



Understanding the Role of Motives and Preferences of Social Networking Sites with Mental Health and Academic Performance Among Medical Students Al Ahsa, Saudi Arabia

Saba Firdos ^{1,*}, Md Amanullah¹ and Muhamad Saiful Bahri Yusoff²

¹College of Medicine, King Faisal University, Hofuf in Al Ahsa, Saudi Arabia

²Medical Education, Universiti Sains Malaysia, Penang, Malaysia

*Corresponding author: College of Medicine, King Faisal University, Hofuf in Al Ahsa, Saudi Arabia. Email: sabaphd@gmail.com

Received 2021 July 18; Revised 2022 March 08; Accepted 2022 March 13.

Abstract

Background: Globally, social networking sites are substantially used for indulgence, content, and interaction. Despite this, the worst impact of prolonged use of social networking sites has been associated with physical, mental, and long-term well-being. Its impact on medical students is a significant concern for many medical schools and administrators as users differ in purpose, preferences, and perceived usefulness.

Objectives: This study aimed to examine the association of social networking sites' preferences and motives with medical students' mental well-being and academic performance.

Methods: The cross-sectional study was conducted on 167 medical students of King Faisal University for three months, from October 2020 to December 2020. Participant's information related to demographics, usage of social networking sites, mental well-being, and academic grades were collected through online questionnaires with valid measures.

Results: Data analyses were performed using SPSS version 21. Almost all medical students were browsing social networking sites daily (98.2%). The most frequently visited sites were WhatsApp (97.6%), followed by YouTube (86.8%), and Instagram (77.8%). It was revealed that 3rd-year students were significantly using Facebook, mainly for fun. Besides, significantly better mental well-being was reported among females' incentives to use social networking sites to keep in touch with family, friends, and relatives. It was also found that females were significantly more of being Instagram users and Snapchat users than males and observed significantly more having excellent academic grades than males.

Conclusions: Our study suggests that students were motivated to connect with social networking sites for their various preferences or needs influenced by their beliefs, attitude, and plans.

Keywords: Academic Performance, Mental Well-being, Medical Students, Social Networking Sites, Saudi Arabia

1. Background

In the technology-driven era, people depend on technology to carry out various daily activities, leading to many technology-related disorders such as technology addiction, technostress due to information overload, poor academic performance, anxiety disorders, and depression (1-3). In recent years, the way of communication has drastically changed due to easy access to the internet that brings technology-related addiction known as irrational use of social networking sites, which can be defined as web-services that permit individuals to communicate electronically through different sites for networking and microblogging. Literature suggests that generally, users have enrolled with online communities or sites to share their information, ideas, photos, personal messages, and other

content such as videos (4). Globally, social media has often been used for socialization and is also recognized as a powerful tool for information (5, 6). Besides, different populations are using social media for different purposes, as it is also prevalent among students because they consider it an essential communication tool, especially in higher education. As reported in the middle east that overall, 90% of medical students were using social networking sites, but only less than 40% were used for educational purposes (7). Studies have shown a significant increase in social media use and have identified approximately 12% of the reported impact of social networking sites among individuals (8, 9). Indeed, an excessive use of social networking sites has been linked as a cause of many problems such as emotional state, health, and performance (10, 11). Excessive participation on social media through sites affects not only mental

health but also reduces physical activity and increases the risk of developing non-communicable diseases such as diabetes, obesity, and hypertension (12, 13).

Preliminary studies have shown adverse effects on associated factors such as low grades and performance (1, 14). A study in the United States reported through the larger sample that students who spent more time on Facebook were significantly negatively associated with their total academic performance (15).

Similarly, non-academic activities and multitasking on social media also predicted negative growth in academic learning (16). Likewise, medical students in Saudi Arabia have also reported a negative impact of excessive enrolment in social networking on their academic grades (17). However, it is also noteworthy to understand and explore further factors such as preferences and motives behind the use of social networking sites as a key correlation (18) with other elements to identify the gaps and possible associations. Studies showed that individuals preferred to use social networking sites to expand their network and interpersonal reasons (19). Enjoyment and usefulness are the most influential factors to motivate users (male and female) to continue the intentions to use social networking sites (20). However, perceived usefulness might affect the user's intention concerning to using social networking sites (21, 22). In this context, it is essential to have insight into uses, preferences, and motives of social networking. This potential association will draw the attention of educators, researchers, and other community members to look at social networking sites from different perspectives. Thus, the primary aim of this study was to explore the association of social networking sites' preferences and motives with mental well-being and academic performance of medical students in the College of Medicine at King Faisal University, Saudi Arabia.

2. Objectives

(1) To determine the usage of different social networking sites per frequency, hours, specific time, and how long have students been using them.

(2) To examine the intention of the users of social networking sites and their association with other factors.

(3) To investigate the association between demographic characteristics, academic performance and mental well-being of medical students.

(4) To study the association of students' mental well-being with social networking sites' preferences and motives as per gender.

