Influence of Social Media on user's anxiety level: A quantitative study

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Abstract

Social media has now become an integral part of our daily lives. It's more than just a medium for people to connect and communicate with each other. Nowadays it plays a big part in how people interact, share and perceive people around them. This study is conducted to investigate whether social media usage affects people's mental health in any way. To aid this investigation data from more than 70 participants was gathered through a survey that asked about their social media usage patterns as well as their emotional reactions and how it affects their mental health. A quantitative analysis was performed to test the hypothesis that social media usage affects people's self-esteem significantly using factors like hours spent on social media and their emotional responses to online interactions.

1 Introduction

Anxiety is a widespread mental health problem that falls in line with lifestyle and habits. Anxiety is one common mental health concern and disrupts normal daily activities and total wellbeing. An excessive or lack of social media use can make your anxiety symptoms worse as shown by different studies. To evaluate the relationship of the time spent on social media and self reported anxiety levels. The participants were put into groups based on the amount of time spent ("1– 3 hours," "4–6 hours," "More than 6 hours") and their anxiety levels were measured using 4 critical questions. The intention is to deliver actionable insights in order to help steer interventions that can reduce anxiety through good social media management.

The goal of this research is to share actionable insights that can inform interventions to mitigate anxiety achieved by engaging on healthy use of social media. Given growing worries about mental health especially among young people, it's important to understand the part that digital platforms play in defining emotional well-being. This work could help provide the basis for strategies for encouraging balanced social media engagement and in support of mental health.

2 Literature Review

The paper "Relationship between Social Media Use and Social Anxiety in College Students: Mediation Effect of Communication Capacity "[1] studies responses from 1,740 participants

and categorizes social media usage of these people. The categories are divided as active and passive. They found that there is a correlation between passive use of social media and higher social anxiety. On the other hand, active use of social media has a lesser impact. Furthermore, a structural equation modeling was used to test a mediation model. The researchers were able to identify communication capacity as a mediating factor. They predicted that improved communication skills, and encouraging engaged participation will help to diminish social anxiety.

The study[2] based on the impact of social media on social anxiety systematically reviews the relationship between them. Based on 17 studies identified through databases like Web of Science, Scopus, and PubMed, the review explores four key areas: user demographics, social media types, usage patterns, and their association with social anxiety. The research also highlights that excessive screen time, and social media interactions increase anxiety symptoms. This mostly happens among adolescents and young adults. The findings also put a strong note on the correlation between social media addiction and anxiety. It was also evident that emotional engagement is like a bridge between these. Here, the authors focused more on longitudinal and experimental research to explore causality and the major factors comprehensively. The review also underlines the dual nature of social media, how it has a connection with loneliness and explains the strategies to reduce the adverse effects.

To investigate the connection between the dual effects of active social media use (ASMU) and loneliness a study was performed among 454 Chinese university students. The results were discussed in the paper[3] and structural equation modeling (SEM) was used for the model. The result was found that ASMU positively influences interpersonal satisfaction, reducing loneliness through decreased fear of missing out (FoMO). However, ASMU also heightens online-specific state-FoMO, indirectly increasing loneliness. The results reveal a complex interplay of beneficial and adverse outcomes. It also focuses on ASMU's dual potential to alleviate and exacerbate loneliness.

A study was done focusing on countries like Norway, the UK, the USA, and Australia to analyze the relationship between social media use and loneliness. The research paper[4] found out the motives for social media use, such as maintaining relationships or alleviating boredom, impact loneliness levels differently. The study uses different linear regression models to analyze associations and identify user profiles. The key findings of the research suggest that excessive use linked to relational motives contributes to increased loneliness. This cross-national research underscores the nuanced effects of social media on mental well-being.

3   Methodology

To examine the relationship between social media usage and anxiety levels, the following hypotheses were formulated:

- **Null Hypothesis (H_0)**: Social media usage does not have a significant effect on participants' anxiety levels.

- **Alternate Hypothesis (H_1)**: Social media usage has a significant effect on participants' anxiety levels.

We collected data by conducting a survey on how much time participants spent on social media and related anxiety questions. Rows having 'Less than 1 hour' as their first column entry were removed from the dataset to be in line with the study focus. Remaining rows were grouped

into three categories based on time spent: For the results of the two popular models, the results are categorized as "1–3 hours," "4–6 hours," and "More than 6 hours". The grouping allowed for a clearer analysis of time based variances of anxiety levels.

Responses to survey questions were systematically mapped to numerical values to enable quantitative analysis: Scores for questions dealing with frequency ('Always' to 'Never') were 5 to 1 and higher scores indicated more frequent. Similarly, scores also ranged 5 to 1, for questions assessing agreement ("Strongly Agree" to "Strongly Disagree") as indicated by strength of agreement. Likelihood scores ("Definitely" to "Definitely Not") were scaled similarly from 5 to 1.

