

Increased social media usage leads to a decline in mood, especially in the evenings.

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Abstract—This research examines the potential effects of prolonged social media use on mood declines during the evening hours. Utilizing a survey methodology, we gathered data from 90 participants ranging in age from 13 to 65+, with a majority falling between 18 to 34 years old. The survey collected information on the duration of social media usage, evening mood assessments, and perceptions of how social media impacts mood. The study was structured to determine if there is a statistically significant relationship between evening social media use and mood alterations, implicitly testing the assumption that social media use does not influence evening mood against the possibility that it does. Employing a chi-square test of independence, our findings, indicated by a p-value greater than 0.1, support the former assumption. The results led to the acceptance of the null hypothesis, confirming that there is no statistically significant evidence that social media usage in the evening affects mood. This conclusion highlights the complexity of interactions between social media usage and emotional well-being and underscores the necessity for further research with broader participant samples to more deeply understand this relationship.

I. INTRODUCTION

In the digital age, social media has become an integral part of daily life, profoundly influencing various aspects of human behavior and psychological well-being. As the use of platforms like Facebook, Instagram, and Twitter continues to rise, concerns have also grown about their potential negative effects on mental health. One particular area of concern is the impact of social media on mood, especially during evening hours—a critical time for relaxation and sleep preparation. The prevailing thought is that high engagement with stimulating social media content during this time might lead to mood declines. Investigating the impact of social media on mood is crucial due to the increasing prevalence of mental health issues among populations with high digital engagement. Previous research has identified correlations between extensive social media use and symptoms of anxiety and depression, indicating that mood disturbances might be exacerbated by evening use of these platforms. Understanding how social media can affect mood in the evenings is essential for developing targeted interventions aimed at mitigating its negative psychological impacts. This study challenges the common hypothesis by testing the assumption: "Increased social media usage in the evenings leads to a decline in mood." This hypothesis is grounded in the theory that the overstimulation from evening social media exposure disrupts natural winding-down processes, potentially

affecting sleep quality and mood regulation. However, contrary to widespread concerns, our findings suggest that there is no statistically significant evidence to support that evening social media usage affects mood adversely. This result points to a more complex relationship between social media use and mood than previously thought. By focusing specifically on evening hours, this research aims to clarify the temporal dynamics of social media usage and mood changes, addressing a gap in the current understanding. The outcome of this study could reshape public health strategies and recommendations for social media use, emphasizing the necessity for further research to explore other potential factors influencing mood in the context of social media engagement.

II. LITERATURE REVIEW

The proliferation of social media has transformed human interaction and communication, offering unprecedented connectivity. However, alongside these benefits, a growing body of research suggests significant psychological impacts associated with prolonged social media use. Researchers such as Twenge and Campbell (2019) [3] have linked high social media usage with increased levels of anxiety and depression, particularly among adolescents and young adults. These effects are often attributed to the nature of interactions and the intensity of information flow on these platforms (Twenge & Campbell, 2019) [3]. Research exploring the diurnal patterns of mood in relation to social media presents compelling insights. Kross et al. (2013) [4] indicate that mood deterioration linked with social media use is most significant during the late evening hours. This period coincides with a natural decline in positive affect as part of the circadian rhythm, which may be exacerbated by negative social media interactions or overstimulation (Kross et al., 2013) [4]. The Stimulus-Response Theory posits that social media acts as a stimulus that can elicit a psychological response, potentially leading to mood alterations. Conversely, the Cognitive Behavioral Theory suggests that the cognitive processing of social media content can influence emotional states, particularly if the content is negative or distressing (Beyari, 2023) [1]. The Chi-square test of independence is commonly used in social media research to analyze whether variations in one categorical variable are independent of another. In the context of social media studies, it is particularly useful for examining the relationship between

categorical variables such as social media use (e.g., high vs. low usage) and mood outcomes (e.g., improved vs. worsened mood). This statistical method helps researchers determine if observed differences in survey responses across different groups are statistically significant (Dreier et al., 2024) [2]. Recent empirical studies provide a nuanced view of the association between social media use and mental health. Beyari (2023) [1] discusses how social media features like likes, comments, and followers significantly affect mental health, emphasizing the complex relationship between social media usage and psychological well-being (Beyari, 2023) [1]. Dreier et al. (2024) [2] found that increased social media 'screen time' and frequent checking were associated with positive mood changes on the same day, challenging the typical narrative that social media only harms mood (Dreier et al., 2024) [2]. The literature reviewed underscores the potential adverse effects of social media on mood, particularly emphasizing evening usage. It suggests a complex interplay between the timing of social media interactions and their intensity, impacting users' psychological well-being. This review establishes a solid foundation for investigating the proposed hypothesis, aiming to enrich the understanding of social media's impact on daily mood rhythms and contribute to better mental health practices.

