

Association Between Over-Use of Social Media and Depression among Medical Students, King Khalid University, Kingdom of Saudi Arabia

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ABSTRACT

Background: Previous researches on the association between the use of social media and depression have yielded conflicting results. As some studies reported that social media use may reduce depression, whereas other studies observed that frequent use of social media may be associated with depressive symptoms.

Objectives: To assess the relation between overuse of social media and depression as well as identifying other risk factors related to depression among medical students.

Subjects and methods: A cross-sectional, comparative study was carried out among a representative random sample of male and female medical students in King Khalid University, Abha, Kingdom of Saudi Arabia (KSA). Anonymous self-administrated questionnaire was utilized for data collection. It consists of socio-demographic characteristics, details of social media use and PHQ-9 instrument to assess depression among the participants. Data were collected through sending the questionnaire online through a specific WhatsApp group for the students.

Results: Out of 297 students invited to participate in the study, 239 responded by completing the questionnaire giving a response rate of 80.5%. Their age ranged between 19 and 26 years with a mean±SD of 21.4±1.5 years. Depression was reported among 67.4% of them, based on PHQ-9 instrument; it was mild among 41.8% and severe among 9.6% of the participants. Depression was more reported among female than male students (74.1% versus 63.6%), $p=0.034$. The highest age was reported among students with no depression (22.1±1.3 years) whereas the lowest age was observed among those with moderate depression (21.3±1.7 years), $p=0.018$. Histories of having family problems ($p<0.001$), financial problems ($p=0.001$), study problems ($p<0.001$), physical or emotional abuse ($p<0.001$), psychiatric problems ($p=0.007$) and family history of depression ($p=0.047$) were significantly associated with depression and its severity among the participants.

Conclusion: Depression is a common hidden health problem among medical students in Saudi Arabia. The prevalence of depressive symptoms was not significantly associated with pattern of using social media.

Keywords: Social media, Depression, Medical students, PHQ-9.

INTRODUCTION

In Saudi Arabia, a considerable high prevalence of depression has been documented among the medical students, representing a hidden problem among them^{1, 2}. Globally, it is estimated that by the year 2020, depression will be the second most common cause of disability³. The economic burden of depression is very impressive from reduced productivity and increased medical expenses⁴.

Depression usually begins in adolescence⁵. Multiple risk factors are usually associated with depression⁷, however, there is recently increasing interest in the association of over-utilization of social media, such as Facebook, Twitter, WhatsApp, Snapchat and YouTube on depression. Nowadays, social media has become an essential part of our life connecting us with others, and represent a main source of obtaining news^{8, 9}. In the Kingdom of Saudi Arabia, Facebook and Twitter constitute the largest number of social media users, where Facebook users are approximately 11 million, while Twitter users amounted to 9

million¹⁰. Previous researches on the association between the use of social media and depression have yielded conflicting results^{11, 12}. As some studies reported that social media use may reduce depression¹³, as a result of an increase in perceived social support, and life satisfaction^{14, 15}. Whereas other studies observed that frequent use of social media may be associated with depressive symptoms^{12, 16}.

As, it has been noticed that medical students in King Khalid University, Saudi Arabia are using social media applications so intensively, this study was carried out aimed to assess the relation between overuse of social media and depression as well as identifying other risk factors related to depression among these students.

SUBJECTS AND METHODS

A cross-sectional, comparative study was carried out among male and female medical students in King Khalid University, Abha, Kingdom of Saudi Arabia (KSA). Abha city is

located in the South region of the KSA. King Khalid University is a public university, with around 70,000 students distributed over 17 colleges, including college of medicine. The male students were recruited from University City in Algriger and female students from Assamer academic center in Abha¹⁷.

Using online Raosoft sample size calculator with the assumption that the prevalence of depression among social media users as 56.5 as recently reported by **Yi Lin et al.**¹⁸ and knowing that the total medical students registered at King Khalid University is 1374 (879 males and 495 females). Considering a confidence interval of 95% and margins of errors of 5%, the calculated sample size was 279. Using a stratified sampling technique with proportional allocation (according to gender), 190 male and 107 female students were invited to participate in the study. Simple random technique was applied to select students from both groups after preparing two lists for all students, one for males and one for girls.

