, they are more likely to take naps. Because our variables were ratio-level in nature, we again used a Pearson r correlation test. This time we asked how often respondents nap and with that how many minutes per day they spend on Facebook. The Pearson r correlation test was not statistically significant, r (81) = -.101 p = .362. Seeing as this p value is greater than .05, once again our hypothesis was not supported

Discussion

The purpose of this survey was to test four different hypotheses to learn more about the relationship between Facebook use and sleeping habits. The non-statistically significant results

indicated that our research was inconclusive. These inconclusive results leave room for future research on the relationship between Facebook and sleeping habits.. Based on our inconclusive findings, we can not say that Facebook usage can be linked to change in quality and/or quantity of sleep. Our statistical results, and their lack of statistical significance, can be related to our small sample size. As a result of our lack of excessive time to gather data, we only had a total of 86 responses. Our small sample was non-probabilistic and thus lacked representativeness of the overall population at the University of Miami. Issues with the sample's demographics could have been avoided if we had more time for people to respond before needing to close the survey. If given a second opportunity to administer the survey, we would need to have more time to collect data and send it out to more undergraduate students. We could spend more time focusing on getting a representative sample instead of just multiple responses.

Our results can also be linked to the fact that the survey is based on participants' self-evaluation of sleep and Facebook use. With this being said, we can assume that not all participants responded truthfully, or maybe their estimates were not reliable, and we can assume that most participants answered the survey quickly without really taking the time to answer each question to the best of their ability. We noticed that on the open-ended questions people chose not to respond more often than on the ones that they could simply click a circle to fill in. In turn, we had fewer data for the open-ended questions than for the close-ended questions.

Our survey questionnaire should also have looked at possibly one or two more social media platforms because by focusing on Facebook we were limited to participants who avidly

use or do not use Facebook at all. Some participants may use Instagram or Snapchat more often than Facebook. To improve data accuracy, we could have used a filter question at the beginning. This could have been used to find separate data for Facebook and other social media platforms. This way, we would have had more specific data for each social media network adding another level of depth to our survey.

Our survey would have also benefited from a few more questions. Perhaps we could have also asked a wider range of questions regarding sleep and Facebook. For example, questions about type of Facebook use or sleep could be added. For the most part our survey asked questions regarding hours of sleep and hours of Facebook use. We could have expanded the questions to perhaps include more questions on actual quality of sleep rather than just use on question with a Likert scale regarding how likely participants were to experience sleep disturbances.

Some of our hypotheses may have also not been supported because of the vagueness of the variables. For example the operational definitions, some people may have been confused when it comes to the definition of a nap, or simply not know the difference between using Facebook and checking Facebook. In conclusion, although the results were not statistically significant, they pointed us in a direction toward more research and a basis for future studies.

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Appendix 1