III. METHODOLOGY

The study implemented a quantitative approach to investigate the relationship between social media usage in the evening and subsequent mood changes. Data were collected through a structured Google Forms survey administered to 90 participants. This survey was designed to capture a variety of information, including the duration of social media usage in the evening, mood ratings both in the morning and evening on a scale from 1 to 10, frequency of social media checks throughout the day, perceived mood changes due to social media categorized as positive, negative, or no change, sleep duration per night, and daily stress levels. In preparation for analysis, the data underwent several preprocessing steps to ensure consistency and usability. Null values were removed to maintain data integrity. The categorical variable indicating the duration of social media usage was segmented into four distinct categories: low, moderate, high, and very high. Numerical scores were assigned to various responses such as mood scores, mood change scores, stress scores, sleep scores, and addiction scores to facilitate quantitative analysis. Feature engineering was conducted to synthesize the collected data into a more analyzable form. Individual scores from different variables were aggregated to create a composite feature, representing the overall impact of social media usage on participants. The data were also grouped based on the duration of usage in the evening to align with the categorization for further detailed analysis. To visually interpret the data, various visualization techniques were employed. Box plots were used to analyze the distribution of mood scores across different categories of social media usage. Histograms helped visualize the frequency distribution of responses, and counterplots were

utilized to compare the frequencies of categorical variables such as perceived mood changes. A correlation matrix was developed to explore the relationships between different features, providing a visual representation of potential correlations within the data. The core of the data analysis involved the use of the Chi-Square Test of Independence. This statistical test was chosen to examine whether variations in mood could be attributed to differences in the duration of social media usage in the evening. The outcome of this test indicated that the p-value was greater than 0.1, suggesting an insignificant statistical relationship between the duration of social media usage in the evening and changes in mood.

IV. DATA ANALYSIS AND RESULTS

A. Data Visualization

The analysis began with employing various visualization techniques to explore the distribution and relationships within the data. Box plots were extensively used to analyze mood score distributions across different categories of social media usage in the evening, providing a clear depiction of central tendencies and variances. Histograms offered insights into the frequency of responses, enabling a visual assessment of data normality and skewness. Additionally, correlation matrices were constructed to examine the relationships between various features, highlighting potential dependencies and interactions that could influence the outcomes of the study.

B. Statistical Analysis

The core of the statistical analysis was the Chi-Square Test of Independence. This test was specifically chosen to investigate the association between the duration of social media usage in the evening and changes in mood. By categorizing social media usage into distinct groups based on duration (low, moderate, high, very high), the test assessed whether variations in reported mood changes could be statistically attributed to how long participants used social media during the evening hours.

C. Results Interpretation

The outcome of the Chi-Square Test provided critical insights into the research hypothesis. The p-value obtained from the test was greater than 0.1, indicating that the association between the duration of social media usage in the evening and mood changes was not statistically significant. This result led to the acceptance of the null hypothesis, which posited that "social media usage does not affect mood in the evening." Such findings suggest that the impact of social media usage on mood, particularly during the evening, may not be as substantial as previously assumed.

