

The Effect of Social Media Use on Depressive Symptoms

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Abstract. The rising incidence of social media usage among youth and adults has raised worries about its impact on mental health, particularly depressed symptoms. This study analyzes whether social media use predicts depression symptoms in adolescents and adults. The quantitative study uses a Kaggle survey of 481 adults and adolescents on a 5-point Likert scale. It assessed depression and social media use length and frequency. Data analysis is done in SPSS using descriptive statistics, Pearson correlation, and simple linear regression to determine if social media use can predict depressive symptoms. A positive correlation exists between social media use and depression. Social media also causes teenage and adult interest changes and sleep disruptions. The findings add to the mental health discourse of adolescents and warn parents, lawmakers, and educators about social media overuse. Mental health interventions and digital well-being activities are crucial policy and parental guiding insights, according to the study. Future research can examine social media's long-term mental health consequences and mediation processes. Social media online interactions, and coping mechanisms can be examined to determine their impact on depression symptoms.

Keywords: Depressive symptoms; social media use; mental health.

1. Introduction

As the digital age progresses rapidly, social media has emerged as an integral part of everyday lives. Adolescent lives have also been considerably influenced by social media, as it influences social interactions, mental health, and identity development. Social media platforms such as YouTube, Instagram, and Snapchat have boosted connectivity and idea sharing along with self-expression [1]. A quantitative study done with 940 social media users from Mexico used structural equation modelling (SEM) to shed light on the effect of social media use on psychological well-being [2]. Despite finding positive effects of social media on psychological well-being, it raised concerns about the potential negative psychological impact social media can have due to its excessive use, which can transform into isolation and smartphone addiction [2]. Social media use can spark depressive symptoms. A possible reason for this can be the constant exposure to content curated carefully by using algorithms. This elevates social comparisons and negative interactions among adults/adolescents. It can exacerbate feelings of loneliness, anxiety, and inadequacy among them, potentially leading to depressive tendencies [1]. Their narrative review revealed divergent findings, which reflected the evolution of social media use by the youth. However, it still covets the need to consider different factors that can influence social media use in this cohort.

Depression among adolescents is a highly prevalent issue, as the World Health Organization (WHO) has also acknowledged adolescent mental health issues as a public health concern, as it accounts for 15% of the global burden of disease [3]. This emphasizes the need to research factors that influence depression. Here, social media can be seen as a potential contributor since it might foster unrealistic standards of living or beauty among teenagers. They can also be exposed to cyberbullying and face sleep disturbances. By using partial least squares structural equation modelling (PLS-SEM) on Smart-PLS Software, research on 367 Chinese university students highlighted emotional dependence on virtual validation as another reason why compulsive social media use can be a contributor to pronounced depressive tendencies [4]. It found that self-esteem, fear of negative evaluation, and social interaction anxiety contribute to perceived depressed mood. This can happen because of compulsive social media use. However, there exist mixed findings where social media is also upheld as a provider of emotional support and engagement with like-minded

community members. Therefore, the relationship individuals, especially adolescents, share with social media is nuanced and layered. Additionally, insight into psychological treatments and the development of counselling programs can boost the efficacy of mental health services for adolescents.

Another research on 219 U.S. college freshmen (transitioning to college) was conducted using Mplus to perform structural equation modelling (SEM) [5]. It revealed that rumination, which is linked to depression (or depressed mood), acted as a mediator for increased social media use among these freshmen. Besides the studies using SEM as their main method, some review papers also identify the relationship between social media use and mental health [6-8]. The review study also establishes positive as well as negative effects of social media and mental health [6]. However, it states that social media was used to manage depression and had a positive effect. This finding showed the where young users turned to social media to share their experiences, seek treatment and mental health information, as well as to give and receive support [7]. At-risk social media addiction users often report lower self-esteem and depressive symptoms [8]. SEM was also used where a majority of 288 participants reported using social media daily for more than three hours [9]. It found sleep problems to be connected to problematic social media use and their well-being. Another study used descriptive statistics, one-way ANOVA, and an independent t-test to analyze results from 804 students [10]. It found smartphone addiction and sleep quality to be linked positively.