(5) To examine the relationship between academic achievement and behavior toward social networking sites' preferences and motives.

3. Methods

3.1. Sample and Procedure

A cross-sectional study was carried out among medical students at the College of Medicine in Al Ahsa, King Faisal University, Saudi Arabia. Sampling formula with an error of 5%, the level of significance (type 1 error) of 5%, and a 95% confidence interval indicated that 278 participants were needed and invited. However, a total of 167 students participated electronically. They were requested to fill online questionnaire via Google form as it was a valid approach for data collection (23). The Research Ethics Committee, College of Medicine, King Faisal University, Al Ahsa, Kingdom of Saudi Arabia, was provided ethical approval for the study with approval no (35). In addition, ethical concerns subjected to this study were informed consent, confidentiality, withdrawal rights, anonymity, privacy protection, and maintaining the dignity of all the participants.

3.2. Inclusion Criteria

Medical students, male and female age range 18 - 26 years, active and familiar with social networking sites.

3.3. Exclusion Criteria

Non-medical students over the age of 26, inactive and without knowledge of social networking sites.

3.4. Measures

3.4.1. Demographic Information

The researchers prepared a background sheet to gather personal information (age, gender, academic year, marital status, residency, family related information).

3.4.2. Social Media Networking

Based on the research questions that will be addressed and hypotheses in which the questionnaire needs to be designed, this study has developed a structured questionnaire to measure social networking sites' usages, frequencies, types, and intentions of use. During the process, the researchers followed the following steps to gather the required information based on the target sample, such as selecting the content, identifying the question's wording, suitability of questions order, format, and length of the questionnaire. An external expert opinion and peer feedback was also accounted for the face and content validity to assess the degree of relevance of each item. Besides, the final pre-test was done to make the necessary adjustment to the questionnaire. Overall, this section had six questions with multiple options. Cronbach's alpha of the questionnaire was estimated as 0.86. The internal consistency coefficient of the scale in this current study was found suitable.

3.4.3. Warwick-Edinburgh Mental Well-being Scale

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) has 14 items and is answered based on a Likert-point scale (1 = none of the time; 5 = for all of the time). It has good content validity, high internal consistency (Cronbach's alpha = 0.89), and high test-retest reliability in student samples. It demonstrated a high level of correlation with mental health and well-being parameters (24).

3.4.4. Academic Grade

The academic grade was measured based on grade point average (GPA) scores reported by medical students. Academic performance was categorized as "excellent" (GPA $\geq 90 - 95$), "above average" (GPA $< 80 - 89$), "average" (GPA $< 70 - 79$), or "below average" (GPA $< 60 - 69$) or "fail" (GPA $< 60 - 0$) as per the norms of the college of medicine, King Faisal University, Saudi Arabia.

3.5. Statistical Analysis

Descriptive statistics were presented by frequency (n), proportions (%), mean, and standard deviation. The relationship between the dependent and independent variables was assessed using the chi-square test. We used the independent *t*-test, Mann-Whitney U test, or Kruskal Wallis test for skewed data to compare medical students' mental well-being and socio-demographic characteristics. Normality tests were conducted using the Shapiro-Wilk test; a P-value ≤ 0.05 was considered skewed data. A P-value of < 0.05 (two-sided) indicated statistical significance. All data analyses were performed using the statistical package for social sciences, version 21 (SPSS, Chicago, IL, USA).

4. Results

Demographical information of the participants is presented in Table 1, the common age group was 21 - 22 years (49.1%) with females slightly more (56.9%) than males (43.1%). Concerning the academic years, approximately one-third of them (34.7%) were in the third-year, followed by first-year (23.4%) and fourth year (21.6%). The majority of students were single (92.8%) and mostly living inside Al Ahsa (92.8%). Concerning the occupational status of parents, the majority of the mothers were not working (68.3%), whereas it was the opposite of fathers, as most of them were working (73.1%). The most common academic grade was very good (42.5%), followed by excellent (35.3%) and good (18.6%).

Behavioral characteristics of all-year medical students toward social networking sites' preferences and motives were explained in Table 2. It was found that the use of Facebook was significantly higher among medical students, specifically among the 3rd-year. At the same time, the intern was significantly less users of Facebook. For the reason

Table 1. Demographic Characteristics of Medical Students (n = 167)

Study Variables	No. (%)
Age group (y)	
18 - 20	50 (29.9)
21 - 22	82 (49.1)
23 - 25	35 (21.0)
Gender	
Male	72 (43.1)
Female	95 (56.9)
Academic year level	
First year	39 (23.4)
Second year	23 (13.8)
Third year	58 (34.7)
Fourth year	36 (21.6)
Fifth year	07 (04.2)
Intern	04 (02.4)
Marital status	
Single	138 (82.6)
Married	29 (17.4)
Residence	
Inside Al Ahsa	155 (92.8)
Outside Al Ahsa	12 (07.2)
Mother occupational status	
Working	53 (31.7)
Not working	114 (68.3)
Father occupational status	
Working	122 (73.1)
Not working	45 (26.9)
Academic grade	
Fail	03 (01.8)
Acceptable	03 (01.8)
Good	31 (18.6)
Very good	71 (42.5)
Excellent	59 (35.3)

of using social networking sites, we have found that the 3rd-year level had significantly more usage of social networking sites for fun whereas the intern had the least. Figure 1 reveals the most commonly cited motive was about knowledge and education (86.8%), followed by staying in touch with family, friends, and relatives (80.8%) and fun (78.4%) while making a new friend (15%) was the slightest motive.

