

A Review of the Effects of Social Media on Sleep in High-School-Aged Students

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ABSTRACT

The purpose of this study was to determine if there was a correlation between the social media use and the sleep habits of teenagers. After conducting a literature review, the researcher found that there were very few studies conducted observing the relationship between social media use and its effects on sleep, and additionally, the few studies done were conducted among adults. This led to the identification of the gap, which was the lack of research done in teenagers. The researcher decided to use a survey to collect data and fill this gap, and said survey collected both quantitative data, through Likert scale questions and information about the teenagers' daily habits, and qualitative data, through free responses which were analyzed for popular themes. From the responses in the survey and the correlational analyses conducted, the researcher found that there was little to no correlation between social media use and worse sleep schedules among teenagers. The researcher determined that there was no significant statistical relationship among the two variables, however, it was identified that students were staying up too late and not getting enough sleep, as well as spending too much time on social media. The limitations of the survey were that the research process was inflexible, human trials are usually inconclusive, and there is respondent bias. The implications of this survey are that it can be researched in other spheres or with other methods, and that how teenagers interact with social media should be examined.

Introduction

In today's society, social media usage plays a key role in the lives of most teenagers and adults alike. Rarely discussed are the negative repercussions of frequent social media use or the long-term consequences of daily social media use. Previous research has shown a variety of the effects of social media on teenagers across the board, with no one key result, leading to disparities in how frequently social media should be used (Beyens et al., 2020). Excessive usage of social media takes away crucial time from other activities, such as getting enough sleep or performing efficiently in school. Although social media use and sleep have been linked a few times in the past, the effect social media has on the quality and quantity of teenagers' sleep has largely gone unresearched for a conclusive answer. While some studies have attempted to link social media use and sleep quality in adults, they have failed to provide a conclusive answer, and additionally have not looked at the effects amongst American teenagers.

Social media has become a prevalent topic in psychological research, as it is a newer concept and the long-term effects are unknown. Additionally, according to Hjetland, "Adolescents are particularly active users of social media, and their use has been suggested as a contributing factor to mental health issues in this group" (Hjetland et al., 2021). Many researchers focus on the effects of social media on mental health, and while previous studies have been conducted on social media's effect on sleep quality and feelings before sleep, few studies have focused on an in-depth look at teenagers' sleep quality. Despite showing that teenagers are at a crucial point in emotional and physical development, where both sleep and social media use are highly influential, the perspective of teenagers is not often considered, pointing to a gap in the research.

Literature Review

Social Media's Effects on Teenagers

Although a large amount of research has been conducted on social media's effects, many of the studies have not provided a definitive conclusion on whether social media has negative or positive effects. According to Akram and Kumar, "Social media is a term used to describe the interaction between groups or individuals in which they produce, share, and sometimes exchange ideas, images, videos and many more over the internet and in virtual communities" (Akram & Kumar, 2017). In current times, this occurs on a wide variety of platforms including Instagram, TikTok, Twitter, Reddit, Snapchat, YouTube, and many others. The ways that people interact on these platforms vary greatly, so different platforms have varying effects on people's mental health and lives.

The positive effects of social media change from person to person. One study found that social media increased social connectedness, as well as gave a sense of belonging and community to many teenagers (Hjetland et al., 2021). Other studies found that teenagers typically felt better after using social media; Beyens found that "46% felt better, and 10% felt worse" and the other 44% said that social media had little to no perceived effect on their lives (Beyens et al., 2020). Many researchers tend to agree with the analysis of the 44% mentioned before, concluding that social media's effects are not so drastic as to need consideration. A paper published in the British Medical Journal stated that data analyzed from around 13,000 children found that any effects of social media should be considered minor, and not a predictor of life satisfaction and mental health (Mahase, 2019). Based on this research, among many other studies, one could conclude that social media is wholly uninformative in the lives of teenagers. However, many of these effects, such as effects on sleep quality and social lives, are twofold and cannot be taken lightly.

