



OPEN

Association between mobile social networks usage and mental health and social behaviours in medical students in southern Iran

Masoomeh Khajeh Ahmadi^{1,2}, Masoud Bahreini^{1,3}✉, Eisa Safavi^{1,4}, Kamran Mirzaei^{1,5,6} & Reza Nemati^{1,7,8}✉

Mobile social networks (MSNs) have emerged as a pervasive technological phenomenon in the 21st century, significantly influencing both mental health and social interaction. This study aims to determine the relationship between MSN use and mental health as well as social behaviours among medical students. This demographic is particularly salient due to their increasing engagement with MSNs and their crucial role as prospective contributors to societal health and development. A cross-sectional study was conducted involving 260 medical students enrolled at a university in southern Iran. Data were collected using the 28-item General Health Questionnaire (GHQ-28), a purpose-designed questionnaire assessing mobile social network addiction, and a social behavior questionnaire. Statistical analyses were performed using SPSS version 22. The findings indicated that approximately 30% of the student population exhibited behaviors suggestive of emerging social media addiction. A statistically significant positive correlation was found between the extent of social network use and mental health status ($r=0.242, p=0.001$). Furthermore, a significant relationship was observed between the use of mobile social networks and social behaviors ($r=0.138, p=0.036$). Mobile social network use is widespread among medical students in southern Iran. The findings suggest an association between MSN and psychological disturbances, including anxiety, sleep disorder, and depression, as well as reduced social maturity. It is crucial to note that these findings highlight potential correlations rather than causal relationships, as the cross-sectional design does not allow for causal inferences. Educational programs and psychological interventions promoting balanced social media use may help support students' mental health and social development.

Keywords Social behaviours, Mental health, Social networks, Mobile

Abbreviations

MSN	Mobile social network
GHQ	General health questionnaire
SPSS	Statistical package for the social sciences

The pervasive influence of social media

In the contemporary digital era, the widespread adoption of communication technologies and pervasive internet access has established social media as an indispensable aspect of daily life¹. The rapid advancements in technological infrastructure and digital communication have paved the way for novel platforms that facilitate social interactions and information dissemination, with mobile-based social networks demonstrating particular

¹Student Research Committee, Bushehr University of Medical Sciences, Bushehr, Iran. ²Department of Nursing, Darab Branch, Islamic Azad University, Darab, Iran. ³Department of Psychiatric Nursing, School of Nursing and Midwifery, Bushehr University of Medical Sciences, Bushehr, Iran. ⁴Department of Laboratory Sciences, School of Allied Medical Sciences, Bushehr University of Medical Sciences, Bushehr, Iran. ⁵Department of Community Medicine, School of Medicine, Bushehr University of Medical Sciences, Bushehr, Iran. ⁶Department of Community Medicine, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran. ⁷Department of Medical Emergencies, School of Allied Medical Sciences, Bushehr University of Medical Sciences, Bushehr, Iran. ⁸Clinical Research Development Center, The Persian Gulf Martyrs Hospital, Bushehr University of Medical Sciences, Bushehr, Iran. ✉email: m.bahreini@bpums.ac.ir; reza.nemati@outlook.com

prominence². As of October 2024, global internet users totaled a staggering 5.52 billion, accounting for 67.5% of the world's population. Of this demographic, 5.22 billion or 63.8%, were active social media users³. These platforms have significantly permeated daily routines, providing diverse avenues for communication, sharing experience, and acquiring information⁴. Notably, students, especially those enrolled in medical disciplines, who confront unique challenges such as academic pressures and the continuous imperative for scientific updates, represent a demographic with high rates of social media engagement^{5–7}. Given the demanding and stressful nature of their academic pursuits, they often turn to social media as a means of stress relief^{8,9}, to cultivate social support networks, and to participate in scholarly discussions⁷.

Dual impacts on mental health and social behaviours

Despite the myriad benefits associated with social media, empirical evidence suggests that its excessive or imbalanced utilization can exert detrimental effects on mental health^{10,11}. Research consistently correlates excessive social media consumption with increased incidence of anxiety, depression, feelings of social isolation, and diminished self-esteem^{10,12,13}. Moreover, prolonged engagement with social media may adversely impact sleep patterns¹⁴, overall quality of life, and adaptive coping mechanisms¹⁵. Conversely, the proliferation of virtual interactions has the potential to attenuate or erode face-to-face social connections, thereby influencing students' social behaviours^{16,17}.

Conversely, research indicates that when judiciously employed, social media can positively contribute to students' mental and social well-being. These platforms offer invaluable opportunities for social support, fostering meaningful interpersonal connections and sharing experiences, which can help alleviate stress and enhance overall life satisfaction^{18,19}. This dual nature of social media's impact underscores the intricate relationship between social media use and students' mental health and social behaviours, thereby necessitating rigorous scientific inquiry. Given the unique challenges encountered by medical students, an investigation into the specific impact of social media on this population is particularly pertinent. Despite extensive research, a dedicated study examining this relationship within the context of medical students in southern Iran remains an identified gap in the literature.

Medical students are among the groups that make the greatest use of social networks due to the demanding and stressful nature of their studies²⁰. They frequently use these platforms to mitigate stress, seek social support, and even establish academic connections²¹. At the same time, the substantial educational workload, long hours of study, and exposure to high-stress clinical environments elevate the susceptibility of this group to mental health challenges and alterations in social behaviours, especially when compared to other student populations²². In addition to these issues, medical students in southern Iran face further challenges such as limited educational resources, geographical distance from major academic centres, and stressors intrinsic to the specific cultural and social conditions of the region²³. These circumstances justify the selection of this group as the study population and highlight the imperative of examining the relationship between the use of mobile social networks, mental health, and social behaviours in this context^{22,24}.

Purpose of the study and research hypotheses

This study aims to investigate the relationship between MSN usage and the mental health and social behaviours of medical students. Specifically, the objectives are to: (a) identify the correlation between the extent of MSN use and both mental health and social behaviours, as well as (b) explore the potential for addiction to these platforms among medical students.

