

Social media interventions for mental health: A scoping review

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Research article

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Abstract

Background: Social media in healthcare has been widely used over the past few years with increasing popularity worldwide. Social media platforms can potentially act as a possible mental health service provider by improving communication, awareness and education.

Objective: The aim of this scoping review is to describe the use of social media interventions for mental health and to provide an understanding of the current state of knowledge.

Methods: The search platforms utilized for the scoping review were PubMed and IEEE. The inclusion criteria were as follows: research-based articles, primary means for mental health service is social media, and articles that specify mental disorders (depression, anxiety, etc).

Results: After applying the inclusion and exclusion criteria on 190 articles, 30 were included for the purpose of this review. Twelve studies originated from the USA while six studies were from the UK. While fourteen papers were on general mental health disorders, twelve papers focused on depression. The results generally showed that social media interventions for mental health had advantages over the conventional treatments. A lack of studies from developing countries, and fewer studies including the elderly population and the assumption of digital literacy are among the identified gaps.

Conclusion: Social media has the potential to act as a service provider for users with mental health issues. However, the effectiveness of this method has not been accurately measured and more research is required for evaluating the effectiveness of using social media for treatment over conventional methods.

Background

Social media is being utilized on a daily basis by the vast majority of the world's population. By 2018, various social media platforms reported having 3.196 billion users¹ from around the globe. With this increase in number, there has also been a rise in the number of people utilizing social media for various purposes, especially health-related ones. The ability of social media interventions for physical and lifestyle management, diabetes management, asthma and obesity control are well known and widely used². Most recently the ability of social media to act as a mental health service provider has been explored². This association is important as mental disorders are one of the prominent causes of disability according to WHO and around 450 million people worldwide suffered from various mental health problems as of 2018³.

According to a report by Care Quality Commission in 2017, young people are not receiving timely care for their mental health issues and as a result have to wait for weeks and months to get access to a psychiatric consultant, which is very risky⁴. One possible solution for this problem is to utilize social media as a mental health service provider. With mental health being a highly stigmatized topic, patients need a lot of support and encouragement from people to acknowledge the presence of it and talk about it

openly, all of which can be provided by various platforms of social media⁵. The anonymity of social media can make mentally ill patients more comfortable as well⁵.

Social media offers accessibility to information from around the world and better communication and rapid response, which is crucial for mental illnesses⁵. Incorporating machine learning can help in the early detection and prediction of mental illness from the activities of a user in their social media account.

The purpose of this scoping review is to describe the existing literature that deals with social media interventions for mental health. We anticipate this work will help researchers, psychologists and policy makers to understand the role and use of social media interventions for mental health.

Methods

2.1 Identification and selection of study

The searches were carried out in two prominent electronic databases: Pubmed and IEEE. Article selection was not subject to any constraints based on publication date. Medical subject heading (MeSH) was used to search in Pubmed. Searches comprised of the following keywords and related terms in different combinations: 'mental illness', 'mental health', 'mental health informatics', 'social network', 'social media', 'mental health interventions', and 'mental health services'.

The preliminary search from the two databases generated 190 citations according to the keywords used. 45 duplicates of those articles were removed. 76 articles were further removed by checking the titles and their relevance to our topic. The abstracts were checked and reviewed for the remaining 69 articles. After reading the abstracts, 38 papers were removed on the basis of not meeting the inclusion criteria. 31 articles were retrieved for a thorough full-text review among which 2 papers were removed. However, 1 article was added at this point as a result of examining the references. The finalized set of papers were thirty (see Figure 1).

2.2 Inclusion criteria and exclusion criteria

The inclusion criteria included the following: (i) research-based articles; (ii) primary means for mental health service is social media; (iii) articles that specify mental disorders (depression, anxiety, etc); (iv) people falling in any age group; (v) all social media platforms and (vi) the language of article should be English. Any commentary articles or reports were excluded. Also papers that investigated about mental illness that was caused as a result of another disease such as cancer, were excluded. In addition, the reference lists of the selected papers were searched.

2.3 Data Extraction

From the studies selected after reviewing the abstracts, the following information was extracted and recorded in an Excel spreadsheet: objective of the study, types of participants, different methods used, study design, intervention design, research location, and main outcomes of the study.

