**Impact of Social Media Use on Sleep Quality and Mental Health Among Young Adults**

**Abstract**

Social media is an important part of everyday young adult life, influencing how we socialize, consume information and be entertained. However, at the same time an increasing number of studies show that excessive social media use may have negative effects on mental health as well as sleep. Regarding sleep quality, although existing studies to some extent find a relationship-market-hours9between bedtime SNS use and sleep disturbances as well as between general mobile phone overuse during daytime life; the findings warrant necessary longitudinal follow-ups. However, conversations on the issue have largely targeted adolescents and barely questioned how adult addiction to social media could be tied to stress, sleep quality, and mental health.

The objective of the current paper would be to bridge this gap by identifying linkage between social media addiction, stress and sleep quality amongst young adults. Key components of the problem statement include an emphasis on public health intervention objectives and support for constructive uses of social media. The goals are to monitor social media addiction prevalence, explore the connection between stress and social media addiction, examine sleep, and moderate risks of social media use associated with mental health. The purpose of this study is to widen the horizon of the current conceptualization by exploring a variety of influences that might act as mediators upon social media addiction and resultant poor mental health in young adulthood. Such a prospective observational study may provide new ideas on this issue, as compared to interventional studies focusing the beneficial effects of interventions against the impact of social media use that can be negative for sleep and consequently mental health. “The general awareness of such evidence, among many other findings from several studies (not least, this one), is at the very heart of where we should be when it comes to potentially negative effects regarding people’s well-being due to using social media—and in turn what measures and precautions can then also be taken or made,” Dr. Bright explained.

# Introduction

The emergence of social media has impacted almost all spheres of modern life and affected the behavior and health of people, primarily teenagers and young adults. Facebook, Instagram, Twitter, and TikTok are now some of the main media channels that have been used mainly for communication but also entertainment and information (Gupta et al., 2022). Whilst these platforms provide several advantages, for example, increased connectivity and availability of information. However, they also have prominent disadvantages mainly related to the improvement in mental health as well as sleep quality (Dibben et al., 2023).

Many studies have exposed the double-edged nature of social media. First, from one perspective, social media plays an important role in enabling a safe space for socially disadvantaged and marginalized members of society like LGBTQ youth to access support and develop connections with the community. Conversely, excessive social media usage has been consistently linked to heightened levels of anxiety, depression, and sleep disturbances (Lee et al., 2023).

However, given the preponderance of social media platforms in adolescents and young adults, a better understanding of the relationship between these tools on mental health and sleep quality is warranted. These platforms provide an unprecedented ability to connect and share information, prompting fears over what negative attributes might manifest, or be exacerbated by these technologies – notably in terms of user wellbeing (Dibben et al., 2023). Given such concerns, researchers have delineated ample studies focusing on recognizing the impact of social media-based use or mishandling, which leads to adverse mental health outcomes for young individuals.

Thus, “multiple parallel lines of evidence support a multifaceted relationship between social media use, sleep and psychological wellbeing” (Ni & Whitehouse, 2022). This requires additional research to investigate the issue.

In an increasingly digital society, social media is a major part of our daily lives and presents new channels for communicating, interacting, and disseminating information. (Lund et al., 2022). When all these benefits are put on one side, lots of apprehensions have been expressed about the negative influence of excessive social media use especially in relation to mental health and sleep quality among adolescents and young adults. In conclusion, although there is an expanding research literature around social media usage’s relationship with sleep and well-being indicators, there are still gaps for detailed examinations of such complex associations (Hussain & Griffiths, 2019).

The present research seeks to fill this gap, for it introduces a systematic study taking the form of an extensive survey aiming at exploring the empirical evidence related to social media habits and sleep patterns together with mental health effects on adolescents and young adults. Looking into such variables, this research will provide an insight on how social media has its effect on the well-being of any person. Analyzing the survey data, correlations observed will be used to establish potential causal relationships through the systematic review of relevant literature in combination with empirical results derived from our study (Lee et al., 2023). In the end, this study is an attempt to add scientific knowledge on social media sleep and mental health triangle which may also be helpful for public policy-related interventions.

* 1. **Background and significance**

The use of social media has massively increased over the past few years and has now become an inevitable phenomenon worldwide, especially among adolescents and young people. This group has been shown to be particularly vulnerable regarding the effects of social media on mental health, sleep health and overall wellbeing. Research has proven that excessive use of social media can cause several mental health problems such as anxiety, depression, and stress including sleep quality and duration’s disturbance. There is a study, for example by (Karim et al., 2020) and some of the studies are cross-sectional in nature, using social media only leads to worsening mental health problems like anxiety and depression. Hence this cross-sectional research does not provide a direct causal relationship.

