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Social media use and associated mental health indicators among University students: a cross-sectional study

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Social media has become more common in today's digital society, providing individuals with significant opportunities for social connection and information sharing. However, there are concerns about the potential effects of social media on mental health. This study aimed to assess the extent of social media use and its correlation with mental health indicators among health sciences students at Mogadishu University. A cross-sectional study was conducted among 268 participants selected using stratified random sampling. The findings revealed that 84.7% of the students spent more than three hours daily on social media. The high extent of social media use was significantly associated with sleep disturbance (AOR: 2.7; 95% CI: 1.04–7.04), mental exhaustion (AOR: 4.7; 95% CI: 1.80–12.46), social isolation (AOR: 7.4; 95% CI: 1.62–33.35), and anxiety (AOR: 22.2; 95% CI: 3.73–131.70). University students heavily use social media, which negatively impacts their psychological well-being. This highlights the need for responsible usage and institutional guidelines to mitigate these effects. Educating students on managing social media time and fostering healthy habits is essential to prevent health issues. Parents and lecturers should monitor usage and create schedules for study and social media.

Keywords Mental health, Social media, Students, University

Mental health includes an individual's emotional, psychological, and social well-being. It influences almost every aspect of life and can change our ideas, feelings, behaviors, stress reactions, interpersonal connections, and decision-making abilities. Furthermore, mental health disorders are affected by and influence daily social encounters[1]. In the twenty-first century, there was a transition from old (traditional) media, which included newspapers, magazines, and television, to new or social media[2]. Most people spend several hours a day on social media sites, demonstrating the profound integration of social media into society[3]. Over the past 10 years, the rapid emergence of social networking has led to significant changes in how people connect and communicate[4].

Globally, 4.65 billion people use social media, which accounts for 58.7% of the global population[5]. Many university students today are familiar with and often addicted to social media, using it for educational and leisure purposes[6]. 68% of college students use social media for six or more hours daily, with those aged 18 to 29 being the most active users[7]. The prevalence of social media usage is significant among health science students, with most of them spending several hours daily on these platforms[8,9]. In Africa, most students use social media to connect with friends and for academics. 88% are on Facebook, using it primarily to communicate (82%), seek job and bursary ads (9%), and stay updated on global news (20%). Only 8% use it for academic purposes like study group discussions[10].

During the early stages of the COVID-19 pandemic, social media may have helped young adults manage depressive symptoms and psychological stress from quarantine. However, this effect is influenced by certain personality traits[11]. Technology-based tools, particularly via social media, can alleviate psychological distress and provide health information to university students. Their availability and anonymity help reduce mental health stigma and complement standard treatments[12]. Social media interventions are valuable tools for addressing health and well-being issues, especially among youth and vulnerable populations. They use the unique features of social media to create engaging, evidence-based content that promotes positive behavioral changes[13,14].

However, there are concerns about the potential impact of social media use on mental health[15]. Social media use poses significant risks to mental health, raising concerns among parents, researchers, and society[16]. As a result, individuals are more likely to experience negative effects like anxiety, stress, bullying, and loneliness[17]. Studies

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have categorized the relationship between social media use and its negative outcomes, such as increased levels of depression[18], body image concerns, eating disorders[19], and external problems in young people, particularly among girls[20]. Scientists hypothesize that social media may significantly contribute to youth suicides[21].

Social media is a relatively recent phenomenon, and research on its potential links to mental health is still limited. Additionally, previous studies primarily focused on students from various disciplines; however, this study specifically investigates students in health sciences. As social media becomes increasingly important to university students' social lives, it was hypothesized that social media use would be associated with mental health outcomes. Therefore, this study aimed to investigate the relationship between social media use and mental health outcomes among health sciences students at Mogadishu University by offering a comprehensive research perspective on the negative impacts of social media use. Understanding this will help us develop targeted interventions to improve mental well-being in the context of social media use.

Methods

Study design and population

A cross-sectional study was conducted from March to May 2023 among health sciences students at Mogadishu University in Somalia. Students in the Faculty of Health Sciences can use mobile phones during class but with certain restrictions. They have access to the internet and are active social media users. Additionally, students can attend lectures, access course materials, take quizzes, and track their exam results using smartphones and tablets.

