Social Media and Mental Health: Understanding the Association between SNS Addiction and Depression in Students

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ABSTRACT

Background: Social media usage has significantly increased among university students, leading to concerns regarding its psychological impact. Excessive engagement with social networking sites (SNS) has been associated with depression, social comparison, and sleep disturbances. However, limited research has explored these associations in developing regions like Pakistan. **Objective:** This study aims to examine the relationship between social media addiction and depression among university students in Larkana, Sindh, Pakistan. **Materials and Methods:** A cross-sectional study was conducted among 289 undergraduate and postgraduate students. Data were collected through a structured questionnaire incorporating the Bergen Social Media Addiction Scale (BSMAS) and the Patient Health Questionnaire-9 (PHQ-9) to assess social media addiction and depressive symptoms, respectively. Pearson's correlation and multiple regression analyses were performed using SPSS v24.0 to evaluate association between SNS addiction and depression, controlling for demographic and lifestyle factors. A p-value of <0.05 was considered as statistically significant. **Results:** The findings revealed a significant positive correlation ($p<0.001$) between social media addiction and depression, with higher SNS addiction scores associated with greater depressive symptoms. Gender differences were observed, with female students reporting slightly higher levels of social media addition than males ($p<0.05$). Additionally, excessive SNS use was linked to sleep disruption, reduced academic performance, and increased psychological distress. **Conclusion:** This study provides empirical evidence supporting the association between social media addiction and depression among university students. The findings emphasize the need for digital literacy programs, psychosocial interventions, and institutional policies to regulate screen time and mitigate the negative effects of SNS addiction. Future research should adopt longitudinal and cross-sectional approaches to explore causality and underlying socio-economic factors influencing this relationship.

INTRODUCTION

Depression is a major public health concern, recognized as the leading cause of disability worldwide, affecting over 300 million individuals (1). Characterized by persistent sadness, loss of interest, low self-worth, sleep disturbances, fatigue, and cognitive impairments, depression significantly disrupts daily life and productivity. In severe cases, it can lead to suicide, which remains the second-leading cause of mortality among individuals aged 15-29 years, with over 800,000 cases annually (2,3). University students are particularly vulnerable to depression due to academic pressure, social transitions, and financial stress. Despite its prevalence, many students do not seek professional help due to stigma, lack of awareness, and limited mental health resources (4–6). The high incidence of depression in university students underscores the necessity of investigating its cause and risk factors to inform prevention and intervention strategies.

The rise of social media usage has added a new dimension to mental health discourse. Social networking sites (SNS) such as Facebook, Instagram, Twitter, and TikTok have revolutionized communication and self-expression, with nearly 90% of young adults engaging on at least one platform (7). Social media enables users to connect, share experiences, and access information, yet its excessive use has been linked to various psychological concerns, including anxiety, stress, and depression. The distinction between normal and problematic use is crucial, as not all SNS engagement results in negative outcomes. Some individuals develop compulsive behaviors resembling addiction, characterized by excessive preoccupation, loss of control, and continued usage despite adverse consequences (8,9). These behaviors have been measured using psychomotor tools such as the Bergen Social Medial Addiction Scale (BSMAS), which assesses problematic engagement with SNS (10). The mechanisms linking social media addiction and depression remain complex. The Social Comparison Theory suggests that individuals frequently compare themselves with others online, often perceiving their own lives as inferior, leading to lower self-esteem and depressive symptoms (11). This phenomenon is particularly pronounced on visually-driven platforms like Instagram and TikTok, where curated content creates unrealistic portrayals of success, beauty, and happiness. Additionally, cyberbullying and online harassment have emerged as significant risk factors, exacerbating stress and emotional distress among frequent SNS users (12,13). The Coping Style Hypothesis proposes that individuals with maladaptive coping strategies may turn to social media as an escape, thereby exacerbating depressive symptoms (14). Young adults struggling with academic or personal stressors may use SNS as a distraction rather than addressing their underlying problems, which can lead to a reinforcing cycle of avoidance and increase psychological distress. Moreover, sleep disruption due to prolonged screen exposure has been identified as a mediating factor between SNS use and depression (15). Excessive SNS usage, especially before bedtime, has been linked to poor sleep quality, reduced duration, and difficulty falling asleep, all of which contribute to mood disorders.

