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Impact of social media on mental health of the general population during Covid-19 pandemic: A systematic review

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Abstract:

During the COVID-19 pandemic, people are using social media more than usual routine because they rely on online sources to seek health information for themselves and their loved ones. The spread of inaccurate and misleading information via social media has a number of detrimental psychological effects on members of society. The aim of this systematic review was to describe the impact of social media on the mental health of the general population. An extensive systematic search was done till the last month of 2021 for collecting the evidence using the PRISMA technique. The search was mainly focused on the article leading with keywords and search engines used during the course of the study were Pubmed, Semantic Scholar, Mendeley, and Science direct. Articles for this study were selected based on the predetermined eligibility criteria and performed quality assessment by using the NHLBI quality assessment tool. Most of the studies included in this review are found fair (score between 9 and 12) quality. Out of 866 publications, 533 articles were included in the initial screening, after duplication removal 46 full-text articles were assessed for eligibility and 14 studies were selected for systematic review. In most of the studies, maximum participants used social media as a primary source of information. Relatively high rates of symptoms of depression (14.14% to 48.3%), anxiety (7.4% to 47.82%), and prevalence of stress increased to 37.67% are reported after exposure to social media for coverage of COVID-19 news in the general population. Risk factors of psychological distress are associated with female gender, younger age group, marital status, staying alone, and duration of exposure to mass media. Increased exposure to COVID-19 information through mass/social media is associated with highly significant levels of psychological health issues; mitigating the hazardous effect of social media exposure during the COVID-19 pandemic on the psychological health of the general population is an international public health priority.

Keywords:

Anxiety, covid-19, depression, general population, mass media, mental health, pandemic, social media

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Introduction

To be mentally healthy, humans require face-to-face contact. Nothing relieves stress and improves our mood faster or more effectively than making direct eye contact with someone who cares about us. The more we prioritize social media interaction over in-person relationships, the more likely we are to develop or worsen mood disorders such as anxiety and depression.[1]

During the COVID-19 outbreak, to counteract COVID-19, strict lockdown, social isolation, tracking and isolating suspect cases for the first time, working-from-home solutions, travel, and gathering restrictions were implemented globally.[1,2] Following the implementation of these measures, the use of the internet and social media has reached an all-time high. These were the primary

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sources of information for the general public, who had little knowledge of COVID-19. To quench the thirst for information, social media was overloaded with complete and irrelevant information, affecting both the mental health hygiene and the physical health of the human being.[3]

In response to the coronavirus disease 2019 (COVID-19) pandemic, medical faculty members around the world are attempting to facilitate the transmission of knowledge and skills to the next generation in the face of social distancing and other health protocol rules that have proven to be powerful disruptors of standard practices.[2,4]

The "desperate flea" phenomenon has now spread throughout the world, with many people remaining socially isolated at home.[5] A number of studies have found that pandemics and social isolation can have a negative impact on the general population's mental health.[6] As a result, during the COVID-19 epidemic, a timely understanding of the general public's psychological manifestations is critical for society.[7] Furthermore, the ease and speed with which information is disseminated on social media results in a flood of information, including the prevalence, mortality, confirmed cases, and high contagion of COVID-19, as well as terrible reports of patients and families who have died. According to studies, the stress associated with quarantine and upsetting news is associated with depression and anxiety.[8,9]

The last decade has seen a tremendous increase in social media usage; nevertheless, the recent COVID-19 pandemic has highlighted the bad side of social media by suggesting that excessive use is spreading panic, fear, and disinformation about COVID-19 across large audiences.[10] In this study, problematic social media usage is defined as; excessive use of social media regularly, to the extent that it seems difficult to stay away from it.[11]

The spread of inaccurate and misleading information via social media has a number of detrimental psychological and social effects on members of society.[12] In fact, according to Dr. Tedros Ghebreyesus, Director-General of the World Health Organization (WHO), "false information about COVID-19 may be the most infectious disease," and that misinformation about the pandemic has traveled as quickly as the virus itself.[13] Furthermore, numerous people who were forced to live alone during the lockdown grew increasingly reliant on social media to keep up with the growing number of diseases and deaths.[14]

During the COVID-19 pandemic, social media usage has increased as more people rely on it to stay up to current on the latest COVID-19 information.[15] The spread of the so-called COVID-19 "infodemic" has been aided by the rise in social media use.[16]

Individuals who are compelled to stay at home for an extended time have no choice but to change their focus from social to indoor activities, which may result in their participating in more sedentary behaviors than usual.[17] Individuals desire to learn more about COVID-19, which is one cause for increased internet and social media usage.[18]

Fake news is distributed by media without norms or editorial processes, which has a negative impact on information accuracy.[19] Meanwhile, the format and style of this news give rise to misrepresentation and distortion.[20] However, the speed with which this type of disinformation spreads and becomes viral is accelerated in technological environments such as those found in modern society.[12]

After doing an enormous brainstorming analysis and review of literature, the researcher developed a view that although many descriptive studies have been done in the above-mentioned area still the field is having a vacuum of knowledge deficit in the systemic review studies of the above topic during COVID-19 period. This systematic study will identify, aggregate, and evaluate all available data quantitatively and qualitatively to generate a warm and accurate response to the research questions at hand.[21]

Furthermore, the researcher wants to explore more about the social media effects on mental health, which is sedentary behavior that, when excessive, increases the risk of health problems. This study is significant because it provides insight into future concerns regarding mental health issues that require scientific attention. The current systematic review was designed to analyze the effect of social media on mental health, the relationship between social media and mental health, and to identify recommendations to improve population mental health amid the COVID-19 pandemic.