The criteria for inclusion in this research study were specifically designed to focus on undergraduate students from the Faculty of Health Sciences at Mogadishu University. Eligible participants were those students who actively agreed to partake in the study and were present during the designated research period. In contrast, students who were enrolled in the Faculty of Health Sciences but were absent during the study's implementation were not considered for participation. This approach aimed to ensure that all data collected accurately reflected the experiences and views of those students actively engaged in their academic environment during the study timeframe.

Sample size and sampling procedure

Upon reviewing the literature, it is evident that no previous studies have been done in the study area, and the expected percentage of social media usage was unknown. The sample size was determined using the formula recommended by Fisher et al.[22], which is $\mathbf{n = [Z^2 \times p\ (1–p)]/\ d^2}$, with a 95% confidence interval and a margin of error of 0.05. The calculation resulted in 384 participants. Since the number of health sciences students at Mogadishu University is less than 10,000, sample adjustment was performed using the following formula. $\mathbf{nf = n/[1+ (n/N)]} = 384/\ [1+ (384/811)] = 256$. A 5% non-response rate was added to account for an effective sample size. Therefore, the final sample size was **268**, and the participants were selected using stratified random sampling due to its ability to enhance representativeness and reduce sampling error. The students were initially divided into groups based on the proportions of their respective departments to select samples. A simple random sample was then taken from each group, with the proportion of each group in the overall population used as the sampling fraction.

Data collection and measurements

An adapted version of previously published studies[23–26] was used to develop a close-ended questionnaire. The researcher modified the study instrument according to the experts' recommendations. A pilot study was conducted on 30 participants[27] before data collection to assess its accuracy and identify any completion difficulties. Final adjustments were then made to the questionnaire. A Cronbach's alpha test was conducted, and the results indicated a score of 0.82, which is often considered good for scale reliability. The actual samples used for the study, however, did not include the results of the pilot study. The questionnaire context comprised three sections: the first section covered the participants' demographics, the second section focused on social media use, and the third section included questions exploring mental health indicators.

The main independent variable was the extent of social media use, defined as the amount of time and activity a student engages in on social media platforms. Participants who reported using social media for three hours or less per day were classified as low users, while those who reported using social media for more than three hours per day were classified as high users[28]. The researcher examined the dependent variable, which included mental health indicators such as eating disorder, apathy (lack of interest), depression or hopelessness, sleep disturbance, fear of missing out, mental exhaustion (feeling tired), difficulty concentrating, low self-esteem, social isolation, and anxiety. These indicators were measured by asking the participants to indicate whether they had experienced them in the past 30 days. If they had experienced any of the indicators, they were instructed to answer "Yes," and if they had not encountered any of the indicators, they were instructed to answer "No."

Data analysis

SPSS version 26 was used to analyze the gathered data, and a statistical test was performed using percentages. To verify the correctness, consistency, missing values, and variables, data cleaning was performed. All errors have been identified and corrected. The chi-square test was utilized to analyze and compare the demographic profiles of participants, as well as to evaluate their interaction hours with social media platforms. This statistical technique was employed to ascertain whether notable differences existed in social media usage among various demographic categories. Additionally, the crude odds ratio (COR) and the adjusted odds ratio (AOR) were calculated to evaluate the strength of the correlation between social media usage and the observed mental health outcomes. The odds ratios were accompanied by a 95% confidence interval (CI) to indicate the reliability of the estimates and the range within which the actual odds ratios are expected to reside. To further explore these relationships, both bivariate and multivariate logistic regression analyses were conducted. The bivariate analysis examined the

direct links between social media usage and specific mental health outcomes, while the multivariate analysis controlled for potential confounding factors, thereby enhancing the clarity of the associations. A threshold of P values ≤ 0.05 was deemed indicative of statistical significance.

Ethical considerations

The study was conducted following the guidelines of the Declaration of Helsinki. Before the survey, all participants were provided with information about the purpose of the study and instructions on how to complete the questionnaire. Verbal informed consent was obtained from the students before the study was conducted. The participants' information was kept confidential. The study protocol was approved by the Mogadishu University Faculty of Health Sciences Research Ethics Committee with reference number (03/2023).