Scores for anxiety were calculated as the sum of responses to ten key questions on anxiety related to ten different anxiety dimensions (frequency, agreement, likelihood of manifestation). This gave us a cumulative score from which we could get a more complete measure of a participants' level of anxiety. The total anxiety score was categorized into predefined ranges to facilitate interpretation:

- 0–18: Not Anxious

- 19–24: Slightly Anxious

- 25–30: Anxious

- 31–40: Moderately Anxious

- 41–50: Very Anxious

4 Results

A contingency table was used to check out the distribution of anxiety categories into time groups. Those frequencies of each anxiety category within those time groups formed this table. Independence of time spent on social media and anxiety levels were assessed with a Chi-Square test. The contingency table below was investigated by means of this statistical test to find out whether the observed pattern differed significantly from what would be expected under the null hypothesis of independence.

	1–3 hours	4–6 hours	More than 6 hours	Total
Anxious	12	14	5	31
Moderately Anxious	6	11	9	26
Not Anxious	4	2	0	6
Slightly Anxious	9	2	1	12
Very Anxious	1	2	1	4
Total	32	31	16	79

Frequencies of anxiety levels in each time group were calculated and tabulated. The frequencies gave us a rough idea of how anxiety levels changed with time spent on social media. Of particular significance is the fact that some time groups featured a higher proportion than others in certain anxiety categories indicating that trends possibly exist. The test yielded the following results:

- Chi-Square Statistic: $\chi^2 = 13.8294$

- Chi-Square Critical: $\chi^2 = 13.368$

- P-value: 0.086

- Degrees of Freedom: 8

- Confidence level: 90% ($\alpha = 0.1$)

Observed frequencies were compared to frequencies expected under null hypothesis. In several cases, there were significant deviations, suggesting a nonrandom relation between use of social media and anxiety.

5 Analysis

The analysis revealed distinct patterns in the distribution of anxiety levels across the time groups. For instance, participants categorized as 'Not Anxious' or 'Slightly Anxious' predominantly spent '1–3 hours' on social media, while those in the 'Moderately Anxious' or 'Very Anxious' categories were more likely to have spent 'More than 6 hours' on social media. These observations were supported by the results of the Chi-Square test.

5.1 Hypothesis Testing

The hypothesis testing was conducted at a significance level of $\alpha = 0.1$ (90% confidence level). The results of the Chi-Square test are as follows:

- **Chi-Square Statistic**: $\chi^2 = 13.8294$

- **Chi-Square Critical Value**: $\chi^2 = 13.368$ (from Chi-Square distribution table with 8 degrees of freedom)

- **P-value**: 0.086

- **Degrees of Freedom**: 8

5.1.1 Decision Rule

- If the Chi-Square statistic (χ^2) is greater than the Chi-Square critical value ($\chi^2_{critical}$), or if the p-value is less than the significance level (α), we reject the null hypothesis (H_0).

- Otherwise, we fail to reject the null hypothesis.

5.1.2 Results

The calculated Chi-Square statistic (13.8294) is greater than the critical value (13.368), and the p-value (0.086) is less than the significance level ($\alpha = 0.1$). Therefore, the null hypothesis (H_0) is rejected in favor of the alternate hypothesis (H_1).

6   Conclusion

The Chi-Square test results demonstrate a significant relationship between the time spent on social media and anxiety levels, as there were significant deviations between observed and expected frequencies under the null hypothesis. These findings emphasize that prolonged use of social media is associated with higher levels of anxiety.

From this study, you will see how much time spent on social media affects anxiety levels. The discovery indicates that inappropriate or insufficient social media usage can hugely affect mental health which supports the necessity of excellent methods of managing social media. This raises questions that could be studied further, particularly with relation to what underlying mechanism drives this relationship and ways to advocate for mental well being through targeted interventions.

However, it is essential to note that the data is self-reported and does not account for contextual factors such as socioeconomic status or preexisting mental health conditions that may also influence anxiety levels. Future studies should include additional variables and employ longitudinal designs to explore causal relationships more rigorously.

7   Links

- Form Link: Google From Link

- Colab File: Colab file Link

References

[1] Lai, F., Wang, L., Zhang, J., Shan, S., Chen, J., & Tian, L. (2023). Relationship between Social Media Use and Social Anxiety in College Students: Mediation Effect of Communication Capacity. *International Journal of Environmental Research and Public Health*, 20(4), 3657

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[3] Mao, J., Fu, G., & Huang, J. (2023). The double-edged sword effects of active social media use on loneliness: The roles of interpersonal satisfaction and fear of missing out. *Frontiers in Psychology*, 14.

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