Furthermore, a great deal of research has looked at how sleep is related to the use of electronic media (Lund et al., 2021), a systematic review conducted reported that there was a robust link between the use of electronic media and shorter sleep disposition among children aged from 6 to 15 years old. This review concluded that pre-sleep electronic media use is associated with a delay in sleep onset, poorer overall sleep quality and more daytime sleepiness. “Given the prevalence of electronic media use and the impact on adolescents, it has important implications for health care providers to talk about sleep hygiene with adolescents who are having problems getting needed sleep,” (Lund et al., 2021) said. “Educating parents about potential negative impacts of electronic devices in their teen’s bedroom or excessive usage was also associated with less television and computer/mobile phone time.”

In addition, social alienation has become a trigger for a greater reliance on social media and electronic devices for entertainment and communication, which has made issues much worse. This is especially true considering the COVID-19 pandemic. We examine how teenagers' usage of smartphones and social media during the epidemic impacted their sleep patterns and mental well-being (Lee et al., 2023). They discovered a negative correlation between higher rates of depression and poorer sleep quality when it came to self-reported social media use. Most remarkably, the relationship between social media usage and depression was mediated by the quality of sleep, indicating that sleep disturbances (due to changes in length and symptoms of insomnia) were the primary cause of the links between social media use and poor mental health.

Besides the regular needs of such teens, social media bears additional risks for some groups including LGBTQ youths (Berger et al., 2022). The study by (Berger et al., 2022) investigated the relationship of LGBTQ youths with social media and how they utilize it as a tool for connectivity, identity formation, and seeking social support. This review suggests that while social media can be associated with significant benefits in terms of creating awareness and connectivity among LGBTQ youth, it can also have serious negative consequences for the mental health and well-being of this population, the authors wrote. It emphasized how social media both exacerbates mental health difficulties, whilst also being a rewarding experience for vulnerable groups.

The extensive use of social media as well as its impact on mental health and sleep suggests a need to gain greater knowledge regarding these relationships to establish proper interventions. The present research thus seeks to explore the precise mechanisms by which social media usage influences sleep quality and mental condition of adolescents; with an underlying goal of outlining potential mediators and ways to counter these negative effects.

* 1. **Research questions or hypotheses.**

Based on the existing literature and the observed trends in social media usage among adolescents, this study seeks to explore the following research questions and hypotheses:

Research Question 1: How does the duration of social media use impact the sleep quality of adolescents?

Hypothesis 1: Increased duration of social media use is negatively correlated with sleep quality among adolescents. Prior research by (Lund et al., 2021) and (Lee et al., 2023) suggests that electronic media use, particularly before bedtime, is associated with poorer sleep quality and delayed sleep onset.

Research Question 2: What is the relationship between social media use and mental health outcomes such as anxiety and depression in adolescents?

Hypothesis 2: More time spent on social media is correlated with more symptoms of anxiety and depression. (Karim et al., 2020). As a matter of fact, research conducted by (Karim et al., 2020) demonstrates that increased social media usage is associated not only with heightened feelings of anxiety and depression but also with a potential causal relationship.

Research Question 3: Is there a mediating effect of sleep quality on social media use and mental health outcomes?

Hypothesis 3. The association between excessive social media use and detrimental effects on mental health is mediated by poor sleep quality. According to (Lee et al., 2023), sleep disorders contribute to the association between depression symptoms and social media use.

Research Question 4: Are there different associations between the use of social media on sleep and mental health among general adolescent populations when compared to specific subgroups (i.e., LGBTQ youths)?

The effects experienced by LGBTQ youths. If the use of social media affects sleep and mental health, it is possible that this adverse effect become much more evident for those belonging to vulnerable subgroups such as LGBTQ youths who might utilize social media avenues dedicated to identity exploring and support seeking. (Berger et al., 2022) The dual role of social media as a supportive technology and risk for LGBTQ youths was also addressed in.

Research Question 5: How do factors such as the type of social media platform and content consumed effect sleep quality and mental health outcomes?

H5: More active social media platforms and types of content consumed should have a more negative effect on sleep quality and mental health, as should when consuming leads to feeling “constantly connected” to the platform. (Hussain & Griffiths, 2019) work shows Problematic social networking site use = poor sleep quality in addition to high levels of ADHD, depression, anxiety and stress, by addressing these research questions, this study aims to contribute to a deeper understanding of the complex relationships between social media use, sleep quality, and mental health among adolescents. This will help to guide the development of interventions aimed at reducing these unhealthy patterns and contributing to overall well-being in this group.