The participants' demographic variables and academic performance associated with mental well-being show that the middle age group (21 - 22 years) was significantly lower than the other age group. We also observed that males had significantly higher mental well-being when compared to females, while the intern also showed substantially better mental well-being than their counterparts. In contrast, marital status, residence, and academic grade did not differ from mental well-being sig-

Table 2. Social Media Behavior by Academic Year Level, 1st Year (n = 39), 2nd Year (n = 23), 3rd Year (n = 58), 4th Year (n = 36), 5th Year (n = 7), and Intern (n = 4) in the Types of Social Networking Sites and Motives for Using the Social Networking Site^a

Variables ^b	1st Year	2nd Year	3rd Year	4th Year	5th Year	Intern	P-Value ^c
Type of social networking site							
Google scholar	10 (25.6)	06 (26.1)	25 (43.1)	17 (47.2)	04 (57.1)	01 (25.0)	0.203
YouTube	33 (84.6)	20 (87.0)	49 (84.5)	32 (88.9)	07 (100)	04 (100)	0.814
Twitter	29 (74.4)	15 (65.2)	38 (65.5)	29 (80.6)	06 (85.7)	03 (75.0)	0.578
Facebook	10 (25.6)	06 (26.1)	28 (48.3)	25 (69.4)	06 (85.7)	02 (50.0)	0.001 ^d
WhatsApp	39 (100)	22 (95.7)	56 (96.6)	35 (97.2)	07 (100)	04 (100)	0.863
Instagram	33 (84.6)	15 (65.2)	40 (69.0)	33 (91.7)	06 (85.7)	03 (75.0)	0.073
Snapchat	32 (82.1)	16 (69.6)	39 (67.2)	32 (88.9)	07 (100)	03 (75.0)	0.093
Reason for using social networking site							
Stay in touch with family, friends, and relatives	30 (76.9)	18 (78.3)	49 (84.5)	29 (80.6)	07 (100)	02 (50.0)	0.404
Knowledge and education	35 (89.7)	17 (73.9)	50 (86.2)	33 (91.7)	07 (100)	03 (75.0)	0.311
Spend time	21 (53.8)	10 (43.5)	32 (55.2)	25 (69.4)	04 (57.1)	03 (75.0)	0.447
Fun	31 (79.5)	12 (52.2)	47 (81.0)	32 (88.9)	05 (71.4)	04 (100)	0.021 ^d
Make new friend	05 (12.8)	02 (08.7)	07 (12.1)	08 (22.2)	01 (14.3)	02 (50.0)	0.254
For relaxation	19 (48.7)	11 (47.8)	31 (53.4)	22 (61.1)	02 (28.6)	02 (50.0)	0.681

^a Values are expressed as No. (%).

^b Variable with multiple responses

^c P-value has been calculated using the chi-square test.