Materials and Methods

The preferred reporting items for systematic reviews and meta-analyses (PRISMA) [Figure 1][21] criteria were used to present this review. This systematic review has been registered in Prospero; the registration number is CRD42021264257. Initial screening was done by reviewer 1. For initial screening, the title and abstract of all the articles were reviewed. Duplications of articles and other articles, which were not related to concerning topics were excluded. All the articles that were potentially relevant after initial screening were produced in full text. Articles

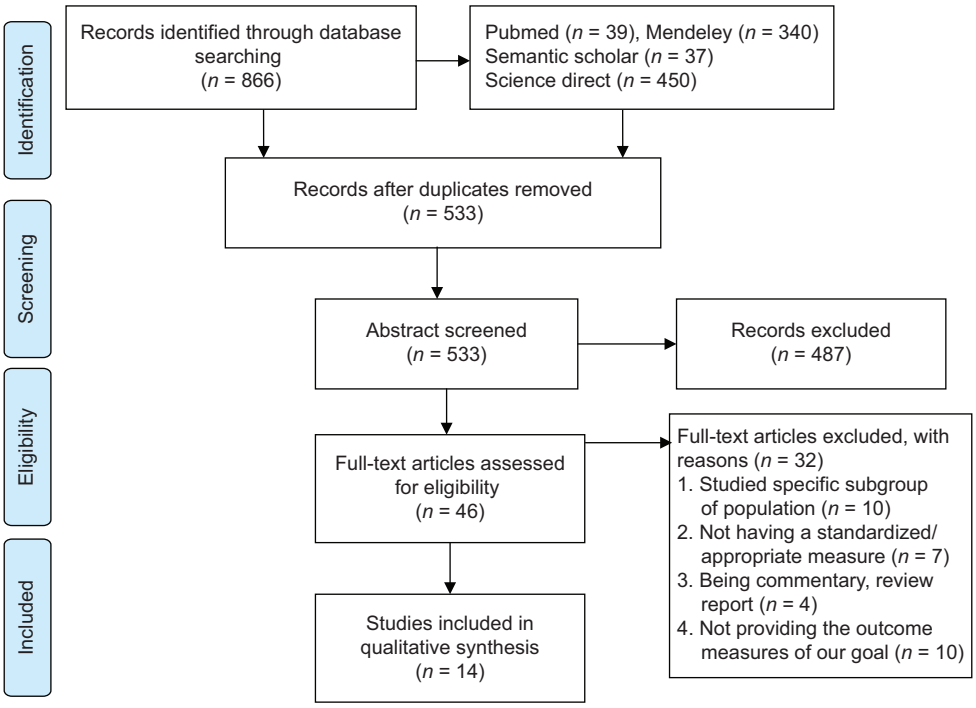

Figure 1: PRISMA chart diagram[21]

were included for final review only if they specifically measured the impact of social media on the mental health of the general population during the COVID-19 pandemic. Three reviewers with expertise in clinical nursing practice reviewed the selected articles.

Information sources and search strategy

An electronic search was conducted through four e-databases including Pub Med, Semantic Scholar, Mendeley, and Science Direct. The search strategy was designed by two authors and consisted of three concepts regarding the aim of the study: (1) use of social media (2) psychological impact (3) the 2019 novel coronavirus disease. It is also limited to the English-language articles published from December 2019 to the last month of 2021. The following search words were used: (mental health OR psychological health OR depression OR anxiety OR PTSD OR PTSS OR post-traumatic stress disorder OR post-traumatic stress (General population OR general public OR public OR community) AND (social media OR mass media OR COVID news) AND (COVID-19 OR SARS-CoV-2 OR severe acute respiratory syndrome coronavirus OR 2019nCoV OR HCoV-19). Only open accessed free full-text articles were searched during the searching process.

Eligibility criteria

For the review the researcher focused on the following criteria to include the studies in the review:

- English-language papers, original research articles, and peer-reviewed publications.
- Papers were freely available in full text.
- Articles in which proper methodology was used.
- The study sample included the general population who engaged in social media news about COVID-19 infection and reported psychological consequences such as depression, stress, anxiety, distress, fear, phobia, and sleep disorders.

Exclusion criteria

An article was excluded from the review if it is not fulfilled the single criteria of inclusion.

Data extraction

To include important data, a data extraction table was used: (1) The name of the lead author and country, (2) Population and sample size, (3) Type of mental health and measurement of a tool, (4) Total result, (5) Result by sex, (6) Association, (7) Quality Score.