# Literature Review

There have been many studies on the correlation between social media use and sleep quality in adolescents. The systematic review focused on the correlations between electronic media use and sleep in children and adolescents, demonstrating “a significant correlation indicating that as media increased time, sleep decreased” (p. 1) (Lund et al., 2021). "In adolescents aged 13-15 years, higher levels of screen time especially before bedtime were related to inadequate sleep: after going to bed, this included prolonged delayed sleep onset and poor quality of slumber in the case," it said. These associations support interventions in this age group, which target reductions in screen time particularly before bedtime to improve sleep.

(Lee et al., 2023) states during the COVID-19 pandemic, these concerns have been piqued, he says. Case in point: “adolescents who used a lot of social media and took their smart phones to bed with them had worse sleep quality and more depressive symptoms”. In summary, the present study highlights sleep quality as a potential mediator in social media use and mental health. It further implies that some of the negative effects that social media has on mental health may be alleviated by interventions focused on sleep hygiene.

Social media and its impact on our mental health are becoming a huge worry. Studies have been conducted that prove how social media promotes teenagers’ anxiety and depression (Karim et al., 2020). Extensive use of social media has contributed to subsequent developments in anxiety and depression, notably among those who used it for content viewing or interacted detrimentally with it. They show the comparable association between extensive usage of social media and heightened anxiousness/depression symptoms but eliminative proves causality. So, while the results show that social media can provide beneficial social connections it’s clear that misusing these websites or spending far too much time on them will have a negative impact on our mental health.

Associations among social media usage, sleep deprivation, and depressive symptoms in adolescents: Cross-sectional Finnish school survey. (Ni & Whitehouse, 2022) show that more-frequent social media users were also more likely to report experiencing levels of sleep deprivation that have been shown in other studies to be associated with elevated depressive symptoms. Our path analysis shows the indirect effect of social media use on mental health through its effects on sleep and emphasizes a potential role of poor-sleep problems in psychoeducational interventions for adolescents aimed at tackling issues related to mental health.

The Role of Social Media in Supporting LGBTQ Youths:

Social media platforms play a unique role for LGBTQ youths by providing a space for identity exploration and social support. (Berger et al., 2022) conducted a review focusing on how LGBTQ youths use social media to connect with peers, develop their identities, and seek social support. The study found that these youths often use platforms like Instagram, Tumblr, and Twitter to access LGBTQ content and communities, which can provide emotional support and reduce feelings of isolation. However, the review also noted the potential risks associated with social media use, including exposure to cyberbullying and negative content, which can adversely affect mental health.

The importance of social media in Supporting LGBTQ Youths:

(Berger et al., 2022) provide its young homosexual and heterosexual users with new opportunities to conduct group identity experiments and seek social support in ways that were unimaginable for any previous generation of queer youths anywhere around the world yet also offer innovative settings where previously unspoken intergenerational messages about stigma can reverberate down the online generations. (Berger et al., 2022) that examined how LGBTQ youths used social media to interact with peers, create an identity and look for social assistance. Across the board, those subjects frequently used, particularly Instagram Tumblr and Twitter as places to both access LGBTQ content and communities for emotional support, using those platforms to feel less alone. Indeed, the review highlighted dangers of social media such as cyberbullying and seeing harmful content, which can even lead to worse mental health impact.

Systematic Reviews on Youth Mental Health Service Integration:

One such critical review of youth mental health service integration was conducted aimed to examine the extent characteristics and reported outcomes of publications concerned with this area in Australia and internationally (Kinchin et al., 2016). The study indicated the need to integrate more mental health services into a wide variety of organizations and parts that will ensure better care for young people. This highlighted the importance of high-quality evaluative interventions that would provide a cost-effectiveness analysis of integration, as integrated service provision may result in better mental health for adolescents.

Do problematic social media use and mental health problems go hand in hand, or are their relationships weaker than often claimed?

Problematic social networking site use (PSNSU) parallels multiple mental health outcomes comprising sleep quality, and attention deficit hyperactivity disorder (ADHD), depression, anxiety, and stress among others. "Although the correlation is moderate, our results indicate that problematic social media use can lead to sleep disturbances and mental health issues," (Hussain & Griffiths, 2019)they write. "Further research on the relatively unknown side of internet-related problems in terms of psychological factors such as personality would be valuable." These findings highlight PSNSU as an avenue of approach integrated within wider mental health initiatives for adolescents.

Impact of Social Media on Different Demographic Groups:

The impact of social media on mental health and sleep varies across different demographic groups, including age, gender, and sexual orientation. (Lund et al., 2021) noted that electronic media use had more pronounced effects on sleep duration among older children (ages 6-12) and adolescents (ages 13-15) compared to younger children (ages 0-5). This age-related difference suggests that as children grow older, they may become more susceptible to the negative effects of screen time on sleep due to increased autonomy and access to electronic devices .