^d P < 0.05

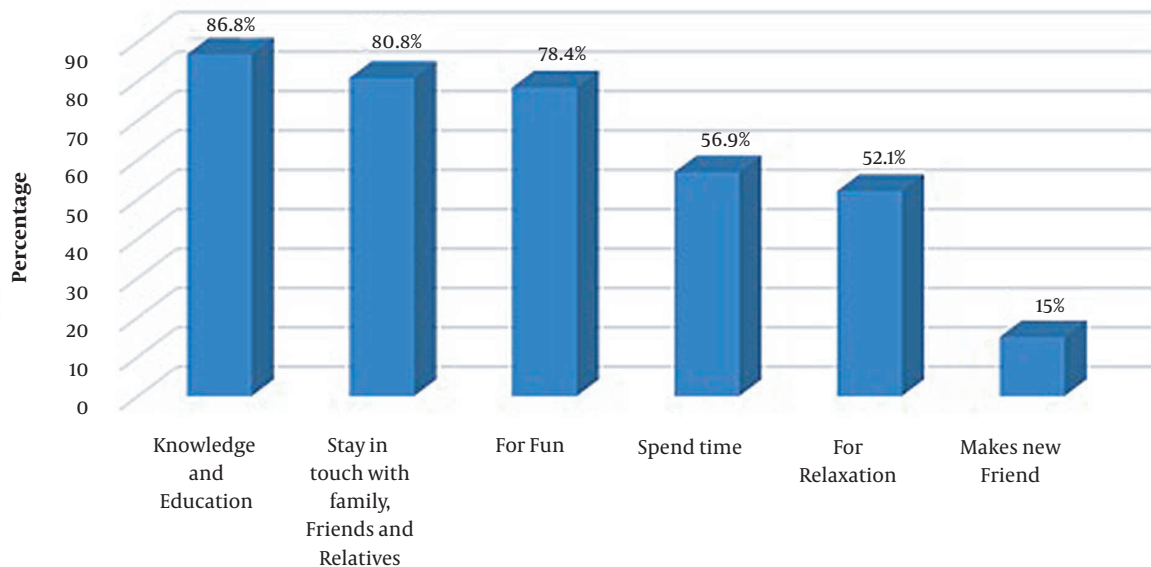


Figure 1. Motives for using social networking sites.

nificantly (Table 3).

As shown in Table 4, the mental well-being of female Instagram users was significantly better as opposed to non-Instagram users. For the motives of using social networking sites, the mental well-being of females who had a reason to spend time, make a new friend, and for relaxation were significantly lower when compared to those with

other reasons. In contrast, those females, who used social networking sites to stay in touch with family, friends, and relatives showed significantly better mental well-being. Males also showed a significant difference for relaxation as motives for using social networking sites.

Table 5 indicated that the females were significantly more Instagram users and Snapchat users than males. It

Table 3. Statistical Association Between Mental Well-being and the Socio-Demographic Characteristics of Medical Students (n = 167)

Factor	Mental Well-being (Mean ± SD)	t/F Test	P-Value
Age group (y) ^a		F = 2.479	0.050 ^b
18 – 20	49.9 ± 7.64		
21 – 22	46.7 ± 8.36		
23 – 25	48.1 ± 7.20		
Gender ^c		t = 2.574	0.003 ^d
Male	49.7 ± 7.96		
Female	46.6 ± 7.78		
Academic year level ^a		F = 3.066	0.025 ^b
First year	50.7 ± 6.36		
Second year	48.1 ± 8.41		
Third year	47.7 ± 8.07		
Fourth year	44.7 ± 8.08		
Fifth year	46.7 ± 5.06		
Intern	55.7 ± 12.0		
Marital status ^c		t = 0.526	0.433
Single	48.1 ± 8.04		
Married	47.2 ± 7.85		
Residence ^c		t = -1.719	0.218
Inside Al Ahsa	47.7 ± 7.87		
Outside Al Ahsa	51.7 ± 8.98		
Academic grade ^a		F = 0.573	0.851
Fail	44.0 ± 5.29		
Acceptable	43.0 ± 15.6		
Good	47.4 ± 9.21		
Very good	48.2 ± 7.61		
Excellent	48.4 ± 7.55		

^a P-value has been calculated using the Kruskal Wallis test.

^b P < 0.05

^c P-value has been calculated using the Mann-Whitney U test.

^d P < 0.01

was also observed that females were significantly more of having excellent academic grades than males. Other behaviors related to using social networking have no significant relationships compared to males and females.

5. Discussion

This study reveals several significant findings to the body of knowledge. First, nearly all medical students were browsing social networking sites daily (98.2%) and regularly doing this for every hour (77.2%). Moreover, more than half of them (57.5%) were using social networking sites in both night and day and most students were using networking sites for than two years (97.6%).

WhatsApp, YouTube, Instagram, and Snapchat were frequently-visited sites by medical students. Second, the essential motive for using social networking sites was knowledge and education, staying in touch with family, relatives, friends, and fun. Third, age, sex, and academic

year were the associated factors of mental well-being. Besides, female's motives to connect with family, friends, and relatives through social networking sites showed significantly better mental well-being. Lastly, females were more Instagram and Snapchat users and having excellent academic grades than male students.

An in-depth analysis of social networking usage shows that medical students were using more WhatsApp (97.6%), followed by YouTube (86.8%) and Instagram (77.8%). In comparison, Google scholar (37.7%) was the least visited, and the third-year students significantly used Facebook more than the rest. Our results are similar to the finding that shows WhatsApp and Snapchat are the most commonly used sites by medical students (25). On the contrary, it has also been highlighted in some studies that YouTube, Facebook, and Twitter were the most used sites by the medical students, not WhatsApp; thus, the differences reflecting the transformative changes according to demand and interest.

Similarly, 3rd-year students significantly used social networking sites for fun compared to other motives, as studies have shown that variations in usage and motives generally determine social networking behaviors (26). Another study revealed that 75% of medical and allied health science students used social networking sites for general purposes and 20% for sharing academic information (27). The finding of mental well-being with the socio-demographic characteristics of medical students showed that the mental well-being of the middle age group (21 - 22 years) was significantly lower than the other group. Similar to our findings, psychological distress among students was reported as double in the initial years (28), and significant risk factors for medical students are emphasized as high stress, academic stress, physical problems, and personal matters (29). In addition, results also highlighted that males had significantly higher mental well-being when compared to females and interns also showed substantially better mental well-being than their counterparts. Other studies also reports that psychological distress may vary by gender and different course levels (30).