Quality assessment

The quality of the articles included in this study were assessed by using the quality assessment tool for observational cohort study and cross sectional studies(released by NHLBI) as depicted in Table 1.[22] Two authors separately assessed the quality of the work. There are 14 things in this tool, each of which can be marked as Yes, No, or Not Reported. Yes, receives a score of 1, whereas all other responses received a score of 0. The total score, in other words, is the number of affirmative responses. In terms of qualitative evaluation of the final scores, those above 12 are considered good, those below 9 are considered poor, and those between 9 and 12 are considered fair.[23] Most of the studies

Table 1: Study characteristics and findings

Author name, country, population, and sample size	Type of mental health and measurement of tool	Results	Result by sex	Association
Lin *et al*.[24] Iran Young adult *n*=1078 (Male=628, Female=450)	1. Psychological Distress (HADS) 2. Insomnia (ISI) 3. Problematic Social Media Use (BSMAS) 4.Fear Of Covid-19 (FV- 19S) 5. Covid- 19 Misunderstanding (SELF DEVELOPED)	Mean (SD) 1. Psychological distress=19.16 (7.84) 2. Problematic social media use=17.15 (4.86) 3. Fear of Covid=10.28 (4.45) 4. Covid 19 misunderstanding=2.18 (1.02) 5. Insomnia=9.25 (5.86) (All *P*<0.01)		1. Problematic media use was associated with psychological distress (β=0.375) and insomnia (β=0.095). 2. Psychological distress associated and triggered by fear of Covid- 19 and Covid- 19 misunderstanding 3. Insomnia induced by fear of covid-19
Zakout *et al*.[25] Saudi Arabia *n*=215 (Male=129, Female=86)	1. Stress, Anxiety and Depression (DASS-21)	1. Most of the participants (69.3%) using social media as a primary source of information. 2. Prevalence: Stress (37.67%) and depression (36.74%) were most frequent issue as compare to anxiety (20%) 3. Mean (SD): Depression=8.39 (0.629) Anxiety=4.09 (0.416) Stress=9.91 (0.656)	Anxiety: Female (30.23%) >Male (13.17%). Stress: Female (54.65%) >Male (26.35%)	1. Anxiety level is high in daily covid 19 news followers as compared to non-daily followers (9.61% vs. 3.60%) 2. Most of the (55.8%) participants felt media coverage creates stress and anxiety among them.
Hou *et al*.[26] China *n*=3063 (Male=1327, Female=1736)	1. Depression (PHQ-2) 2. Anxiety (GAD-2) 3. Resilience To Stress (CD-RISC-10) 4. Perceived Stress (10 POINT ITEMS SCALE)	1. Source of information: Social media - 95.89% Traditional media-4.11% 2. Total Prevalence: Depression- 14.14% Anxiety- 13.25%	Prevalence: 1) Depression- Males (14.92%)> Females (13.52%) Anxiety: Males (21.21%) >Females (14.04%)	1. Age, marriage status, occupation, adaption, resilience and stress associated with depression. 2. Marriage, education, health status, time on covid 19 related information, adaption, resilience and stress associated with anxiety
Yang *et al*[3] China *n*=3,159 (Female=1,611, Male=1,548)	1. Life Satisfaction (MHQ) 2. Sense of Adequacy, Depression, Anxiety (GHQ-20) 3. Social Media Activities (SELF DESIGNED ITEMS) 4. Emotion Regulation Strategies (SELF DEVELOPED)	1. Over half of the participants use the internet more than 6 hours for COVID-19 news. 2. Lowlife satisfaction level-2.7% 3. Low sense of adequacy- 5.1% 4. High depression level-6.8% 5. High anxiety level-7.4%		1. Between life satisfaction and COVID-19 online discussion (β=-0.295), social media judgment (β= -0.395), Positive COVID-19 information sharing (0.189). 2. Between depression and Social media dependence (0.776), Social media self-expression (0.340), COVID-19 information Sharing (-0.340), feeling toward social media (-0.833). (All values are at the level of *P*<0.001) 3. COVID-19 information sharing, feeling toward COVID-19 information, and feelings toward social media interaction had negative relationship with anxiety (-0.454, -0.365, -0.630)

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Table 1: Contd...