Anonymous self-administrated questionnaire was utilized for data collection. It consists of three main sections; Socio-demographic characteristics (age, gender, marital status). Details of social media use were inquired, using questions developed by the researchers and validated by three consultants in family medicine. Depression was assessed using a PHQ-9 instrument, which contains nine items. For each item the participants were asked to assess how much they were bothered by the symptoms over the last two weeks. There are four answer options: not at all (0), several days (1), more than half of the days (2), and nearly every day (3). The total score (range 0 to 27) indicates the degree of depression, with scores of ≥ 5 , ≥ 10 , and ≥ 15 representing mild, moderate, and severe levels of depression whereas a score less than 5 indicates no depression¹⁹.

Data were collected through sending the questionnaire online through a specific WhatsApp group for the students.

Statistical Package for Social Sciences (SPSS), version 22 was used for data entry and analysis. Data description was performed using frequency and percentage for categorical variable and mean and standard deviation for continuous variables. Chi square test was used to test for the association and/or difference between categorical variables whereas ANOVA test was utilized to compare means of a continuous variable between more than two groups. Post-hoc Least Significance Difference test (LSD) was used for comparison

between each two individual groups. P-value less than 0.05 was considered statistically significant.

The study was done after approval of ethical board of Khalid university.

RESULTS

Out of 297 students invited to participate in the study, 239 responded by completing the questionnaire giving a response rate of 80.5%. Their age ranged between 19 and 26 years with a mean±SD of 21.4±1.5 years. Their other demographic characteristics are summarized in table 1. Almost two-thirds (64.4%) were males and majority of them were Saudis (96.2%). Slightly more than half of them (52.7%) had an income of less than 1000 SR/month whereas 42.3% has an income ranged between 1000 and 5000 SR/month.

Table 1: Demographic characteristics of the participants (n=239).

	Frequency	Percentage
Gender		
Male	154	64.4
Female	85	35.6
Nationality		
Saudi	230	96.2
Non-Saudi	9	3.8
Income (SR/month)		
<1000	126	52.7
1000-5000	101	42.3
>5000	12	5.0

Depression was reported among 67.4% of them, based on PHQ-9 instrument; it was mild among 41.8% and severe among 9.6% of the participants as shown in figure 1.

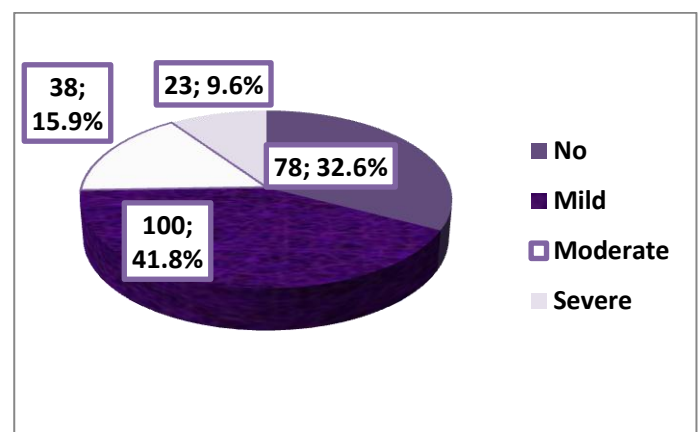


Figure 1: Depression among the participants based on PHQ-9 instrument

From table 2, it has been seen that depression was more reported among female than male students (74.1% versus 63.6%) and moderate and severe depressions were more reported among female than

male students (24.7% and 10.6% versus 11% and 9.1%, respectively). These differences were statistically significant, $p=0.034$. The highest age was reported among students with no depression (22.1±1.3 years) whereas the lowest age was observed among those with moderate depression (21.3±1.7 years). The difference was statistically significant, $p=0.018$. The age was significantly higher in no-depression group compared to mild

depression ($p=0.005$) and also compared to those of moderate depression group ($p=0.004$), using LSD post-hoc test. Histories of having family problems ($p<0.001$), financial problems ($p=0.001$), study problems ($p<0.001$), physical or emotional abuse ($p<0.001$), psychiatric problems ($p=0.007$) and family history of depression ($p=0.047$) were significantly associated with depression and its severity among the participants