Although there are many listed positive effects of social media, the negative effects could be taken to outweigh any benefits that social media provides. For example, Akram and Kumar cite a reduction in real human contact, lessened creative writing skills, time wastage, loss of motivation, cyberbullying, and poorer health as negative aspects of social media (Akram & Kumar, 2017, page 351). Similarly, the same study done in Norway found that participants had more "perceived stress, body pressure, and displacing [of] other activities such as sleep and homework" (Hjetland et al., 2021). These studies cite that the negative results of social media do not outweigh the positive ones, and additionally claim that social media creates negativity in daily life. Whether the research concludes, however, the general impact of social media, is still undecided.

Importance of Sleep and Dangers of Sleep Loss in Teenagers

A key concept in this study is the importance of sleep among teenagers. One could argue that social media's effects are not large enough to warrant research done on how it affects sleep in adolescents. However, sleep is key in the social, emotional, and physical development of teenagers, and that is crucial in understanding how sleep is affected. As stated by Tarokh, Saletin, and Carskadon, "To summarize, research overwhelmingly supports an important role for sleep in many areas of adolescent brain function and behavior" and that sleep performs a key role "in supporting cognitive function and mental well-being in adolescence" (2016). Additionally, a study performed by Peirano and Algarín, found that "The large amounts of sleep during periods of rapid brain growth, connectivity and synaptic plasticity suggest a role for sleep in brain development" (2007). These studies, among many others, demonstrate that teenagers need sleep in order to properly develop, so getting the best sleep possible is highly critical. Determining the factors impacting teenagers' sleep could help experts to provide suggestions and ways to improve sleep quality.

Many factors can affect a teenager's quality and quantity of sleep, one of them being social media usage. In the literature review conducted by Bryan and Gómez, they cited peer interaction as well as the incorporation of technology and social media as a major reason for teenagers' sleep loss. They found that "up to 44% of U.S. young people between 12 and 18 years of age reported accessing their mobile phones before bed, and up to 55% admitted to using

the Internet at that time (Calamaro, Mason, & Ratcliffe, 2009)” (Bryan & Gómez, 2015, page 117). This statistic shows how frequently teenagers use social media before sleep, and yet there is very little research on the quality of sleep and emotions in teenagers after frequent use of social media before bed. It is important to look further and dive into the effects of social media use before sleep, as very few studies have looked into this connection when social media is known as one of the biggest parts of adolescents’ daily lives.

Social Media’s Found Effects on Sleep

Based on previous research conducted in other countries and among other age groups, social media is proven to cause negative effects on mental health, which contribute to poorer and less sleep. This research can almost certainly be applied to teenagers, aged 13-18, although there is little research to show that this is the case. A study conducted by Garrett, Liu & Young, found that college students who tweeted frequently late at night often had worse sleep quality, compared to those who did not. Their study “suggest[s] that social media use is associated with sleep quality among students” (Garrett et al., 2016). Additionally, Levenson found that “participants with higher social media use volume and frequency had significantly greater odds of having sleep disturbance” (Levenson et al., 2016). Although both of these studies show that sleep is affected by social media, neither one looked at the age range of 13-18, and neither one specified specific effects of social media on sleep, only that there were disturbances. One study, however, addressed both of these gaps. Performed by Scott and Woods, a study was conducted to explore the link between social media use and poor adolescent sleep outcomes. They found that “Nighttime social media use was associated with later bed-times, increased pre-sleep cognitive arousal, longer sleep onset latency and shorter sleep duration” (Scott & Woods, 2018). This study, which addresses what the researcher plans to address, was performed in Scotland, which is not necessarily representative of the US population, and additionally was one of very few that chose to use teenagers (aged 12-18) as their subject group, which justifies why my study should be conducted.