Results

Sample characteristics and the extent of social media use

The majority of the respondents were aged between 18 and 23 years (97.4%), females (78.4%), enrolled in the nursing program (38.1%), and were in their fourth academic year (32.5%). Furthermore, a significant proportion of the respondents, 84.7%, spent more than three hours daily on social media, with Facebook being the most widely used platform, accounting for 30.6% of the total usage. Additionally, approximately 38.1% of the study participants used social media for educational purposes (Table 1).

Table 2 compares the demographic characteristics and social media use of study participants. Students aged 21 to 23 use social media more frequently, with a significant difference noted ($\chi 2 = 20.011$; $P < 0.001$). Females spend over three hours daily on social media, showing a significant difference between genders ($\chi 2 = 10.525$; $P = 0.001$). Nursing students use social media more than those in other programs, with a significant difference by

Variable	Frequency ($N = 268$)	Percent
Age group (years)		
18–20	130	48.5
21–23	131	48.9
+24	7	2.6
Sex		
Male	58	21.6
Female	210	78.4
Faculty Department		
Nursing	102	38.1
Midwifery	35	13.1
Public Health	45	16.8
Medical Laboratory Sciences	70	26.1
Nutrition & Dietetics	16	6.0
Academic year		
1st	39	14.6
2nd	58	21.6
3rd	87	32.5
4th	84	31.3
Time spent of social media per day		
≥ 3 h	227	84.7
< 3 h	41	15.3
The most used social media platform		
Facebook	82	30.6
TikTok	44	16.4
Snapchat	16	6.0
Instagram	19	7.1
YouTube	42	15.7
WhatsApp	17	6.3
Telegram	48	17.9
Main purpose of using social media		
Communication	58	21.6
Education	102	38.1
Entertainment	89	33.2
Marketing	19	7.1

Table 1. Sample characteristics and the extent of social media use.

Variable	>3 h per day (*N* = 227) *N* (%)	≤3 h per day (*N* = 41) *N* (%)	χ2	*P* value
Age group				
18–20 years	97 (42.7)	33 (80.5%)	20.011	< 0.001
21–23 years	123 (54.2)	8 (19.5%)		
+ 24 years	7 (3.1)	0 (0.0%)		
Sex				
Male	57 (25.1)	1 (2.4)	10.525	0.001
Female	170 (74.9)	40 (97.6)		
Faculty department				
Nursing	90 (39.6)	12 (29.3)	11.518	0.021
Midwifery	30 (13.2)	5 (12.2)		
Public Health	34 (15.0)	11 (26.8)		
Medical Laboratory Sciences	63 (27.8)	7 (17.1)		
Nutrition & Dietetics	10 (4.4)	6 (14.6)		
Academic year				
1st year	27 (11.9)	12 (29.3)	16.819	0.001
2nd year	45 (19.8)	13 (31.7)		
3rd year	75 (33.0)	12 (29.3)		
4th year	80 (35.2)	4 (9.8)		

Table 2. Comparison of demographic characteristics and the extent of social media use among students.

faculty department (χ2 = 11.518; *P* = 0.021). Additionally, fourth-year students use social media more than their peers in other academic levels (χ2 = 16.819; *P* = 0.001).

Social media use and selected mental health indicators

Among 268 participants, 227 spent more than three hours a day on social media. Among these participants, 76.7% reported experiencing an eating disorder, and 60.8% had little interest or pleasure in their daily activities. More than half of the respondents (64.3%) reported experiencing depression or feelings of hopelessness, 70% had difficulty sleeping, 57.7% experienced fear of missing out, 82.4% felt tired or had little energy, and 74.4% reported having trouble concentrating on tasks such as reading books or watching videos. Additionally, 63.9% of them experienced low self-esteem. Social isolation and anxiety were common in this group, with 74% and 76.7%, respectively, indicating mental health concerns (Table 2).