Table 2: Socio-demographic factors associated with depression among medical students, King Khalid University, Abha

	Depression				P-value
	No N=78 N (%)	Mild N=100 N (%)	Moderate N=38 N (%)	Severe N=23 N (%)	
Gender					
Male (n=154)	56 (36.4)	67 (43.5)	17 (11.0)	14 (9.1)	0.034*
Female (n=85)	22 (25.9)	33 (38.8)	21 (24.7)	9 (10.6)	
Age (years) mean±SD	22.1±1.3 ^o §	21.5±1.5 ^o	21.3±1.7 [§]	21.7±1.6	0.018**
Marital status					
Single (n=230)	75 (32.6)	96 (41.7)	37 (16.1)	22 (9.6)	0.982*
Married (n=9)	3 (33.3)	4 (44.5)	1 (11.1)	1 (11.1)	
Income (SR/month)					
<1000 (n=126)	45 (35.7)	43 (34.1)	25 (19.8)	13 (10.3)	0.131*
1000-5000 (n=101)	29 (28.7)	53 (52.5)	10 (9.9)	9 (8.9)	
>5000 (n=12)	4 (33.3)	4 (33.3)	3 (25.0)	1 (8.3)	
Family problems					
No (n=180)	72 (40.0)	72 (40.0)	26 (14.4)	10 (5.6)	<0.001*
Sometimes (n=50)	6 (12.0)	26 (52.0)	9 (18.0)	9 (18.0)	
Always (n=9)	0 (0.0)	2 (22.2)	3 (33.3)	4 (44.4)	
Financial problems					
No (n=156)	57 (36.5)	61 (39.1)	29 (18.6)	9 (5.8)	0.001*
Sometimes (n=74)	20 (27.0)	35 (47.3)	9 (12.2)	10 (13.5)	
Always (n=8)	1 (12.5)	3 (37.5)	0 (0.0)	4 (50.0)	
Study problems					
No (n=115)	56 (48.3)	45 (38.8)	11 (9.5)	3 (3.4)	<0.001*
Sometimes (n=100)	19 (19.0)	49 (49.0)	24 (24.0)	8 (8.0)	
Always (n=23)	3 (13.0)	6 (26.1)	3 (13.0)	11 (47.8)	
Drug/alcohol use					
No (n=232)	73 (31.5)	99 (42.7)	38 (16.4)	22 (9.5)	0.114*
Yes (n=7)	5 (71.4)	1 (14.3)	0 (0.0)	1 (14.3)	
Physical/emotional abuse					
No (n=207)	75 (36.2)	89 (43.0)	28 (13.5)	15 (7.2)	<0.001*
yes (n=32)	3 (9.4)	11 (34.4)	10 (31.4)	8 (25.0)	
Psychiatric problems					
No (n=229)	78 (34.1)	97 (42.4)	34 (14.8)	20 (8.7)	0.007*
Yes (n=10)	0 (0.0)	3 (30.0)	4 (40.0)	3 (30.0)	
Organic health problems					
No (n=218)	74 (33.9)	92 (42.2)	32 (14.7)	20 (9.2)	0.247*
Yes (n=21)	4 (19.0)	8 (38.1)	6 (28.6)	3 (14.3)	
Family history of depression					
No (n=213)	76 (35.7)	84 (39.4)	34 (16.0)	19 (8.9)	0.047*
Yes (n=24)	2 (8.3)	15 (62.5)	4 (16.7)	3 (12.5)	

