

The association between social media use and the incidence of depression among undergraduate students: an integrative review.

Loujain Sharif¹, Manal Alzahrani^{2*}

¹Department of Psychiatric and Mental Health Nursing, King Abdulaziz university, Jeddah, Saudi Arabia

²Department of Psychiatry, Mental Health and Psychiatric Hospital, Saudi Arabia, Tabuk City 21551, Saudi Arabia

Abstract

Undergraduate students in various scientific disciplines use social media for several reasons. However, excessive use of these applications may lead to a negative impact on mental health. This review aimed to determine the association between social media use and the incidence of depression among undergraduate students. An integrative review was conducted to examine literature published from January 2010-April 2021, on the association between social media use and the development of depression among undergraduate students. Relevant studies were obtained from several electronic databases, and 19 studies met the inclusion criteria. A wide range of selected studies focused on the time spent on social media. Other themes emerging in prior studies include the role of social media addiction, the purpose of social media use, the number of personal accounts, and mediating factors and their role in the development of depression. The findings of this study reveal a correlation between the utilization of social media and the development of depression. Hence, increasing awareness about these relationships may lead to better utilization of social media platforms and mental health promotion among young adults.

Keywords: Undergraduate students, Social media, Depression, Mental health.

Introduction

Depression is the most prevalent mental illness, globally [1]. A majority of people who are diagnosed with depression are exposed to psychological or physical symptoms, which result in increased financial burden due to the costs of treatment [2]. It is estimated that only 50% of individuals diagnosed with major depressive disorder receive medication and appropriate psychological care; moreover, less than 10% receive psychiatric therapy, worldwide [3,4]. Furthermore, the social, genetic, and biological factors underlying the development of depression predispose individuals to the illness.

Social media platforms are a group of applications that depend on the Internet to enable communication between users through pictures or video calls [5]. Social media connects individuals and enhances emotional support, while improving social relationships by providing multiple methods to communicate with individuals with similar interests [6,7]. In recent years, popular social media applications such as Twitter and Facebook have become an essential part of people's lives, despite their effect on social relationships and mental wellbeing [8].

With recent technological advances in the education sector, there has been an increase in undergraduate students' social media use to support their academic success [9]. However, due to increased academic pressure and misuse of social media applications, undergraduate students are at risk of burnout, sleep disturbances, and social isolation, which makes them susceptible to depression [10].

The impact of social media use on the development of depression has been investigated in prior studies, albeit with controversial findings [11,12]. Some studies confirm a positive association between social media use and depression, reporting that social media may have a beneficial impact on mental wellbeing (e.g., higher self-esteem) [13]. However, social media can adversely affect mental health through increased stress and anxiety, social isolation, low self-esteem, and depression [14].

The rationale for conducting this review is to provide an update on the last review conducted on social media use and depression, which was published five years ago. Furthermore, this review examines studies on social media use and the incidence of depression among a specific sample (undergraduate students), and to the best of the authors' knowledge, there are no published reviews focusing on depression and social media use among an undergraduate student sample group.

Literature Review

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed in this review. The PRISMA guideline is commonly used to conduct and improve the reporting quality of systematic reviews [15].

Review question

The review question was formulated based on the acronym PICO (i.e., patient, intervention, comparator, and outcome). The PICOT question format was utilized to determine the review question, "What is the association between social media

Citation: Sharif L, Alzahrani M. The association between social media use and the incidence of depression among undergraduate students: an integrative review. *Curr Pediatr Res* 2021;25(12):1-12.

use and the incidence of depression among undergraduate

students?" as well as conduct the search process in the databases (Table 1).

Table 1. PICOT Question

PICOT	Content	PICOT question
P	Undergraduate students	What is the association between social media use and the incidence of depression?
I	Social media use	
C	Not applicable	
O	Depression	
T	January 2010–April 2021	

Search Strategy

Selection of relevant databases and search items: A search strategy was utilized to find relevant published and unpublished evidence to answer the review question. The electronic search was completed on April 15, 2021, resulting in 244 records. The researcher applied search limits, which included the year of publication (beginning from 2010), the date of search completion, English language, and full-text availability. The Boolean operators "OR" and "AND" were used with key search terms to expand and narrow the search, respectively.

The keywords used for the search included social media-related terms, such as social network sites and social media platforms, depression-related terms such as depression, depressive symptoms, and major depressive disorder, and undergraduate students-related terms such as undergraduate students and young adults (Table 2).

Table 2. Key search terms/words and relevance

Participants	Undergraduate students OR young adults
	AND
Exposure	Social media OR social networks OR social networking OR social platforms
	AND
Outcomes	Depression OR depressive symptoms OR major depression OR depressive disorder

The total search results in Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medical Literature Analysis and Retrieval System Online (MEDLINE), PubMed, Academic Search Ultimate, Education Research Complete, and Arab World Research were 241 studies; two additional articles were added to the review from a Google Scholar search.

Criteria for selecting studies: The research team independently assessed possible evidence that met the inclusion criteria. All duplicate studies were excluded from the analyses. The title and abstract were carefully checked to select relevant studies. In addition, some full-text articles were read, and those that met the criteria were included. Few studies on the association between using social media and depression were excluded, and the reasons for elimination were explained (Figure 1).