This study seeks to examine the impact of social media usage on depressed symptoms. The objectives are to investigate the correlation between social media usage and depressive symptoms, to ascertain whether the frequency and duration of social media engagement relate to depressive symptoms, and to offer insights that inform policies, interventions, and parental guidance aimed at fostering healthier social media practices among adolescents. This study aims to examine the impact of social media usage on depressed symptoms.

2. Methods

2.1. Data Source

This study is based on secondary data sources; therefore, it has used the existing survey data from an authentic database. The reason for using a secondary data set is to collect large sample size data in a short time and complete the research with existing high-quality data without involving participants directly. Data used in this paper has been taken from Kaggle. This data set was published by Souvik Ahmed and Muhesena Nasiha Syeda in 2023. It has a total of 13,000 downloads with 733 in the last 30 days. This data set includes survey responses from 481 participants and participants belong to Dhaka, the capital city of Bangladesh. The project for which the researchers collected this data involved organizing it and using machine learning (ML) to develop a predictive model. The model was needed to determine if an individual should seek expert assistance based on their responses to the survey questions. The dataset owners used a 5-point scale to collect their data. It includes strongly agree = 5, agree = 4, neutral = 3, disagree = 2, and strongly disagree.

2.2. Indicator Selection and Explanation

The original dataset has various variables and questions; however, the current study is only related to social media and mental health, and therefore the following six variables have been used. For selecting these six variables, the survey question and response reflecting them have been used. These variables are listed in Table 1 for a clear explanation of what they mean and how they have been measured. The dependent variable of this study is Depressive Feeling, and the independent variables are average social media time, sleep issues, validation seeking on social media and interest fluctuation. There were no missing data here. Hence, it did not require any pre-processing to clean the data. The existing values from the dataset were kept as all data points were complete. It did not require any deletion or manipulation.

Table 1. Variable explanation

Name of Variables	Scale of Variables	Definition of the Variables
Depressive Feelings (F)	Self-reported depressive feelings on a scale of 1-5	Higher values indicating higher depressive symptoms
Average social media Time (β_1)	Measured in hours	The average amount of time spent on social media daily
Sleep Issues (β_2)	Self-reported sleep disturbances on a scale of 1-5	Higher values indicating more sleep-related problems
Validation Seeking on social media (β_3)	Validation Seeking on social media disturbances on a scale of 1-5	Tendency to seek validation from social media interactions
Interest Fluctuation (β_4)	Interest Fluctuation disturbances on a scale of 1-5	Fluctuation in interest and motivation in daily activities

2.3. Method Introduction

This study conducted three statistical analyze using SPSS. First, descriptive statistics was done to present a summarized version of the six key variables included in the study. Secondly, the Pearson correlation was conducted to measure the strength and direct relationship between Variables. Thirdly, multiple linear regression was conducted to determine whether social media time, sleep issues, and validation-seeking predicted depressive symptoms. Participants' depressive feeling was the dependent variable tested here. This model assesses how each independent variable (average social media time, sleep issues, validation seeking, and interest fluctuation) individually and collectively contributes to self-reported depressive feelings.

3. Results and Discussion

3.1. Descriptive Statistics

The frequency distributions of key variables are illustrated in the bar diagram in Figure 1-3. In the Bar Diagram of Depressive, the distribution of depressive feelings shows that most of the respondents are placed within the neutral to strongly agree range, signifying that the majority of them experience some level of depressive symptoms.