Research hypotheses

1. There is a significant relationship between the extent of mobile social media use and the mental health of medical students in southern Iran.
2. There is a significant relationship between the extent of mobile social media use and the social behaviours of medical students in southern Iran.
3. There is a significant relationship between mental health and social behaviours among medical students in southern Iran.
4. Excessive use of mobile social media (addictive use) is associated with lower levels of mental health and less desirable social behaviours among medical students.

Methods

Design, settings, and participants

This investigation employed a cross-sectional study of the correlational design. The research population consisted of all students enrolled at a specific university of medical sciences located in the south of Iran. Data collection was conducted over three months, from October to December 2020. Stratified-quota random sampling was utilized to select participants from various academic disciplines. The participants were selected from different disciplines. Inclusion criteria for participation were: active use of social networking applications on a mobile phone, no documented history of diagnosed mental illness, and voluntary consent to participate in the study. The exclusion criteria were unwillingness to continue participating in the project or incomplete submission of the questionnaire.

The principal investigator personally visited classrooms to introduce the study and articulate its objectives. Questionnaires were then distributed for immediate, self-administered completion by the students.

To determine the requisite sample size, based on the correlation coefficient between harmful social media use and mental health ($r = 0.24$), as reported by Stockdale and Coyne (2020)²⁵, was referenced. With an alpha level

(α) set at 0.05 and a beta level (β) set at 0.1, the following formula for sample size calculation for a correlation study was applied:

$$N = [z_{1-\alpha/2} + z_{1-\beta}/c]^2 + 3 C = 0.5 \times \ln[1 + r/1 - r]$$

Accounting for an anticipated 20% dropout rate and to enhance the study's statistical power, a final sample size of 260 participants was calculated.

Data collection instruments

The process of data collection employed a suite of instruments, comprising a demographic information collection form, the Goldberg and Hillier General Health Questionnaire, a researcher-developed questionnaire assessing addiction to mobile social networks, and a researcher-developed questionnaire on social behaviours.

The questionnaires were administered through an online platform, and efforts were made to ensure uniform conditions for all participants. To ensure uniform comprehension of response protocols, all participants received identical, standardized instructions at the outset. The sequential arrangement and structural integrity of the questionnaire remained consistent across all administrations. Furthermore, the researchers were available to provide only general and consistent clarifications in case of any ambiguities. These measures were implemented to enhance consistency in data collection and to improve the reliability of the acquired responses.

The demographic information form encompassed gender, age, marital status, educational level, field of study, average family income, parental education levels, parental occupations, duration of mobile social network application usage, daily user engagement with social media applications, and the places where social networks are used.

General health questionnaire (GHQ-28)

Developed by Goldberg and Hillier (1979)²⁶, this 28-item instrument examines an individual's mental state over the preceding month. It evaluates 4 scales, including physical symptoms, anxiety and sleep disorder, social dysfunction, and depression. The items are rated on a 4-point Likert scale. As a result, the minimum total score of the questionnaire is zero, and the maximum is 84. Scores are subsequently categorized into four levels: none or minimal (0–22), mild^{23–40}, moderate^{41–60}, and severe (61–84). Malakoutikhah et al. (2022) demonstrated that this instrument exhibited high validity and reliability, with Cronbach's alpha of 0.78 for the General Health Questionnaire²⁷.

Addiction questionnaire to mobile social networks

This questionnaire, developed by Khajehmadi et al. (2017), consists of 23 items. The conceptual framework of this questionnaire encompasses four dimensions: individual performance (9 items), time management (6 items), self-control (4 items), and social relationships (4 items). The instrument employs a 5-point Likert scale, with response options ranging from "strongly disagree" (score of 1) to "strongly agree" (score of 5), encompassing "neutral", "slightly disagree", and "slightly agree" as intermediate options. The minimum total score for the questionnaire is 24, and the maximum is 120. A total score between 24 and 48 indicates a less usage than usual, a score between 48 and 72 suggests that Normal use, a score between 72 and 96 suggests that the user is Subject to addiction and a score between 96 and 120 indicates a high level of mobile social media addiction. To assess the validity and reliability of the instrument, factor analysis and Cronbach's alpha coefficient were calculated for the entire 23-item questionnaire. The Cronbach's alpha coefficient for the sample of 260 students was 0.92, with the coefficients for the individual dimensions as follows: individual performance (0.907), time management (0.81), self-control (0.72), and social relationships (0.68)²⁸.

Questionnaire of social behaviours

Also developed by Khajehmadi et al. (2017), this questionnaire consists of 14 items each rated on a 5-point Likert scale ranging from strongly disagree (score of 1) to strongly agree (score of 5), with neutral, disagree, and agree as intermediate options. The total score ranges from a minimum of 14 to a maximum of 70, categorized into four levels: undesirable^{14–28}, somewhat desirable^{28–42}, desirable^{42–56}, and very desirable (56–70). Elevated scores are indicative of more positive social behaviours. The validity and reliability of this instrument have been assessed and confirmed by the researchers, with a Cronbach's alpha coefficient of 0.84²⁹.

Ethical consideration

This investigation received ethical approval from the Research Council (Code: 37771) and the Ethics Committee (Code: IR.BPUMS.REC.1395.5) of Bushehr University of Medical Sciences. Before the commencement of data collection, all participants were comprehensively informed regarding the objectives and inherent nature of the study, and their participation was entirely voluntary. all the participants were provided informed consent. They were free to withdraw from the study at any juncture without repercussion. Participants were assured that their information would remain confidential and anonymous and would be used solely for scientific purposes. Additionally, in the event of any concerns or signs of psychological distress, appropriate referrals were promptly extended to the university's counselling services and other accredited support services to ensure access to professional assistance. These protocols were implemented to uphold the ethical principles of research and to safeguard the mental well-being of the participants.

