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Impact of COVID-19 Epidemic on Mental Health: A Systematic Review

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Abstract

Mental health problems associated with COVID-19 are directly affecting almost all small and large communities of the world. Due to social isolation, perceived danger, physical discomfort, uncertainty, fear of virus transmission and portraying negative news in large-scale media coverage, people may experience symptoms of loneliness, stress, anxiety, depression, insomnia and anger. Psychiatrists, psychologist and other health workers around the world should know about these manifestations, their correlations, and the strategies to manage them. The purpose of this systematic review was to analyse researches that investigated the effect of COVID 19 on mental health. 24 full text studies were reviewed and included in this study. Out of which 15 researches were conducted in China, 2 in Iran, 2 in Italy, 2 in India and one each in Turkey, USA, Spain and Denmark. There were a total of 97,770 participants in 24 studies, with a sample size ranging from 20 to 52,730 participants. The effect of COVID-19 on mental health was assessed on the general population in 17 studies and on health workers in 7 studies. Studies found moderate or severe levels of stress, depression, and anxiety in respondents due to the effect of COVID-19. Female gender, student status specific physical symptoms, poor self-rated health status and history of chronic illness were associated with high levels of stress, anxiety, and depression.

Keywords: COVID-19, Mental Health, Stress, Depression, Anxiety

There was a lockdown in almost the entire world, roads were deserted, factories and offices were closed and people were imprisoned in their homes, the cause of all this is a virus named Novel Corona Virus (COVID-19). The World Health Organization has declared COVID-19 the sixth public health emergency of international concern on January 30, 2020 and an epidemic on March 11, 2020.

The first case of COVID-19 was found in China's Wuhan province in late 2019. Subsequently, Iran, Italy, South Korea, Spain, Germany, England and the United States saw a rapid increase in the number of COVID-19 cases. As of 19 October 2020, COVID-19 spread to 215 countries and there have been 39,801,612 confirmed cases of COVID-19, including 1,110,908 deaths. This large scale infectious and public health event put tremendous pressure on the government, medicine, healthcare providers and the general public.

Mental health problems associated with COVID-19 are directly affecting almost all small and large communities of the world. The continuous spread of the epidemic and strict isolation measures across the country is expected to influence the mental health of Individual. Due to social isolation, perceived danger, physical discomfort, uncertainty, fear of virus transmission and portraying negative news in large-scale media coverage, people may experience symptoms of loneliness, stress, anxiety, depression, insomnia and anger.

Psychiatrists, psychologist and other health workers around the world should know about these manifestations, their correlations, and the strategies to manage them. They should also be aware of all aspects of the existing literature, and should seek to rectify the deficiencies through more extensive clinical experience and research. With these facts in mind, the current review analysed researches that investigated the effect of COVID 19 on mental health.

The purpose of this systematic review is to summarize the existing literature and provide an overview of research findings on mental health issues due to COVID-19. An additional objective was to identify factors that are associated with mental health.

Methods

Literature Search

A search strategy was designed to identify empirical studies related to COVID-19 epidemic and mental health. Google Scholar and PubMed electronic databases were searched from their inception through September 2020. The search terms "COVID-19", "novel coronavirus", "nCoV", "mental health", "psychological problems", "stress", "anxiety" and "depression" were searched using those electronic databases.

Inclusion Criteria

Empirical studies published in English language and in full paper form were eligible. The studies were eligible if they assessed at least one mental health aspect such as stress, anxiety, depression, and insomnia etc.

Result

A total of 117 articles were retrieved, of which 36 duplicate articles were excluded. Of the remaining 83 articles, 55 articles were either unrelated to the influence of COVID-19, were editorials or commentators, or were written in a language other than English, and full paper were not available. 24 full text articles were reviewed and included in this study.

Out of which 15 researches were conducted in China, 2 in Iran, 2 in Italy, 2 in India and one each in Turkey, USA, Spain and Denmark. There were a total of 97,770 participants in 26 studies, with a sample size ranging from 20 to 51,843 participants. All these studies are diverse in terms of sample and outcome characteristics. Demographically there was variation in age range and gender composition. The majority of these studies used a Cross-sectional online survey method to collect data. In most of the studies, the available measures of mental health were used and in some, the researchers developed the measures (Roy et al., 2020; Sun et al., 2020). The current review found that the effect of COVID-19 on mental health was assessed on the general population in 17 studies and on health care workers in 7 studies.