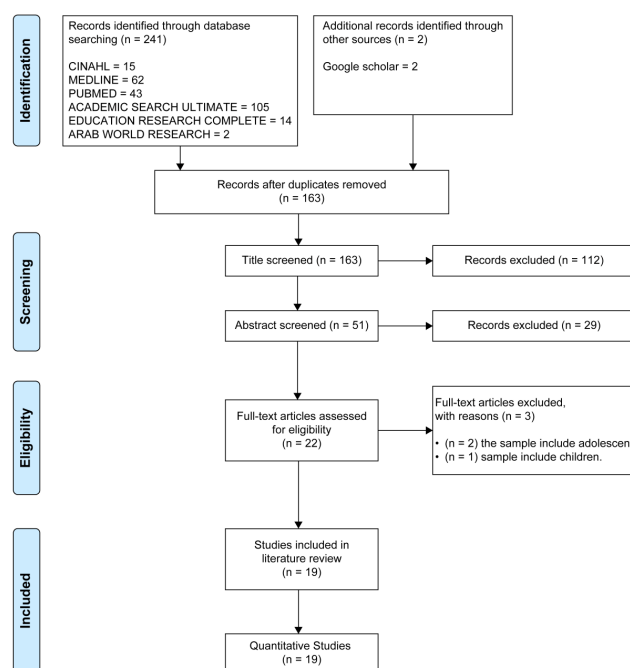


Figure 1. PRISMA diagram for included studies

The inclusion criteria were the following: (a) studies published between 2010 and 2021; (b) full text papers; (c) published in English; (d) primary original studies that investigated the association between social media use and the incidence of depression; (e) studies that included samples of young adult students aged between 18-30 years; and (f) studies that included samples of undergraduate students. The exclusion criteria included: (a) studies investigating the association between social media use and depression among adolescents or children aged below 18 years or older adults above 65 years.

Quality assessment of selected studies: The quality of included studies was independently evaluated by the researchers using the tool designed by Hawker et al. [16]. The tool was established to assess the risk of bias as well as to evaluate the quality and usefulness of certain elements in

research studies such as the abstract and title, introduction and aim, methods and sampling, data analysis, ethics and bias, findings or results, transferability, implications, and usefulness.

A Likert scale of 4 points, ranging from 1 "very poor" to 4 "good quality," was used to assess each item. The overall study quality score was the sum of the scores of the nine items, and the final scores ranged from 9-36. Scores ranging from 9-18 are described as poor-quality studies, 18-27 as fair quality studies, and 28-36 as good quality studies.

In relation to the quality of selected studies, the majority of their scores ranged from 17-35, indicating that the selected studies were acceptable and reliable references according to Hawker et al. (Table 3).

Table 3. Quality assessment of selected studies

Authors	Abstract	Method data collection	Introduction and aims	Sampling	Data analysis	Ethics and bias	Finding	Transferability generalizability	Implications usefulness	Total	
Alsabaani et al. (2018)	3	3	3	4	4	4	4	3	3	31	Good
Barman et al. (2018)	3	3	3	3	4	3	3	3	3	28	Good
Jeri-Yabar et al. (2019)	3	4	3	4	4	4	4	3	4	33	Good
Moreno et al. (2011)	4	4	3	4	4	4	4	3	3	33	Good
Primack et al. (2018)	4	4	4	4	4	4	4	3	3	34	Good
Shensa et al. (2017)	2	4	3	4	4	3	3	3	3	29	Good
Primack et al. (2017)	3	4	3	4	4	4	4	3	4	33	Good
Ahmad et al. (2018)	4	4	4	4	4	4	4	3	4	35	Good
Aalbers et al. (2019)	4	2	3	1	3	4	3	3	3	26	Fair
Wong et al. (2020)	3	4	3	4	4	4	4	3	4	33	Good
Al Mamun & Griffiths (2019)	4	4	4	4	4	4	4	3	4	35	Good
Brailovskai a & Margraf (2017)	3	4	3	3	4	3	3	3	3	29	Good
Tang & Koh (2017)	3	3	3	3	4	3	3	3	3	28	Good
Saglam et al. (2018)	4	4	3	1	3	3	3	3	3	27	Fair
Zeeni et al. (2018)	3	3	3	4	4	4	4	3	3	31	Good
Elhai et al. (2018)	3	4	3	3	4	3	3	3	3	29	Good
Brailovskai a & Margraf (2018)	4	4	4	4	4	4	4	3	3	34	Good
Shensa et al. (2018)	3	4	4	3	3	4	3	3	3	30	Good
Lee et al. (2018)	2	1	2	2	2	2	2	2	2	17	Poor

Extracting the data: This step involved extracting pertinent information from the included studies to find answers to the

review question [17]. The primary researcher used a data extraction matrix (Table 4) to extract and summarize the

Citation: Sharif L, Alzahrani M. The association between social media use and the incidence of depression among undergraduate students: an integrative review. *Curr Pediatr Res* 2021;25(12):1-12.

following information on each study: participants, methods, and main findings, which helped enhance the reliability and validity and decrease the risk of bias [18]. Thus, data extraction should involve study variables to answer the review question

[18]. Data were extracted from 19 quantitative studies in Figure 1.