Despite an expanding body of literature on social media addiction and mental health, research has largely focused on developed nations, leaving gaps in understanding its impact in least-developed regions. Cultural, economic, and technological differences influence how individuals engage with SNS and perceive mental health. While studies in Western countries have established strong links between problematic SNS use and depression, findings from developing regions are less conclusive due to variations in digital literacy, mental health stigma, and access to healthcare. Additionally, the role of gender, socio-economic background, and personality traits in moderating the relationship between social media use and depression remains underexplored. Understanding these factors is crucial for designing targeted interventions that address the unique challenges faces by students in different contexts. The negative effects of social media addiction extend beyond mental health. Studies suggest that excessive SNS use is associated with academic difficulties, reduced productivity, and lower overall well-being (16). University students who spend excessive time on social media report lower grades, decreased concentration, and difficulties managing time effectively. Furthermore, problematic SNS use has been linked to disrupted interpersonal relationships, social withdrawal, and increased feelings of loneliness, counteracting the very purpose of social media – to enhance social connectivity (17). These findings highlight the urgent need for research examining the broader implications of SNS addiction and its potential to hinder personal and professional growth.

Given the penetration of SNS and the serious effects of depression, examining the underlying mechanism in this association is crucial for both academic and practical reasons. Prior research has mostly concentrated on jealousy, social comparison, and cyberbullying as mediators between SNS usage and depression. However, further investigation is needed into the role of self-regulation, digital mindfulness, and psychological resilience in mitigating the negative effects of effective social media use. Interdisciplinary approaches integrating psychology, digital media studies, and public health can provide a more comprehensive understanding of how social media addiction impacts mental well-being. Therefore, this study aims to examine whether the association between excessive social media use and mental issues is consistent across different socio-economic settings. Specifically, it investigates the relationship between social media addiction and depression among university students in the Larkana region of Sindh. Pakistan. By focusing on an underrepresented population, this research seeks to provide new insights into the psychological impact of SNS use in developing nations. The findings will contribute to the global discourse on digital well-being and inform evidence-based interventions to promote healthier online behaviors.

MATERIALS AND METHODS

This study employs a cross-sectional study design to examine the association between social media addiction and depression among university students. The study follows a descriptive-analytical approach, aiming to evaluate the prevalence, patterns, and correlation between social media use and depressive symptoms. The research setting consists of various academic

departments at the Medical University of Larkana, Sindh, Pakistan, where data was collected from undergraduate and postgraduate students over a period of six months, January 2024 to June 2024. Before participation, all students were provided with detailed information about the study, and informed consent was obtained to ensure voluntary participation. A stratified random sampling technique was used to ensure adequate representation across different academic faculties. The target population includes undergraduate and postgraduate students enrolled in the university, and the sample size was determined using OpenEpi to achieve significance while accounting for non-response bias. The inclusion criteria comprise students actively enrolled in a degree program and regularly using social media. The exclusion criteria include students with diagnosed psychological disorders undergoing clinical treatments, students who do not use social media, and those unwilling to participate.

Data collection was carried out using a structured questionnaire, which was administered online through emails and social media platforms to reach a broader student population. The questionnaire was divided into four key sections: demographic information, social media usage patterns, social media addiction assessment, and depression assessment. To measure social media addiction, the Bergen Social Media Addiction Scale (BSMAS) (10) and the Internet Addiction Test (IAT) (18) was used, both of which have been widely validated in previous studies. To assess depression level, the Center of Epidemiological Studies Depression Scale (CES-D) (19) and the Patient Health Questionnaire-9 (PHQ-9) (20) were utilized. These tolls provide a reliable and standardized means of measuring depressive symptoms.

The statistical analysis was conducted using SPSS v24.0. Descriptive statistics were used to summarize demographic characteristics and social media usage patterns. Pearson correlation was applied to analyze the relationship between social media addiction and depression, while multiple regression analysis was performed to adjust for potential confounding variables such as gender, academic performance, and socioeconomic status. A p-value of <0.05 was considered as statistically significant.

RESULTS

The study samples consisted of 289 undergraduate and postgraduate students from diverse academic discipline, with 49% being male (n=140) and 51% female (n=149). The mean age of participants was 21.5 ± 3.8 years. A majority of participants (62%) preferred using smartphone for social media access, followed by laptops (21%) and tablets (17%). The mean daily screen time among participants was 5.8 ± 2.0 hours, with social media usage averaging 3.9 ± 1.6 hours (Table 1).

Descriptive analysis revealed significant variations in social media usage patterns and their association with depression. The mean depression score, measured using the CES-D scale, was 21.5 ± 5.4, with 34% of students scoring above the threshold for moderate to severe depression. Social media addiction scores, assessed using the IAT, had a mean value of 48.6 ± 7.2, with 41% of participants classified as having moderate to severe social media addiction (Figure 1, 2, Table 2).

Correlation analysis indicated that students with high social media usage had significantly lower academic performance compared to those with lower usage (p<0.001). Additionally, gender-based comparisons revealed that female students had slightly higher social media addiction scores than males (p<0.05). Moreover, social media usage negatively correlated with sleep duration (r = 0.38, p<0.01), suggesting that increased time spent on social media was linked to reduced sleep quality. Correlational analysis revealed a significant positive relationship between social media addiction and depression scores, indicating that individuals with higher levels of SNS addiction reported greater depressive symptoms (Table 3, 4). Regression analysis further confirmed that social media addiction served as a significant predictor of depression, even after controlling for potential confounding variables.