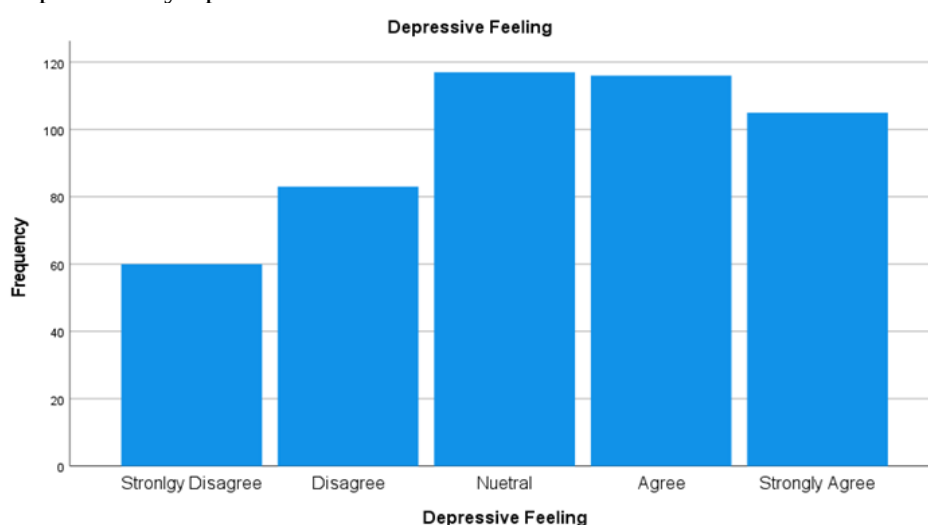


Fig. 1 Bar Diagram of Depressive

In Bar Diagram of Validation Seeking on social media, average social media time follows a slightly right-skewed distribution, with most participants using social media for 3 to 6 hours per day. Validation-seeking behavior on social media exhibits a downward trend, with a larger proportion of participants strongly disagreeing with reliance on social media for self-worth. Social media use

without a specific purpose has a relatively even distribution, with many respondents agreeing that they engage in purposeless social media use.

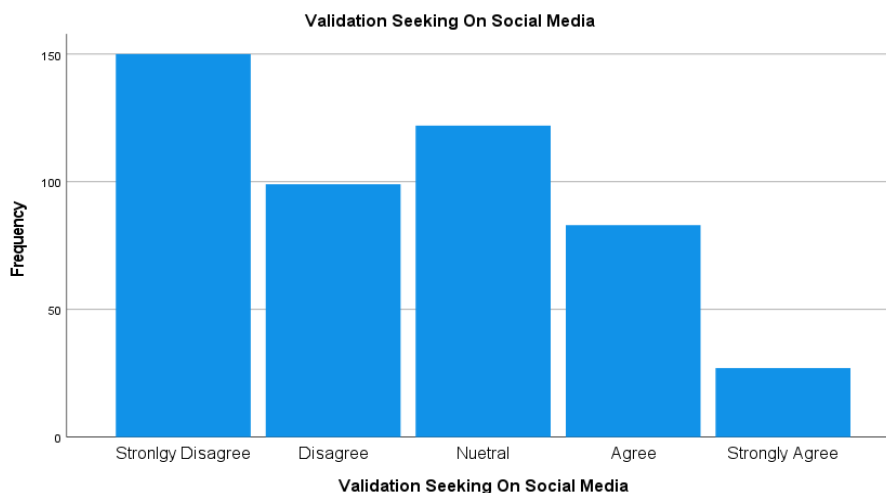


Fig. 2 Bar Diagram of Validation Seeking on social media

In Bar Diagram of Sleep Issues, interest fluctuation and sleep issues show a trend where higher levels of agreement correspond to increased frequency, indicating that many participants reported inconsistent motivation and sleep disturbances.