Table 4. Study matrix for selected studies

Researcher name/ Publication year	Site of Study	Study aim	Type of study design	Total sample/Type of Participants/Gender/ Participants' age group	Instruments used to assess depression/ social media use	Main Findings/ Result
Alsabaani et al. (2018)	Saudi Arabia	To evaluate the relationship between depression and overuse of social media. To determine possible risk factors for the development of depression in medical students	Quantitative design, comparative cross-sectional study	Type of Participants = medical undergraduate students. Age group =19–26 years. Gender = Male→154 Female →85	For depression → Patient Health Questionnaire (PHQ-9). For social media use →self-developed scale. experiences involved positive and negative experiences, respectively.	Depression was more prominent among female than among male students. Risk factors for the development of depression included family problems, economic, education, and mental or physical health problems. The study revealed that there was no significant relationship between depression and overuse of social media.
Primack et al. (2017)	United states of America	To measure the relationship between negative and positive experiences on social media and the development of depression.	Quantitative cross-sectional survey	Total sample = 1,179 Type of Participants = undergraduate students. Age group =18–30 years Gender =Male→ 439 Female → 726 Other→14	For depression → Patient-Reported Outcomes Measurement Information System (PROMIS). For social media use → positive and negative experiences on social media were assessed by directly asking participants to estimate what percentage of their social media experiences involved positive and negative experiences, respectively.	An increase in positive experiences (10%) on social media helped decrease the depression scores by 4%.An increase in negative experiences on social media increased depression scores by 20%.
Ahmad et al. (2018)	Pakistan	To measure the relationship between depression and social media use. To explore student's awareness concerning social media use.	Quantitative, correlational research design.	Total sample = 200 Facebook and Twitter users Type of Participants = undergraduate university students. Age group = not reported Gender = Male→ 123 Female → 77	For depression → Beck Depression Inventory (BDI) For social media use →self-developed questionnaire	Lower levels of depression were found in female medical students who used social media, compared with their male counterparts. Higher levels of depression were found among students who used social media to search health and medicine-related information. Students who used social media to communicate and interact with their friends or family had lower levels of depression.
Saglam et al. (2018)	Turkey	To evaluate social network usage among medical students. To assess their attitudes towards social network usage in medicine, anxiety and	Quantitative Descriptive Survey	Total sample = 70 Type of Participants = Medical undergraduate students. Age group = not reported Gender = not mentioned	For depression → Beck Depression Inventory (BDI) For social media use →self-developed questionnaire	Medical students who spent more hours on social media had lower awareness and usage of health-related applications. Depression and

		depression levels, and sleep disorders. To examine the relationship between the aforementioned variables and their grade point averages.				anxiety were associated with poor sleep quality for medical students. The relationship between sleepiness during the day and anxiety and depression may be reciprocal.
Wong et al. (2020)	Hong Kong	To investigate associations between problematic social media use, severances of internet video gaming, and psychological, sleep disorders among young adults.	Quantitative, A cross-sectional study	Total sample = 300 Type of Participants = undergraduate university students. Age group = not reported Gender = Male → 122 Female → 178	For depression → Depression Anxiety Stress Scales. For social media use → Bergen Social Media Addiction Scale (BSMAS)	Participants who were addicted to social media had higher levels of depression, anxiety, and stress than those who were not addicted to social media.
Zeeni et al. (2018)	Lebanon	To explore university students' awareness towards all types of social media. To identify the relationship between use of media and technology and the development of physical and mental distress.	Cross-Sectional correlational descriptive study	Total sample = 244 Type of Participants = undergraduate university students. Age group = 16–21 years. Gender = Male → 88 Female → 156	For depression → Depression Anxiety Stress Scale For social media use → Media and Technology Usage and Attitudes Scale (MTUAS))	A positive correlation between use of media and stress and eating problems was found. Fear of separation from social media use and other technological tools increased risks for developing mental illnesses such as anxiety and depression.
Barman et al. (2018)	Bengal	To assess the prevalence of social media use. To assess the incidence of anxiety and depression among medical students. To explore the relationship between the anxiety, depression, and social media use	Quantitative descriptive cross-sectional design.	Total sample = 200 Type of Participants = Undergraduate students of a medical college in Kolkata Age group = 21–23 years Gender = Male → 51.0% Female → 49.0%	For depression → Depression Inventory (BDI) For social media use → Researchers developed a tool comprising questions such as: time spent on social media in one week, ability to spend a long time without using social media, effect of social media on student's sleep, and life satisfaction, self-esteem.	A significant relationship between social media use and depression was found. -Approximately 41% students had three or more personal accounts on different social media. A negative correlation between number of personal accounts on social media and the development of depression was revealed.
Aalbers et al. (2019)	United states of America	To explore the association between passive social media use and level of depression and stress.	Quantitative exploratory study	Total sample = 132 Type of Participants = Undergraduate psychology students Age group = not reported Gender = Male → 41 Female → 91	For depression → modified items taken from questionnaires used to measure depressed mood, loss of interest, fatigue, concentration problems, feelings of loneliness, inferiority, and hopelessness. For social media use → Active social media use scale (ASMU) and passive social media use scale (PSMU)	Participants who used social media passively had a higher level of depressed mood, loneliness, hopelessness, and sense of inferiority.
Brailovskaia & Margraf (2018)	Germany	To explore the association between mental illness, personality disorder, and media use especially social media applications among German university students.	Quantitative exploratory study	Total sample = 633 Type of Participants = Undergraduate students. Age group = Not reported Gender = Male → 214 Female → 419	For depression → Depression Anxiety Stress Scale. For social media use → self-developed tool (not clearly reported).	A significant association between social media use and low self-esteem, decreased life satisfaction, and consequent development of mental health issues

Citation: Sharif L, Alzahrani M. The association between social media use and the incidence of depression among undergraduate students: an integrative review. *Curr Pediatr Res* 2021;25(12):1-12.