Table 1

Demographic Variables of Participants (N=289)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	140	49%
	Female	145	51%
Qualification	Undergraduate	170	59%
	Postgraduate	90	31%
Marital Status	Single	190	66%
	Married	99	34%
Device Preference	Smartphone	180	62%
	Laptop	60	21%
	Tablet	49	17%

Table 2

Lifestyle and Technology Statistics (N=289)

Variable	Mean	Median	Standard Deviation
Age (years)	21.5	22	3.8
Internet Usage (hours)	4.5	4.0	1.9
Academic Performance (Score)	77.9	79	6.5
Daily Screen Time (Hours)	5.8	5.5	2.0
Social Media Usage (Hours)	3.9	4.0	1.6
Sleep Duration (Hours)	6.3	6.5	1.3
Depression Score (CES-D)	21.5	22	5.4
Social Media Addiction Score (IAT)	48.6	45	7.2

Figure 1
Depression Level among Participants (N=289)

Depression Level (%)

Social Media Addiction Level among Participants (N=289)
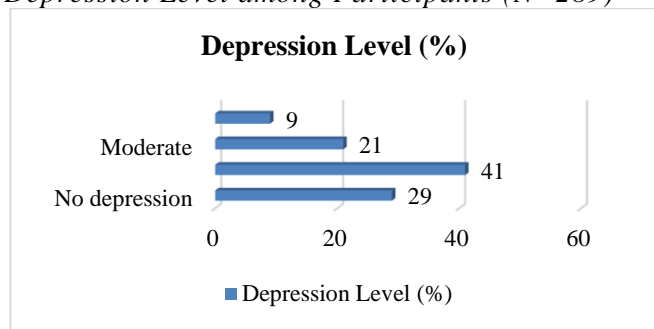

Social Media Addition Level (%)

Table 3
Group Comparison of Social Media, Academic Performance, and Mental Health (N=289)

| Comparison Groups	t-value	p-value	Cohen's d
Male vs. Female (Social Media Addiction)	2.31	<0.05	0.28
High vs. Low Social Media Usage (Academic Performance)	-3.21	<0.01	0.39
Undergraduate vs. Postgraduate (Social Media Usage)	-2.45	<0.05	0.32

Figure 2

Table 4
Predictors of Depression, Sleep Duration, and Academic Performance (N=289)

Predictor	Outcome	Beta Coefficient (β)	t-value	p-value	R^2	Adjusted R^2	F-value
Social Media Addiction	Depression Score	0.52	7.02	<0.001	0.37	0.26	49.33
Internet Usage	Sleep Duration	-0.38	-4.09	<0.01	0.14	0.13	16.72
Social Media Usage	Academic Performance	-0.30	-2.54	<0.05	0.10	0.09	6.48

DISCUSSION

This study explored the intricate relationship between social media addiction and depression among university students in Larkana, Sindh, Pakistan. The findings revealed a significant positive correlation between excessive social media use and depressive symptoms, reinforcing growing concerns regarding the psychological consequences of prolonged and unregulated engagement with social networking sites (SNS). The results suggest that students with higher social media addiction scores exhibited significantly greater depressive symptoms. This findings aligns with multiple studies from both Western and Asian contexts, all of which indicate a strong relationship between problematic SNS use and mental health concerns (16,17). Prior research highlights that individuals who spend excessive time on social media are more likely to experience low self-esteem and depressive symptoms due to social comparison, particularly on platforms emphasizing curated content (21). Similar to findings in studies from U.S. and Europe, where visually-driven platforms such as Instagram and TikTok contribute to negative self-perception (22,23), this study also confirms the adverse impact of idealized online portrayals on university students' psychological well-being.
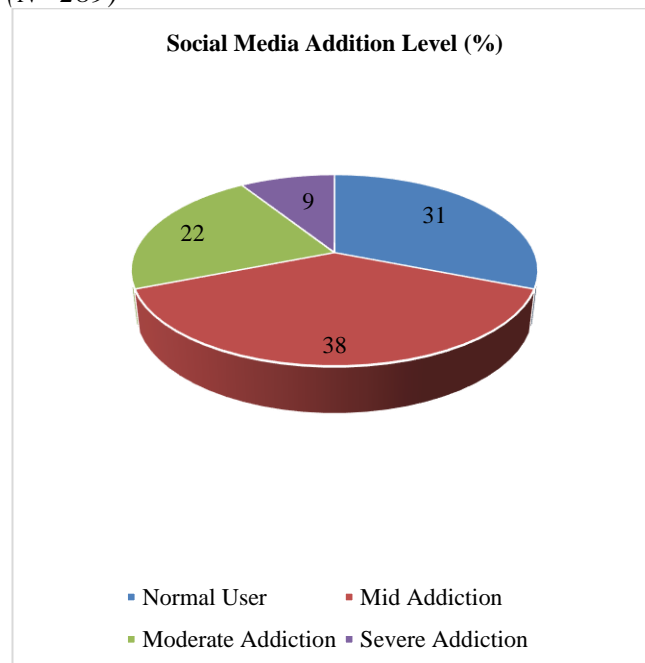
Furthermore, the relationship between social media use and sleep disruption observed in this study corresponds with earlier studies indicating that excessive SNS engagement before bedtime leads to poor sleep hygiene (15). Studies in China and Japan similarly found that prolonged screen exposure suppresses melatonin production and disturbs sleep cycles, thereby exacerbating mood disorders (24,25). This supports the hypothesis, which posits that social media addiction indirectly contributes to depression by impairing sleep quality (26). Our study's findings reinforce these prior observations, demonstrating that students who spend more time on social media report reduced sleep duration and greater depressive symptoms.