A summary of studies assessing the mental health impact of COVID-19 on the general population

Study	Duration	Sample	Method	Measures	Finding
Qiu et al., (2020) China	31 January to 10 February 2020	Sample size: 52,730	Cross-sectional online survey	Self-report questionnaire developed by researcher	35% of the respondents experienced psychological distress
Y. Zhang & Ma, (2020) China	Between January and February 2020.	Sample size: 263 Mean age: 37.7 _ 14.0 years	Cross-sectional online survey	Impact of Event Scale (IES)	The mean IES score in the participants was 13.6 _ 7.7, reflecting a mild stressful impact
Wang, Pan, Wan, Tan, Xu, Ho, et al., (2020) China	31 Jan. to 2 February 2020	Sample size: 1738	Cross-sectional online survey	Event Scale-Revised (IES-R), Depression, Anxiety and Stress Scale (DASS-21)	16.5% respondents reported moderate to severe depressive symptoms; 28.8% reported moderate to severe anxiety symptoms; and 8.1% reported moderate to severe stress levels
Pourhaji et al., (2020) Iran	19 Feb. to 13 March 2020	Sample size: 500 mean age 31.9 ± 11.9.	Cross-sectional online survey	7 item GAD Scale	92.4% participants had moderate or severe anxiety (GAD-7 score ≥10)
Ahmed et al., (2020) China	February	Sample size -1074 Age range: 14-68 Mean age: 33.54±11.13 Sex(f/m):503/571	Cross-sectional online survey	Beck Anxiety Inventory, Beck Depression Inventory and Warwick Edinburgh Mental Wellbeing Scale	Higher rate of anxiety, depression, hazardous and harmful alcohol use, and lower mental wellbeing than usual ratio.
Cao et al., (2020) China	Between February March 2020	Sample size: 4,872, Age range: 18-85, Mean age: 32.3±10.0 Sex(f/m): 3,267/1,560	Cross-sectional online survey	Generalized Anxiety Disorder Scale (GAD-7)	Results indicated that 0.9% of the respondents were experiencing severe anxiety, 2.7% moderate anxiety, and 21.3% mild anxiety.
Roy et. Al., (2020) India	22 to 24 March, 2020	Sample size: 662 Participants, mean age = 29.09 ± 8.83 years.	Cross-sectional online survey	Online semi-structured questionnaire developed by the Researcher	More than 80% of the people were preoccupied with the thoughts of COVID-19 and Sleep difficulties, paranoia about acquiring COVID-19 infection and distress related social media were reported in 12.5%, 37.8%, and 36.4% participants respectively.
Moghanibas hi- Mansourieh, (2020) Iran	1 to 9 March, 2020	Sample size: 10,754	Cross-sectional online survey	Dass 21 questionnaire	Total anxiety level was 8.61±6.95 and the severity of anxiety symptoms in 49.1% of cases was normal, in 9.3% was severe and in 9.8% was very severe.
Wang et al. (2020) China	March	Sample size: 1738	Cross-sectional online survey	Event Scale-Revised (IES-R), Depression, Anxiety and Stress Scale (DASS-21) and IES-R measures PTSD symptoms	During the initial evaluation, moderate-to-severe stress, anxiety and depression were noted in 8.1%, 28.8% and 16.5%, respectively and there were no significant longitudinal changes in stress, anxiety and depression levels (p>0.05).
González-Sanguino et al, (2020) Spain	March	Sample size: 3,480 Age range: 18-80 Mean age: 37.92 Sex(f/m): 2,610/870	Cross-sectional online survey	Patient Health Questionnaire-2 (PHQ-2) Anxiety Disorder Scale-2 (GAD-2) Civilian version of the Post-traumatic Stress Disorder Checklist-Reduced version (PCL-C-2)	The 18.7% of the sample revealed depressive, 21.6% anxiety and 15.8% PTSD symptoms.
Huang et al, (2020) China	N/A	Sample size: 7,236 Age range: 6-80 Mean age: 35.3±5.6 Sex(f/m): 3,952/3,284	Cross-sectional online survey	Generalized Anxiety Disorder-7 (GAD-7) Center for Epidemiology Scale for Depression (CES-D) Pittsburgh Sleep Quality Index (PSQI)	The overall prevalence of GAD, depressive symptoms, and sleep quality of the public were 35.1%, 20.1%, and 18.2%, respectively. Younger people reported a significantly higher prevalence of GAD and depressive symptoms than older people.
Moccia et al, (2020) Italy	between April 10th and April 13th, 2020.	Sample size: 500 Age range: 18-75 Sex(f/m): 298/202	Cross-sectional online survey	Kessler 10 Psychological Distress Scale (K10) Attachment Style Questionnaire (ASQ)	62% of the individuals reported no likelihood of psychological distress, whereas 19.4% and 18.6% displayed mild and moderate-to-severe likelihood.
Mazza et al, (2020)	18–22 March, 2020	Sample size: 2,766 Age range: 18-90	Cross-sectional	Depression, Anxiety and Stress Scale–21 items	In relation to depression, 67.3% (n = 1859) of respondents had an average