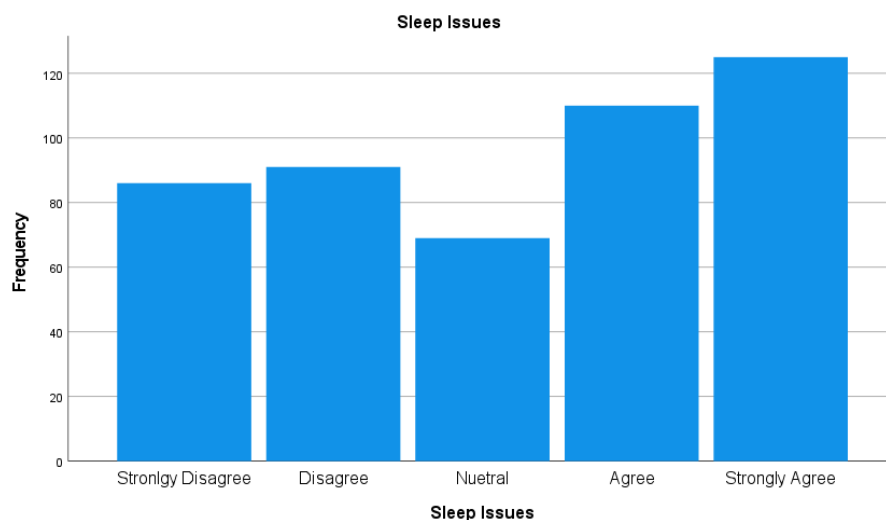


Fig. 3 Bar Diagram of Sleep Issues

Descriptive Statistics presents the summary of key variables in the study. The mean social media usage per day was 3.86 hours ($SD = 1.547$), indicating that participants, on average, spend a significant amount of time on social media. Additionally, the mean values for depressive feelings ($M = 3.26$, $SD = 1.313$), sleep issues ($M = 3.20$, $SD = 1.462$), and interest fluctuation ($M = 3.17$, $SD = 1.257$) suggest that many respondents experience moderate levels of emotional distress and sleep disturbances. Notably, validation-seeking on social media had a lower mean score ($M = 2.46$, $SD = 1.248$), implying that participants exhibit a relatively lower tendency to seek validation through social media engagement. The social media without purpose variable ($M = 3.55$, $SD = 1.096$) reflects frequent usage without specific intent, which may contribute to emotional well-being concerns.

3.2. Pearson Correlation

When Pearson Correlation (Table 2) explores the relationships between the core variables. A moderate positive correlation was found between social media time and depressive feelings ($r = 0.317$, $p < 0.001$), indicating that increased social media usage is associated with heightened depressive

symptoms. Similarly, a weak but significant correlation between social media time and sleep issues ($r = 0.185$, $p < 0.001$) suggests that longer social media engagement may contribute to sleep disturbances, although the effect size is relatively small.

Table 2. Pearson Correlation

Variable	Method	Average social media Time	Depressive Feeling	Sleep Issues
Average social media Time	Pearson Correlation	1	0.317**	0.185**
	Sig. (2-tailed)		0.000	0.000
	N	481	481	481
Depressive Feeling	Pearson Correlation	0.317**	1	0.375**
	Sig. (2-tailed)	0.000		0.000
	N	481	481	481
Sleep Issues	Pearson Correlation	0.185**	0.375**	1
	Sig. (2-tailed)	0.000	0.000	
	N	481	481	481

**, Correlation is significant at the 0.01 level (2-tailed).

Furthermore, a stronger correlation between depressive feelings and sleep issues ($r = 0.375$, $p < 0.001$) highlights a notable association between mental health and sleep quality. This finding suggests that individuals experiencing depressive symptoms are more likely to report sleep disturbances, reinforcing the idea that mental health and sleep problems often co-exist.

Since all correlations are statistically significant at $p < 0.001$, these relationships are unlikely to have occurred by chance, supporting the reliability of the observed patterns.

3.3. Multiple Regression Analysis

Model Summary (Table 3) for Multiple Regression examines whether social media time, Sleep issues, validation-seeking, and interest fluctuation collectively predict depressive feelings. The R^2 value of 0.339 indicates that 33.9% of the variance in depressive feelings is explained by these predictors, suggesting a moderate explanatory power of the model.

Table 3. Model Summary

Model	R	R^2	Adjusted R^2	Std. Error	R^2 change	F change	df1	df2	Sig.F change
1	0.582	0.339	0.333	1.072	0.339	60.929	4	476	0.000

The ANOVA (Table 4) results ($F(4, 476) = 60.929$, $p < .001$) confirm the statistical significance of the regression model. This indicates that at least one of the independent variables significantly contributes to predicting depressive symptoms.