						such as depression, anxiety, and stress symptoms was found. Having more than one social media personal account can contribute to reducing depression.
Elhai et al. (2018)	United states of America	To investigate the development of mental health issues from an imaginary social media and mobile phone loss.	Quantitative descriptive correlational study	Total sample = 358 Type of Participants = Undergraduate university students Age group = 18–25 years Gender = Male → 90 Female → 268	For depression → Depression Anxiety Stress Scale. For social media use → The researcher developed a tool.	The social media loss group participants reported higher fear of loss from imagined smartphone. Their fear mediated the relationship between social media loss and depression, anxiety, and stress.
Shensa et al. (2018)	United states of America	To investigate the relationship between real life closeness of social media contacts and the development of depression	Quantitative a cross-sectional observational study	Total sample = 1124 Type of Participants = Undergraduate university students. Age group = 18–30 years Gender = Male → 36% Female → 64 %	For depression → Patient-Reported Outcomes Measurement Information System (PROMIS). For social media use → not reported.	Students who had close personal contacts with social media contacts had lower levels of depression, whereas students with no direct personal contact with social media contacts had more signs of depression.
Al Mamun & Griffiths (2019)	Bangladeshi	To investigate the relationship between Facebook addiction and depression.	Quantitative cross-sectional survey	Total sample = 300 Type of Participants = Undergraduate university students. Age group = 18–30 years Gender = Male → 184 Female → 116	For depression → Patient Health Questionnaire (PHQ-9). For social media use → Bergen Facebook Addiction Scale	A significant correlation between Facebook addiction and the development of depression among undergraduate university students was found.
Brailovskaia & Margraf (2017)	Germany	To evaluate Facebook addiction among undergraduate university students in a one-year period and assess its relationship with the development of mental illness	Quantitative longitudinal correlational approach	Total sample = 300 Type of Participants = Undergraduate university students	For depression → Depression Anxiety Stress Scale. For social media use → Facebook Addiction Disorder Scale (FAD)	A strong correlation between Facebook addiction and personality traits such as narcissism was revealed. A strong relationship between Facebook addiction and other mental issues such as depression, anxiety, and stress symptoms was reported.
Moreno et al. (2011)	United states of America	To assess the relationship between depressive symptoms and self-reported depression symptoms using a clinical screening among Facebook users.	Quantitative correlational approach	Total sample = 224 Type of Participants = Undergraduate university students Age group = 18–20 years Gender = Male → 102 Female → 122	For depression → Patient Health Questionnaire (PHQ-9). For social media use → self-developed tool (not clearly reported).	Overall, 30% of undergraduate university students who were active social media users over a period of one month showed signs of depression and difficulty in functioning.
Jeri-Yabar et al. (2019)	United states of America	To identify the relationship between social media dependence and depression. To assess the level of dependence on social media.		Total sample = 212 Type of Participants = Undergraduate university students (Psychology, Architecture, and Civil Engineering students). Age group = 18–35 years Gender =	For depression → Beck Inventory of Depression. For social media use → Social Media Addiction Test was used, adapted from the Internet Addiction Test.	A significant relationship between dependence on social media and the development of depressive symptoms was found. Overuse of social media had a significant relationship with depression. Depression was

				Male→116 Female → 96		higher among students who preferred to use Twitter rather than Facebook and Instagram.
Tang &Koh (2017)	Singapore	To assess the degree of social networking addiction. To identify the possible behavioral and psychological disorders that develop from social	Quantitative cross-sectional descriptive design	Total sample = 1110 Type of Participants = Undergraduate university students	For depression → Not reported For social media use → Not reported	Overall, 27.7% of participants had anxiety, while 21% of them showed signs of depression. A significant correlation between social networking addiction and the development of behavioral and psychological distress was reported.
Lee et al. (2018)	United states of America	To explore the effect of social media use during face-to-face contact on mental and psychological wellbeing.	Quantitative cross-sectional descriptive design	Total sample = 437 Type of Participants = Undergraduate university students	For depression → Not reported For social media use → Not reported	Face-to-face interaction positively influenced mental health. A significant relationship between social media use during face-to-face contact and the development of mental illness such as depression and anxiety was found.
Primack et al. (2018)	United states of America	To assess the relationship between social media and depression. To assess the general uses of social media in a large sample.	Quantitative Correlational longitudinal study	Total sample = 1,787 Type of Participants = young adults Age group = Adults aged 19–32 Gender = Male→ 43%Female → 57%	For depression → Patient-Reported Outcomes Measurement Information System (PROMIS). For social media use → The researcher used a self-developed tool. The tool included questions such as number of hours spent on different social media applications.	A significantly strong correlation between number of hours spent on social media and depression was found.
Shensa et al. (2017)	United states of America	To investigate the relationship between problematic social media use and depression. To examine the role of time and frequency of social media on the development of depression	Quantitative cross-sectional correlational study	Total sample = 1,749 Type of Participants = young adults. Age group = Adults aged 19 – 32. Gender =Not reported	For depression → Patient-Reported Outcomes Measurement Information System (PROMIS). For social media use → set of items adapted from the Bergen Facebook Addiction Scale (BFAS) (Modified tool)	A strong significant relationship between social media use and depression was found. The frequency of using social media was significantly associated with the development of depression. The time spend on social media was not significantly associated with the development of depression.