Author name, country, population, and sample size	Type of mental health and measurement of tool	Results	Result by sex	Association
Majeed *et al*.[14] Pakistan *n*=267 (Male=177, Female=90)	1. Problematic Social Media Use (BFAS) 2. Fear of COVID-19 (7-item scale developed by Ahorsu *et al*.) 3. Mindfulness (MAAS) 4. Depression (PHQ- 9)	Prevalence of depression: Minimal- 0% Mild- 3% Moderate- 19.10% Moderately severe- 42.69 Severe-35.21%		Correlation: 1. Problematic social media usewith fear of Covid 19 (r=0.38), depression (*r*=0.41) 2. Mindfulness of employee negatively correlated with problematic social media use (*r*=-0.22), fear of COVID-19 (*r*= -0.27), and depression (*r*= -0.12) 3. Fear of COVID-19 positively correlated with employee depression (*r*=0.45)
Brailovskaia *et al*.[27] Germany *n*=501 (Female=383, Male=118 Italy *n*=951 (Female=737, Male=214)	1. Stress Symptoms (DASS-21) 2. Burden caused by COVID-19 (6 ITEM SCALE)	In both countries, most of the participants use official government sites as the source of information (Germany=74.3%, Italy=75.3%) Social media use (Germany=49.3%, Italy=59%)		Germany: Social media usepositive correlated with stress symptoms (*r*=0.128, *P*<0.01) And Burden (*r*=0.132, *P*<0.01) Italy: Social media use positively co related with stress symptoms (*r*=0.131) and burden (*r*=0.136, *P*<0.01)
Radwan *et al*.[28] Gaza Strip, Palestine *n*=942 (school students) (Female=620, Male=322)	1. Demographic Characteristics 2. Social Media Platform 3. Effect of Social Media Panic (Questionnaire Developed by Ahmed and Murad)	1. Facebook is mostly used application among students (81.8%) 2. Most frequently topic seen, read, watch and heard are health news (56.2%) 3. About 76.4% of the participants thought that posting more information related to COVID-19 on social media has spread panic among individuals.	Female students had a higher likelihood than male students to use their face book platform to get news about COVID-19.	Significant association of gender and age with the type of social media used to get information about COVID-19
Sharma *et al*.[29] India *n*=320 (Male -141, Females - 179)	1. Use Of Mass Media 2. Psychological Health 3. Physical Health 4. Social Health 5. Minner Mental Health (Self-Questionnaire developed using Google Form)	1. Majority of participants were using television and social media for COVID-19 news 2. 27.81% of respondents felt anxious and nervous after watching the COVID-19 news 3. 38.75% of the respondents are dissatisfied with their sleep during the COVID-19 period. 4. 31.9% participants thought that there is big difference between news and reality. 5. 29.8% thought that media only gives us stress due to continuous.		Correlation 1. Between hours spend on social media for COVID news and anxiety, *r*=0.54, *P* = <0.01 2. Between hours spend on social media for COVID news and stop worrying, *r*=0.41, *P*≤0.01 3. Between hours spend on social media for COVID news and quality of life, *r*=0.48, *P* = <0.01

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Table 1: Contd...

Author name, country, population, and sample size	Type of mental health and measurement of tool	Results	Result by sex	Association
Zaho *et al.*[30] China *n*=512 college students (Female -320, Male- 192)	1. Social Media Use (Assessment tool developed by Lin *et al.*) 2. Covid 19 Stressor (10-item checklist developed by main *et al.*) 3. Negative Effect (PANAS) 4. Secondary Traumatic Stress (STSS-SM) 5. Depression (PHQ-9) 6. Anxiety (GAD -7)	1. Social media use was positively related to negative effect (r=0.12), depression (r=0.10), stress (r=0.14) and anxiety (r=0.10) 2. Online media use positively correlated with stress r=0.10 3. Disaster-related social media use is negatively associated with mental health.		1. Association of social media use with stress (β= 0.18, p<.001) depression (β= 0.11, P=0.019) and anxiety (β= 0.12, P=0.014) 2. Participants who spent more time on social media reported more mental health problems.
Ahmad M *et al.*[14] Saudi Arabia *n*=371 (Male -272, Female-99)	1. Anxiety (GAD-7) 2. Depression (CES-D-10) 3. Loneliness (6 ITEM DJGLS)	1. Low level of education had less exposure to social media than higher education. 2. Prevalence: anxiety, depression and social isolation which was 47.82%, 47.57% and 46.42% respectively. 3. Frequent exposure to social media had a higher level of anxiety, depression and social isolation as compared to less exposure.	1. Anxiety, depression and social isolation were low among males. 2. Social media exposure was higher among women (77.77%) than men (73.16%), higher among married (71.23%) than unmarried participants (51.97%).	1. Correlation between social media exposure and anxiety, depression, and social isolation were 0.368, 0.355 and 0.342 respectively. (All were significant at P 0.01) 2. Exposure to misinformation via social media has a significant positive relationship with anxiety, depression and social isolation.
Gao J *et al.*[31] China *n*=4872 (Male=1560, Female=3267)	1. Depression (WHO-5 Well-being Scale) 2. Anxiety (GAD - 7)	1. Participants with low education had a lower frequency of social media use as compared to higher education. 2. Prevalence- Depression 48.3%, Anxiety 22.6%. Combination of depression and anxiety 19.4%. 3. Unmarried participants had low depression than a married one.	Social media use frequency. Men=78.4% Women=83.8%	Social media use were positively associated with high odds of anxiety (or=1.72, 95% CI=1.31-2.26)
Liu. M *et al.*[32] China *n*=4991 (Female -2514, Male - 2477)	1. Anxiety (SAS-20)	1. Anxiety levels: Normal=79.4%, mild to moderate anxiety=14%, moderate to severe=5.1%, severe anxiety=1.5%. 2. Participants who knew someone infected with COVID-19 or those who lived within the neighborhood with COVID-19 cases also experience a high level of anxiety.		1. Education associated with anxiety (β = 0.04, P= < 0.01) who have higher education reported more anxiety 2. Age negatively associated with anxiety, (β = -0.14, P<0.001) 3. gender and income were not associated with anxiety
Bendau *et al.*[33] Germany *n*=6233 (Female -4387, Male - 1793)	1. Anxiety (DSM - 5 Severity major for specific phobia adult scale) 2. Depression (PHQ -4)	1. Average daily social media use was 2.40±2.01 h. 2. Mean frequency of media consumption was 7.23 times per day. 3. Participants who reported the use of official sites as a primary source of information showed less anxiety and depression.		1. Daily average time of media consumption was significantly and positively correlated with anxiety. 2. Frequency of media use positively correlated with specific covid 19 related fever, r=0.10, and unspecific anxiety (r=0.09) and depression symptoms (r=0.09) (all values are at the level of P<0.001)

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Table 1: Contd...