Research Question

As the analysis of the popular literature on social media’s effects on sleep and emotional well-being have shown, teenagers and the topic itself are frequently overlooked when conducting research. Although there is research about the effects of social media on sleep in undergraduate students and adults, there are very few studies about how it affects adolescents, and none have been conducted in the United States. This study will contribute to the information about how social media affects sleep and emotions in adolescents by widening the age range of collected information. It may also uncover new effects since teenagers are self-reporting how social media makes them feel, and how they directly believe it impacts their sleep quality. The researcher plans to address this research with the question: What do high-school-aged students in Southeastern Pennsylvania believe to be the effects of social media on their mental health, more specifically sleep schedules? The method the researcher chose to use in order to answer this question includes a survey of a high school’s student population to compile the effects of social media on adolescents.

Methodology

In order to address the question of what adolescents believe to be the effects of social media on their mental health, an anonymous survey was conducted among the student body of a high school. A survey was the optimal method to answer this research question because it allowed the researcher to conduct a correlational analysis of the results, as well as reach a larger population than other methods would have allowed. It was also chosen over a meta-analysis, as it allowed for high school students to be targeted. No significant amount of data was found about social media use and sleep schedules among teenagers, similarly not in the United States, so a meta-analysis would have been ineffective. The survey was constructed using “Google Forms” and was based on questions from studies that have explored this

topic in other age groups, such as “How do Norwegian adolescents experience the role of social media in relation to mental health and well-being: a qualitative study” and “The Association between Social Media Use and Sleep Disturbance among Young Adults” (Hjetland et al., 2021; Levenson et al., 2016). The researcher did not take any questions directly from the studies; all were original content. Ethical considerations were also considered at the beginning of the study. All questions in the survey were approved by the IRB, and there was a statement at the beginning of the survey informing the participants of the purpose of the research, and that it was completely anonymous and voluntary.

The first section of the survey featured a variety of types of questions in order to analyze the participant’s use of social media, sleep schedule, and daily activities. Multiple choice questions featured asking if the participant to select generalized options of how much time they spent on social media and their sleep data. Multiple-select questions allowed the participant to indicate how busy they were on a typical day and what social media platforms they chose to use. Free-response questions allowed the respondents to give qualitative answers on what they believed to be the effects of social media on their own lives and if they thought social media had any generalized positive or negative effects on peoples’ lives, allowing the researcher to gain qualitative answers without conducting individual interviews.

The next section of questions had the participants respond on a five-point scale with a neutral option. The neutral option allowed for participants to indicate that they believed the statements were not relevant to the topic of the research, or if they were unsure of whether or not they were affected by them. The scale went from one to five, with one signifying “strongly disagree” and five signifying “strongly agree”. One and two indicate that the participant does not think the statement applies to them, three indicates that the participant thinks the statement is untrue or were unsure how to answer the question, and four and five indicate that the participant believes the statement does apply to them.

The final section of questions allowed the researcher to collect demographics as well as ask for any other information that the participant deemed “important or useful” for the researcher to know. This provided an opportunity for the researcher to further receive qualitative results without conducting interviews. However, much of the information left in the open response box was deemed unnecessary. Collecting demographics allowed for the researcher to see if there was any correlation between gender, age, and amount of social media use. It also allowed the researcher to properly distribute the data and attempt to remove sampling bias by creating an even number of responses from all genders and ages and to be more representative of the researcher’s high school student population. Race and ethnicity were not considered as limiting factors of this survey, therefore they were not collected in the demographic section.

In order to narrow down the subject pool, and make the research easier to conduct, the researcher set parameters for the survey ahead of time. Only high school students (grades 9-12) were allowed to participate in the survey. Additionally, the survey was only distributed among the members of one high school to prevent an overwhelming number of responses.

Once the data was collected, the researcher chose to perform multiple correlational analysis tests on the data, comparing each of the variables. The researcher chose a correlational analysis because it was the best test to determine whether or not a relationship exists between the variables, and was easy to find the magnitude of the relationship. In the correlational analysis, the researcher compared the variables of the amount of time on social media, feeling rested throughout the day, what time the respondents went to bed, how much sleep the respondents got, and whether or not the respondents went on social media before going to bed, in order to determine whether or not there is a statistically significant relationship between social media use and sleep schedules.