Results

Sample population range

There were two types of studies based on the sample population type: studies with human subjects as sample and studies with data extracted online as the sample population. While the range of the sample size for human subjects varied from 20 adolescents to 526 adults, the sample size for posts differed from 132 tweets to 620,000 posts from various social media platforms. Studies with posts or tweets as the sample population collected the data from either one single source or made use of multiple sources.

Mental health domain

The included studies either concentrated only on a particular illness like depression or studied multiple illnesses. Fourteen studies focused on general mental health disorders without specifying one particular disorder^{11,12,14,15,16,17,18,19,21,23,25,28,32,35}. Twelve studies were on depression^{8,9,13,20,22,24,26,27,29,31,33,36}, two on schizophrenia^{10,36} and four discussed suicide^{29,30,34,36}. Individual studies also discussed other illnesses such as anxiety³⁶, stress⁸, bipolar disorder²⁰ and post-traumatic stress disorder²⁰.

3.1 Characteristics of studies

A summary of the selected articles is presented in Table 1. Of the thirty studies, ten studies discussed interventions that used social media, five were observational studies, fourteen studies employed machine learning methods and one randomized control trial. The intervention based studies included three qualitative analyses studies that respectively examined the comments under YouTube videos related to schizoaffective disorders⁸, the posts from various social media platforms to understand what users expected in this exchange²⁸, and the tweets to see why users use social media for mental health services⁹. Intervention based studies also included three thematic analyses^{14,16,26} with various purposes such as assessing the power of Twitter for mental health and studying experiences of youth using social media for the same purpose. One longitudinal text analysis study³² was conducted to explore timelines of users that committed suicide to identify patterns and another text outlined a framework that proposed an e-psychology platform¹³. In addition, there was a conceptual model²¹ and an empirical model²⁷ to promote the social media platform for mental health services.

One randomized control trial¹¹ was carried out to develop and test a tool that helped prevent depression. Two surveys^{10,19} were carried out to see the interest of psychiatric patients in using technology for treatment and how social media can help manage them. Another study conducted a survey to study exclusively about the 'Historically black colleges and universities' (HBCU) population. One cross sectional study⁶ to investigate the popularity of mobile apps for mental health and an online questionnaire³³ to study the effectiveness of social media interventions were included in the thirty articles.

The fourteen machine learning based studies^{7,1,15,17,18,20,22,24,25,29,30,31,34,35} included ten studies that utilized machine learning techniques to predict or classify users with depression^{12,20,22,24,25,30,31}, anxiety⁶, suicide ideation²⁹ or any cognitive distortions³⁵. Two studies^{23,38} used Natural Language Processing (NLP) to extract and transform information in a post or comment to predict possible post-traumatic stress disorder (PTSD), depression, bipolar disorder, and seasonal affective disorder (SAD) and two studies^{18,31} described about tools with machine learning that helped in the collection and exploration of big data.

Ten articles out of the thirty examined accounts or collected posts from different social media platforms rather than focusing on one of them^{15,16,19,20,21,24,28,29,32,33}. Examinations and findings of seven articles were based solely on Twitter^{9,12,13,14,17,18,27}. One study investigated comments under videos in YouTube⁸ and four study concentrated on Facebook^{22,25,30,31}. Six studies analyzed the usage and benefits of different mobile applications related to mental health^{6,10,11,17,23,26} while three studies collected posts from online websites that give access to posts from social media accounts and personal blogs freely^{7,34,35}.

3.2 Study outcomes

All the studies involved arrived at the conclusion that social media has the potential to be used as a mental health service provider. Eight studies particularly illustrated how social networks can act as a mental health consultant and improve the wellbeing of people suffering from mental illnesses^{5,18,21,22,24,29,30,31}. One study reported that 16% of the people they interviewed believed that the usage of apps related to mental health can bring positive results and help people understand more about their mental issues⁴. Four studies identified important themes that proved the use of social media to be convenient as they provide immediate response and continuous interaction and care^{7,14,27,30}. The presence of peer support was an important factor for people approaching social media over traditional consultation methods. In a study where YouTube comments were examined, people with schizoaffective disorders posted comments under videos so that they could identify themselves with others and have support from fellow schizoaffective users⁶. Subjects of five studies confirmed they were more comfortable and less conscious using social media as their service providers for mental health^{36,19,22,37,38}.