Study findings also depict that female Instagram users had significantly better mental well-being; unlike previous results that revealed violence and taunting are being observed as a new trend in youth while using social networking sites (31). However, our finding is compatible with the results indicating that intention-based behavior, positive interaction; social presence through social networking sites could enhance the well-being of students. Greater self-esteem, reduced loneliness, and life satisfaction were also reported as associated factors with social networking sites (32). In addition, our study concept is also supported by the "hyper-personal model", which reflects that selective self-presentation positively enhances the impression of the self (33) and is more favorable to mental health. As a

Table 4. The Statistical Association of Male Students Mental Well-being with Social Networking Sites and Motives and the Association of Females Mental Well-being with Behavior Toward SNSs and Its Reasons (n = 167) ^{a, b}

Variables	Mental Well-being					
	Male (n = 72)			Female (n = 95)		
	Mean ± SD	t	P-Value	Mean ± SD	t	P-Value
Type of Social networking site ^c						
Google scholar	50.8 ± 8.03	0.784	0.699	46.6 ± 7.97	0.038	0.760
YouTube	49.4 ± 8.22	-1.042	0.283	46.5 ± 7.92	-0.395	0.536
Twitter	49.3 ± 7.83	-0.690	0.526	47.2 ± 8.23	1.380	0.249
Facebook	49.1 ± 8.37	-0.556	0.604	46.8 ± 7.78	0.250	0.617
WhatsApp	49.7 ± 7.95	-0.350	0.979	46.5 ± 7.81	-0.568	0.484
Instagram	49.6 ± 8.31	-0.187	0.962	47.3 ± 7.59	2.426	0.007 ^d
Snapchat	50.0 ± 7.97	0.387	0.553	46.6 ± 7.37	-0.042	0.690
Reason for using social networking sites ^c						
Stay in touch with family, friend and relatives	50.5 ± 7.21	1.608	0.080	47.6 ± 7.52	2.621	0.044 ^e
Knowledge and education	50.1 ± 7.71	0.753	0.545	50.1 ± 7.71	0.753	0.070
Spend time	48.9 ± 7.82	-0.958	0.317	45.0 ± 7.45	-2.448	0.026 ^e
For fun	49.5 ± 7.38	-0.361	0.659	46.2 ± 7.90	-1.185	0.169
Make new friend	46.6 ± 9.94	-1.420	0.191	43.1 ± 5.59	-1.855	0.043 ^e
For relaxation	48.0 ± 8.96	-1.957	0.048 ^e	44.7 ± 8.18	-2.625	0.007 ^d

^a P-value has been calculated using the Kruskal Wallis test.^b P-value has been calculated using the Mann-Whitney U test.^c Variable with multiple answers.^d P < 0.01^e P < 0.05**Table 5.** Relationship Between Male (n = 72) and Female (n = 95) Among the Academic Grade and the Behavior of Medical Students Toward Social Networking Sites ^a

Factor	Male	Female	P-Value ^b
Type of social networking site ^c			
Google scholar	23 (31.9)	40 (42.1)	0.180
YouTube	63 (87.5)	82 (86.3)	0.823
Twitter	47 (65.3)	73 (76.8)	0.100
Facebook	27 (37.5)	50 (52.6)	0.052
WhatsApp	69 (95.8)	94 (98.9)	0.192
Instagram	48 (66.7)	82 (86.3)	0.002 ^d
Snapchat	49 (68.1)	80 (84.2)	0.014 ^d
Reason for using social networking sites ^c			
Stay in touch with family, friends, and relatives	58 (80.6)	77 (81.1)	0.936
Knowledge and education	60 (83.3)	85 (89.5)	0.245
Spend time	39 (54.2)	56 (58.9)	0.537
For fun	52 (72.2)	79 (83.2)	0.089
Make new friend	11 (15.3)	14 (14.7)	0.923
For relaxation	37 (51.4)	50 (52.6)	0.874
Academic grade			0.048 ^d
Good or below	18 (25.0)	19 (20.0)	
Very good	36 (50.0)	35 (36.8)	
Excellent	18 (25.0)	41 (43.2)	

^a Values are expressed as No. (%).^b P-value has been calculated using the chi-square test.^c Variable with multiple responses.^d P < 0.05

whole, positive online activities may be beneficial for emotion regulation.

Further, the results show females who used social networking sites to spend time, make a new friend, and for relaxation were significantly lower than those females who used social networking sites to stay in touch with family, friends, and relatives showed significantly better mental well-being. Potential mental health benefits of social networking sites were reported as socialization, improved relationships, self-esteem, connection, and learning (34). On the contrary, the male also showed significantly less mental well-being for relaxation as a motive for using social networking sites.