* Chi-square test ** ANOVA test ^o $p=0.005$, [§] $p=0.004$ (Using LSD test)

Among studied social media-related factors, none of the studied factors was significantly associated with depression. Table 3

Table 3: Association between social media use and depression among medical students, King Khalid University, Abha

	Depression				P-value
	No N=78 N (%)	Mild N=100 N (%)	Moderate N=38 N (%)	Severe N=23 N (%)	
Duration of using social media					
<1 years (n=5)	2 (40.0)	3 (60.0)	0 (0.0)	0 (0.0)	0.756
1 year- 2 years (n=15)	5 (33.3)	6 (40.0)	2 (13.3)	2 (13.3)	
2years – 3 years (n=40)	13 (32.5)	14 (35.0)	6 (15.0)	7 (17.5)	
>3 years (n=197)	58 (32.4)	77 (43.0)	30 (16.8)	14 (7.8)	
Daily duration of using chatting programs (hours)					
<1 (n=47)	19 (40.4)	18 (38.3)	5 (10.6)	5 (10.6)	0.228
1-3 (n=87)	30 (34.5)	37 (42.5)	14 (16.1)	6 (6.9)	
3-6 (n=71)	21 (29.6)	29 (40.8)	16 (22.5)	5 (7.0)	
>6 (n=34)	8 (23.5)	16 (47.1)	3 (8.8)	7 (20.6)	
Daily duration of using Twitter (hours)					
Never (n=41)	15 (36.6)	17 (41.7)	4 (9.8)	5 (12.2)	0.934
<1 (n=126)	39 (31.0)	57 (45.2)	21 (16.7)	9 (7.1)	
1-3 (n=50)	15 (30.0)	18 (36.0)	10 (20.0)	7 (14.0)	
3-6 (n=14)	5 (35.7)	6 (42.9)	2 (14.3)	1 (7.1)	
>6 (n=7)	3 (42.8)	2 (28.6)	1 (14.3)	1 (14.3)	
Daily duration of using snapshot (hours)					
Never (n=34)	10 (29.4)	15 (44.1)	5 (14.7)	4 (11.8)	0.102
<1 (n=76)	29 (38.2)	28 (36.8)	13 (17.1)	6 (7.9)	
1-3 (n=93)	33 (35.3)	39 (41.9)	12 (12.9)	9 (9.7)	
3-6 (n=27)	4 (14.8)	17 (63.0)	5 (18.5)	1 (3.7)	
>6 (n=9)	2 (22.2)	1 (11.1)	3 (33.3)	3 (33.3)	
Daily duration of using youtube (hours)					
Never (n=9)	5 (55.6)	2 (22.2)	1 (11.1)	1 (11.1)	0.182
<1 (n=105)	42 (40.0)	41 (39.0)	16 (15.2)	6 (5.7)	
1-3 (n=101)	27 (26.7)	46 (45.5)	17 (16.8)	11 (10.9)	
3-6 (n=19)	4 (21.1)	4 (21.1)	7 (36.8)	4 (24.0)	
>6 (n=5)	0 (0.0)	4 (80.0)	0 (0.0)	1 (20.0)	
Daily duration of using Instagram (hours)					
Never (n=37)	10 (27.0)	12 (32.4)	9 (24.3)	6 (16.2)	0.212
<1 (n=123)	46 (37.4)	50 (40.7)	15 (12.2)	12 (9.8)	
1-3 (n=63)	21 (33.3)	27 (42.9)	11 (17.5)	4 (6.3)	
3-6 (n=13)	1 (7.7)	8 (61.5)	3 (23.1)	1 (7.7)	
>6 (n=3)	0 (0.0)	3 (100)	0 (0.0)	0 (0.0)	
Daily duration of using Internet (hours)					
<1 (n=10)	5 (50.0)	3 (30.0)	2 (20.0)	0 (0.0)	0.593
1-3 (n=65)	25 (38.5)	26 (40.0)	9 (13.8)	5 (7.7)	
3-6 (n=88)	30 (34.1)	38 (43.2)	14 (15.9)	6 (6.8)	
6-9 (n=43)	12 (27.9)	18 (41.9)	7 (16.3)	6 (14.0)	
>9 (n=33)	6 (18.2)	15 (45.4)	6 (18.2)	6 (18.2)	

