

# Mental health outcomes and psychological interventions during the COVID-19 pandemic

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**Abstract.** In the aftermath of the new crown epidemic, people's lives have been turned upside down and stress levels have increased, resulting in negative psychological and mental health outcomes. Anxiety, depression, insomnia, and other psychological symptoms ensued. And if appropriate measures are not taken in a timely manner, the "psychological crisis pandemic" will erode people more than COVID-19. To date, many experts have proposed interventions centred on maintaining the mental health of the population. Considering some special populations and the specificity of the epidemic period, researchers have given a variety of references, encompassing traditional psychological treatment methods and emerging online therapies. This paper reviews and summarizes the psychological problems that emerged in the population during the COVID-19 pandemic, and proposes appropriate interventions for different populations, providing feasible solutions for maintaining the mental health of the population, which will help people have a clearer understanding of mental health and prevent mental illness in time.

## 1. Introduction

The World Health Organization (WHO) declared the Coronavirus disease 2019 (COVID-19) outbreak a public health emergency of international concern on January 30, 2020[2]. Beyond affecting people's physical health, the COVID-19 epidemic has had a globally unparalleled negative impact on mental health.

Multiple lines of evidence indicate that the outbreak of COVID-19 pandemic did affect the mental and psychosocial health of individuals and led to a widespread increase in psychological problems. Moghanibashi-Mansourieh conducted a cross-sectional study of 10,754 individuals from all Iranian provinces during the COVID-19 epidemic and showed that more than half experienced anxiety symptoms, with normal anxiety symptoms in 49.1% of cases, severe anxiety symptoms in 9.3% of cases, and very severe anxiety symptoms in 9.8% of cases[3].

Previous Research examined the initial psychological responses of the general population in China during the COVID-19 epidemic, and found that 53.8% of the 1210 respondents rated that the epidemic had a mild or severe psychological impact. the psychological impact of the epidemic as moderate or severe[4]. What's even scarier is that this "mental health pandemic" could last for years and even outlive the actual pandemic.

The poor mental health outcomes of the new crown epidemic include, but are not limited to, anxiety and depression. According to previous literatures, a wide variety of psychiatric symptoms emerged during the

pandemic, such as insomnia, Obsessive-Compulsive (OC), Phobic Anxiety (PHOB)[5], post-traumatic stress disorder(PTSD)[6], and headline stress disorder[7], etc. If appropriate measures are not taken in time, the "psychological crisis pandemic" will erode people more than COVID-19. Therefore, psychological crisis intervention needs to be considered a true public health priority. Even though separate lines of research have been reported on psychological interventions for various target populations, most of them have been conducted for a specific population. In this paper, we classify psychological interventions during the pandemic into three categories, including universal, selective or indicated interventions, according to the classification framework proposed by the Institute of Medicine Committee on Mental Illness Prevention (now the National Academy of Medicine) for mental illness prevention[8], and screen previously published interventions to summarize the interventions that ought to be implemented for each stage of the population.

In previous literature, some reported on various types of psychological symptoms during a new crown epidemic, and some reported on interventions that can reduce psychological problems, but there was little research that integrated problems and solutions. This review is aimed at listing various psychological symptoms that have emerged since the new crown outbreak and summarizing interventions for people at different stages of psychological crisis.

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## 2. Mental health outcomes during the COVID-19 pandemic

The COVID-19 outbreak has led to a very serious emotional epidemic. The virus poses a serious threat to the mental health of the public due to its unclear incubation period and potential for asymptomatic transmission. Figure 1 shows the Emotional Epidemic Curve (EEC), which demonstrates the changes in people's

emotional behaviour at different stages under the propagation dynamics of COVID-19. Two peaks of emotional prevalence can be found in it, the first of which may be related to inadequate communication, misinformation, myths, and fake news. The second peak is complicated and may be brought on by a loved one's passing, a financial setback, or an apparent social upheaval.