Fourteen papers used machine learning algorithms to analyze the data extracted online. The results of the studies that used classification models to predict depression, yielded above 70% accuracy scores in all three cases^{25,26,37}. One study categorized depression into four levels and through their model, classified a user with depression into any of the four categories²⁵. The studies that employed Natural Language Processing techniques were able to extract information from the posts or comments to predict possible mental illnesses^{18,23,38}. Another study that made use of a multilevel predictive model to detect depression with respect to another variable concluded that a multilevel predictor had more performance capability than a model that predicted depression single-handedly³⁴. Three studies that analyzed posts

related to suicide found commonly that there is always an increase in the occurrence of posts or tweets nearing the time of suicide^{28,31,35} and it is viable to detect and track suicide behaviors through social media.

Other studies focused their work on two particular populations:- Sexual and gender minorities (SGM) and Historically black colleges and universities (HBCU). The study that took 'sexual and gender minorities' (SGM) as their population described that SGM exhibited more negative feelings through Twitter compared to others¹². The study that tested the use of an app specially designed for students in 'Historically black colleges and universities' (HBCU) called 'Soul Glow' reported that the app provided a platform for students with mental health issues to share their stories and interact openly²⁴.

3.3 Patient reported experiences

One of the most prominent advantages of social media is its reach and accessibility. McClellan, C.²⁸ states the fact that mobile phones and social media are ubiquitous and personal in nature, thus helping the user keep their health status private. Van Rensburg, S. H et al.³⁰ highlights the rapid response and better communication ability of social media to be outstanding. Patients felt like they were heard and got immediate responses⁶. Since social media is available all over the world, people from different countries, backgrounds and cultures were able to communicate and connect to each other based on their common mental health disorders¹⁸. This allowed people to talk about a stigmatized topic without the fear of being judged or labeled. Berry N et al. in their thematic analysis found that users prefer using Twitter as it provides a sense of belongingness and community and thus could be identified with others. They also found that tweeting about mental health issues aids in raising awareness and reduce the stigma attached with it all the while helping the users with such illnesses cope with their state of mind. Zhang Q et al. in their research states that with considering social media as a mental health provider users or patients can get treatment any time regardless of place or hours and can use them according the desires of the patients. This method also helps reducing the dependency on therapist and makes the work of both therapist and patient easier.

Along with the advantages certain disadvantages or challenges were also emphasized. Privacy is the most notorious among them. People are taking a very high risk of losing their confidentiality while discussing their mental illnesses online and public^{6,4,25}. Reliability of information available online is another risk. Patients should take care of the facts and figures they get online and make sure they are accurate and reliable. Also it is not necessary that a particular way of treatment can be applied or effective on everyone. Fergie G et al. details in their study about the concerns of validity and reliability of information online and distinguishes between content produced professionally that is evidence-based and social media content.

Discussion

The results of all the studies direct towards the potential use of social media in the treatment of mental health problems and different ways to analyze them. The articles included for this scoping review indicated an increasing trend in the use of technological interventions for health-related purposes, especially mental health. The social media platform, be it Twitter, Facebook, YouTube, personal blogs or social media enabled apps, provides users with mental health disorders to become aware of what they are going through, get information about their disease and become self-aware. Overall, the future of mental health care through social media is promising and it has already headed towards this direction. The review also found that the impact of using social media for community engagement, providing health information, raising awareness and empowering patients are high. However, more research is needed to ascertain if these benefits are achieved.

The predictive power of social media through a thorough analysis of the posts and comments available is a major highlight of this medium. The large amount of data available online enhances the prediction. Especially sites like Twitter and Google plus have provisions to access posts and comments using keywords. The classification model is a prominent one which can categorize a user to possibly have depression by going through their posts and spotting symptoms for depression. The prediction of a probable suicide or suicide ideation is of at most importance as an accurate prediction can save a life. However, more methods should be employed and studies be conducted to increase the prediction accuracy level. The social media enabled internet based apps for mental health services should be constructed in a way that deals with the user carefully and gently and should be very user friendly considering the fact that the users are mental health patients. The data the social media leaves behind can be an important source to the doctors or consultants to assess the emotional cycle and quality of life of their patients.