Author name, country, population, and sample size	Type of mental health and measurement of tool	Results	Result by sex	Association
Liu *et al*.[34] China *n*=6233 (Female -4387, Male - 1793)	1. Media Vicarious Traumatization (VTS) 2. Anxiety (SAS)	1. 50% of participants Spend, 1-3 hours per day on social media. 2. Participants who stayed alone were significantly more anxious than those who stayed with their family or with a friend/roommate/classmate) 3. Media vicarious traumatization was important mediator between different type of media exposure and anxiety. 4. Commercial media was the one that was most strongly linked to vicarious traumatization followed by oversees media, social media and official media.		1. Anxiety was positively related to age, r=0.11, $P \leq 0.01$ 2. Anxiety was negatively related to health conditions r= –0.16, P=0.01 3. Gender, education and socio-economic status are not associated with anxiety.

HADS=Hospital Anxiety and Depression Scale, ISI=Insomnia Severity Index, BSMAS=Bergen Social Media Addiction Scale, FCV-19S=Fear of COVID-19 Scale, DASS-21=Depression, Anxiety And Stress Scale, PHQ=Patient Health Questionnaire, GAD=Generalized Anxiety Disorder Scale, CD-RISC-10=Connor- Davidson Resilience Scale, MHQ=Multiple Happiness Questionnaire, GHQ=General Health Questionnaire, BFAS=Bergen Face Book Addiction Scale, MAAS=Mindful Attention And Awareness Scale, PANAS=Positive and Negative Affect Schedule, STSS-SM=Secondary Traumatic Stress Scale For Social Media Users, CES-D-10=Centre For Epidemiology Studies Depression Scale, DJGLS=De Jong Gierveld Loneliness Scale, SAS=Self-Rating Anxiety Scale, VTS=Vicarious Trauma Scale

Table 2: NHLBI quality assessment score

Author name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total Score
Yang *et al*.[3]	1	1	1	1	1	-	1	-	1	-	1	-	-	1	9
Ahmad *et al*.[14]	1	1	1	1	1	1	1	1	-	-	1	-	-	1	10
Lin *et al*.[24]	1	1	1	1	1	1	1	-	1	-	1	-	-	1	10
Zakout *et al*.[25]	1	1	1	1	1	1	1	-	-	-	1	-	-	1	9
Hou *et al*.[26]	1	1	1	1	1	1	1	-	1	-	1	-	-	1	10
Brailovskaia *et al*.[27]	1	1	1	1	1	1	1	-	1	-	1	1	-	1	11
Radwan. *et al*.[[28]	1	1	1	1	1	1	1	1	1	-	1	1	-	1	12
Sharma P *et al*.[29]	1	1	1	1	1	-	1	-	1	-	1	1	-	1	10
Zaho *et al*.[30]	1	1	1	1	1	-	1	1	-	-	1	1	-	1	10
Gao *et al*.[31]	1	1	1	1	-	1	1	1	1	-	1	-	-	1	10
Liu *et al*.[32]	1	1	1	1	-	1	1	-	1	-	1	-	-	1	9
Bendau *et al*.[33]	1	1	1	1	1	-	1	1	1	-	1	1	-	1	11
Liu *et al*.[34]	1	1	1	1	1	-	1	1	1	-	1	--		1	10

included in this review are found fair (moderate) quality. [Table 2].

Results

Search result

In total, 866 publications were identified. Of those, 533 articles were included in the initial screening after duplication removal. Further, 487 articles were excluded based on the screening of titles and abstracts. The eligibility of the 46-remaining full-text articles was determined. There were 10 articles excluded for studying specific subgroups of the population, 7 articles excluded for not having a standardized/appropriate measure, 4 articles excluded for being commentary, review report, and 10 articles were excluded for not providing the outcome measures of our goals. Following the full-text screening, 14 studies met the inclusion criteria and were included in this review.

Study characteristics

Study characteristics and primary study findings are summarized in Table 1. The sample size of the 14 studies ranged from 215 to 6,233 participants, with a total of 27,642 participants. A majority of study participants were over 18 years old except for one study (Radwan *et al*.).[28] Female participants (n = 18,084) made up 65.42% of the total sample. All studies followed a cross-sectional study design with an online survey sampling design. The 14 studies were conducted in eight different countries, including China (n = 5), Saudi Arabia (n = 2), Germany (n = 1), Iran (n = 1), Pakistan (n = 1), India (n = 1), Gaza strip, Palestine (n = 1), and one study conducted in two countries, Germany and Italy (n = 1). The major outcomes used in the included research differed from one study to the next.