Quantitative Results

The survey was completed by 447 participants. Certain responses were deemed to be fraudulent by the researcher, due to responses to open-ended questions and inconsistencies between their answers and the majority of answers. The researcher also chose to remove any responses that stated they did not use social media, as they would not fall into the selected criteria, which cut down the total number of responses to 434. Of the respondents, there were: 101 in ninth grade (23%), 93 in tenth grade (21%), 133 in eleventh grade (31%), and 107 in twelfth grade (25%). Compared to the

high school’s actual student population—which is 24% ninth grade, 25% tenth grade, 28% eleventh grade, and 23% twelfth grade—the responses were almost perfectly distributed, which led the researcher to not choose to remove any of the responses not already deemed fraudulent. For their gender, the respondents classified themselves as 144 males (33%), 266 females (61%), 15 non-binary (4%), and 9 who preferred not to say (2%). There was a slight surplus in the ratio of female-to-male responses, but the researcher determined that the responses would be representative regardless of this fact, as social media use seems to be the same across both genders.

Table 1 represents the answers to various questions, allowing the researcher to determine what the majority of participants’ daily lives were like in regard to their sleep schedule and social media use, as well as show what the percentages are for the responses to each question.

Table 1: Question Responses by Percent

Question	Responses	Number of Respondents	Percentage of Total
What time, on average, do you go to bed each night?	8:30 to 9:30	13	3.0%
	9:30 to 10:30	56	12.9%
	10:30 to 11:30	174	40.1%
	11:30 to 12:30	130	30.0%
	After 12:30	61	14.1%
How many hours do you sleep each night?	Less than 4 hours	8	2%
	4 to 5 hours	38	9%
	5 to 6 hours	86	20%
	6 to 7 hours	176	41%
	7 to 8 hours	111	26%
	More than 8 hours	15	3%
How long does it take you to fall asleep each night?	5 - 15 minutes	164	38%
	15 - 30 minutes	162	37%
	30 - 45 minutes	56	13%
	45+ minutes	52	12%
How much time do you spend on social media each day?	0 to 2 hours	149	34%
	2 to 4 hours	186	43%
	4 to 6 hours	78	18%
	6 to 8 hours	16	4%
	More than 8 hours	5	1%
Do you go on social media before you go to bed (1 hour before going to sleep)?	Yes	361	83%
	No	73	17%

Table 2 represents the responses to the Likert scale questions which evaluated what teenagers believed to be the effects of social media on their sleep schedule. The table shows the percentage of people who selected each number for each statement, with 1 indicating strongly disagree, 3 indicating neutrality, and 5 strongly agree.

Table 2: Likert Scale Responses by Percent

Statement	1	2	3	4	5
I think social media affects me negatively.	5%	22%	30%	33%	9%
I frequently use social media before I go to bed.	10%	12%	16%	33%	29%
Going on social media negatively affects my sleep.	18%	25%	22%	25%	10%
I feel like I get enough sleep.	21%	24%	24%	24%	8%
I feel rested when I wake up.	23%	32%	28%	13%	4%
I feel rested throughout the day.	21%	32%	27%	15%	5%

Table 3 represents the correlational analyses that the researcher conducted with the information collected in the survey. They compare multiple variables, such as time on social media, bedtime, time to fall asleep, social media use before bed, and agreement with the statement “I feel rested throughout the day.”