The success of using social media is subjective and depends solely on the users. The effectiveness or success rate has not been studied enough and can be considered as a future study area. Also, the potential of possible negative health impacts while using social media or apps needs to be taken into account. The continuous usage of social media can also leave a negative impact on patients, especially with mental health issues. Also usability and user experience of the apps that use social media as a primary tool for mental health service is a key factor. Too many technicalities should be avoided and make sure the users do not get frustrated, as they are dealing with people with mental illness. For this purpose, digital literacy is vital, which will further help in providing better mental health services through technologies.

In the selected studies, little consideration was given to the elderly population. A good majority of the studies concentrated on the mental health of the youth, teenagers or adolescents. The elderly population is also vulnerable to mental health issues and future studies should include them as well.

4.2 Limitations

Scoping reviews are conducted to map the currently available knowledge in any area, thus spotting issues worthy of more research. This can help in exploring the research area initially during the

development phase. However, a scoping review does not assess the quality of the studies included. There could have been limitations regarding the keywords used for searching. The language was a limitation for sure. Only English language was considered for this review when good quality papers might exist in several other languages as well. The lack of papers that assessed the effectiveness and efficiency of social media interventions for mental health is a limitation

Conclusions

With the increase in mental health illness worldwide and the stigma attached to it, social media can be valuable in the treatment and monitoring of mental illnesses. As social media is accessible and people are faceless in it, they can choose to openly talk about their illnesses online without the fear of being judged. Platforms such as Twitter, Facebook, and YouTube provide access to a large number of health data. Social media also provide good interaction, rapid response, and peer to peer support, which is lacking in the conventional health system. However, more research is necessary to fill the gaps identified in the current literature. Researchers and psychological specialists should take advantage of social media interventions and explore how they can be used to promote mental health and achieve positive results in the long run. Also, different platforms of social media can enhance their features keeping in mind that they are being used for health related purposes.

Declarations

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Availability of data and materials

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Competing interests

The author declare that they have no competing interests.

Consent for publication

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Ethics approval and consent to participate

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Tables

Table 1: Summary of the characteristics of the selected articles

	Author/Year	Mental health illness	Study purpose	Research design	Intervention	Main findings
1	Berry et. al (2017) ⁹	General mental disorders	To see why users use Twitter to discuss mental health	Design: qualitative analysis Sample: 132 tweets Location: UK	Twitter	Using Twitter gave patients of inclusion and also helped raise awareness.
2	Torous et al(2014) ¹⁰	General mental disorders	To investigate if psychiatric patients are interested in using devices for treatment purposes	Design: Survey Sample: 320 patients Location: USA	Social media enabled mobile apps	Patients were ready to use mobile applications for their treatment.
3	Zhao Y et al (2018) ¹²	General mental disorders	Focused on sexual and gender minorities (SGM)	Design: machine learning method Location: USA	Twitter	SGM minorities opened about negative feelings through Twitter.
4	Zhang Q et. al(2011) ¹³	General mental disorders	Propose an e-psychology platform for patients	Design: framework Location: China	Twitter	Finds that e-based therapy has benefits over conventional therapy.
5	Shepherd et. al (2015) ¹⁴	General mental disorders	To assess the power of Twitter for mental health service	Design: thematic analysis Sample: 515 tweets Location: UK	Twitter	Identified a balance of power between the mental health service provider and patient.
6	Krishnamurthy M et al (2016) ¹⁵	General mental disorders	To explore trends in Mental health and behavioral studies	Design: semantic model Location: USA	Social media	73% accuracy for identification of psychiatric users through online.
7	Fergie G et. al (2015) ¹⁶	General mental	To study the experiences of youth	Design: thematic	Social media	Users recognizes