Measurement tools

A variety of scales were used in the studies (n = 14) for

assessing different adverse psychological outcomes. Patient Health Questionnaire-9/2 (PHQ-9/2), The World Health Organization- Five Well-Being Index (WHO-5), and the Center for Epidemiologic Studies Depression Scale (CES-D) were used for measuring depressive symptoms. The Generalized Anxiety Disorder 7/2-item (GAD-7/2), Self-rating Anxiety Scale (SAS), and DSM -5 criteria were used to evaluate symptoms of anxiety. For the evaluation of depression, anxiety, and stress symptoms, the Depression, Anxiety, and Stress Scale- 21 items (DASS21) was utilized. Anxiety and depressive symptoms were assessed using the Hospital Anxiety and Depression Scale (HADS) (psychological distress). There are some other tools to assess other psychological measures such as ISI (Insomnia Severity Index) for insomnia, BSMAS (Bergen Social Media Addiction Scale), and BFAS (Bergen Facebook addiction scale) for problematic social media use, FCV-19S (fear of COVID-19 scale), CD- RISC-10 (Connor- Davidson resilience scale), MHQ (Multiple Happiness Questionnaire) for life satisfaction, GHQ-20 (general health questionnaire) For a sense of adequacy, depression, and anxiety, MAAS (mindful attention and awareness scale) for mindfulness, PANAS (positive and negative affect schedule) for negative effect, STSS-SM (secondary traumatic stress scale for social media users), DJGL (De Jong Gierveld loneliness scale) and VTS (Vicarious trauma scale).

Self-developed item scales were also used in some studies to assess various other measures such as COVID-19 misunderstanding, fear of COVID-19, Perceived stress, the burden caused by COVID-19, and the effect of social media panic, use of social media, and COVID-19 stressors.

Social media use

In most of the studies, maximum participants used social media as a primary source of information except in one study conducted by Brailovskaia *et al*.[27] Social media exposure was higher among women than men expressed through studies conducted by Ahmad *et al*., Radwan *et al*., and Gao *et al*.[14,28,31]

According to Ahmad *et al*.[14] Social media exposure was higher among married than unmarried participants and frequent exposure to social media had a higher level of anxiety, depression, and social isolation as compared to less exposure. However, researchers Ahmad *et al*. and Gao *et al*.[14,31] found that lower levels of educated people had less exposure to social media as compared to higher educated people.

Yang *et al*.[3] noticed that over half of the participants uses the internet for more than 6 h for COVID-19 news. Similarly Liu *et al*.[34] found that more than half of the participants used social media for 1 to 3 h for COVID-19 news. A study conducted by Radwan *et al*.[28] showed that the most popular application among students is Facebook (81.8%). The most frequently topic seen, read, watch, and heard is health news (56.2%). About 76.4% of the participants thought that posting more information related to COVID-19 on social media has spread panic among individuals. Next, 58.7% of students confirm that dissemination of COVID-19 infection and fake news about the outbreak is an important factor in spreading panic.

A study conducted in India by Sharma *et al*.[29] found that 27.81% of respondents felt anxious and nervous after watching the COVID-19 news.

Another study done by Bendau *et al*.[33] shows that average daily social media use was 2.40 ± 2.01 h. The average number of times per day that people consumed media was 7.23. Participants who reported the use of official sites as a primary source of information showed less anxiety and depression as compared to those who used social media as a primary source of information. In addition Liu *et al*.[34] found media vicarious traumatization was an important mediator between different types of media exposure and anxiety. Commercial media was the one that was most strongly linked to vicarious traumatization followed by overseas media, social media, and official media. Vicarious trauma can be formed not only among those who had direct contact with trauma survivors but also via repeated media exposure.

Maximum studies find association or correlation of problematic social media use with psychological distress (β= 0.375),[24] insomnia (β=0.095),[24] life satisfaction (β= -0.395),[3] fear of COVID-19 (r = 0.38, P<0.0),[35] mindfulness (r=-0.22)[35] and burden (r=0.132).[27]

Depression and associated factors

Symptoms of depression were assessed in seven out of the 14 studies.[3,14,26,30,31,33,35] The prevalence of depressive symptoms ranged from 14.14% to 48.3%. Although the reported rates are higher than the previously estimated 1-year prevalence (3.6% and 7.2%) of depression among the population before the pandemic (Huang *et al*., Lim *et al*.)[36,37] It is important to note that the presence of depressive symptoms does not reflect a clinical diagnosis of depression. During the COVID19 pandemic, a number of risk variables were discovered to be linked to depression symptoms.

A study conducted by Zakout *et al*., Ahmad *et al*., and Gao *et al*.[14,25,31] found that females were reported as are generally more likely to develop depressive symptoms

when compared to their male counterparts. Gao *et al*.[31] noticed that unmarried participants presented with fewer depressive symptoms as compared to married participants.

Yang *et al*.[3] showed that social media dependence and social media self-expression had significantly positive relationships with depression (β = 0.776, $P < 0.01$; β = 0.340, $P < 0.05$), respectively. Majeed *et al*.[35] showed that problematic use of social media significantly correlated with fear of COVID-19 ($r = 0.38$, $P < 0.01$) and depression ($r = 0.41$, $P < 0.01$).

Another study by Zaho *et al*.[30] found that social media use was positively related to negative effect ($r = 0.12$), depression ($r = 0.10$), stress ($r = 0.14$), and anxiety ($r = 0.10$).