Besides, the finding on the association between males and females concerning academic grade and the behavioral characteristics toward social networking sites reveals that compared to males, the females were significantly more Instagram and Snapchat users and had substantially more excellent academic grades than male students. However, as per literature, the relationship between the use of social networking sites and its association with academic grades is contradictory. A significant contribution to students' motivation in learning reported a positive relationship between social networking sites and their academic performance (35). Other studies, on the contrary, found no effect, as few studies have shown the association to a minor extent (17, 35, 36). Moreover, it has suggested that educational institutions could benefit their students with the combination of pedagogy and online social networking as this connection was found to be positive with cognitive, affective, and skill-based learning outcomes (36).

5.1. Conclusions

The study concludes that intrinsic and extrinsic factors such as intention, purpose, satisfaction, pleasure, and usefulness play a significant role in students' continuous use of social networking sites. As social networking technology allows users to build and enhance relationships between close people and strangers to show their existence and approach one another. Possibly, this pleasure-oriented method promotes mental health and associated factors such as users' well-being or grades to some extent. However, the role of personality, level of motivation, gender perceptible, lifestyle changes, effects on physical health, and other maladaptive behaviors resulting from social networking sites involvements should be a concern and gripping points for further research.

5.2. Limitations

This study has some limitations. One of the important limitations of this study is the data collection. The small sample size collected from a single college and convenient sampling was employed by focusing only on medical students, which may increase the possibility of errors.

Participants from other colleges who may use social networking sites for different intentions and through various alternatives may have increased the generalizability of research findings to represent different socio-economic backgrounds and diversity of interest, which this study lacks.

Footnotes

Authors' Contribution: S. F.: Study concept and design, statistical analysis and interpretation of data, technical support, drafting of the manuscript. M. A.: Acquisition of data, technical support and study supervision, drafting of the manuscript, M. Y.: Provided critical comments for intellectual content.

Conflict of Interests: The authors declared no potential conflicts of interest concerning the research, authorship, and publication of this study.

Ethical Approval: Ethical approval for the study was provided by the Research Ethics Committee, College of Medicine, King Faisal University, Al Ahsa, Kingdom of Saudi Arabia. Approval no-35.

Funding/Support: The authors received no financial support for the research, authorship, and publication of this study article.

Informed Consent: Ethical concerns subjected to this study were informed consent, confidentiality, withdrawal rights, anonymity, privacy protection, and maintaining the dignity of all the participants.

References

1. Doleck T, Lajoie S. Social networking and academic performance: A review. *Educ Inf Technol (Dordr)*. 2017;**23**(1):435–65. doi: [10.1007/s10639-017-9612-3](https://doi.org/10.1007/s10639-017-9612-3).
2. Matthes J, Karsay K, Schmuck D, Stevic A. "Too much to handle": Impact of mobile social networking sites on information overload, depressive symptoms, and well-being. *Comput. Hum. Behav*. 2020;**105**:106217. doi: [10.1016/j.chb.2019.106217](https://doi.org/10.1016/j.chb.2019.106217).
3. Tarafdar M, Maier C, Laumer S, Weitzel T. Explaining the link between technostress and technology addiction for social networking sites: A study of distraction as a coping behavior. *Inf. Syst. J*. 2019;**30**(1):96–124. doi: [10.1111/isj.12253](https://doi.org/10.1111/isj.12253).
4. Webster, N. Social media. *Webster's Dictionary*. 11th ed. Springfield, Massachusetts, USA: Merriam-Webster; 2020.
5. Heo J, Chun S, Lee S, Lee KH, Kim J. Internet use and well-being in older adults. *Cyberpsychol Behav Soc Netw*. 2015;**18**(5):268–72. doi: [10.1089/cyber.2014.0549](https://doi.org/10.1089/cyber.2014.0549). [PubMed: 25919967].
6. Schivinski B, Muntinga DG, Pontes HM, Lukasiak P. Influencing COBRAs: the effects of brand equity on the consumer's propensity to engage with brand-related content on social media. *J. Strateg. Mark*. 2019;**29**(1):1–23. doi: [10.1080/0965254x.2019.1572641](https://doi.org/10.1080/0965254x.2019.1572641).
7. Guraya SY, Almaramhy H, Al-Qahtani MF, Guraya SS, Bouhaimed M, Bilal B. Measuring the extent and nature of use of Social Networking Sites in Medical Education (SNSME) by university students: Results of a multi-center study. *Med Educ Online*. 2018;**23**(1):1505400. doi: [10.1080/10872981.2018.1505400](https://doi.org/10.1080/10872981.2018.1505400). [PubMed: 30081773]. [PubMed Central: PMC6084502].