		disorders	with online mental health services	analysis Sample: 40 young users Location: UK		themselves responsible for believing online information.
8	Watkins N G et al (2018) ¹⁷	General mental disorders	To develop a tool SMCT to collect Twitter data	Design: innovative tool development Location: Australia	Twitter	This tool enables data collection in large amount.
9	Di Napoli, W. A et al (2015) ¹⁹	General mental disorders	To assess how the social media helps in the management of mental diseases	Design: context analysis by survey Sample: 88 patients Location: Italy	Social media	Highlights the importance of digital literacy for using social media for this purpose.
10	Naslund J A et al (2016) ²¹	General mental disorders	To study how online community can promote mental health	Design: conceptual model Location: USA	Social media	Social media provides a feeling of belongingness and acceptance.
11	Williams, L. et al (2018) ²³	General mental disorders	To study about 'historically black colleges and universities' (HBCU) students mental difficulties	Design: survey Sample: 92 HBCU students Location: USA	Social media enabled mobile apps	Provided a community for HBCU students to interact
12	Kenny R et al (2016) ²⁶	General mental disorders	To study about the needs and expectations of adolescents regarding apps	Design: thematic analysis Sample: 34 young people Location: Ireland	Social media enabled mobile apps	Safety, engagement, awareness were some of the themes identified.
13	Wongkoblak, A et al (2017) ³⁰	General mental disorders	To develop a tool to identify depressed users and help them	Design: machine learning Sample: 940 users	Facebook	Social media can help identify symptoms leading to depression.

				Location: UK		
14	Livingston J D et al (2014) ³³	General mental disorders	To evaluate the effects of a social media intervention	Design: questionnaire Sample: 438 Location: Canada	Social media	Attitudes of youth towards mental health were improved.
15	Whittaker et al (2012) ¹¹	Depression	To develop and test an intervention for depression prevention	Design: Randomized control trial Sample: 1348 students Location: New Zealand	Social media enabled mobile apps	Patients found that messages can be delivered easily and the app is helpful.
16	Saha B et. al (2016) ⁷	Depression	To classify mental health-related co-occurring online communities.	Design: machine learning classification model Sample: 620,000 posts Location: Australia	Blogs, online communities	Social media can help in early detection and monitoring of mental health problems.
17	Yazdavar A H et al (2018) ²⁰	Depression	to explore big social media data to predict depressive behaviors	Design: machine learning technique Location: USA	Social media	Models built to help spot individuals with depression and their demographics.
18	Katchapakirin, K et al (2018) ²²	Depression	To provide a depression detection tool	Design: machine learning technique Sample: 35 Facebook posts Location: Thailand	Facebook	The behavioral information helped predict depression.
19	Aldarwish, M. M., & Ahmad, H. F. (2017) ²⁴	Depression	To find an association between social network users and mental illness	Design: machine learning	Twitter and Facebook	Classifies the users into one of the four groups of depression

				Sample: 2073 posts Location: Saudi Arabia		level from their activity.
20	Wongkoblap, A et al (2018) ²⁵	Depression	To develop a model using machine learning to classify depressed users	Design: machine learning Sample: 431 users Location: UK	Facebook	Depressed users posts mental health related things more frequently.
21	De Choudhury, M et al (2016) ²⁹	Depression	To develop a statistical methodology to predict suicide ideation	Design: statistical methodology Sample: 16348 posts Location: USA	Reddit posts	Model can help identify probable suicide ideation in a user.
22	Wongkoblap, A et al (2018) ³¹	Depression	To study the association of depression and life satisfaction and build model	Design: machine learning Sample: 424619 posts Location: UK	Facebook	The model predicts life satisfaction in a user and classify them.
23	Coppersmith G et al (2014) ¹⁸	Depression, bipolar, stress disorder	To present the analysis of data in Twitter related to mental health	Design: machine learning technique Location: USA	Twitter	A lot of information is available on Twitter and can be used for treatments.
24	Atallah N et. al. (2018) ⁶	Depression, anxiety, stress	To study the popularity of the use of mobile health applications for mental health patients in Saudi Arabia	Design: Quantitative cross sectional descriptive design. Sample: 526 patients Location: Saudi Arabia	Social media enabled mobile apps	16% of the sampled patients believed in a positive outcome through mobile apps.
25	Simms, T et al (2017) ³⁵	Depression, anorexia, anxiety	To explore the use of machine learning to detect cognitive distortions	Design: machine learning	Personal blogs	A good accuracy score was obtained for the