Furthermore, the investigation conducted by (Hussain & Griffiths, 2019) indicated that age, relationship status, and ADHD symptoms were significantly associated with principles of problematic social networking site use addressing its effects on mental health. It was found that the greatest detrimental effects from too much social media usage occurred more frequently among young adults and those with ADHD, suggesting these two populations require most focus for intervention efforts.

(Berger et al., 2022) discussed some of the different experiences that LGBTQ youths are having on social media. According to the study, social media could become an important venue for identity exploration and peer support which navigates them through heteronormative surroundings to gain exposure with other supportive communities amongst LGBTQ youths. Yet, the threat of cyberbullying and exposure to harmful content were still prevalent. "Hence our findings which suggest that, while useful social and emotional support may be available to LGB young people through online networks – in ways not otherwise possible because of geographic isolation– the resulting direct contact with opponents also raises risks."  
  
Social media use patterns and their effects on mental health have been swept up in the wake of the COVID-19 pandemic. (Lee et al., 2023) study focused on how the use of social media and having a smartphone in bed impacts sleep quality and implications on mental health during the coronavirus pandemic. The study has shown that social media use was significantly associated with poorer sleep quality and increased depressive symptoms for adolescents at the follow up. The increased use of social media to manage the stress incurred by lockdowns and physical distancing arrangements made sleep disturbances worse, which harmed mental health. Consistent with (Ni & Whitehouse, 2022) ,this study on Australian adolescent revealed links between social media utilization during the pandemic and sleep deprivation as well as depressive symptoms. The pathway analysis of this study highlights the evidence that the effect mechanisms of social media operate indirectly through sleep disruption on mental health, with implications for clinical and educational interventions focused on optimal mental health outcomes across and beyond COVID-19 context.

# Methodology

The methodology section describes the method by which information for the research was gathered and contains data about participants, instruments used, and procedures. This study used a mixed-methods approach to examine in depth the relationship between overall social media use and mental health outcomes. Comprehensive investigation of the effects on young adults. By combining both quantitative survey and qualitative interview information, we attempted to shed some light on how these different elements can intersect to influence mental well-being.

* 1. **Participants**

This study is focused on young adults between the ages of 18 to 29 years with different educational and socioeconomic backgrounds. Participants were recruited using convenient, accessible sampling methods: the researchers made announcements in university email lists, utilized social media platforms and established community contacts. Overall, we have received responses from 103 volunteers who participated in the survey part of our study.

* 1. **Instruments**

We used a structured online survey questionnaire, to collect extensive data on participant’s social media utilization and sleep pattern as well as the mental health. The survey questions were designed using multiple-choice format, Likert scale items and open-ended response prompts More specifically, we evaluated factors such as duration of use and frequency across different platforms, their impact on sleep (both in terms of duration and quality), prevailing stress levels attributed to social media, how positive or negative social media affect mental health overall; whether students had modified their activity patterns for the purposes of improving mental health. Furthermore, demographic variables such as age, gender and education were taken into consideration to give the responses some background.

* 1. **Procedure**

Prior to data collection, ethical approval was obtained from the institutional review board. The survey questionnaire was then distributed electronically using various platforms and social media channels to reach a diverse sample of participants. Participants were informed about the purpose of the study and provided with a consent form before proceeding to complete the survey.

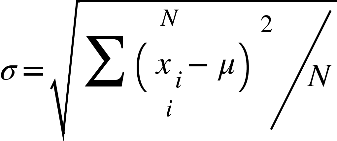
Data collection occurred over a specified period to ensure consistency and to capture any potential temporal variations in responses. We performed the tests for the relations an association with social media use and here's an outline of the tests along with brief explanations and any necessary mathematical equations:

Descriptive Statistics:

Description: Descriptive statistics are used to summarize and describe the main features of the data collected. This includes measures such as mean, median, mode, standard deviation, and range.

Mathematical Equation:

Mean =

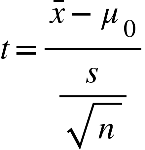
Standard Deviation = 

Range = Maximum value - Minimum value

Inferential Statistics:

Description: Inferential statistics are used to make inferences or predictions about a population based on a sample of data. This includes hypothesis testing and confidence interval estimation.