Italy		Mean age: 32.94±13.2 Sex(f/m): 1,982/784	online survey	(DASS-21)	level, 17% (n = 470) were in the high range, and 434 (15.4%) were in the extremely high range. In relation to anxiety, 81.3% (n = 2247) of respondents had an average level, 7.2% (n = 198) were in the high range, and 318 (11.5%) were in the extremely high range.
Olagoke et al, (2020) USA	March	Sample size: 501 Age range: ≥18 Mean age: 32.44±11.94 Sex(f/m): 277/224	Cross-sectional online survey	Patient Health Questionnaire (PHQ-2)	Participants reported exposure to COVID-19 news on mainstream media as 2.73 -0.91, depressive symptoms (1.92 - 0.93), perceived severity (3.73 - 1.19), perceived vulnerability (3.67 - 1.07) and, self-efficacy (4.01 - 0.67).
Özdin et al, (2020) Turkey	Between 14 and 16 April 2020	Sample size: 343 Age range: ≥18 Mean age: 37.16±10.31 Sex(f/m): 169/174	Cross-sectional online survey	Hospital Anxiety and Depression Scale (HADS)	In terms of HADS cut-off points, 23.6% (n = 81) of the population scored above the depression cut-off point, and 45.1% (n = 155) scored above the cut-off point for anxiety.
Sønderskov et al, (2020) Denmark	N/A	Sample size: 2,458 Age range: N/A Mean age: 49.1 Sex(f/m): 1,254/1,204	Cross-sectional online survey	WHO-5 well-being scale	Result found quite strong negative correlations between the reported levels of depression/anxiety and the WHO-5 scores

A summary of studies assessing the mental health impact of COVID-19 on the health care workers