Data analysis

In this study, the proportion of missing data for the main variables was less than 5%. Given the low proportion and in line with statistical recommendations, the missing data were considered negligible and handled using

Gender			The number of years of using mobile social networks		The number of hours of daily use of mobile social networks
Variables	Number (%)		Variables	Number (%)	Number (%)
Male	80 (30.8)		Less than 1 year/hours	46 (17.8)	36 (13.8)
Female	180 (69.2)		1 to 2 years/hours	75 (28.6)	63 (24.3)
Marital status			2 to 3 years /hours	89 (34.2)	66 (25.4)
Single	203 (78.0)		3 to 4 years /hours	29 (11.2)	48 (18.5)
Married	57 (22.0)		More than 4 years/hours	21 (8.2)	47 (18.0)
Level of education			Place of use		
Bachelor's	181 (69.6)		Variables	Number (%)	
Doctorate	79 (30.4)		Dormitory	149 (57.7)	
Field of Study			Home	99 (38.4)	
College	Field	Number (%)	University	5 (1.2)	
Nursing and Midwifery	Nursing	25 (9.6)	Friend's house	1 (0.4)	
	Midwifery	29 (11.2)	Various places	6 (2.3)	
Medical	-	56 (21.5)	Average monthly income		
Dental	-	24 (9.2)	Variables	Number (%)	
Environmental health and public health	-	45 (17.3)	Less than \$50	47 (18.0)	
			Nutrition	12 (4.7)	50 to \$100
Paramedicine			Librarianship	7 (2.7)	\$ 100 to \$200
			Operating Room	19 (7.4)	Over \$ 200
			Laboratory sciences	21 (8.0)	Parents' education
			Anaesthesia	22 (8.4)	Variables
				Father	Mother
Parents' occupation			Illiterate	9 (3.5)	25 (9.7)
Variables	Father	Mother	Primary	44 (16.9)	77 (29.6)
Unemployed	18 (7.1)	-	Junior High School	28 (10.8)	40 (15.3)
Housewife	-	204 (80.6)	Diploma and Associate Degree	95 (36.6)	81 (31.2)
Employee	76 (29.9)	35 (13.8)	Bachelor's	62 (23.8)	27 (10.4)
Self-employment	90 (35.4)	3 (1.2)	Master of science	22 (8.4)	10 (3.8)
Retired	70 (27.6)	11 (4.4)			

Table 1. Demographic characteristics of students participating in the study ($n=260$).

The amount of use of mobile social networks	Frequency	Percent
Less usage than usual	62	23.8
Normal use	117	47.8
Subject to addiction	61	23.4
Addiction	20	5

Table 2. Frequency of use of mobile social networks among students ($n=260$).

listwise deletion. Accordingly, the results of the analyses were not substantially affected by missing data. Data analysis was conducted using SPSS version 22 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to describe the demographic characteristics of the sample, along with their reported mental health status, propensity for mobile social networks, and social behaviours. Pearson's correlation coefficient was employed to investigate the correlational relationship between social network usage and mental health.

Results

Sociodemographic factors

A total of 270 individuals were invited to participate in this study. However, 10 questionnaires were excluded due to incomplete data, resulting in a final sample size of 260 participants, yielding a response rate of 96%. Table 1 provides a summary of the demographic characteristics of the study participants.

Table 2 shows the amount of usage of mobile social networks. As can be seen, 47.8% (117) of the participants were in the normal usage state in terms of daily user engagement with social media applications. However, in total, approximately 30% of people on the verge of becoming addicted or were already addicted to social networks.

College	Mean	Standard Deviation	Minimum	Maximum
Nursing and Midwifery	57.42	17.97	24.00	91.00
Medical	69.16	18.88	39.00	115.00
Dental	66.08	18.73	28.00	110.00
Health	67.88	20.09	31.00	120.00
Paramedical	60.45	20.10	25.00	108.00

Table 3. Average score of addiction to social networks among students participating in the study ($n=260$).

Variable	Dimensions	Mean	Standard Deviation	Minimum	Maximum
Mental health	Physical symptoms	5.38	3.51	0.00	20.00
	Anxiety and sleep disorder	5.65	3.66	0.00	21.00
	Social functioning disorder	7.48	3.07	0.00	20.00
	Depression	3.05	3.99	0.00	20.00
	Total score	21.72	11.77	0.00	77.00
Social behaviour	Individual development	13.61	2.83	4.00	20.00
	Social development	14.18	3.06	5.00	20.00
	Social maturity	3.71	3.29	0.00	18.00
	Social behaviour	49.27	8.24	20.00	70.00

Table 4. Average scores of mental health dimensions and social behaviours of students participating in the study ($n=260$).

Mental health	Dependence on social networks		
	R	p value	95% CI for r
Physical symptoms	0.12	0.054	-0.002–0.248
Anxiety and sleep disorder	0.19	0.003	0.069–0.313
Social functioning disorder	0.12	0.04	0.001–0.252
Depression	0.27	0.001	0.151–0.385
Total	0.24	0.001	0.116–0.360

Table 5. The relationship between the amount of use of social networks and the mental health of students participating in the study ($n=260$).

The average score of addiction to mobile-based social networks in students of nursing and midwifery faculty (57.42 ± 17.97), in medical faculty (69.16 ± 18.88), in dental faculty (66.08 ± 18.73), health faculty (67.88 ± 20.09) and in paramedical faculty (60.45 ± 20.10).

A one-way analysis of variance indicated that the level of mobile social network addiction differed significantly across students from various academic disciplines, $F(4, 237) = 3.556$, $p = 0.008$, $\eta^2 = 0.057$. Post hoc comparisons using the Tukey HSD test revealed that nursing students reported significantly lower levels of addiction compared with students in medicine and public health.

The results of scores of addiction to social networks in students are presented in Table 3, and the overall average scores of mental health, social behaviours and their dimensions are presented in Table 4.

Further analysis revealed a statistically significant, direct relationship between dependence on MSNs and several aspects of mental health, specifically anxiety and sleep disorder, social actions, and severe depression. However, no significant correlation was observed between the physical symptoms and the study variables (Table 5). Moreover, the study showed a direct and significant statistical relationship between dependence on social networks and social behaviours ($p = 0.03$ and 0.13).

The findings of this study revealed a statistically significant positive association between mobile social network addiction and overall mental health (GHQ), as well as with the subcomponents of anxiety and sleep disturbance, social dysfunction, and depression. In contrast, no significant relationship was observed between mobile social network addiction and the somatic symptoms subscale (Table 5). Based on the correlation coefficients obtained ($r = 0.19$ to $r = 0.27$ for the significant variables), the effect sizes fall within the small to moderate range according to Cohen's criteria. Thus, although these associations are statistically significant, the magnitude of the correlations suggests that their practical importance is relatively modest, yet still noteworthy.