Associations between social media use and selected mental health indicators

Table 3 presents the results of multiple logistic regression analysis, indicating that university students who used social media for more than 3 h per day were significantly less likely to experience an eating disorder (AOR = 0.03; 95% CI = 0.00-0.17) but more likely to experience sleep disturbance (AOR = 2.7; 95% CI = 1.04–7.04), mental exhaustion (AOR = 4.7; 95% CI = 1.80-12.46), social isolation (AOR = 7.4; 95% CI = 1.62–33.35), and anxiety (AOR = 22.2; 95% CI = 3.73–131.70).

Discussion

The findings highlighted that the majority of the students spend more than three hours daily on social media. This aligns with previous studies indicating that a significant percentage of students use social media networks for more than three hours daily[29–31]. Facebook was the main platform used by the students, which is consistent with the results of earlier investigations[32–34]. The results correspond with other studies that have shown university students use social media for educational purposes[35,36]. The present study contradicted the findings of Deniz and Geyik[37] who indicated that the most prevalent purpose for Turkish students' online activities was entertainment, including chatting, social networking, downloading movies or music, playing games, gambling, or shopping.

Students aged between 21 and 23 years use social media more than any other age group. This finding was consistent with a study conducted by Al-Tameemi[38]. Furthermore, female students were more likely to use social media than male students. This is consistent with earlier results showing that female users of social media outnumber male users[39,40]. This is because female students tend to choose health sciences programs more often than male students. The study also revealed that students enrolled in the nursing program have high levels of social media use. This study was similar to[41], where the majority of nursing students were found to use social media extensively compared to other groups. Fourth-year undergraduates have been found to use social media more frequently. This discovery is consistent with another study on social media use in Indonesia[42]. The reason for this is that they are more familiar with university life and have a greater desire to connect with their peers, especially as they approach graduation.

This study revealed that students who used social media for more than 3 h per day were 97% less likely to experience eating difficulties compared to those who used it for 3 h or less per day. This finding is consistent with

Variable	>3 h per day (*N* = 227) *N* (%)	≤3 h per day (*N* = 41) *N* (%)	COR (CI 95%)	AOR (CI 95%)	*P* value
Eating disorder					
Yes	174 (76.7)	19 (46.3)	3.8 (1.91–7.55)	0.03 (0.00-0.17)	**< 0.001**
No	53 (23.3)	22 (53.7)	Ref.	Ref.	
Apathy (lack of interest)					
Yes	138 (60.8)	12 (29.3)	3.7 (1.82–7.73)	1.7 (0.67–4.42)	0.260
No	89 (39.2)	29 (70.7)	Ref.	Ref.	
Depression or hopelessness					
Yes	146 (64.3)	17 (41.5)	2.5 (1.29–5.01)	0.9 (0.35–2.77)	0.986
No	81 (35.7)	24 (58.5)	Ref.	Ref.	
Sleep disturbance					
Yes	159 (70.0)	18 (43.9)	3.0 (1.52–5.89)	2.7 (1.04–7.04)	**0.042**
No	68 (30.0)	23 (56.1)	Ref.	Ref.	
Fear of missing out (FOMO)					
Yes	131 (57.7)	14 (34.1)	2.6 (1.31–5.28)	1.8 (0.72–4.77)	0.204
No	96 (42.3)	27 (65.9)	Ref.	Ref.	
Exhaustion (feeling tired)					
Yes	187 (82.4)	17 (41.5)	6.6 (3.25–13.41)	4.7 (1.80-12.46)	**0.002**
No	40 (17.6)	24 (58.5)	Ref.	Ref.	
Trouble concentrating on things					
Yes	169 (74.4)	20 (48.8)	3.1 (1.55–6.05)	0.9 (0.28–2.64)	0.797
No	58 (25.6)	21 (51.2)	Ref.	Ref.	
Low self-esteem					
Yes	145 (63.9)	21 (51.2)	1.7 (0.86–3.29)	0.5 (0.19–1.38)	0.183
No	82 (36.1)	20 (48.8)	Ref.	Ref.	
Social isolation					
Yes	168 (74.0)	11 (26.8)	7.8 (3.66–16.47)	7.4 (1.62–33.35)	**0.010**
No	59 (26.0)	30 (73.2)	Ref.	Ref.	
Anxiety					
Yes	174 (76.7)	12 (29.3)	7.9 (3.79–16.62)	22.2 (3.73–131.70)	**0.001**
No	53 (23.3)	29 (70.7)	Ref.	Ref.	