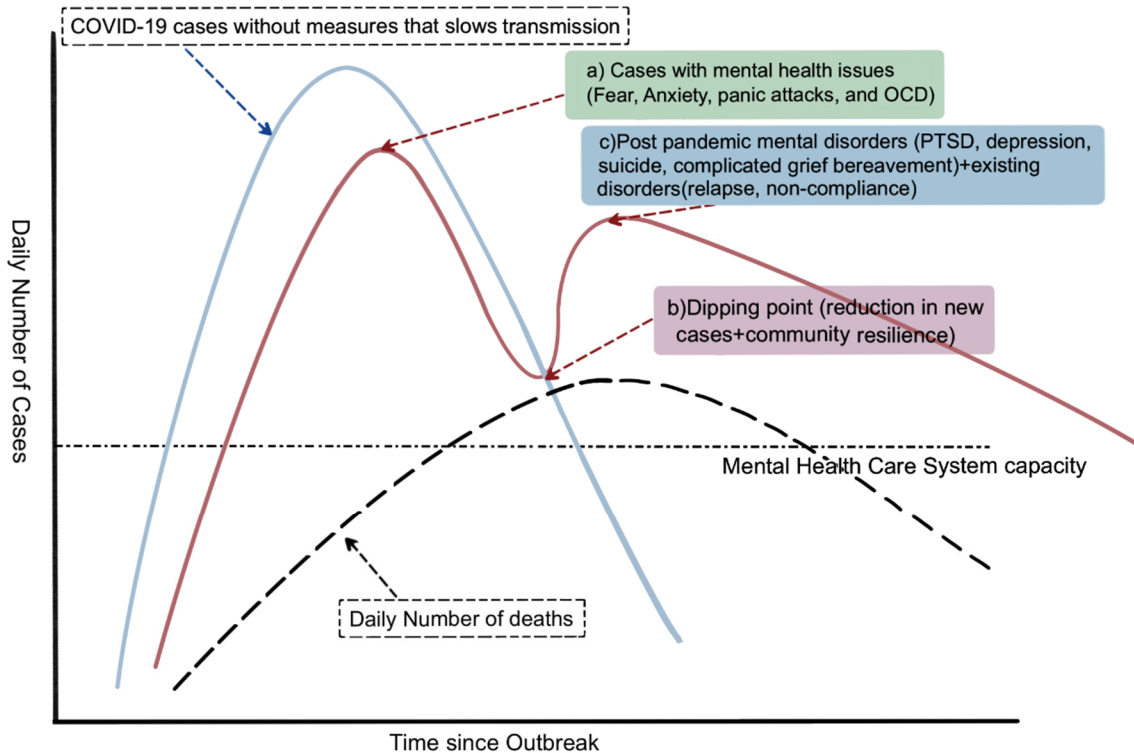


Figure 1. COVID-19 Pandemic Emotional Pop Curve[1]

As shown in the figure, the virus spreads globally, and the "emotional pandemic" has become a serious issue. We have summarized the mental health symptoms that occur during a pandemic based on different types of people.

### 2.1 Non-clinical population

During the pandemic, many studies reported mental health conditions related to the novel coronavirus outbreak. According to the findings, more than 50% of Chinese people experienced psychological distress during the outbreak, and when it came to concerns about novel coronavirus pneumonia, Approximately 75.2% of those polled were extremely or somewhat concerned about other family members contracting novel coronavirus pneumonia[9]. In a survey of 1,060 people in China, moderate to severe psychological symptoms were present in more than 70% of the participants, and the psychological impact of the outbreak on the average Chinese citizen was focused on four areas: obsessive compulsive (OC), interpersonal sensitivity (IS), phobic anxiety (PHOB), and psychotic (PSY)[5]. In the general population, the most common psychological symptoms are usually anxiety, depression, and post-traumatic stress

disorder. According to previous studies, anxiety symptoms were found in 6.33% to 50.9% of people, depressive symptoms in 14.6% to 48.3% of people, and post-traumatic stress disorder in 7% to 53.8% of people[10]. The prevalence of anxiety symptoms was higher and there was noticeable variation. Variations in prevalence rates could be attributed to the use of different assessment tools in various studies. The presence of anxiety symptoms is often accompanied by depression, and anxiety-depression (anxiety and depression comorbidities) is a relatively common syndrome. A UK study analysed the proportion of the UK adult population experiencing some form of depression in the summer of 2021, based on opinion and lifestyle surveys. The results showed that about one in six (17%) individuals reported suffering from depression in some way in the summer of 2021, higher than the level before the coronavirus (COVID-19) pandemic (10%)[11].

In addition to these common psychological symptoms, many emerging psychological problems appeared during the COVID-19 epidemic: a psychological disorder caused by too much news coverage called "headline stress disorder"[7]. After the onset of NICHHD, a wide variety of negative news stories flooded the public, bringing

overwhelming fear and shock to the public. Psychologist Steven Stosny, PhD, first defined this "headline stress disorder" as a heightened emotional response to endless news media coverage (e.g., feeling anxious and stressed). Medical dysfunction from ongoing stress or anxiety may include palpitations, chest tightness, and insomnia. As the condition worsens, it may also result in physical and mental ailments such as anxiety disorders, depression, endocrine abnormalities, and hypertension[12].