An examination of social behavior frequency showed that 15.6% of students exhibited very good social behaviour, 69.1% had good social behaviour, and only 1.2% had poor social behaviour. Delving deeper into specific dimensions, 19.8% of the participants assessed their social progress as 'very good', 52.8% as 'good', and

Variable	B	SE B	β	t	p	95% CI B	Tolerance	VIF
Constant	30.091	9.236	–	3.258	0.001	11.887–48.296	–	–
GHQ	0.465	0.112	0.278	4.151	0.000	0.244–0.685	0.941	1.062
Rafter	0.478	0.167	0.191	2.859	0.005	0.149–0.808	0.941	1.062

Table 6. Predicting mobile addiction using mental health and social behavior.

5.6% as ‘poor’. A notable finding emerged in the social maturity dimension, where a significant portion of the student cohort (92.9%) reported ‘poor’ social maturity, with only 7.1% reporting an ‘average’ level, and none achieving ‘very good’ or ‘good’ ratings. Regarding individual progress, 14.7% of the participants rated themselves as ‘very good’, 53.0% as ‘good’ and 4.4% as ‘poor’.

Linear regression results

A multiple linear regression analysis was conducted to predict social addiction (socialaddict) using GHQ and behaviour (rafter) as independent variables. The results indicated that the model significantly predicted social addiction, $F(2, 216)=10.44$, $p<0.001$, with an adjusted $R^2=0.08$, suggesting that approximately 8% of the variance in social addiction was explained by these two predictors. Both GHQ ($\beta=0.278$, $p<0.001$) and behaviour ($\beta=0.191$, $p=0.005$) were significant predictors. The VIF values for both variables were below 2, and the tolerance values were above 0.9, indicating that multicollinearity was not a concern and that the independent contribution of each predictor could be meaningfully interpreted (Table 6).

Discussion

This study investigated the relationship between MSN use, mental health, and social behaviours among medical students in southern Iran. Specifically, the study sought to identify the correlations between the extent of social media engagement and both psychological and social outcomes, while also assessing the potential for addiction to these platforms with this cohort. The findings revealed that approximately 30% of students were either at risk of or already addicted to MSNs, whereas nearly half fell within the normal range of use. This prevalence underscores a significant challenge of excessive use among medical sciences students.

In alignment with these findings, Singh et al. (2024) reported a social media addiction prevalence of 76.7% among medical students, which is notably higher than the 30% observed in the current study³⁰. Similarly, Said et al. (2020) examined the prevalence of smartphone addiction risk among medical and dental students, revealing that a substantial proportion (30–40%, depending on associated factors) were at risk³¹. Naushad (2025) also demonstrated an 81% social media addiction rate among medical students, further substantiating a high prevalence (exceeding 30%) and its correlation with poor academic performance³². Conversely, Traore et al. (2023) reported an internet addiction prevalence of approximately 9%, substantially lower than the 30% identified here³³. This discrepancy may be attributable to methodological variations, such as the use of different measurement tools. For instance, that study employed Young’s Internet Addiction Test, which may have lower sensitivity to mild levels of addiction. Population differences could also contribute, since Moroccan students are subject to cultural contexts and levels of social media accessibility that differ significantly from those in Iran, potentially influenced by economic or societal restrictions. Furthermore, the focus of Traore’s study on sociodemographic variables such as gender and financial status, factors less emphasized in the present study, could account for the lower prevalence observed. Thus, the lower prevalence reported in Traore’s study may reflect either more effective control of confounding factors or cultural divergences in usage patterns.

It appears that MSN use among medical sciences students transcends the realm of routine daily habit; instead, approximately one-third of students seem to be progressing toward dependency or behavioural addiction³⁴. From a psychological perspective, this finding is plausible, as social media platforms stimulate the brain’s reward system through mechanisms such as likes and notifications, thereby eliciting experiences similar to certain chemical addictions³⁵. For medical students who often contend with demanding academic schedules and high stress levels, social networks may initially function as a transient coping mechanism; however, over time, they may foster a cycle of dependency³⁶.

Cultural and social factors in Iran also play a critical role. Widespread access to mobile phones and platforms such as Instagram and Telegram, coupled with societal pressure to maintain an active online presence, are likely to exacerbate the risk of dependency. From a sociological perspective, these findings align with the Uses and Gratifications Theory, which postulates that individuals engage with media to satisfy social needs; however, disproportionate utilization may lead to adverse psychological consequences³⁷. Potential outcomes encompass diminished academic productivity and heightened real-world social isolation, even while students appear to be actively engaged online. In the long term, such outcomes could affect the quality of medical care delivered by prospective healthcare professionals. To address this problem, educational interventions and workshops focusing on time management and constructive online engagement are recommended to mitigate addiction and encourage judicious usage³⁸.

A comparative analysis of mean addiction scores across faculties indicated a significantly elevated prevalence among medical and dental students relative to other cohorts. This discrepancy may be reflective of the unique academic and psychological pressures inherent to these disciplines, as well as students’ stronger tendency to use social networks as a coping mechanism for stress mitigation. Gedam (2016) similarly reported that severe addiction prevalence was higher among dental students (2.3%) compared to medical students (1.2%), thus underscoring discipline-specific pressures as critical contributing factors³⁹. Likewise, Farghal et al. (2023) found

social media addiction to be more pronounced among dental students, attributing this to stress-mediated coping strategies⁴⁰. Furthermore, Susmitha (2024) reported a substantial 71.9% prevalence of addiction among dental students, again emphasizing the influence of stress-related factors⁴¹. In contrast, Saadeh et al. (2020) found no significant differences between medical and dental students, instead highlighting a generalized reluctance to use social media for the acquisition of medical information, thereby suggesting that cultural variables may exert an influence on these findings⁴². These discrepancies could be explained by methodological differences, such as an over-reliance on self-report instruments that may not adequately capture the educational stressors unique to medical and dental training.