Results

Description of the selected studies

A total of 241 studies were identified by the search process; these studies were published between 2010 and 2020. Initially, 78 articles were excluded, as they were duplicate articles. Of these, 163 were screened by abstract and title to ensure that they met the inclusion criteria. The title and abstract screening

resulted in 22 articles, similar to the study's aim. In addition, the researcher added two studies from a Google Scholar search, resulting in a total of 19 studies for the review [19-37].

This review presents a description of the characteristics of the included studies, followed by a presentation of the extracted themes. The 19 studies focused on the direct and indirect association between social media use and depression. Furthermore, to determine the research themes, a review matrix

was developed to arrange the extracted studies by theme. This step helped locate common themes emerging from the selected studies, while identifying the main argument of the study (Table 4).

The majority of selected studies were conducted in North America (n=9), followed by Asia (n=5), Europe (n=3), and the Middle East (n=2). The study design of the included studies can be divided into cross-sectional studies (n=6), descriptive correlational study (n=5), descriptive surveys (n=1), cross-sectional comparative studies (n=1), exploratory studies (n=2), cross-sectional observational studies (n=1), longitudinal correlational approaches (n=2), and cross-sectional correlational studies (n=1). In terms of sample size, eight articles had a relatively large sample (300 students or more), whereas 11 articles had samples of less than 300 students.

A wide range of selected studies focused on the role of time spent on social media. Other studies focused on the role of social media addiction and the purpose of social media use. Furthermore, some studies focused on mediating factors, such as gender, poor sleep quality, anxiety or fear of separation from social media, and poor social contact associated with social media use, and their role in developing depression.

In terms of the inclusion criteria, most studies selected college students, aged 18-30, as participants. Moreover, four studies included students studying in the medical field, whereas 13 studies included students from other scientific fields. Finally, only two studies involved young adults aged between 19-32 years, selected as a nationally representative sample.

The outcome tools used in the selected studies were survey questionnaires (n=19), including a depression-adapted tool (n=16), and a tool developed by the researchers (n=1). Moreover, while some studies developed a tool to measure social media (n=10), others adopted a tool for this purpose (n=5). However, two studies modified a tool from the original researcher.

Regarding outcome tools used to measure depression, five studies [19-23] used the Depression Anxiety Stress Scale (DASS), four used [24-27] the Patient-Reported Outcomes Measurement Information System (PROMIS), and four studies [28-31] used the Beck Depression Inventory (BDI) version-2 comprising 21 items. Moreover, the self-administered patient health questionnaire scale, comprising nine items, was used in three studies [32-34].

Finally, regarding tools used to assess social media use, a majority of the selected studies used self-developed tools in their studies. The types of questions included in self-developed tools varied from questions about time spent on social media, frequency and purpose of use, ability to stay one day without social media use, number of personal accounts, impact of social media on self-esteem and life satisfaction, and Facebook profile activity in the last 30 days [24,27-30,32,34]. Moreover, two studies measured participants' engagement on the Facebook application only [19,33]. Some scales, including the Bergen Social Media Addiction Scale [23], the Media and Technology Usage and Attitudes Scale (MTUAS) [22], the

Active Social Media Use Scale (ASMU), and the Passive Social Media Use Scale (PSMU) [35] were used to assess social media use.

Analysis of results

A total of six themes including time spent using social media, number of personal accounts, purpose of use, social media addiction, mediating factors, and the relationship between social media use and depression emerged from the analysis. These themes are examined in more detail in the subsequent sections

Time spent using social media: Time spent using social media refers to the number of hours that users spend on social media, which is classified into three categories: number of hours, frequency of use, and social media overuse. Regarding social media overuse, Alsabaani et al. [32] revealed that there was no significant relationship between social media overuse and the development of depressive symptoms. Furthermore, Barman et al. [30] found a strong association between the overuse of social network sites and depression and anxiety.

Jeri-Yabar et al. [31] also investigated time spent on social media and found that students who used social media for more than 5 hours, especially Twitter users, had higher levels of depression, compared with students who used social media applications for a lesser number of hours. Similarly, Moreno et al. [34] found that 30% of college students who used Facebook for an average of five hours per day for one year reported sleep and appetite disturbance, low energy, and depressed mood. In line with the previous two studies, Primack et al. [27] and Ahmad et al. [28] revealed that students who used social media for more than six hours had depressive symptoms, compared with students who used social media for 2-3 hours. In contrast, Shensa et al. [25] reported that the time spent on social media was not significantly associated with the development of depressive symptoms.

The frequency of social media use was mentioned in two studies [25,30], which evaluated the association between social media use and the development of depression. The findings of the aforementioned studies emphasized the effect of the frequency of social media use over a long duration on the development of signs of depression; moreover, they found a significant correlation between the frequency of social media use and depression. In contrast, Alsabaani et al. [32] reported no association between the frequency of social media use and the development of depressive symptoms.

Number of personal accounts: The number of personal accounts refers to the total number of social media websites in which personal subscription is registered, and through which the user actively sends text messages, pictures, and videos to other users.

In this review, the role of the number of personal accounts was discussed in two studies. According to Brailovskaia and Margraf [20], having more than one personal social media account can help shy and anxious students enhance their social skills, thus reducing their likelihood of developing depression.

Similarly, Barman et al. [30] mentioned that the number of personal accounts on social media had no influence on the development of depression.

Purpose for using social media: Purpose of use refers to the reasons for using social media and its negative or positive impact on mental health. Three selected studies investigated the role of the purpose of social media use on depression.