Gender differences observed in this study also reflect patterns noted in prior literature. Female students reported slightly higher social media addiction scores than males, consistent with studies from South Korea and the Australia, where women have been found to engage more frequently in SNS interactions and are more susceptible to appearance-based comparisons (27,28). This heightened engagement often translates to increased anxiety and body image dissatisfaction, further reinforcing the link between SNS addiction and depression. Given these findings, the necessity for

gender-sensitive interventions remain evident. The study benefits from methodological rigor, particularly in its use of standardized psychometric tools such as the Bergen Social Media Addiction Scale (BSMAS) and Patient Health Questionnaire-9 (PHQ-9), both of which have been extensively validated in international research. The implementation of a stratified random sampling approach ensured diverse representation across different academic disciplines, increasing the generalizability of the findings within the study setting. Furthermore, the use of multiple regression analysis allowed for the control of confounding variables, enhancing the reliability of conclusion drawn.

However, several limitations are also present in this study. First, as with many cross-sectional studies, causality cannot be inferred. While the data suggest a strong correlation between social media addiction and depression, it remains unclear whether excessive SNS use contributes to depression or if individuals experiencing depressive symptoms are more inclined to engage in social media as a coping mechanism. This limitation is shared with previous research in both Western and Asian contexts, which has similarity relied on correlational designs. Future longitudinal studies would be beneficial in clarifying this relationship. Additionally, self-reported data introduce the possibility of response biases, a challenge frequently observed in SNS addiction studies. Participants may underreport or exaggerate their social media usage and mental health symptoms due to social desirability biases. Given the findings of this study, several future directions should be considered to address the growing concern of social media addiction and its impact on student mental health. Firstly, educational institutes should prioritize digital literacy programs aimed at raising awareness about the potential risks associated with excessive social media use. These programs should not only highlight the psychological consequences but also equip students with strategies for healthier digital consumption, such as setting usage limits, engaging in mindful scrolling, and prioritizing face-to-face interactions. Research from multiple global contexts indicates that such interventions can effectively reduce problematic social media behaviors and improve overall well-being (29,30). Secondly, universities should integrate psychological support services that specifically address social media addiction. Traditional counseling services should incorporate evidence-based approaches such as cognitive-behavioral therapy (CBT), which has been found to be effective in helping individuals develop healthier coping mechanisms (31). Additionally, peer support groups and mental health workshops focused on social media management could provide students with practical strategies to balance online and offline interaction while fostering emotional resilience.

Furthermore, institutions should consider policy-level intervention to regulate excessive screen time. Implementing structured guidelines, such as designated 'screen-free' study hours or promoting the use of productivity-enhancing applications, may encourage students to cultivate a more balanced digital lifestyles. Studies have demonstrated that such policies contribute to improved academic performance and mental well-being by reducing digital distractions and fostering better time management skills (32,33). Lastly further research should explore the long-term effects of social media addiction through longitudinal studies, as the cross-sectional nature of studies limit casual interpretations. Understanding the trajectory of social media addiction and its psychological consequences over time would offer valuable insights into its developmental patterns. Additionally, cross-cultural studies are necessary to examine how different social and economic backgrounds influence the relationship between social media use and mental health outcomes. Comparative research can help identify region-specific factors that contribute to problematic SNS engagement and inform targeted interventions tailored to diverse populations.

CONCLUSION

This study confirms a significant relationship between social media addiction and depression among university students in Pakistan, mirroring findings from studies in various global contexts. The results highlight the need for targeted interventions that promote digital well-being and mental health awareness. By fostering responsible social media engagement and implementing supportive institutional policies, education institutions can play a crucial role on mitigating the negative effects of SNS addiction. Future research should focus on longitudinal studies to establish causality and explore cross-sectional differences in social media behavior and mental health outcomes.

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