Discipline-specific differences, therefore, appear to play an important role. Medical and dental students, frequently confronted with rigorous academic workloads including long clinical shifts, intensive examinations, and demanding responsibilities, are more likely to resort to social networks for stress relief. From a psychological perspective, this behaviour can be understood through the Stress Compensation Model, which postulates that individuals experiencing considerable pressure frequently employ media for mood regulation. However, such short-term coping strategies may develop into addiction, as the immediate rewards of online interaction replace healthier alternatives such as physical exercise or real-world social support⁴³.

In the Iranian context, where medical education is highly competitive, students frequently experience burnout, leading them to turn to social networks as a form of digital escape. However, this escape may initiate cycles of dependency that adversely affect sleep quality and cognitive concentration. Sociologically, these findings align with Role Strain Theory, suggesting that the multiple roles medical students must juggle, being both learners and prospective healthcare professionals, engender elevated stress levels, thereby intensifying susceptibility to social media addiction⁴⁴. Long-term consequences may include reduced training quality and heightened risk of medical errors, as addiction undermines cognitive skills and concentration. Therefore, discipline-specific interventions, such as stress management counselling and reasonable limitations on social media engagement, may contribute to re-establishing balance and preventing dependency⁴⁵.

Furthermore, the present study revealed a significant relationship between social media addiction and various indicators of mental health, particularly anxiety, sleep disorder, and severe depression. However, no significant association was detected with somatic symptoms. These findings are consistent with Che et al. (2025), who reported positive correlations among addiction, anxiety, depression, and poor sleep quality, while implicitly observing an absence of association with somatic complaints⁴⁶. Similarly, Jameel et al. (2025) identified links between addiction, depression, anxiety, and insomnia, emphasizing the mediating role of sleep⁴⁷. Osman et al. (2025) also highlighted strong associations with sleep disturbances and psychological fatigue⁴⁸. A comprehensive systematic review and expert consensus by Capraro et al. (2025) affirmed that prolonged use and addictive patterns of social media are strongly associated with higher levels of anxiety, depression, and sleep difficulties. Online pressures, including social comparisons and exposure to cyberbullying, may reduce self-esteem and increase feelings of loneliness. Moreover, excessive engagement may reduce face-to-face social interactions and compromise the quality of real-world relationships. While judicious use can facilitate social support and positive interactions, evidence suggests that the adverse outcomes of overuse predominate. Although definitive causality remains unconfirmed, substantial evidence suggests that excessive social media use represents a potential risk factor for mental health and social functioning in adolescents⁴⁹.

Conversely, Jasso-Medrano et al. (2018) observed no statistically significant relationship between social media use and depressive symptoms, with some cases even reporting negative or absent correlations⁵⁰, which stands in contrast to the findings of the present study. This divergence may be explained by methodological differences, such as the application of depression scales with limited sensitivity to mild symptoms, or the focus on non-addictive patterns of social media engagement. Additionally, differences in study populations may be relevant; for example, general youth populations in some contexts may experience social media as a source of social support, rather than as a contributor to anxiety and depression. In contrast, the specific stressors and challenges faced by medical students in the present study may not have been adequately accounted for in those investigations.

The observed associations between social media addiction, anxiety, sleep disturbances, and depression can be explained by several mechanisms⁵¹. Neurobiologically, disruptions to circadian rhythms due to screen-emitted blue light reduce melatonin production, impairing sleep and potentially fostering a cycle of depression⁵². The absence of associations with somatic symptoms suggests that the effects of addiction are initially more psychological than physical, consistent with the Behavioural Addiction Model, which emphasizes neuropsychological rather than direct physiological impacts⁵³. Among medical students, these associations may be further intensified by Fear of Missing Out (FOMO), wherein the compulsion to check social media increases anxiety, disrupts sleep, and contributes to depressive symptoms⁵⁴. Clinically, these findings align with the DSM-5 framework, which considers internet addiction as a potential disorder, underscoring the need for regular psychological assessment⁵⁵. Potential long-term consequences may encompass elevated dropout rates and challenges in professional contexts. Interventions such as cognitive-behavioural therapy (CBT) and structured sleep hygiene programs may help mitigate these risks and improve students' mental health⁵⁶.

The study also found a significant association between social media addiction and social behaviours. Although a large proportion of students reported good social behaviour, the majority scored poorly in the domain of social maturity, indicating that excessive use undermines the quality of social development. Lin et al. (2023) reported similar findings, demonstrating that addiction weakens interpersonal relationships⁵⁷. Walaa Elsayed (2021) also underscored adverse effects on social identity and maturity⁵⁸. Laaber et al. (2024) emphasized that digital maturity is closely tied to social well-being, identifying addiction as a key barrier⁵⁹.

By contrast, Irmer and Schmiedek (2023) reported neutral or even positive associations between daily social media engagement and social well-being, including social behaviours and maturity, and even highlighted enhanced social interaction as a potential benefit⁶⁰. These results contradict the present findings, which suggest

impaired social maturity. Such discrepancies may arise from differing study designs; longitudinal studies may capture short-term positive effects while failing to account for long-term adverse outcomes. Additionally, the general youth population included in that study differs from medical students, who confront unique academic pressures that may intensify negative effects.

The findings of the present study highlight an important paradox: students display high levels of online presence but low levels of social maturity. This paradox can be interpreted through the lens of Social Displacement Theory, which posits that time allocated to online activities replaces real-life interactions, thereby undermining the development of social skills such as empathy and conflict resolution⁶¹. In medical students, competitive environments and academic stressors may cause addiction to social networks to substitute superficial interactions, such as likes and comments, instead of deeper, meaningful relationships, ultimately weakening social maturity. From a developmental perspective, these findings align with Erikson's stage of identity versus role confusion, suggesting that addiction may disrupt natural trajectories of social growth⁶¹. Long-term consequences could include difficulties in teamwork and collaboration within medical settings. Consequently, interventions that promote balance between online and offline engagement and strengthen real-life social skills appear necessary to improve students' social maturity⁶².