Ahmad *et al*.[14] showed that frequent exposure to social media had a higher level of anxiety, depression, and social isolation as compared to less exposure. Hou *et al*.[26] detected that age, marriage status, occupation, adaption, resilience, and stress are associated with depression.

Anxiety and associated factors

Anxiety symptoms were assessed in 10 out of the 14 studies, with a noticeable variation in the prevalence of anxiety symptoms ranging from 7.4% to 47.82%.)[3,14,25,26,29-31,33,34] Female participants showed more anxiety as compared to male participants (Ahmad *et al*., and Zakout *et al*.)[14,25] Opposite result showed in a study conducted by Hou *et al*.,[26] males had higher anxiety as compared to female participants. With respect to marital status, Ahmad *et al*.[14] reported that married participants had higher levels of anxiety compared to unmarried participants. In contrast, Liu *et al*.[32] found that higher educated and younger people showed more anxiety comparatively. Zakout *et al*.[25] found that most of the (55.8%) participants felt media coverage creates stress and anxiety among them. One study (Cong Liu *et al*.)[34] showed that participants who stayed alone were significantly more anxious than those who stayed with their family or with a friend/roommate/classmate. Two studies conducted by Ahmad *et al.* and Sharma *et al*.[14,29] showed that positive correlation ($r = 0.54$, $r = 0.368$) between hours spend on social media for COVID news and anxiety. Most of the studies showed that social media exposure or frequent exposure to news information concerning COVID-19 was positively associated with symptoms of anxiety.

Stress, life satisfaction, and social isolation

A study conducted by Zakout *et al*.[25] Saudi Arabia reported a prevalence of stress of 37.67% due to social media use for COVID-19 information. Also found that female participants experience more stress as compared to male participants. Two studies completed Brailovskaia *et al*. and Zhou *et al*.[27,30] showed that social media use positively correlated ($r = 0.128$, $r = 0.10$) with stress symptoms.

Yang *et al*.[3] assessed the relationship between life satisfaction during COVID-19 and social media activities. It found, COVID-19 online discussion and social media judgment had significant negative relationships with life satisfaction (β = −0.295, $P < 0.01$; β= −0.395, $P < 0.01$, respectively). Furthermore, persons who used social media to critique other people's behavior had lower levels of life satisfaction than those who did not. Greater levels of positive COVID-19 information sharing and favorable attitudes toward COVID-19 information; however, were associated to people's higher levels of life satisfaction, though only marginally (β = 0.189, $P = 0.05$; β= −0.395, $P = 0.05$, respectively).

However, Ahmad *et al*.[14] found that the prevalence of social isolation is 46.42% and social isolation is low among male candidates as compared to females. Exposure to misinformation via social media had a positive relationship with social isolation.

Recommendations

There are lots of suggestions advised through all these articles. With the help of the below suggestions, we can avoid false information on social media, associated with a bad psychological impacts, which creates unnecessary panic in the general population. Suggestions such as online campaign,[24] limit the use of social media,[24,26,28-30] trusted authentic source of information,[24,29,26] avoid unreliable source of information,[25] mental health care program,[25] special attention to be given to female and younger's,[25] avoid excessive pandemic news,[25] Governments, policy makers should pay attention to the general public social media literacy,[3] media encouraged to share more suggestions of positive mental health practices,[3] offer free of cost mental health consultation,[14] regular mindfulness training session,[14] campaigns to enhance public awareness of the potential drawbacks of excessive social media use,[14] Government authorities should create official pages on different social media platforms where people can get accurate information,[14] conscious use of social media as information source,[27,33] suggest home activities should be done during school closure,[28] check true authenticity of the information before disseminating the news,[29] learn effective emotional regulation strategies to reduced negative emotions induced by news,[30] Government should pay attention to the general populations mental health during COVID-19 pandemic,[14,31] legal action on misleading COVID-19 information,[14,31] monitor social media and filter out false information and promote the spread of accurate information with cooperation of WHO,[14,31] deliver the balance information about the pandemic instead of over emphasizing on the

negative information.[32] Positive information should be disseminated such as infection prevention of the COVID-19,[32] media should follow the media ethics and humanistic care,[34] avoid consuming the public affection and privacy of victims or creating secondary trauma for the audience.[34] With the help of these recommendations, we can reduce the impact of social media on psychological health and able to build a better mental level even during COVID-19 periods.