According to a study by Primack et al. [24], positive experiences on social media such as chatting with family and friends reduced depressive symptoms, whereas negative experiences on social media, such as playing violent video games were strongly related to depressive symptoms. Moreover, Ahmad et al. [28] found high levels of depression among students who preferred to use social media to search for medicine and health-related information. However, medical students who used social media to interact with family and friends did not report depressive symptoms. In addition, Aalbers et al. [35] stated that participants who used social media to chat with strangers or play violent games experienced a sense of self-inferiority, loneliness, and hopelessness, which put them at a higher risk of developing depression.

Social media addiction: With regard to addiction, four selected studies investigated the role of social media addiction on depression. Social media addiction refers to a condition of being dependent on social media applications, either addiction to all types of social media applications, or addiction to specific types of social media applications. According to the Diagnostic and Statistical Manual of Mental Disorders, daily social media use of over six hours is considered a sign of addiction [38].

Regarding social media addiction, Wong et al. [23] found that students who were addicted to social media had higher levels of depression, anxiety, and stress, compared with those who had mild to moderate social media use. However, Tang and Koh [36] reported that around 21% of students who were addicted to social media experienced depression.

Facebook addiction was mentioned in two studies. Al Mamun and Griffiths [33] reported high levels of Facebook addiction among students; moreover, the results revealed a positive correlation between Facebook addiction and depression. Similarly, Brailovskaia and Margraf [19] found a strong correlation between Facebook addiction and personality traits such as narcissism and other mental health issues, such as depression, anxiety, and stress symptoms.

Mediating variable/or factors: Regarding mediating variables or factors, eight selected studies discussed the role of mediating factors in the development of depression. Mediating factors include gender, poor sleep quality, fear of loss or separation from social media, poor self-esteem, decreased life satisfaction, and poor social contact associated with social media. Mediating factors, or confounding, moderating factors, refer to an explanation of the relationship between the independent and dependent variables by outlining how and why the relationship exists.

Similarly, Saglam et al. [29] revealed that poor sleep quality, mediates the association between social media use during sleep time and depression and anxiety. In addition, a study by Zeeni et al. [22] found that continuous fear of separation from social media use was associated with an increased probability of the development of depression.

In line with previous studies, Elhai et al. [21] found that participants in the social media loss group demonstrated more fear of loss and showed signs of anxiety owing to the imagined loss of their smartphone. Thus, their emotion and fear mediated the relationship between imagined loss of smartphone and depression, anxiety, and stress. Moreover, Brailovskaia and Margraf [20] reported a positive association between poor self-esteem, decreased life satisfaction, and general use of social media, and consequent development of mental illnesses such as depression.

Furthermore, Shensa et al. [26] reported that poor social contact associated with social media use and the absence of direct personal interaction with social media contacts were related to the development of depression. Similarly, Lee et al. [37] reported that using social media during face-to-face interaction causes poor social contact, increases social isolation, thus negatively affecting social relationships and increasing the risk of depression and anxiety.

Finally, the role of gender was mentioned in two selected studies in the current review. Alsabaani et al. [32] reported that the prevalence of depression was higher among female than among male students. Moreover, they emphasized the role of Saudi culture's restrictions on women as well as the historical trajectory of economic, social, psychological, and family problems in the development of depression among female students. Similarly, Ahmad et al. [28] reported higher levels of depression among male medical students who used social media applications, compared with their female counterparts.

Social media use and depression relationship: The association between social media use and depression was the result of the statistical analysis conducted by researchers to assess the relationship between social media and depression using a correlational method. Some studies reported a significant positive correlation between social media use and depression, while others reported a negative correlation between social media and depression.

A positive correlation between social media use and depression was found in five studies. Aalbers et al. [35] found that social media use was positively correlated with depression, wherein an increase in social media use scores resulted in an increase in the total depression score. Similarly, several studies have reported a positive correlation between social media use and depression [27,28,30,31].

However, only the study by Alsabaani et al. [32] study revealed a negative correlation among medical students in Saudi Arabia who used social media.

Discussion

This integrative review was designed to investigate relevant evidence on the potential association between social media use and depression among undergraduate students. In the selected studies, the most commonly measured outcome was depression, in addition to other mental illnesses such as anxiety. Emerging themes on the risk factors for the development of depression included time spent on social media; purpose of social media use; number of personal accounts; social media addiction; and mediating factors in the development of depression such as gender, poor sleep quality, anxiety, fear of loss or separation from social media, poor self-esteem, decreased life satisfaction, and poor social contact associated with social media use.

Moreover, the results of the included studies showed inconsistent and varying findings regarding the association between the two variables. However, most researchers have reported a complicated and controversial association between social media use and depression. However, some studies investigated the possible role of mediating factors in the development of depressed mood.

This review showed a positive association between social media use and depression according to the finding of Primack et al. [27], Ahmad et al. [28], Jeri-Yabar et al. [31], Aalbers et al. [35], and Barman et al. [30]. However, this result is inconsistent with the findings of Alsabaani et al. [32] and Brailovskaia and Margraf [19], who found that using social media for long hours and having more than one personal account on social media applications helped reduce depression by decreasing social isolation and enhancing communication skills.