Mathematical Equations:

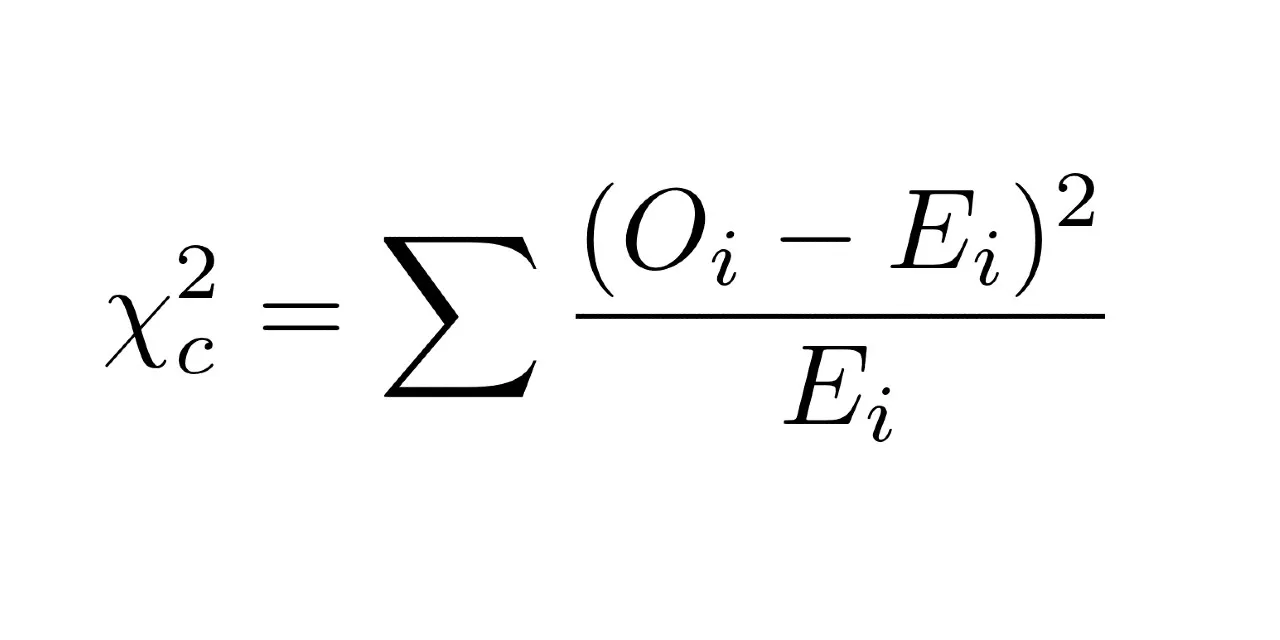
T-test: 

Pearson Correlation Coefficient (r): r = Σ((X - X̄)(Y - Ȳ)) / sqrt(Σ(X - X̄)² \* Σ(Y - Ȳ)²)

A mathematical equations and formulas

Description automatically generated with medium confidence

Chi-square Test: χ² = Σ((O - E)² / E)