TABLE I
STATISTICAL RESULTS FOR EVENING SOCIAL MEDIA USAGE

Mean	Variance	Std. Deviation	N of items
6.621	19.261	4.389	89

Table IV-C contingency table

Score category	low	moderate	high
Usage in the evening			
high	5	17	2
low	3	13	1
moderate	9	18	4
very high	0	5	1

Table IV-C expected frequencies

Score category	low	moderate	high
Usage in the evening			
high	5.23076923	16.30769231	2.46153846
low	3.70512821	11.55128205	1.74358974
moderate	6.75641026	21.06410256	3.17948718
very high	1.30769231	4.07692308	0.61538462

Table IV-C result

Chi-Square Statistics	P-Value	Degrees of Freedom
3.918	0.687	6

V. DISCUSSION

This section establishes the discourse on each hypothesis proposed based on relevant literature. Empirical analysis of each hypothesis will be conducted to see whether the proposed hypotheses exhibit a significant or negligible connection. Contrary to prevalent concerns and our initial hypothesis, this study found no statistically significant evidence to suggest that increased social media usage in the evenings correlates with a decline in mood among users. The Chi-square analysis robustly confirmed the lack of significant correlation, challenging previous assertions that evening social media use disrupts natural relaxation processes and sleep preparation, potentially leading to mood deterioration. These findings diverge from studies like those by Dreier et al. (2024) [2], which noted mood effects related to increased screen time during the COVID-19 lockdown but indicated that individual differences might significantly influence mood responses to social media usage. Furthermore, our results contrast with Beyari's (2023) [1] exploration into the general impacts of social media on mental health, which suggested a pronounced time-of-day vulnerability to these effects. From a theoretical standpoint, these results question the direct applicability of the Stimulus-Response Theory in the context of social media and mood interactions during evening hours. Although the Cognitive Behavioral Theory remains relevant for understanding how the content consumed on social media can influence emotional states, the expected negative impacts associated with evening usage were not observed. This suggests that other factors,

such as individual differences in social media engagement and content type, may play more critical roles than previously thought. The implications of this study are significant for public health strategies and individual behavior management. Given that no direct correlation was found between evening social media use and mood decline, broad recommendations for reducing social media exposure to improve mood may not be justified. However, the importance of promoting responsible social media use remains critical, particularly in educational settings and through mental health campaigns. This can help users make more informed choices about their social media habits, taking into account a broader array of influencing factors. The study is not without limitations. The reliance on self-reported data introduces potential biases related to memory and social desirability, which could affect the accuracy of reported social media usage and mood states. Moreover, the cross-sectional nature of the study limits our ability to establish causality definitively. Future research should employ longitudinal designs to track mood changes over time with varying patterns of social media use and might explore the mechanisms through which social media use in the evening affects mood. Investigating the role of individual differences, such as personality traits and existing mental health status, could provide deeper insights into vulnerability factors. Experimental designs where social media use is manipulated could also offer more definitive evidence of causality and help to parse out the complex dynamics between social media usage and mood.

VI. CONCLUSION

The findings of this study provide compelling evidence that challenges the widely held belief that increased social media usage in the evening leads to a decline in mood among users. Contrary to initial expectations and existing narratives, the statistical analysis using the Chi-square method revealed no significant correlation between the duration of evening social media use and mood deterioration. This absence of a significant impact calls for a reassessment of the assumed negative influences of social media on mental health during what are often considered vulnerable periods. This research contributes significantly to the broader discourse on digital health, underscoring the complex nature of social media's impact on psychological states. It highlights the necessity of considering individual and contextual factors when evaluating the effects of digital technologies on mood. The findings suggest that public health interventions might be more effectively directed towards fostering personalized media literacy and promoting responsible usage habits, rather than imposing broad restrictions based on time alone. Furthermore, this study adds depth to theoretical discussions around digital interactions. It challenges the traditional views of social media's impact as both a stimulus affecting emotional responses and a cognitive influencer impacting mood through content interaction. These theoretical implications suggest a more nuanced interaction between social media usage and psychological well-being than previously acknowledged. Future research should aim

to further clarify these dynamics through more controlled experimental designs and longitudinal studies. Such studies could provide a more definitive exploration of causality and identify specific elements of social media interaction that influence mood. By investigating how different types of social media content and user engagement affect emotional states, researchers can help develop targeted strategies to mitigate any potential risks associated with social media use. In conclusion, as social media continues to permeate the fabric of daily life, accurately understanding its nuanced effects on mental health becomes increasingly crucial. The findings from this study lay a foundation for ongoing investigation and the development of guidelines that can help maximize the benefits of social media while minimizing its potential risks to mental health. By fostering a more informed and cautious approach to social media use, it is possible to harness its advantages while safeguarding against detrimental impacts on mood, particularly during evening hours.

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