Table 3. Crude and adjusted associations between social media use and mental health outcomes. Significant values are in [bold].

the literature[43], which reported no significant association between eating disorders and the intensity of social media use. This is because exposure to social norms on social media can influence students' eating habits to align with societal standards. Platforms also encourage sharing experiences of body positivity and self-acceptance, fostering a healthier body image. Furthermore, social media connects students to resources and support groups for addressing eating disorder triggers. However, this is inconsistent with various studies[44–46] that confirm that excessive time spent on social networking sites can lead to disordered eating behaviors among undergraduate students. Students who spend more than 3 h a day on social media have a 170% greater chance of experiencing sleep disturbances than those who spend 3 or fewer hours a day. This is aligned with previous studies[45,47,48].

It has also been found that students who use social media for more than three hours daily are 4.7 times more likely to feel exhausted than those who use social media for 3 h or fewer a day. This finding is corroborated by earlier studies[49,50]. Students who spend more than three hours daily on social media are 7.4 times more likely to experience social isolation and loneliness than those who spend 3 h or fewer a day. This finding is consistent with previous studies[51,52], suggesting that excessive social media use increases feelings of loneliness among university students. Furthermore, students who spent more than 3 h on social media per day were 22 times more likely to develop anxiety than those who spent 3 h or fewer a day. This finding is similar to those of previous studies[53,54]. Social media exacerbates anxiety and social isolation through social comparison, cyberbullying, information overload, and addiction[55]. These aspects lead to negative self-evaluation, emotional instability, and avoidance behaviors, ultimately diminishing social skills[56].

The major limitation of the present study is that it relies on self-reported measures of social media use and mental health indicators, which are subject to recall bias and social desirability bias. Participants may overestimate or underestimate their social media use or mental health symptoms, which can result in inaccuracies in the data. The use of objective measures or multiple assessment methods could enhance the validity of the results. The study's cross-sectional design limits the ability to establish causal relationships between social media use and mental health indicators. Furthermore, the sample size was inadequate to derive strong conclusions from the

results obtained. Lastly, the population of this study was limited to university students who extensively use the internet for various purposes. Therefore, generalizing the results to other populations with different cultural backgrounds may not be warranted.

Conclusion and recommendations

The study revealed that a significant number of participants spent a considerable amount of time on social media, which aligns with the findings of previous studies emphasizing the extensive use of these platforms. Increased duration of social media use, however, has negative impacts on mental health, including sleep disturbance, mental exhaustion, social isolation, and anxiety. Limiting social media use can contribute to improved mental health outcomes and a reduced risk of mental health disorders including better sleep, improved mood, enhanced focus, and stronger relationships. Although some of the indicators observed in the present study were not significantly different, it is important to consider the broader body of research on social media use and its effects on mental health. Future research should focus on larger, more diverse populations to confirm the observed relationships and gain a more comprehensive understanding of the topic. Longitudinal or experimental designs would be valuable in determining the temporal sequence and identifying potential causal links between these variables. It is crucial to educate students about managing their time on social media and developing healthy habits to prevent health problems. Lecturers and parents should monitor their children's social media use and establish a study and social media schedule. It is also important to develop interventions and guidelines that encourage healthy social media use to reduce potential negative effects and improve well-being by integrating digital ethics into the curriculum, teaching students about the implications of their online actions, and the importance of critical thinking regarding content consumption.

Data availability

The data that support the findings of this study are available on request from the author.

Received: 12 September 2024; Accepted: 13 March 2025
Published online: 19 March 2025

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Acknowledgements

The author would like to acknowledge the study participants who generously shared their time and insights.

Author contributions

The author confirms sole responsibility for the following: study conception and design, data collection, analysis

and interpretation of results, and manuscript preparation.

Competing interests
The authors declare no competing interests.

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