Discussion

This study attempted to conduct a systematic review of the existing literature on the impact of social media use on mental health during the COVID-19 pandemic. Nonetheless, this review discovered evidence of a link between social media and mental health. Anxiety and depression were the most frequently measured outcomes across the 14 studies. Time spent, activity, and addiction to social media were identified as significant risk factors for anxiety and depression in this study. Anxiety is one of the most common mental health issues in today's world. People liked and commented on the photos and videos they posted. Everyone in today's world is immune to the social media context. Some teenagers experience anxiety from social media as a result of their fear of loss, which leads them to try to respond to and check all of their friends' messages and messages on a regular basis. On the contrary, depression is one of the unintended consequences of excessive social media use. More importantly, symptoms of major depression were discovered in individuals who spent the majority of their time online and performing image management on social networking sites. Passive social media use, such as reading posts, is more strongly linked to depression than active use, such as posting.[38]

When compared to the prevalence before the pandemic, then according to Huang *et al*., and Lim *et al*.[36,37] there is a higher prevalence of symptoms of adverse psychiatric outcomes among the general public. Variations in prevalence rates were observed across studies, which could be attributed to different measurement scales, different reporting patterns, and possibly international/cultural differences. Because of varying degrees of outbreak severity, national economy, and government preparedness, availability of medical supplies/facilities, and proper dissemination of COVID-related information, regional differences in the general public's psychological health existed during a massive disease outbreak. Symptoms of negative psychological outcomes were more common at the start of the outbreak when people were confronted with mandatory quarantine, unexpected unemployment, and uncertainty related to the outbreak (Ho *et al*.).[39]

The majority of the studies identified frequent exposure to COVID-19-related social media/news as a source of anxiety and stress symptoms (Gao *et al*. and Moghanibashi-Mansourieh *et al*.).[31,40] Frequent social media use exposes one to the possibility of fake news/reports/disinformation, as well as the possibility of increased anxiety. With the novel coronavirus, unpredictable situations and many unknowns 'misinformation and fake news are easily spread via social media platforms (Erku *et al*.)[41] Causing unnecessary fears and anxiety. Similarly Li *et al*.[41] depicted that sadness and anxiety may arise as a result of constantly seeing members of the community suffering from the pandemic on social media platforms or in news reports.

During this global pandemic, social media consumption for COVID-19 news plays an important role in mental health disturbances (depression, anxiety, stress, life satisfaction, and so on) all over the world. This review discovered that anxiety levels are higher in daily COVID-19 news followers than in non-daily followers and that the majority of participants believed media coverage caused stress and anxiety among them (Zakout *et al*.)[25] Health news is the most often seen, read, watched, and heard topic; around three-quarters of interviewees stated that sharing more information about COVID-19 on social media has caused worry among people (Radwan *et al*.).[28]

Another research by Sharma *et al*.[29] found the majority of participants were using television and social media for COVID-19 news, that more than one-third of the respondents felt anxious and nervous after watching the COVID-19 news, that 31.9 percent of participants believed that there is a big difference between news and reality and that 29.8 percent believed that media only gives us stress because of continuous coverage of COVID-19. This review uncovered a number of predictive factors. For example, females were more likely to use social media for news and to develop symptoms of various types of mental disorders during the pandemic, including depression, anxiety, PTSD, and stress, as reported in our included studies. (Zakout *et al*., Radwan *et al*., Ahmad *et al*., and Gao *et al*.)[14,25,28,31]

Some other findings from Yang *et al*.[3] are that the most of the participants use the internet for more than 6 h for COVID-19 news. According to Ahmad *et al*., and Gao *et al*.[14,31] Married participants, high educated people, and younger age group population experienced more social media use and more mental disturbances. However, Lin *et al*., and Majeed *et al*.[24,35] noticed that problematic social media use was associated with fear of COVID-19, COVID-19 misunderstanding, insomnia, psychological distress, and depression. Liu *et al*.[32] detected that participants who knew someone infected with COVID-19

or lived in a neighborhood with COVID-19 cases reported a high level of anxiety. This review identified several recommendations to reduce the impact of social media exposure on mental health.

Limitations and recommendation

There are some restrictions such as study findings being described in a qualitative and narrative manner. Due to the high heterogeneity in the assessment tools used and primary outcomes measured across studies, a more objective systematic review could not be conducted to examine the prevalence of each psychological outcome. Second, because all of the included studies used a cross-sectional study design, causal inferences could not be made. Furthermore, all studies were conducted independently by study participants via online questionnaires, which raises two concerns: 1] When a professional psychiatrist/interviewer is not present to supervise individual responses in self-assessment, the objectivity of the responses varies. People with limited internet access were most likely excluded from the study, resulting in a selection bias in the population studied. Another source of concern is the over-representation of women in most studies. Because of selection bias and over-representation of certain groups, most studies may not be representative of the true population. Importantly, studies on inclusion were only conducted in a few countries. As a result, global generalizations of mental health among the general population should be approached with caution. The paper is the first systematic review that analyses and summarizes existing literature with relevance to the social media impact on the psychological health of the general population during the COVID-19 outbreak and highlights important associated risk factors and recommendations to reduce false information via social media to reduce psychological measures during this global pandemic.

Conclusion

This systematic review examined the impact of social media on the psychological health of the general public during the COVID-19 pandemic and stressed the associated risk factors. A high prevalence of adverse psychiatric symptoms was reported in most studies due to misinformation spreading on social media. The COVID-19 pandemic represents an unprecedented threat to mental health in high, middle, and low-income countries due to high exposure to social media. In addition, to reduce this effect due to high exposure to social media, priority needs to be given to the prevention of mental disorders (e.g., depression, anxiety, and stress) A combination of government policies that pay attention to social media information, authentic source of COVID-19 information's, free mental health care programs, and avoid excessive negative news should be planned to reduce this negative impact on mental health during this pandemic time.

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Conflicts of interest

There are no conflicts of interest.

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