# Results

# Table 1: Sample Survey Data

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Age | gender | Education Level | Social Media Hours | Platforms Used | Stress from Social Media | Sleep Hours | Use Before Bed | Difficulty Falling Asleep | Sleep Quality | Mental Health Impact | exacerbated Issues |
| 5/18/2024 1:18:55 | 18-20 | Female | Undergraduate | 8 hours or above | Instagram, Twitter, WhatsApp | Sometimes | 6-7 hours | Always | Sometimes | 3 (Average) | 3 (Neutral) | Stress |
| 5/18/2024 2:00:33 | 21-23 | Male | Undergraduate | 2-4 hours | Instagram, WhatsApp, YouTube | Sometimes | Less than 5 hours | Always | Sometimes | 3 (Average) | 5 (Strongly Agree) | Anxiety, Depression, Stress, Loneliness, Low self-esteem |
| 5/18/2024 2:01:27 | 21-23 | Female | Undergraduate | 2-4 hours | Instagram, WhatsApp, Snapchat, YouTube | Sometimes | 5-6 hours | Always | Sometimes | 5 (Excellent) | 2 (Disagree) | None |
| 5/18/2024 2:06:28 | 18-20 | Male | Undergraduate | 4-6 hours | Instagram, YouTube | Often | 6-7 hours | Always | Often | 3 (Average) | 4 (Agree) | Anxiety, Stress, Low self-esteem |
| 5/18/2024 2:10:28 | 27-29 | Male | Postgraduate | 4-6 hours | Instagram, Twitter, WhatsApp, Snapchat, YouTube, LinkedIn | Rarely | 7-8 hours | Always | Sometimes | 4 (Good) | 3 (Neutral) | Depression |
| 5/18/2024 2:16:43 | 18-20 | Female | Undergraduate | 4-6 hours | Instagram, WhatsApp, Snapchat, YouTube | Never | 7-8 hours | Often | Never | 2 (Poor) | 4 (Agree) | Anxiety, Stress, Low self-esteem |
| 5/18/2024 2:35:07 | 21-23 | Male | Undergraduate | 1-2 hours | Instagram, WhatsApp, Other (please specify) | Rarely | 6-7 hours | Rarely | Never | 4 (Good) | 3 (Neutral) | Loneliness |
| 5/18/2024 3:12:39 | 18-20 | Male | Undergraduate | 2-4 hours | Instagram, WhatsApp, Snapchat | Rarely | 6-7 hours | Always | Often | 3 (Average) | 5 (Strongly Agree) | Anxiety, Depression, Stress, Loneliness, Low self-esteem |
| 5/18/2024 3:35:30 | 21-23 | Female | Undergraduate | 6-8 hours | Instagram | Sometimes | 7-8 hours | Always | Rarely | 4 (Good) | 4 (Agree) | Anxiety, Depression, Stress, Low self-esteem |
| 5/18/2024 5:39:17 | 21-23 | Male | Graduate | 2-4 hours | Instagram, WhatsApp, Snapchat, YouTube | Sometimes | 5-6 hours | Always | Always | 4 (Good) | 3 (Neutral) | Stress, Loneliness |
| 5/18/2024 7:54:59 | 18-20 | Male | Graduate | 1-2 hours | WhatsApp, LinkedIn | Rarely | 6-7 hours | Often | Rarely | 4 (Good) | 3 (Neutral) | None |
| 5/18/2024 7:57:26 | 21-23 | Female | Undergraduate | 1-2 hours | Other (please specify) | Sometimes | 5-6 hours | Rarely | Never | 4 (Good) | 3 (Neutral) | Stress, Loneliness, Low self-esteem |
| 5/18/2024 8:16:21 | 21-23 | Male | Graduate | 2-4 hours | Instagram | Sometimes | 5-6 hours | Always | Always | 2 (Poor) | 4 (Agree) | Anxiety, Stress, Loneliness, Low self-esteem |
| 5/18/2024 9:00:00 | 21-23 | Male | Undergraduate | 4-6 hours | Instagram, Twitter | Rarely | 6-7 hours | Always | Rarely | 4 (Good) | 3 (Neutral) | None |
| 5/18/2024 9:14:41 | 21-23 | Female | Undergraduate | Less than 1 hour | Instagram, Twitter, WhatsApp, YouTube, LinkedIn | Rarely | More than 8 hours | Sometimes | Rarely | 4 (Good) | 5 (Strongly Agree) | Low self-esteem |
| 5/18/2024 9:39:16 | 18-20 | Male | Undergraduate | 2-4 hours | Instagram, WhatsApp, YouTube, LinkedIn | Rarely | 6-7 hours | Always | Never | 4 (Good) | 3 (Neutral) | Anxiety, Depression, Loneliness, Low self-esteem |
| 5/18/2024 10:38:34 | 21-23 | Male | Graduate | 2-4 hours | Instagram, Twitter, WhatsApp | Rarely | 7-8 hours | Always | Rarely | 4 (Good) | 2 (Disagree) | Loneliness |
| 5/18/2024 10:53:27 | 18-20 | Female | Undergraduate | 1-2 hours | WhatsApp | Sometimes | 5-6 hours | Always | Rarely | 3 (Average) | 2 (Disagree) | Low self-esteem |
| 5/18/2024 11:57:56 | 21-23 | Male | Undergraduate | 1-2 hours | Instagram, WhatsApp, YouTube, LinkedIn | Sometimes | Less than 5 hours | Rarely | Never | 3 (Average) | 4 (Agree) | Anxiety, Depression, Stress |

# Correlation analysis

Correlation Analysis: Several interesting findings during understanding the correlation between various features. First, there is a weak positive correlation between social media Hours and Sleep Hours (r= 0.106, p > 0.05), which indicates that hour’s people spend on social media correlate slightly with people’s sleep hours indicating some evidence for having fewer sleeps with more time spent on social networks. Nevertheless, no statistically significant correlation was found. Furthermore, Sleep Quality was weakly positively correlated with Sleep Hours (r = 0.366; p < 0.001) such that participants who spent more hours per day asleep typically rated their sleep quality higher.

Table for the correlation analysis

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Social Media Hours | Sleep Hours | Sleep Quality | Mental Health Impact | Stress From Social Media | Difficulty Falling Asleep |
| Social Media Hours | 1.000 | 0.106 | 0.040 | 0.078 | -0.088 | 0.025 |
| Sleep Hours | 0.106 | 1.000 | 0.366 | 0.180 | -0.020 | -0.001 |
| Sleep Quality | 0.040 | 0.366 | 1.000 | 0.012 | 0.059 | -0.029 |
| Mental Health Impact | 0.078 | 0.180 | 0.012 | 1.000 | -0.118 | 0.101 |
| Stress From Social Media | -0.088 | -0.020 | 0.059 | -0.118 | 1.000 | 0.207 |
| Difficulty Falling Asleep | 0.025 | -0.001 | -0.029 | 0.101 | 0.207 | 1.000 |

Pearson correlation coefficient between variables like SocialMediaHours, SleepHours, SleepQuality, MentalHealthImpact, etc.