Table 4. ANOVA test results

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	280.231	4	70.058	60.929	0.000
Residual	547.316	476	1.150		
Total	827.547	480			

The regression coefficients (Table 5) further clarify each predictor's role. Social media time $B = 0.139$, $\beta = 0.164$, $p < .001$ which result confirms that higher social media usage is significantly associated with increased depressive symptoms. However, its impact is weaker than that of other

psychological variables. Sleep issues $B = 0.196$, $\beta = 0.218$, $p < .001$; this variable exerts a stronger influence on depressive symptoms compared to social media use, emphasizing the importance of sleep quality in mental well-being. Validation-seeking on social media $B = 0.136$, $\beta = 0.130$, $p = 0.001$; this predictor is also significant, suggesting that adolescents and adults who rely on social media for validation tend to exhibit higher depressive symptoms. Interest fluctuation $B = 0.358$, $\beta = 0.342$, $p < .001$; this is the strongest predictor in the model, indicating that individuals with unstable interest levels and motivation fluctuations are most likely to experience depressive symptoms. Lastly, the Variance Inflation Factor (VIF) values are all below 5, confirming that multicollinearity is not a concern, and each predictor independently contributes to the model.

Table 5. Model Coefficients

Model	Unstandardized Coefficients		Beta	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error				Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	0.621	0.182		3.409	0.001	0.263	0.979		
1 Average social media Time	0.139	0.033	0.164	4.197	0.000	0.074	0.205	0.907	1.102
Sleep Issues	0.196	0.036	0.218	5.518	0.000	0.126	0.266	0.887	1.127
Validation Seeking on social media	0.136	0.041	0.130	3.336	0.001	0.056	0.217	0.920	1.088
Interest Fluctuation	0.358	0.044	0.342	8.196	0.000	0.272	0.443	0.797	1.255

a. Dependent Variable: Depressive Feeling

Overall, the results explain that excessive social media use contributes to depressive symptoms in adolescents and adults, with fluctuating interest levels and sleep disturbances play an even more significant role. These results emphasize the complex interplay between digital engagement and emotional well-being and sleep health directly affecting mental wellness outcomes and offering key information to mental health professionals, employers, educators, and policymakers.

4. Conclusion

Based on the above results from statistical analysis, the findings show a significant positive correlation between using social media and depressive feelings. The study indicates that social media has a major effect on the depressive symptoms of adolescents as well as adults. As the statistical analysis has found moderate positive correlations between average social media time and depressive feelings, it suggests that increased levels of depressive symptoms may be experienced by people spending more time on social media. The multiple regression analysis also confirms that social media time significantly predicts the depressive feelings of people even after controlling for other psychological factors. The findings also indicate that social media usage increases sleeping issues and also increases interest fluctuations in people. The Pearson correlation results show that social media time is significantly correlated with depressive feelings, indicating a significant relationship between the variables.

This study also highlights the importance of validating seeking behaviors on the use of social media as another predictor of depressive feelings or symptoms. Hence, it is understood that adolescents and adults who frequently go on social media to seek validation from others have a tendency to exhibit higher levels of depressive feelings. Interest fluctuation was also noted as a

significant predictor of depressive symptoms among adults and adolescents. It is highly suggestive that individuals with an unstable level of interest and frequently fluctuating motivation are vulnerable to experiencing depressive symptoms. Hence, the vital role of emotional regulation and stability in the maintenance of well-being is understood from here.

The findings here are significant for mental health professionals, employers, educators, parents, and policymakers. It establishes that the development of integrated and comprehensive strategies for promoting adult and adolescent mental well-being is crucial in the digital age. For example, these strategies can include educational initiatives that aim to boost healthy social media-using habits, promote good sleep practices and sleep hygiene, work on the underlying problems with self-esteem, and the need for social validation. The key insight for policymakers and employers is to integrate digital well-being programs in schools and offices that empower adolescents and adults to observe healthy social media behaviors including minimizing sleep time spent on screens and not making comparisons to lower self-esteem affecting their mental health outcomes that can interfere with adolescents learning motivation and hamper productivity outcomes for adults. For adolescents, parents should encourage healthy social media behavior by setting boundaries around screen time and encouraging open discussions about unpleasant online experiences. Additionally, schools for adolescents and offices and community programs should offer mental health support interventions that include self-esteem building, emotional regulation skills, and sleep management skills for ensuring mental wellness outcomes within adolescents and adults.

Recommendations for future studies involve a deeper exploration of the mechanisms by which excessive social media use leads to depressive feelings and symptoms. Studies can explore the different types of social media activities, online interactions, and individual coping strategies to examine how they mediate the relationship between overall mental health and social media consumption. Additionally, longitudinal studies can also inform about the sustained effects of excessively using social media on users' mental health.

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