Study	Duration	Sample	Method	Measures	Finding
Lai et al., (2020)	29 Jan. to 3 Feb., 2020	Sample size: - 1257 health care workers, aged 26 to 40 years	Cross-Sectional Study	Chinese versions of Patient Health Questionnaire, Generalized Anxiety Disorder scale and Insomnia Severity Index	Participants reported symptoms of depression (634 [50.4%]), anxiety (560 [44.6%]), insomnia (427[34.0%]), and distress (899 [71.5%]).
Sun et. al., (2020)	20 Jan. to 10 Feb., 2020	Sample size: 20 Nurses	Colaizzi's phenomenological method	Interviews developed by the Researcher	Negative emotions present in early stage consisting of fatigue, discomfort and helplessness were caused by high-intensity work, fear and anxiety, and concern for patients and family members.
Xiao et al., (2020a)	January and February 2020	Sample size: 180 Medical staff	Cross sectional self-rated questionnaire	Self-Rating Anxiety Scale (SAS), General Self-Efficacy Scale (GSES), Stanford Acute Stress Reaction (SASR) questionnaire, Pittsburgh Sleep Quality Index (PSQI) and Social Support Rate Scale (SSRS)	Mean anxiety Scores 55.3±14.2; anxiety Positively correlated with stress and negatively with sleep quality, social support and self efficiency (p < .05, all correlations)
Zhang et al., (2020)	19 Feb. to 6 March 2020	2,182 Health workers	Online Survey	Insomnia Severity Index (ISI), Symptom Check List-revised (SCL 90-R), and Patient Health Questionnaire-4 (PHQ-4),	Medical health workers (n = 927) had a higher prevalence of insomnia (38.4 vs. 30.5%, p < 0.01), anxiety (13.0 vs. 8.5%, p < 0.01), depression (12.2 vs. 9.5%; p < 0.04), somatization (1.6 vs. 0.4%; p < 0.01), and obsessive-compulsive symptoms (5.3 vs. 2.2%; p < 0.01).
Kang et al. (2020) Wuhan	N/A	994 medical and nursing staff	Cross-sectional study	Patient health questionnaire-9, Generalized Anxiety Disorder, Insomnia Severity Index and the Impact of Event Scale-Revised	36.9 % had subthreshold mental health disturbances, 34.4 % had mild disturbances, 22.4 % had moderate disturbances, and 6.2 % had severe disturbances
Cai et al. (2020) Hubei	Between January and March 2020	534 Doctors, nurses, and other hospital staff	Cross-sectional study	Questionnaire by Lee et al. (2018)	Medical staff experienced emotional stress during the COVID-19 outbreak
Liang et	N/A	59 doctors and	Cross-	Zung's self-rating	Several staff were experiencing

al. (2020) Guangdong Province		nurses from COVID-19 associated departments and others	sectional study	depression scale (SDS), Zung's self-rating anxiety scale (SAS).	clinically significant depressive symptoms
Mohindra et al. (2020) India	N/A	Frontline health care providers (HP) involved in the care of patients with COVID-19 or suspected COVID-19 Sample size- Not specified	Qualitative analysis	Interviews with HP	Following are the main themes identified for mental health promotion of HP: 1 Positive Motivational factors a Intellectual b Emotional 2 Negatives, frustrations associated with patient care 3 Personal fears and annoyances experienced by doctors

Discussion

The purpose of this systematic review was to analyse researches that investigated the effect of COVID-19 on mental health. The epidemic has affected China for the first time, so most studies have been done in China. Generally, the prevalence of adverse psychiatric symptoms among the public is greater than before the epidemic. It has been found in the reviewed studies that COVID-19 has negatively affected the mental health of a person in various ways. There Was moderate or severe levels of stress, depression, and anxiety in respondents due to the effect of COVID-19 (Ahmed et al., 2020; Cao et al., 2020; Pourhaji et al., 2020; Wang, Pan, Wan, Tan, Xu, Ho, et al., 2020). Participants reported being anxious for themselves, family and friends during the on-going epidemic and some participants found to have sleep problems due to concerns about the epidemic (Roy et al., 2020).

Variations in prevalence rates were observed across studies, resulting in different measurement scales, differential reporting patterns, and possibly international or cultural differences. Regional differences existed in relation to the psychological health during a massive disease outbreak due to varying degrees of severity of the outbreak, national economy, government preparedness, availability of medical supplies / facilities, and appropriate dissemination of information related to COVID. Additionally, the outbreak phase in each region also affected the public's psychological reactions. Symptoms of adverse psychological outcomes were more commonly seen at the beginning of the outbreak when individuals were challenged by mandatory quarantine, unexpected unemployment, and uncertainty associated with the outbreak (Ho et al., 2020).

Frontline health care workers engaged in the direct diagnosis, treatment, and care of patients with COVID-19 were associated with a higher risk of depression, anxiety, and insomnia symptoms (Lai et al., 2020; Sun et al., 2020; Xiao et al., 2020b; W. Zhang et al., 2020). Negative emotions were present in association with fatigue, restlessness, and sleepiness, which cause high intensity work, fear, anxiety, and anxiety for patients and family members (Sun et al., 2020). A study compared medical health workers with nonmedical health workers and found medical health workers had a higher prevalence of insomnia, anxiety, depression, somatization, and obsessive compulsive symptoms (W. Zhang et al., 2020). Another study found that most clinically stable COVID-19 patients suffered from significant post-traumatic stress symptoms prior to discharge (Bo et al., 2020).