8. Alabi OF. A survey of Facebook addiction level among selected Nigerian University undergraduates. *New media and mass communication*. 2013;**10**(2012):70-80.
9. Wolniczak I, Caceres-DelAguila JA, Palma-Ardiles G, Arroyo KJ, Solis-Visscher R, Paredes-Yauri S, et al. Association between Facebook dependence and poor sleep quality: a study in a sample of undergraduate students in Peru. *PLoS One*. 2013;**8**(3). e59087. doi: [10.1371/journal.pone.0059087](https://doi.org/10.1371/journal.pone.0059087). [PubMed: [23554978](https://pubmed.ncbi.nlm.nih.gov/23554978/)]. [PubMed Central: [PMC3595202](https://pubmed.ncbi.nlm.nih.gov/PMC3595202/)].
10. Marino C, Finos L, Vieno A, Lenzi M, Spada MM. Objective Facebook behaviour: Differences between problematic and non-problematic users. *Comput. Hum. Behav.* 2017;**73**:541-6. doi: [10.1016/j.chb.2017.04.015](https://doi.org/10.1016/j.chb.2017.04.015).
11. Marino C, Gini G, Vieno A, Spada MM. A comprehensive meta-analysis on Problematic Facebook Use. *Comput. Hum. Behav.* 2018;**83**:262-77. doi: [10.1016/j.chb.2018.02.009](https://doi.org/10.1016/j.chb.2018.02.009).
12. Zou Y, Xia N, Zou Y, Chen Z, Wen Y. Smartphone addiction may be associated with adolescent hypertension: a cross-sectional study among junior school students in China. *BMC Pediatr*. 2019;**19**(1):310. doi: [10.1186/s12887-019-1699-9](https://doi.org/10.1186/s12887-019-1699-9). [PubMed: [31484568](https://pubmed.ncbi.nlm.nih.gov/31484568/)]. [PubMed Central: [PMC6724312](https://pubmed.ncbi.nlm.nih.gov/PMC6724312/)].
13. Melkevik O, Haug E, Rasmussen M, Fismen AS, Wold B, Borraccino A, et al. Are associations between electronic media use and BMI different across levels of physical activity? *BMC Public Health*. 2015;**15**(1):497. doi: [10.1186/s12889-015-1810-6](https://doi.org/10.1186/s12889-015-1810-6).
14. Patton DU, Hong JS, Ranney M, Patel S, Kelley C, Eschmann R, et al. Social media as a vector for youth violence: A review of the literature. *Comput. Hum. Behav.* 2014;**35**:548-53. doi: [10.1016/j.chb.2014.02.043](https://doi.org/10.1016/j.chb.2014.02.043).
15. Junco R. The relationship between frequency of Facebook use, participation in Facebook activities, and student engagement. *Comput Educ*. 2012;**58**(1):162-71. doi: [10.1016/j.compedu.2011.08.004](https://doi.org/10.1016/j.compedu.2011.08.004).
16. Lau WWF. Effects of social media usage and social media multitasking on the academic performance of university students. *Comput. Hum. Behav.* 2017;**68**:286-91. doi: [10.1016/j.chb.2016.11.043](https://doi.org/10.1016/j.chb.2016.11.043).
17. Al Shawwa L, Abulaban AA, Abulaban AA, Merdad A, Baghlaif S, Algethami A, et al. Factors potentially influencing academic performance among medical students. *Adv Med Educ Pract*. 2015;**6**:65-75. doi: [10.2147/AMEP.S69304](https://doi.org/10.2147/AMEP.S69304). [PubMed: [25674033](https://pubmed.ncbi.nlm.nih.gov/25674033/)]. [PubMed Central: [PMC4321417](https://pubmed.ncbi.nlm.nih.gov/PMC4321417/)].
18. Wang JL, Gaskin J, Wang H, Liu D. Life satisfaction moderates the associations between motives and excessive social networking site usage. *Addict Res Theory*. 2016;**24**(6):450-7. doi: [10.3109/16066359.2016.1160283](https://doi.org/10.3109/16066359.2016.1160283).
19. Lee EJ, Kim YW. How social is Twitter use? Affiliative tendency and communication competence as predictors. *Comput. Hum. Behav.* 2014;**39**:296-305. doi: [10.1016/j.chb.2014.07.034](https://doi.org/10.1016/j.chb.2014.07.034).
20. Lin KY, Lu HP. Why people use social networking sites: An empirical study integrating network externalities and motivation theory. *Comput. Hum. Behav.* 2011;**27**(3):1152-61. doi: [10.1016/j.chb.2010.12.009](https://doi.org/10.1016/j.chb.2010.12.009).
21. Kang YS, Lee H. Understanding the role of an IT artifact in online service continuance: An extended perspective of user satisfaction. *Comput. Hum. Behav.* 2010;**26**(3):353-64. doi: [10.1016/j.chb.2009.11.006](https://doi.org/10.1016/j.chb.2009.11.006).