Table 3: Correlational Analysis

Variables in Correlation	Correlational Coefficient	R-Squared Value
Time on Social Media vs. Bed Time	0.0708	0.005
Time on Social Media vs. Agreement with "I feel rested throughout the day."	-0.163	0.0265
Time on Social Media vs. Time to Fall Asleep	0.137	0.0187
Social Media Use Before Bed vs. Time to Fall Asleep	0.029	0.0008
Social Media Use Before Bed vs. Agreement with "I feel rested throughout the day."	0.0558	0.0031

Qualitative Results

Within the survey, there were a few opportunities where the respondents were allowed to give direct feedback to open-ended questions such as “What negatives does social media add to your life?” and “What positives does social media add to your life?” These questions helped the researcher identify common themes among social media users, in order to determine what the respondents considered to be the negative and positive effects of social media.

Effect on Sleep

After analyzing the responses to the question, “Why do you think social media does/does not affect your sleep?” the researcher found that many respondents said that they either did not keep their phone in their room, had limited screen time, or chose to stop going on social media and read instead. Additionally, many respondents cited that social media had a “relaxing nature” and that they felt like they could simply turn their phones off and go to bed. Many people also stated that they utilized Do Not Disturb and the “nighttime mode” on iPhones, which helps their sleep stay undisturbed.

Of the negative responses, many participants stated that the blue light from their phones and other devices were probably more damaging than the nature of social media itself. Of the effects of social media, many said that

they “can’t stop scrolling” or that social media causes mental stimulation and has many emotional effects. Many people also said that they felt the need to finish their conversations with friends or see what people had to say online, and if they woke up in the middle of the night they wanted to see what they missed.

Positive Themes

After analyzing the qualitative responses to the question “What, if any, positives does social media add to your life?” The researcher found a few common responses among the respondents. Many cited that social media was a way for “connectivity” or “connecting with friends.” Additionally, many people said that social media was “good for a laugh” or a popular source of entertainment, which ties into the addictiveness of social media, as once you get entertained on an app, it sucks in your attention. Similarly, a lot of respondents cited using social media as a “stress relief”, which was a surprising finding, as noted later in the paper, seeing that many respondents cited social media as a source of anxiety and stress.

Negative Themes

After analyzing the qualitative responses to the question “What, if any, negatives does social media add to your life?” the researcher found a few common themes among the respondents. Many cited social media as a “waste of time” or “time-suck”, demonstrating the addictive nature of social media. Additionally, social media was frequently cited as a source of “comparison” and “stress”, which reveals that many participants feel negative thoughts about social media. A few respondents also stated that social media “lowers [their] sleep quality,” “affects [their] sleep schedule[s],” and one participant went so far as to say social media was “intentional sleep deprivation.”

Discussion

The study was designed to determine the correlation between the amount of time spent on social media and its effects on sleep schedules and the time that teenagers go to sleep, as well as answer the research question: What do high-school-aged students in Southeastern Pennsylvania believe to be the effects of social media on their mental health, more specifically sleep schedules? In order to perceive whether there was a strong relationship between the two variables, the researcher asked Likert scale questions, conducted a correlational analysis, and analyzed the themes of the open-ended question responses.

Findings

After examining the results of the two methods, it can be concluded that there is a very slight correlation between social media use and an effect on sleep schedules in adolescents. This is proven by the data given in the correlational analysis, the responses to the Likert scale questions, and the themes identified in the qualitative responses.

One statistically significant finding was that 70% of teenagers go to bed between 10:30 and 12:30 (Table 1). Additionally, it takes 75% of respondents 0-30 minutes to fall asleep, and 67% of respondents are getting 6-8 hours of sleep each night. In a study produced by researchers in multiple European countries, it was found that reduced sleep leads to higher levels of suicidal ideation, emotional and peer-related problems, and higher levels of anxiety (Sarchiapone et al., 2014). Additionally, it has been stated that less daytime activity leads to a higher average of how long it takes to fall asleep (Nixon et al., 2009). Although these are not directly correlated to social media, it shows that adolescents are taking longer to fall asleep and getting less sleep than what is recommended by experts, which could have been influenced by today’s society or by the prevalence of social media in people’s lives. Many respondents cited social media as a “time suck” in the qualitative responses, which demonstrates that it can lead to later bedtimes.