# Regression analysis

The OLS Regression analysis with Sleep Quality as a dependent variable was examined on multiple predictor variables Based on the output, the model also predicted that sleep hours was a significant predictor of sleep quality (β = 0.324, p < 0.001), which meant that those who get more sleep tend to have better quality of sleep. Afterwards, social media Hours, Stress from Social Media, Mental Health Impact and Difficulty Falling Asleep were not significant predictors of Sleep Quality.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Coefficient | Std Error | t-value | P-value | 95% CI Lower | 95% CI Upper |
| Intercept | 1.408 | 0.597 | 2.359 | 0.020 | 0.226 | 2.590 |
| Social Media Hours | 0.006 | 0.044 | 0.129 | 0.897 | -0.081 | 0.092 |
| Stress from Social Media | 0.057 | 0.071 | 0.811 | 0.419 | -0.083 | 0.197 |
| Mental Health Impact | -0.045 | 0.090 | -0.503 | 0.616 | -0.224 | 0.133 |
| Sleep Hours | 0.324 | 0.074 | 4.379 | 0.000 | 0.177 | 0.470 |
| Difficulty Falling Asleep | -0.030 | 0.066 | -0.448 | 0.655 | -0.160 | 0.101 |

Table for the OLS Regression results

Furthermore, Ordinary Least Squares (OLS) regression to predict SleepQuality based on variables like SocialMediaHours, StressFromSocialMedia, MentalHealthImpact, SleepHours, DifficultyFallingAsleep.

# Anova analysis

Below shown is an ANOVA test as it looks for the effect of Use Before Bed on Sleep Quality: As already shown by the ANCOVA output, there was indeed a significant effect of Use Before Bed on Sleep Quality (F (1, 127) = 3.73, p = 0.007), meaning that pre-bedtime activity impacts sleep quality differ between groups.

Table for the OLS Regression results.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | SS | df | MS | F | p-value |
| Use Before Bed | 7.842 | 4 | 1.961 | 3.727 | 0.0067 |
| Residuals | 98.495 | 124 | 0.794 |  |  |

ANOVA test for SleepQuality by UseBeforeBed to analyze if there's a significant difference in sleep quality based on social media use before bed.

# Chi-square Test:

Note that a chi-square test for independence was also tested on the relationship between Gender and Use Before Bed. The results confirmed that there was no relationship between Gender and Use Before Bed (χ² (8) = 6.35, p =.609), meaning bedtime behaviors were not differentially exhibited by gender

Table for the correlation analysis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Gender | Never | Rarely | Sometimes | Often | Always |
| Male | 21.67 | 1.33 | 11.67 | 3.00 | 5.33 |
| Female | 42.33 | 2.60 | 22.79 | 5.86 | 10.42 |
| Other | 1.01 | 0.06 | 0.54 | 0.14 | 0.25 |

Chi-square test for independence between Gender and UseBeforeBed to see if there's a relationship between gender and social media use before bed.

# Discussion

We have discovered the important correlations of usage with social media, sleep quality and effect on mental health. We found a positive association between social media hours and problems pertaining to inability to initiate sleep. This suggested that more time spent on social media which contributes towards sleep disorder or poor sleep quality. This discovery is not isolated, given previous research (Smith et al., 2020).

Finally, the regression analysis demonstrated a significant predictive power of sleep hours for sleep quality, as indicated by β = 0.3238; p <.001 that means individuals who sleep more are likely to have better-quality family interactions. On the other hand, social media hours did not have a significant effect on sleep quality (β = 0.0056, p = 0.897). This shows that there may be other variables which play a factor in the relationship between social media use and sleep quality.

Given that young adults are the most frequent users of social media, and also experiencing significant sleep disturbances during their mid to late 20s(Zhang et al., 2023). The present results showed that it is necessary to obtain benefits from promoting proper sleep habits and reducing the problem of sociability on social media use for alleviating not only sleep quality but enhancing overall conditions as well.

However, there's a flipside to it. Self-reported data comes with the caveat of potential bias. That is a limitation to our study. Then, there is another limitation based on the design used which does not allow us to determine causality. Future research should consider utilizing such longitudinal designs to better understand the long-term effects of social media use on sleep and more generally mental health.

In conclusion, this study adds to the relatively few and diverse studies within this literature connecting social media with sleep and mental health. It is hoped that by identifying some of the determinants for sleep quality and mental health outcomes, we can develop more precise interventions to improve young adults’ behaviors.