DISCUSSION

Medical students are more likely to have depression than their nonmedical peers as a result of heavier academic demands and stressors²⁰. As they are the future of health care, and depression may lead to reduced quality of life, less productivity as well as learning difficulties, which may negatively influence patient care^{21, 22}, this study was carried out to estimate the prevalence and some important predictors of depression among them, with specific emphasis on the role of over use of social media.

The present study revealed that the prevalence of depression among medical students was 67.4%. This figure is comparable to figure reported among female medical students at Qassim University (66.6%)²³, as well as from two studies carried out in Pakistan (60-70%)^{24, 25}. However, it is higher than those reported in similar studies carried out among medical students at Umm Al-Qura University, Makkah (30.9%)¹, King Saud University, Riyadh (48.2%),²⁶ Taibah University (28.3%)² King Faisal University, Al Ahsaa region (53%)²⁷. Also, it is higher than figures reported from other regional countries. In Dubai, UAE a prevalence of 28.6% has been reported among medical students²⁸. In Lebanon²⁹ and Egypt³⁰, reported prevalence of depression among medical students were 28% and 28.3%, respectively. In addition, lower figures were reported from international studies. In India, the prevalence of depression among first to fourth year medical was 49.1%³¹. In a study carried out in Pakistan, a prevalence of 35.1% was reported among medical students³². In Nigeria, the prevalence of depression among medical students was 23%³³. In USA, prevalence of depressive symptoms among medical students ranged between 12-25%^{20, 34-36}. The variation in the rate observed between the present study and others could be attributed to using different tools for identification of depression and different categories of medical schools involved in studies as well as different students' characteristics, mode of teaching and cultural background.

This study revealed that female students were more prone to depression than male students. This finding coincides with findings from the Western reports³⁴ and those from developing countries³¹ and also from Saudi Arabia^{1, 2}. This finding could be explained by the fact that females in general express depressive symptoms easier than men³⁷. Also, according to Saudi higher educational policy in Saudi Arabia, there are separate campuses for male and female

students in their studies, and a Saudi study suggested that a relatively poor learning environment exists in the female campus with lesser educational facilities and recreation opportunities, which would increase the level of stress and depression among them². Further investigation was warranted to explore this suggestion.

This study reported that depression was more observed among younger students. This agrees with findings from other studies^{24, 28, 30, 31, 35}. This could be attributed to the fact that younger students are exposed to a new study environment from secondary school to college of medicine, which necessitate greater degree of work load as a result of shift from the traditional spoon-feeding teaching methodology. In addition to homesickness as most of them might live far from home for the first time, change in their sleeping and eating habits and lack of leisure time are important factors. Older students showed lower rate of depression most probably due to their gradual adaptation to the environment and the study course.

In agreement with findings from a similar study, students with family difficulties, financial problems, study problems, physical/emotional abuse as well as psychiatric problems were more prone to depression than their counterparts³⁸.

In this study, in agreement with others³⁹ we did not confirm a significant association between social media use and depression. However, in other studies¹⁸ an association between social media use and depression has been observed.

Our study observed insignificant association between duration of internet use and depression. This finding opposes what has been observed in a previous recent study carried out in USA among young adults¹⁸. However, this finding agrees with that reported by Moreno who found increased depression in individuals with low internet use⁴⁰.

The cross-sectional design of the study, which affect the direction of the association and the inclusion of students from only one medical college in the KSA are amongst the important limitations of the study.

In conclusion, depression is a common hidden health problem among medical students in Saudi Arabia, as about two-thirds of King Khalid University medical college students had symptoms suggestive of depression. The prevalence of depressive symptoms was

significantly associated with duration of internet use, amongst other factors.

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