Another finding from the survey respondents was that 43% of people spend 2-4 hours on social media every day, which was the category with the highest number of respondents. Additionally, 83% of respondents go on social media before they go to bed. However, the correlational coefficient for the comparison of using social media before bed and how long it takes to fall asleep is 0.029, which shows that there is not a very strong correlation. From inferential statistics, one can assume that there is a slight relationship between using social media before bed and taking longer to fall asleep, but not one that is statistically significant.

From the researcher's correlational analysis, the highest correlational coefficient was from the time on social media versus agreement with the statement "I feel rested throughout the day." The correlational coefficient was calculated to be -0.163, which shows a slight negative correlation. The average amount of sleep each night was 6.3 hours, and the average Likert scale value for this statement was 2.24, which signifies that most participants disagreed with the statement. This was noted this as significant for the findings because it could lead to showing that being on social media during the day leads to worse sleep quality, therefore causing participants to not feel rested throughout the day.

From all of the Likert scale questions administered in the survey, only the most profound ones were included in the results section (Table 2). It was found that most people spend a lot of time on social media, think it negatively affects their sleep, and do not feel rested throughout the day. This corresponds to both the qualitative responses as well as the correlational analyses conducted. From this, it can be determined that although there was not a statistically significant finding from this survey, if it were to be administered in a different way or a different population, it may be found that there is a higher correlation between social media and negative effects on sleep schedules.

Fulfillment of Gaps in the Research

This study aimed to address gaps in prior existing research. Firstly, the aforementioned studies mentioned in the literature review failed to address ages 14 to 18 in their use of social media and sleep schedules, except for one study, which was conducted in Scotland. Additionally, any study conducted among young adults, which would be the most applicable group to high-school-aged students, was conducted in other countries, which don't necessarily apply to students in the United States. The pre-existing literature was conclusive in determining that social media had an effect on sleep but did not include an analysis of the effects in adolescents, which served as the foundation for the gap in this study.

Implications

The results of this study can lead to further investigation into how social media affects brain activity and leads to changes in sleep schedules. Although the results of the study were inconclusive in determining whether or not social media caused a quantifiable effect, there is a slight correlation between spending more time on social media and sleeping less. Those who were not previously aware of the correlation between social media and its effects on sleep can now be informed that going online most likely affects their brain, and other researchers can expand on this issue and the methods of investigating it.

Limitations

As previously noted, some respondents gave seemingly fraudulent answers, which cut down the sample size. Additionally, not all students who responded to the survey use social media, which makes their answers inconclusive, as they do not fall into the category the researcher was attempting to analyze. Another limitation of the study is the lives of the participants. Every day varies greatly from person to person, creating difficulty in analyzing whether social media truly has an effect on sleep schedules in adolescents, which was most likely a major cause of the variances and inclusivity of the data. Some adolescents do not use social media frequently or use it too much, are involved in less or

more outside activities, take easier or harder leveled classes, and are affected by different issues, all of which lead to different sleep patterns, making it difficult to analyze the resulting data. Another limitation to note is that in human surveys, it is hard to get a correlation of more than 0.5, as human nature causes people to act differently in certain spheres. Limitations of the survey method itself include that the respondents may respond or enter the survey with bias and that surveys are very inflexible, and hence cannot adapt to the changing nature of the research process. Both of these could lead to improper data.

Areas for Future Research

This study leads to multiple areas to expand the research and conclusions on how social media affects sleep. Future research can expand to include areas outside of the researched high school in southeastern Pennsylvania to include other regions of the United States and globally, as teenagers may perform differently in other countries, due to social norms and the amount of access to technology. Alternative forms of technology could also be included in the study, such as the amount of time spent using a computer for schoolwork or watching television. One could take this study and distribute it elsewhere or look into other forms of technology to look for more conclusive results. One could also take a more experimental approach to the study, given the time and the resources to do so, and have different groups use social media differently, and see from there if social media affects sleep in a more controlled environment.

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