22. Kwon O, Wen Y. An empirical study of the factors affecting social network service use. *Comput. Hum. Behav.* 2010;**26**(2):254-63. doi: [10.1016/j.chb.2009.04.011](https://doi.org/10.1016/j.chb.2009.04.011).
23. Simsek Z, Veiga JF. The Electronic Survey Technique: An Integration and Assessment. *Organ Res Methods*. 2016;**3**(1):93-115. doi: [10.1177/109442810031004](https://doi.org/10.1177/109442810031004).
24. Tennant R, Hiller L, Fishwick R, Platt S, Joseph S, Weich S, et al. The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): development and UK validation. *Health Qual Life Outcomes*. 2007;**5**:63. doi: [10.1186/1477-7525-5-63](https://doi.org/10.1186/1477-7525-5-63). [PubMed: [18042300](https://pubmed.ncbi.nlm.nih.gov/18042300/)]. [PubMed Central: [PMC2222612](https://pubmed.ncbi.nlm.nih.gov/PMC2222612/)].
25. Al Suwayri SM. The impact of social media volume and addiction on medical student sleep quality and academic performance: a cross-sectional observational study. *Imam Journal of Applied Sciences*. 2016;**1**(2):80.
26. Vasalou A, Joinson AN, Courvoisier D. Cultural differences, experience with social networks and the nature of "true commitment" in Facebook. *Int. J. Hum. Comput.* 2010;**68**(10):719-28. doi: [10.1016/j.ijhcs.2010.06.002](https://doi.org/10.1016/j.ijhcs.2010.06.002).
27. Guraya SY. The Usage of Social Networking Sites by Medical Students for Educational Purposes: A Meta-analysis and Systematic Review. *N Am J Med Sci*. 2016;**8**(7):268-78. doi: [10.4103/1947-2714.187131](https://doi.org/10.4103/1947-2714.187131). [PubMed: [27583234](https://pubmed.ncbi.nlm.nih.gov/27583234/)]. [PubMed Central: [PMC4982355](https://pubmed.ncbi.nlm.nih.gov/PMC4982355/)].
28. Yusoff MSB. Impact of summative assessment on first year medical students' mental health. *Int Med J*. 2011;**18**(3):172-5.
29. Rafique N, Al-Asoom LI, Latif R, Al Sunni A, Wasi S. Comparing levels of psychological stress and its inducing factors among medical students. *J Taibah Univ Med Sci*. 2019;**14**(6):488-94. doi: [10.1016/j.jtumed.2019.11.002](https://doi.org/10.1016/j.jtumed.2019.11.002). [PubMed: [31908635](https://pubmed.ncbi.nlm.nih.gov/31908635/)]. [PubMed Central: [PMC6940666](https://pubmed.ncbi.nlm.nih.gov/PMC6940666/)].
30. Jafari N, Loghmani A, Montazeri A. Mental health of Medical Students in Different Levels of Training. *Int J Prev Med*. 2012;**3**(Suppl 1):S107-12. [PubMed: [22826751](https://pubmed.ncbi.nlm.nih.gov/22826751/)]. [PubMed Central: [PMC3399312](https://pubmed.ncbi.nlm.nih.gov/PMC3399312/)].
31. Patton DU, Eschmann RD, Elsaesser C, Bocanegra E. Sticks, stones and Facebook accounts: What violence outreach workers know about social media and urban-based gang violence in Chicago. *Comput. Hum. Behav.* 2016;**65**:591-600. doi: [10.1016/j.chb.2016.05.052](https://doi.org/10.1016/j.chb.2016.05.052).
32. Seabrook EM, Kern ML, Rickard NS. Social Networking Sites, Depression, and Anxiety: A Systematic Review. *JMIR Ment Health*. 2016;**3**(4). e50. doi: [10.2196/mental.5842](https://doi.org/10.2196/mental.5842). [PubMed: [27881357](https://pubmed.ncbi.nlm.nih.gov/27881357/)]. [PubMed Central: [PMC5143470](https://pubmed.ncbi.nlm.nih.gov/PMC5143470/)].
33. Gonzales AL, Hancock JT. Mirror, mirror on my Facebook wall: effects of exposure to Facebook on self-esteem. *Cyberpsychol Behav Soc Netw*. 2011;**14**(1-2):79-83. doi: [10.1089/cyber.2009.0411](https://doi.org/10.1089/cyber.2009.0411). [PubMed: [21329447](https://pubmed.ncbi.nlm.nih.gov/21329447/)].
34. Collin P, Rahilly K, Richardson I, Third A. *The benefits of social networking services*. Perth, Australia: Murdoch University Research Repository; 2011.
35. Samad S, Nilashi M, Ibrahim O. The impact of social networking sites on students' social wellbeing and academic performance. *Educ Inf Technol (Dordr)*. 2019;**24**(3):2081-94. doi: [10.1007/s10639-019-09867-6](https://doi.org/10.1007/s10639-019-09867-6).
36. Yu AY, Tian SW, Vogel D, Chi-Wai Kwok R. Can learning be virtually boosted? An investigation of online social networking impacts. *Comput Educ*. 2010;**55**(4):1494-503. doi: [10.1016/j.compedu.2010.06.015](https://doi.org/10.1016/j.compedu.2010.06.015).