Among medical health workers, organic disease was an independent factor for insomnia, anxiety, somatisation, depression, and obsessive-compulsive symptoms. Living in urban areas, being female, and being at risk of exposure to COVID-19 patients were the most common risk factors for insomnia, anxiety, obsessive-compulsive symptoms and depression. Among non-health workers, having organic disease was a risk factor for insomnia, depression, and obsessive-compulsive symptoms (W. Zhang et al., 2020). A study found that the level of social support for medical staff was significantly associated with self-efficacy and sleep quality and was negatively associated with degree of anxiety and stress. Anxiety levels were significantly associated with stress

levels, which negatively affected self-efficacy and sleep quality. Anxiety, stress, and self-efficacy were mediating variables associated with social support and sleep quality (Xiao et al., 2020b).

A study found that youth aged 21–40 were more vulnerable in terms of their mental health conditions and alcohol use, proportion of having different level of anxiety and depression, and lower mental wellbeing were relatively higher among them (Y. Zhang & Ma, 2020). Another study found that respondents aged 12 to 21 years demonstrated significantly higher score of IES-R as compared to respondents aged 49 years (Wang, Pan, Wan, Tan, Xu, McIntyre, et al., 2020).

Female gender, student status specific physical symptoms (eg, myalgia, dizziness, chills), and poor self-rated health status and history of chronic illness were associated with high levels of stress, anxiety, and depression (Qiu et al., 2020; Wang, Pan, Wan, Tan, Xu, Ho, et al., 2020).

Specific up-to-date and accurate health information (e.g., treatment, local outbreak situation) and particular precautionary measures (e.g., hand hygiene, wearing a mask) were associated with a lower psychological impact of the outbreak and lower levels of stress, anxiety, and depression (Wang, Pan, Wan, Tan, Xu, Ho, et al., 2020). In addition, living in urban areas, stability in family income, and living with parents were protective factors against anxiety and having relatives or acquaintances infected with COVID-19 was a risk factor for increasing the anxiety (Cao et al., 2020).

Limitations

Studies assessing impact of COVID-19 epidemic on mental health have several limitations. Psychological assessment was based on an online survey and self-report tools in most of these studies. There are risks of wrong decision or over-judgment. The use of clinical interviews is encouraged in future studies to attract a more comprehensive assessment of the problem. In addition, self-report data are subject to social desirability bias. As the COVID-19 epidemic attracts world's attention, social desirability bias may be present in the data. Second, all these studies serve as a short-term study. The long-term experience of research subjects will be a valuable avenue to explore in the future. Most studies were conducted in the particular province and region, which affects the generalization of findings.

Recommendation

Further research is needed in areas where mental health infrastructure is less developed and the effects are likely to be more severe. Vulnerable groups like youth, elderly, women and migrant workers need more attention.

Access to medical resources and the public healthcare system should be further strengthened and improved, especially after reviewing the early combat and management of the COVID-19 epidemic. A comprehensive crisis prevention and intervention system, including epidemiological monitoring, screening, referral, and targeted intervention, should be built to reduce psychological distress and prevent further mental health problems. In addition, there is a need to develop mental health interventions that are time-limited, culturally sensitive, and can be taught to health workers and volunteers. Online counselling should be promoted as an effective alternative to emergency psychological crisis intervention.

Conclusions

The current review provides insight into the negative psychological effects and associated problems of COVID-19. The COVID-19 transition does not differentiate between geography, ethnicity, religion and politics; it is considered a global issue and an epidemic. Mental health concerns are a common response to the outbreak of COVID-19 and have an impact on general public, health workers and parties. The prevalence of stress, anxiety, and depression is worrisome, which can easily develop a psychiatric disorder over a long period of time. The long-term mental health effects of COVID-19 may take several weeks or months to become fully apparent, and to manage this effect requires concerted effort not only from psychiatrists but also from the healthcare system at

large. There is a need to immediately implement multidisciplinary approaches at the individual, social and international levels.

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