Major strengths, limitations, and future directions

This research is the first study to investigate the use of mobile social media and its impact on the psychological well-being and social behaviour of medical students. Due to academic and professional pressures inherent in medical education, students are at a higher risk of experiencing compromised mental health, a risk that may be further amplified by excessive engagement with social media platforms. By identifying related challenges and consequences, this study provides a foundational framework for the development of targeted interventions designed to promote mental and social well-being in this vulnerable group. Moreover, in recognition of cultural and geographical differences of the population, the researchers employed self-developed questionnaires with established reliability and validity. These methodological considerations constitute the primary strengths of the present study.

The main limitation of this study lies in its cross-sectional design, which prevents the drawing of causal inferences between social media engagement and students' mental health outcomes. The findings merely denote associations between these variables, and the direction of causality should be examined in future longitudinal or interventional studies. An additional limitation concerns the reliance on self-report questionnaires, which may be subject to biases such as social desirability or reduced accuracy due to respondent fatigue. To mitigate these potential biases, questionnaires were administered anonymously, and no personally identifying information was collected. Participants were assured that their responses would be used solely for scientific purposes and that confidentiality would be rigorously maintained. Participation was entirely voluntary, and students could withdraw at any stage. Despite these measures, biases inherent to self-reporting methodologies cannot be entirely eliminated and should be considered when interpreting the results. An additional limitation involves the inability to control for certain confounding factors. Variables such as students' pre-existing mental health status, levels of academic pressure, and socioeconomic conditions may have influenced the observed relationships between social media use, mental health, and social behaviour. This limitation should be taken into account when interpreting the findings, and future studies could enhance the validity and generalizability of results by collecting more detailed data and controlling for these confounders.

For future research, it is recommended to employ longitudinal or interventional designs to explore causal relationships more precisely. Examining additional factors such as social support, self-regulatory capacities, coping strategies, and other personal or contextual variables may serve to enhance the understanding of the observed outcomes. Expanding the study population to include students from other disciplines or different geographical regions would enhance generalizability of the findings. Furthermore, designing and evaluating educational or support programs aimed at mitigating the negative effects of social media while promoting mental and social well-being among students is encouraged. Finally, integrating quantitative and qualitative methods and differentiating between types of social media activities, such as active social interactions versus passive content consumption, as well as usage duration, could provide deeper insights into their impact on mental health.

Conclusions

The present study indicated that mobile social network use is widespread among medical students in southern Iran, with a portion of students exhibiting behavioral dependence or being at risk thereof. The findings revealed associations between social media engagement and psychological disturbances, particularly anxiety, sleep disorder, and severe depression, as well as reduced social maturity and impaired social behaviours. These results highlight potential correlations rather than causal relationships, as the cross-sectional design of the study does not allow for causal inferences. Discipline-specific differences, academic pressures, and cultural and social contexts appear to be related to the intensity of social media use and its psychological and social outcomes. Medical and dental students, due to demanding workloads and academic expectations, may be more likely than other students to engage with social networks as a coping strategy, which could be associated with more pronounced psychological and social challenges. In light of these observations, educational programs and workshops to promote balanced social media use and effective time management, particularly for students in academically rigorous disciplines, are recommended. Psychological interventions, such as cognitive-behavioural therapy and structured sleep hygiene programs, may be beneficial in supporting students' mental health and social skills. Overall, the findings provide a foundation for future research and the design of targeted interventions focused on mitigating the negative associations of social media use and enhancing the mental and social well-being of students.

Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Received: 25 January 2025; Accepted: 29 September 2025