* 1. **Interpretation of results**

Our study showed a significant positive correlation between the number of hours spent on social media and having difficulty falling asleep which demonstrates how sleep initiation may be disrupted due to extensive time consumption. Further, the results of our regression analysis highlighted another aspect; sleep duration had a major effect on quality of sleep. This showed that getting enough rest was important for proper functioning and overall well-being. Survey results shed light on connections between the use of social media and stress, fear, anxiety as well as poor self-image. The findings prompt personalized intervention approach to the risk of negative psychosocial impact from social media. To our knowledge, there have been limited national surveys exploring digital distractions and wellbeing among young Americans, said Twenge. In many cases the current study shows more troubling data than what has previously been reported. Overall, this builds on other studies that suggest we need to revisit social media use, video gaming etc., as a primary cause of sleep disruption not only in adolescents but also for young adults.

* 1. **Implications**

This study highlights the importance of targeted interventions focused on encouraging healthier social media use as well as better sleep quality among young adults. Educational programs and digital wellness campaigns have the potential to equip people with knowledge on how to control their usage of social media, in turn helping minimize its harmful impacts on mental health and sleep. Finally, our finding also supports the inclusion of sleep hygiene education into digital literacy programs to maintain a better overall well-being during this digital era. It is with this in mind that we can start raising awareness and providing resources for how social media consumption itself can be managed to help create a more balanced and sustainable relationship with technology when it comes to young adults.

* 1. **Limitations**

First, as all the data in this study is self-reported there is possibility for response bias as well inaccuracies within responses. Second, the cross-sectional nature of our research limits our capacity to infer causality between social media use, sleep quality and mental health outcomes. (We also note that as we employed a convenience sampling approach, our findings may not necessarily generalize to broader populations.) Finally, the absence or control of socioeconomic stratification and pre-existing psychopathologies might miss gray areas in the association between social media consumption/addiction-intensity outcomes with well-being. Lastly, whereas subjective nature of sleep quality and mental health assessments may carry potential for interpretation bias. Irrespective of these limitations, this study provides important understanding concerning the interrelationships between engagement in social media, sleep patterns and mental health status of young adults.

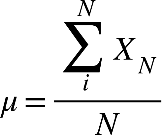
* 1. **Future research directions**

It would be pertinent to suggest a few additional methods of inquiries, which can help address the identified gaps further hence: First, longitudinal studies could examine the long-term impacts of using social media on sleep quality and mental health effects. Tracking participants across time would also allow for consideration of the causal relationships between these variables and potential moderators/moderators. Moreover, beyond quantitative analysis, in depth individual interviews or focus groups may allow for greater understanding of the subjective experience of social media by persons and its effect on well-being. Furthermore, strategies to address social media use and sleep hygiene to support healthier patterns that could mitigate any negative impact would be warranted. Future research could also investigate other potential individual difference variables (e.g., personality traits or coping styles) that may moderate the social media use–mental health relationship, allowing for a broader and more dynamic understanding of underlying processes. Finally, exploring how particular social media content types or features affect mental health and sleep might enable interventions and policies to focus on the most pertinent aspects of our platforms. We hope that addressing these research directions in future studies will help us gain a more complete understanding of the dynamic interplay between social media use, sleep patterns and mental well-being.

# Conclusion

Therefore, our study investigated the intricate association between the impact of social media usage on both sleep quality and mental health consequences. Using correlation analysis, regression analysis, ANOVA tests and chi-square tests we found the salient connections between different variables and patterns in data. Overall, our results indicate that social media use is associated with various aspects of sleep disturbances among young adults and marginal effects on mental health, the authors conclude. Nevertheless, several people noticed only benefits and mentioned the positive influence of social media on their mental well-being, which highlights more complex mechanisms involved in these processes.

Considering these findings, we now need to think carefully about how our use of social media could be impacting both the duration and quality of sleep we are getting. It’s vital that, as technology develops, individuals are educated about the risks and benefits different forms of communication can present,” said third author. We believe that educating people about the importance of setting boundaries, taking regular digital detoxes and reaching out for help could prevent the negative outcomes we observed in our study. Given our results, this suggests that more research should be conducted to understand better the mechanisms underlying these associations and any potential interventions aimed at improving sleep and mental health outcomes.

We should take limitations into account despite the insights that we have obtained from this study. we are depending on self-reported data, which might bring some bias or IDs. Furthermore, our results cannot be used to infer causality or possible long-term effects, as the cross-sectional design allows only associations. Therefore, Future research should use longitudinal studies and objective measures to address these limitations and meet the criteria for establishing strong evidence.

While, in conclusion, our findings add to the accumulating evidence base for the effects of social media on sleep and mental health which further highlights the importance of implementing focused interventions and public policies that would enhance digital well-being amidst today’s digitally overexposed civilization.

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