This review revealed that spending more time and the overuse of social media applications was associated with the development of depression. This finding is supported by Barman et al. [30], Jeri-Yabar et al. [31], Moreno et al. [34], and Primack et al. [27]. However, these results are inconsistent with the findings of Alsabaani et al. [32] and Shensa et al. [25] who found no relationship between the number of hours spent on social media and the development of depressive symptoms.

The main finding of the current review was that students who preferred to use social media for the purpose of identifying health and medicine-related information had higher levels of depression, compared with students who used social applications to interact and communicate with their relatives and friends. In addition, this review revealed that users, who used social media passively to chat with strangers or play violent games, experienced a sense of self-inferiority, loneliness, and hopelessness, which made them more susceptible to developing depression. This result is similar to the findings of a study conducted in Pakistan by Ahmad et al. [28] and two other studies conducted in the United States by Aalbers et al. [35] and Primack et al. [24] who found that the purpose of using social media plays an important role in the development of depression.

In addition, this review highlights the impact of addiction on social media. Some authors reported that students who were addicted to social media had higher levels of depression, compared with those who were not addicted to social media. However, others have reported that addiction to a particular type of social media such as Facebook plays a crucial role in the development of depression. This result is in line with the findings of a study conducted in Hong Kong by Wong et al. [23], a study conducted in Bangladesh by Al Mamun and Griffiths [33], a study conducted in Germany by Brailovskaia and Margraf [19], and another study by Tang and Koh [36] in Singapore.

Furthermore, some evidence in this systematic review highlights the role of mediating factors in the development of depression. Among these factors, poor sleep quality associated with social media use has been reported as a mediating factor in the development of depression [29]. Moreover, fear of separation from using social media, poor self-esteem, decreased life satisfaction associated with frequent social media use, poor social contact, and loss of face-to-face contact associated with social media use have been reported as mediating factors in the development of depression [20,22,26,37, 38].

The influence of gender, associated with social media use, in the development of depression was also revealed in this review. As reported by Ahmad et al. [28] male undergraduate medical students who used social media had higher levels of depression, compared with female medical students. This result was in contrast to the findings of Alsabaani et al. [32] that reported higher levels of depression among female medical students who used social media, compared with their male counterparts. This finding was a result of Saudi's cultural restrictions on women and other risk factors that cause women to spend more time on social media applications to escape from social isolation.

Limitations

Several limitations emerged from the selected studies in this review. First, some included studies employed a convenience sampling method; moreover, some studies had small sample sizes, which reduced the generalizability of their results. Second, few studies focused on Facebook use over other social applications, which caused a bias and influenced the generalizability of the results.

Third, some selected studies not only assessed the effect of social media use on the development of depression, but also measured other mental illnesses such as anxiety and personality disorders. This made it difficult to determine whether social media use alone is a source of depression and other mental illnesses, or depression and other mental illnesses lead to increased frequency and passive use of social media, which result in addiction to social media.

Finally, some selected studies used self-reports and self-developed questionnaires to measure social media use, which may not provide reliable information about students' activities on social media applications. In addition, other studies have

not clearly mentioned the tools used to measure social media use, while others failed to report the validity and reliability of the tools used in their studies.

Conclusion

The findings of the current review are likely to be beneficial to academic faculty and advisors alike as they are in direct contact with undergraduate students and the researchers share significant contributions clarifying the role of social media in the development of depression among undergraduate students. Hence, universities and colleges both have a responsibility towards their students to establish educational programs and/or awareness campaigns on the campus to educating undergraduate students about the potential hazards of social media use on mental health. Such educational programs/campaigns can include group discussions, consultations with academic advisors or on campus counselors to enable students to express their thoughts and feelings, which in turn can help cultivate supportive academic environment.