Published online: 05 November 2025

References

1. Dwivedi, Y. K. et al. Setting the future of digital and social media marketing research: perspectives and research propositions. *Int. J. Inf. Manag.* **59**, 102168 (2021).
2. Tika Dewi Amelia, L. & Rania Balqis, N. Changes in communication patterns in the digital age. *ARRUS J. Social Sci. Humanit.* **3** (4), 544–556 (2023).
3. Statista Number of internet and social media users worldwide as of October 20242024. Available from: <https://www.statista.com/statistics/617136/digital-population-worldwide/>.
4. Naslund, J. A., Bondre, A., Torous, J. & Aschbrenner, K. A. Social media and mental health: Benefits, Risks, and opportunities for research and practice. *J. Technol. Behav. Sci.* **5** (3), 245–257 (2020).
5. Fauzi, M. F. et al. Stress, anxiety and depression among a cohort of health sciences undergraduate students: the prevalence and risk factors. *Int. J. Environ. Res. Public Health.* **18** (6), 3269 (2021).
6. Lozada-Martínez, I. D. et al. Practical guide for the use of medical evidence in scientific publication: recommendations for the medical student: narrative review. *Annals Med. Surg.* **71**, 102932 (2021).
7. Dash, N. R. et al. The educational use of social networking sites among medical and health sciences students: a cross campus intervention study. *BMC Med. Educ.* **22** (1), 525 (2022).
8. Sun, X., Li, B. J., Zhang, H. & Zhang, G. Social media use for coping with stress and psychological adjustment: A transactional model of stress and coping perspective. *Front. Psychol.* **14**, 1 (2023).
9. Cauberghe, V., Van Wesenbeeck, I., De Jans, S., Hudders, L. & Ponnet, K. How adolescents use social media to cope with feelings of loneliness and anxiety during COVID-19 lockdown. *Cyberpsychology Behav. Social Netw.* **24** (4), 250–257 (2021).
10. Zsila, Á. & Reyes, M. E. S. Pros & cons: impacts of social media on mental health. *BMC Psychol.* **11** (1), 201 (2023).
11. Sujarwoto, Saputri, R. A. M. & Yumarni, T. Social media addiction and mental health among university students during the COVID-19 pandemic in Indonesia. *Int. J. Mental Health Addict.* **21** (1), 96–110 (2023).
12. Zubair, U., Khan, M. K. & Albasbari, M. Link between excessive social media use and psychiatric disorders. *Annals Med. Surg.* **85** (4), 875–878 (2023).
13. Iwamoto, D. & Chun, H. The emotional impact of social media in higher education. *Int. J. High. Educ.* **9** (2), 239–247 (2020).
14. Tandon, A., Kaur, P., Dhir, A. & Mäntymäki, M. Sleepless due to social media? Investigating problematic sleep due to social media and social media sleep hygiene. *Comput. Hum. Behav.* **113**, 106487 (2020).
15. Geirdal, A. Ø. et al. Mental health, quality of life, wellbeing, loneliness and use of social media in a time of social distancing during the COVID-19 outbreak: A cross-country comparative study. *J. Mental Health.* **30** (2), 148–155 (2021).
16. Hall, J. A. & Liu, D. Social media use, social displacement, and well-being. *Curr. Opin. Psychol.* **46**, 101339 (2022).
17. Adegboyega, L. O. (ed) *Editor Influence of Social Media on the Social Behavior of Students as Viewed by Primary School Teachers in Kwara State, Nigeria. Elementary School Forum (Mimbar Sekolah Dasar)* (ERIC, 2020).
18. Swinkels, L. T. A. et al. The effectiveness of social network interventions for psychiatric patients: A systematic review and meta-analysis. *Clin. Psychol. Rev.* **104**, 102321 (2023).
19. Orsolini, L. et al. Use of social network as a coping strategy for depression among young people during the COVID-19 lockdown: findings from the COMET collaborative study. *Ann. Gen. Psychiatry.* **21** (1), 44 (2022).
20. Gilavand, A., Fakhri, F. & Seyedtabib, M. Evaluating the attitude of medical students toward the impact of social media on improving learning and increasing awareness during the Covid-19 pandemic: A cross-sectional study in Iran. *Health Sci. Rep.* **6** (6), e1364 (2023).
21. Khalaf, A. M., Alubied, A. A., Khalaf, A. M. & Rifaey, A. A. The impact of social media on the mental health of adolescents and young adults: A systematic review. *Cureus* **15** (8), e42990 (2023).
22. Ghafari, R., Mirghafourvand, M., Rouhi, M. & Osooli Tabrizi, S. Mental health and its relationship with social support in Iranian students during the COVID-19 pandemic. *BMC Psychol.* **9** (1), 81 (2021).
23. Azizi, P. et al. The challenges of medical students in their internship: a qualitative study from Iran. *BMC Res. Notes.* **17** (1), 241 (2024).
24. Jabari, Z. et al. Psycheutopia: an innovative educational program to enhance mental health literacy among medical students. *Front. Psychiatry* **16** (2025).
25. Stockdale, L. A. & Coyne, S. M. Bored and online: reasons for using social media, problematic social networking site use, and behavioral outcomes across the transition from adolescence to emerging adulthood. *J. Adolesc.* **79**, 173–183 (2020).
26. Goldberg, D. P. & Hillier, V. F. A scaled version of the general health questionnaire. *Psychol. Med.* **9** (1), 139–145 (1979).
27. Malakoutikhah, A., Zakeri, M. A., Salehi Derakhtanjani, A. & Dehghan, M. Anxiety, anger, and mindfulness as predictors of general health in the general population during COVID-19 outbreak: A survey in Southeast Iran. *J. Community Psychol.* **50** (2), 916–927 (2022).
28. Khajehahmadi, M., Pooladi, S. & Bahreini, M. Design and assessment of psychometric properties of the addiction to mobile questionnaire based on social networks. *J. Nurs. Educ.* **4** (4), 43–51 (2017).
29. Khajehahmadi, M. *Investigating the Relationship between the Extent of Mobile Social Network Usage and Mental Health and Social Behaviors of Students at Bushehr University of Medical Sciences in 2017* (Bushehr, 2017).
30. Singh, A., Chaudhury, S. & Chaudhari, B. Impact of social media addiction among medical students on their social Interaction, Well-Being, and personality: A comparative study. *Cureus* **16** (9), e70526 (2024).
31. Said, A. H. et al. Prevalence of smartphone addiction and its associated factors among pre-clinical medical and dental students in a public university in Malaysia. *Malays Fam Physician.* **17** (3), 64–73 (2022).
32. Naushad, K., Jamil, B., Khan, N. A. & Jadoon, M. Correlation between social media addiction and academic procrastination in medical students at public and private medical colleges at Peshawar. *Pak J. Med. Sci.* **41** (3), 837–842 (2025).
33. Traore, B., Aguiló, Y., Hassouné, S. & Nani, S. Determinants of internet addiction among medical students in casablanca: a cross-sectional study. *Global Health J.* **7** (2), 101–109 (2023).
34. De, D., El Jamal, M., Aydemir, E. & Khera, A. Social media algorithms and teen addiction: neurophysiological impact and ethical considerations. *Cureus* **17** (1), e7145 (2025).
35. Goldman, B. Addictive potential of social media, explained. Scope in Stanford Medicine [Internet]. (2021). Available from: <https://med.stanford.edu/news/insights/2021/10/addictive-potential-of-social-media-explained.html>.
36. Fernandez, V. Social Media, Dopamine, and Stress: Converging Pathways: Dartmouth Undergraduate Journal of Science; 2022 [Available from: <https://sites.dartmouth.edu/dujs/2022/08/20/social-media-dopamine-and-stress-converging-pathways/>].
37. Ferris, A. L., Hollenbaugh, E. E. & Sommer, P. A. Applying the uses and gratifications model to examine consequences of social media addiction. *Social Media + Soc.* **7** (2), 20563051211019003 (2021).