				Sample: 493 posts Location: USA		prediction model.
26	Briciu, A., & Lupea, M. (2018) ³⁴	Depression, anxiety, schizophrenia, suicide	To study the language of mental illness	Design: machine learning Sample: 1292 posts Location: Romania	Reddit posts	Words used for different mental illness differ significantly.
27	McClellan C et al (2016) ²⁷	Depression, suicide	To develop a model to recognize mental health discussions	Design: empirical model Sample: 176 million tweets Location: USA	Twitter	A peak in the discussion interest were identified for depression.
28	Van Rensburg, S. H et al (2016) ²⁸	Suicide	To explore what patients wanted in social media communications	Design: qualitative study with interviews Sample: 20 adolescents Location: USA	Social media	Advantage of rapid response and better communication was highlighted.
29	Huang X et al (2017) ³²	Suicide	To explore the social media timelines of suicide cases	Design: longitudinal text analysis Sample: 130 accounts Location: USA	Social media	Found patterns in how a user express themselves nearing suicide.
30	Naslund J A et. al (2014) ⁸	Schizoaffective disorder, bipolar	To observe how users with mental illness react on YouTube.	Design: qualitative analysis of YouTube comments Sample: 3044 comments Location: Netherlands	YouTube	Users find peer support and mutual learning through social media.

Figures

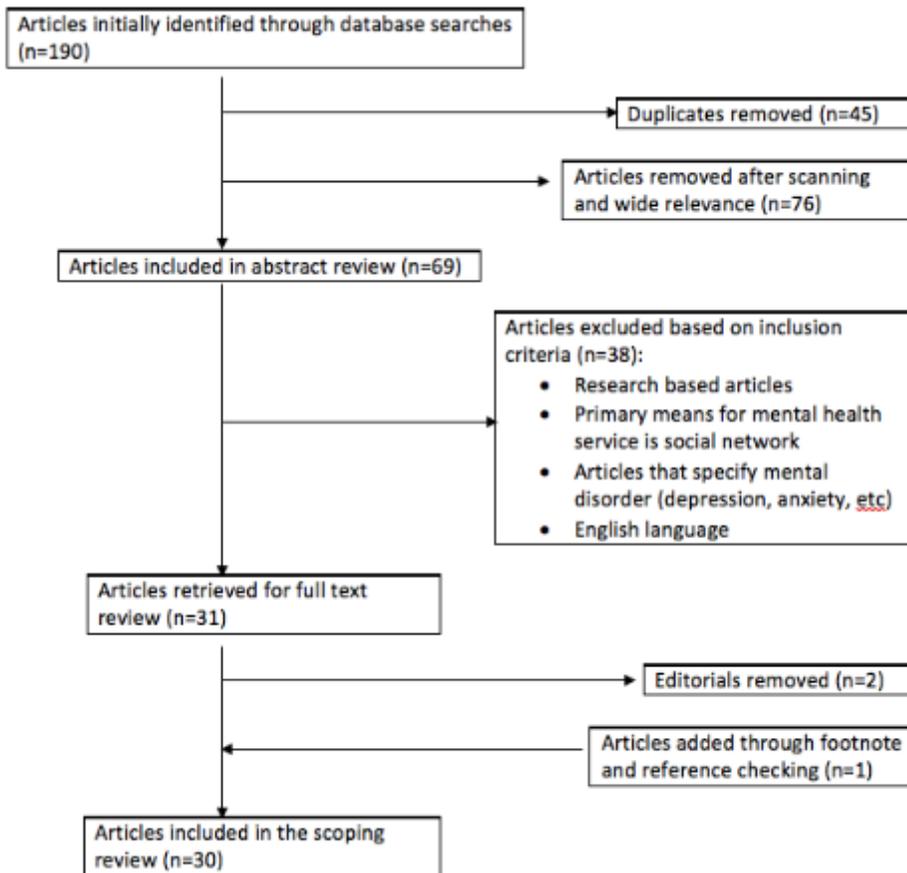


Figure 1

Scoping review flow diagram