References

- World Health Organization (2021) Depression Fact Sheet. Department of Health and Human Services.
- Greenberg PE, Fournier AA, Sisitsky T, et al. The economic burden of adults with major depressive disorder in the United States (2005 and 2010). *J Clin Psychiatry*. 2015;76:5356.
- Substance Abuse and Mental Health Services Administration (SAMHSA) (2021) Behavioral Health Trends in the United States. Results from the 2014 National Survey on Drug Use and Health.
- National Institute of Mental Health (2021) Use of Mental Health Services and Treatment among Children. Department of Health and Human Services.
- Carr CT, Hayes RA. Social media: defining, developing, and divining. *Atl J Commun*. 2015; 23: 46-65.
- Ellison NB, Heino R, Gibbs J. Managing impressions online: self-presentation processes in the online dating environment. *J ComputMediatCommun*. 2006; 11:415-441.
- Ellison NB, Steinfield C, Lampe C. The benefits of Facebook "friends": social capital and college students' use of online social network sites. *J ComputMediatCommun*. 2007;12: 1143-1168.
- Twenge JM. *iGen: Why today's super-connected kids are growing up less rebellious, more tolerant, less happy—and completely unprepared for adulthood*. New York Atria Books 2017.
- Creighton JL, Foster JW, Klingsmith L, et al. I just look it up: undergraduate student perception of social media use in their academic success. *Soc Media Soc*. 2013; 2.
- Allen KA, Ryan T, Gray DL, et al. Social media use and social connectedness in adolescents: the positives and the potential pitfalls. *AustEducDev Psychol*. 2014; 31: 18-31.
- Primack BA, Swanier B, Georgiopoulos AM, et al. Association between media use in adolescence and depression in young adulthood: a longitudinal study. *Arch Gen Psychiatry*. 2009; 66: 181-188.
- Bickham DS, Hswen Y, Rich M. Media use and depression: exposure, household rules, and symptoms among young adolescents in the USA. *Int J Public Health*. 2015; 60: 147-155.
- Gonzales AL, Hancock JT. Mirror, mirror on my Facebook wall: effects of exposure to Facebook on self-esteem. *CyberpsycholBehavSocNetw*. 2011; 14: 79-83.
- Meier A, Reinecke L, Meltzer CE. Facebookrastination? Predictors of using Facebook for procrastination and its effects on students' well-being. *Comput Human Behav*. 2016; 64: 65-76.
- Moher D, Liberati A, Tetzlaff J, et al. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med*. 2009; 151: 264-269.
- Hawker S, Payne S, Kerr C, et al. Appraising the evidence: reviewing disparate data systematically. *Qual Health Res*. 2002; 12: 1284-1299.
- Coughlan M, Cronin P (2016) *Doing a literature review in nursing, health, and social care*. 2nd edition, SAGE Publications Ltd, Los Angeles Sage, London.
- Centre for Reviews & Dissemination (2009) *CRD's guidance for undertaking reviews inHealthcare*. York Publishing Services Ltd., Layerthorpe.
- Brailovskaia J, Margraf J. Facebook Addiction Disorder (FAD) among German students—a longitudinal approach. *PLoS One*. 2017; 12: e0189719.
- Brailovskaia J, Margraf J. What does media use reveal about personality and mental health? An exploratory investigation among German students. *PLoS One*. 2018; 13: e0191810.
- Elhai JD, Hall BJ, Erwin MC. Emotion regulation's relationships with depression, anxiety and stress due to imagined smartphone and social media loss. *Psychiatry Res*. 2018; 261: 28-34.
- Zeeni N, Doumit R, AbiKharma J, et al. Media, technology use, and attitudes: associations with physical and mental well-being in youth with implications for evidence-based practice. *Worldviews Evid Based Nurs*. 2018; 15: 304-312.
- Wong HY, Mo HY, Potenza MN, et al. Relationships between severity of internet gaming disorder, severity of problematic social media use, sleep quality and psychological distress. *Int J Environ Res Public Health*. 2020; 17: 1879.
- Primack BA, Shensa A, Escobar-Viera CG, et al. Use of multiple social media platforms and symptoms of depression and anxiety: a nationally-representative study among US young adults. *Comput Hum Behav*. 2017; 69: 1–9.
- Shensa A, Escobar-Viera CG, Sidani JE, et al. Problematic social media use and depressive symptoms among U.S. young adults: a nationally-representative study. *SocSci Med*. 2017; 182: 150-157.
- Shensa A, Sidani JE, Escobar-Viera CG, et al. Real-life closeness of social media contacts and depressive

- symptoms among university students. *J Am Coll Health*. 2018; 66: 747-753.
27. Primack BA, Bisbey MA, Shensa A, et al. The association between valence of social media experiences and depressive symptoms. *Depress Anxiety*. 2018; 35: 784-794.
28. Ahmad N, Hussain S, Munir, N. Social networking and depression among university students. *Pak J Med Res*. 2018; 57: 77-82.
29. Saglam K, Imam MA, Gumusyayla S. Social media usage of medical school students, health related social media usage, anxiety and depression levels and the frequency of sleep disorders and the relationship between these factors and the success of the course. *Ank Med J* 2018; 18: 41-41.
30. Barman L, Mukhopadhyay DK, Bandyopadhyay GK. Use of social networking site and mental disorders among medical students in Kolkata, West Bengal. *Indian J Psychiatry*. 2018; 60: 340-345.
31. Jeri-Yabar A, Sanchez-Carbonel A, Tito K, et al. Association between social media use (Twitter, Instagram, Facebook) and depressive symptoms: are Twitter users at higher risk? *Int J Soc Psychiatry*. 2019; 65: 14-19.
32. Alsabaani A, Alshahrani AA, Abukaftah AS, et al. Association between over-use of social media and depression among medical students, King Khalid University, Kingdom of Saudi Arabia. *Egypt J Hosp Med*. 2018; 70: 1305-1311.
33. Al Mamun MAA, Griffiths MD. The association between Facebook addiction and depression: A pilot survey study among Bangladeshi students. *Psychiatry Res*. 2019; 271: 628-633.
34. Moreno MA, Christakis DA, Egan KG, et al. A pilot evaluation of associations between displayed depression references on Facebook and self-reported depression using a clinical scale. *J Behav Health Serv Res*. 2012; 39: 295-304.
35. Aalbers G, McNally RJ, Heeren A, et al. Social media and depression symptoms: a network perspective. *J Exp Psychol Gen*. 2019;148: 1454-1462.
36. Tang CS, Koh YY. Online social networking addiction among college students in Singapore: comorbidity with behavioral addiction and affective disorder. *Asian J Psychiatr*. 2017;25:175-178.
37. Lee M, Murphy K, Andrews G. Using media while interacting face-to-face is associated with psychosocial well-being and personality traits. *Psychol Rep*. 2019;122:944-967.
38. American Psychiatric Association (2013) *Diagnostic and statistical manual of mental disorders (DSM-5®)*. 5th edition, American Psychiatric Publishing, Washington, D.C., USA.

***Correspondence to**

Dr. ManalAlzahrani

Department of Mental Health and Psychiatry

Mental Health and Psychiatric Hospital

Tabuk

Saudi Arabia

E-mail: Malzahrani1467@stu.kau.edu.sa