38. Metwally, D., Bakari, H. & Manzoor, A. Social and psychological costs of problematic use of social media: users and gratification perspective. *Cogent Psychol.* **12** (1), 2467513 (2025).
39. Gedam, S. R., Shivji, I. A., Goyal, A., Modi, L. & Ghosh, S. Comparison of internet addiction, pattern and psychopathology between medical and dental students. *Asian J. Psychiatry.* **22**, 105–110 (2016).
40. Farghal, N. S., Islam, M. S., Dasnadi, S. P., Alteneiji, S. O. & Awheed, A. M. The impact of social media on professional learning among undergraduate dental students: A Cross-sectional study. *J. Contemp. Dent. Pract.* **24** (11), 877–886 (2023).
41. Susmitha, T. S., Rao, S. J. & Doshi, D. Influence of smartphone addiction on sleep and mental wellbeing among dental students. *Clin. Epidemiol. Global Health.* **25**, 101447 (2024).
42. Saadeh, R. A., Saadeh, N. A. & de la Torre, M. A. Determining the usage of social media for medical information by the medical and dental students in Northern Jordan. *J. Taibah Univ. Med. Sci.* **15** (2), 110–115 (2020).
43. Hampton, K., Rainie, L., Lu, W., Shin, I. & Purcell, K. Psychological stress and social media use. *Pew Res. Cent.* (2015).
44. Lee, G. & Choi, S. A comparative study on cyberbullying behaviors among Korean and American college students: insights from social learning theory and general strain theory. *Social Sci.* **14** (5), 257 (2025).
45. Clavier, T. et al. Social media usage for medical education and smartphone addiction among medical students: National Web-Based survey. *JMIR Med. Educ.* **10**, e55149 (2024).
46. Che, X., Lu, Z. & Jin, Y. Social media addiction as the central mediating variable to explore the mechanism between physical exercise and sleep quality. *Sci. Rep.* **15** (1), 26800 (2025).
47. Jameel, A., Guo, W., Hussain, A., Kanwel, S. & Sahito, N. Exploring the mediating role of insomnia on the nexus between social media addiction and mental health among university students. *Sci. Rep.* **15** (1), 17872 (2025).
48. Osman, W. A. Social media use and associated mental health indicators among university students: a cross-sectional study. *Sci. Rep.* **15** (1), 9534 (2025).
49. Capraro, V. et al. A consensus statement on potential negative impacts of smartphone and social media use on adolescent mental health. *PsyArXiv Preprints* 206. (2025).
50. Jasso-Medrano, J. L. & López-Rosales, F. Measuring the relationship between social media use and addictive behavior and depression and suicide ideation among university students. *Comput. Hum. Behav.* **87**, 183–191 (2018).
51. Pirdegham, A., Khezme, E. & Panahi, S. Social media use and sleep disturbance among adolescents: A Cross-Sectional study. *Iran. J. Psychiatry.* **16** (2), 137–145 (2021).
52. Newsom, R., Sleep & Media, S. (2025). 2025 Available from: <https://www.sleepfoundation.org/how-sleep-works/sleep-and-social-media>.
53. Moretta, T. & Wegmann, E. Toward the classification of social media use disorder: clinical characterization and proposed diagnostic criteria. *Addict. Behav. Rep.* **21**, 100603 (2025).
54. Hamler, D. Social Media Addiction: Symptoms, Causes, Effect, Diagnosis and Treatment2025 2025. Available from: <https://laopcenter.com/mental-health/social-media-addiction/>.
55. Bottel, L. et al. Predictive power of the DSM-5 criteria for internet use disorder: A CHAID decision-tree analysis. *Front. Psychol.* 14–2023. (2023).
56. Sunter, D. Can social media use affect our sleep?2021 2025. Available from: <https://www.sleepstation.org.uk/articles/sleep-tips/social-media/>.
57. Lin, S., Mastrokoukou, S. & Longobardi, C. Social relationships and social media addiction among adolescents: Variable-centered and person-centered approaches. *Comput. Hum. Behav.* **147**, 107840 (2023).
58. Elsayed, W. The negative effects of social media on the social identity of adolescents from the perspective of social work. *Helijon* **7** (2), e06327 (2021).
59. Laaber, F., Koch, T., Hubert, M. & Florack, A. Young people's digital maturity relates to different forms of well-being through basic psychological need satisfaction and frustration. *Comput. Hum. Behav.* **152**, 108077 (2024).
60. Irmer, A. & Schmiedek, F. Associations between youth's daily social media use and well-being are mediated by upward comparisons. *Commun. Psychol.* **1** (1), 12 (2023).
61. Cherry, K. Identity vs. Role Confusion in Psychosocial Development2023 2025. Available from: <https://www.verywellmind.com/identity-versus-confusion-2795735>.
62. Pan, C-H., Liu, M-J., Ma, L-Y. & Chen, H-C. Presence and empathy as mediators between immersion and prosocial intentions in primary school children. *Comput. Hum. Behav.* **172**, 108765 (2025).

Acknowledgements

This study was undertaken as part of a Master's thesis in Psychiatric Nursing by Masoomeh Khajeh Ahmadi. The authors extend their profound gratitude to the Vice-Chancellor for Research, the Student Research Committee, and the Clinical Research Development Centre of the Persian Gulf Martyrs Hospital of Bushehr University of Medical Sciences for their generous support. We would also like to thank all the professors, specialists, and students who graciously consented to participate in this study.

Author contributions

Study concept and design (MB, ES, MK); collecting data (MK) acquisition of subjects and/or data analysis and interpretation (KM); preparation of manuscript (MB, MK, RN). All authors have read and approved the manuscript.

Funding

This study was funded by Research Deputy of Bushehr University of Medical Sciences. The funder had no role in the study implementation, data collection, data analyses or interpretation of study results.

Declarations

Competing interests

The authors declare no competing interests.

Ethics approval and consent to participate

This study was ethically approved by the Research Council (Code: 37771) and the Ethics Committee (Code: IR.BPUMS.REC.1395.5) of Bushehr University of Medical Sciences. Prior to questionnaire administration, all the participants were provided informed consent about the study's objectives and methodology, and their

participation was entirely voluntary. They were free to withdraw from the study at any time. Participants were assured that their information would remain confidential and anonymous and would be used solely for scientific purposes. Additionally, in the event of any concerns or signs of psychological distress, participants were referred to the university's counselling services and other accredited support services to ensure access to professional assistance. These measures were implemented to uphold the ethical principles of research and to safeguard the mental well-being of the participants. The research adhered strictly to the ethical principles outlined in the Declaration of Helsinki. Furthermore, artificial intelligence was used solely for translation purposes, while the entire manuscript was edited by a professional English language specialist. All authors have reviewed and approved the final manuscript. The Helsinki Declaration was observed in this study. It should also be noted that artificial intelligence was used solely for translation purposes. The translated content was subsequently reviewed and edited word by word by an English language expert.

Additional information

Correspondence and requests for materials should be addressed to M.B. or R.N.

Reprints and permissions information is available at www.nature.com/reprints.

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Open Access This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

© The Author(s) 2025