## 2.2 Health-care workers

Healthcare professionals responding to the COVID-19 epidemic are frequently required to perform in demanding circumstances and are also susceptible to heightened stress. Therefore, they may be at greater risk for mental health problems. According to the study, compared to non-first-line healthcare professionals, first-line healthcare workers were more inclined to report clinically significant levels of stress, anxiety, sleeplessness, and depression[13]. Among health workers, the most prominent problems were distress and anxiety. A Nigerian study observed high prevalence of anxiety, depression, and susceptibility to disease (PVD) among health care workers. Notably, unlike non-clinical populations, insomnia accounted for a proportion of the psychological impact of the epidemic on health care workers. In a study of frontline health care workers in China, insomnia (427 [34.0%]), anxiety (560 [44.6%]), depression (634 [50.4%]) and distress (899 [71.5%]) were all significantly prevalent among subjects[14]. In a study from Oman, mental health problems among health care workers were even more severe. Their findings showed that one quarter of healthcare workers suffered from moderate or severe anxiety according to the GAD-7. When combining the mild, moderate and severe anxiety categories, two-thirds of the sample had some degree of anxiety, with twice the proportion of patients with moderate and severe anxiety disorders reported in the Chinese study[15]. Besides, the results of all of these studies showed lower levels of mental health among nurses and women, who experienced more severe levels of depression, anxiety, insomnia and distressing symptoms during the epidemic.

## 2.3 Patients affected by COVID-19

The unique characteristics of infection contribute to this overwhelming fear because it spreads rapidly and insidiously. Historically, infection has been the leading cause of morbidity and mortality[16]. Fear of the disease and concern about infection in loved ones lead to severe psychological abnormalities such as anxiety, depression, and sleep problems. In recent outbreaks, implicated individuals have exhibited fear, denial, stigma, and loss. In a Japanese study, investigators analysed administrative survey data and showed higher levels of psychological distress among those in close proximity to COVID-19 patients than among those without the disease[17]. In addition to this, a study of patients discharged from COVID-19 in Tianjin showed that the prevalence of post-traumatic stress disorder was 16.0% in 144 laboratory-

confirmed COVID-19 subjects[18]. Tongji Hospital of Tongji Medical College of Huazhong University of Science and Technology used online questionnaire PHQ-9, GAD-7, and PHQ-15 to investigate the mental health status of 106 newly crowned patients in isolation wards, and the results showed that Over 55% of individuals with COVID-19 experienced anxiety, close to 70% had somatic symptoms, and almost 50% had depressive symptoms. The percentage of severe cases among these individuals was 9%, 15%, and 21%, respectively, with married patients experiencing more severe somatic symptoms and depression overall. Only 39.62% of patients had no anxiety or depression. People in this study also reported insomnia (67.92%) and suicidal or self-harming thoughts (25%)[19]. These suggest that the diagnosis of COVID-19 increases the psychological burden of the patient, and the likelihood of depression is higher.

The adverse effects of hospitalization for coronavirus infection on mental health last longer than physical illness[20], so health care workers need to pay attention to the psychological status of newly crowned patients and intervene in a timely manner to avoid more serious psychological problems in patients.

## 3. Psychological interventions at different stages

In 1994, the Institute of Medicine's Committee on Prevention of Mental Disorders (now the National Academy of Medicine) recommended that mental disorder prevention be divided into three categories: universal preventive interventions, selective preventive interventions, and indicated preventive interventions[8]. Therefore, this study collected and summarized the corresponding psychological interventions for the different stages.

### 3.1 Universal preventive interventions

The generic approach is designed for everyone in the general population, regardless of whether they are already experiencing psychological symptoms. Reducing stress, fear and isolation in the general population during the COVID-19 crisis is critical to improving mental health. Research shows that yoga and music therapy can improve mental health and reduce levels of depression, anxiety, and stress[21]. Yoga practitioners and music listeners report better life satisfaction and reduced stress. Yoga reduces social isolation by promoting social interaction and physical activity. As well, physical wellness, green space, art, creativity, and positive thinking can provide a positive atmosphere in which to live. Furthermore, digital interventions are an important contemporary way to improve mental health. Digital interventions can provide mental health services at a lower cost, bringing universal mental health care closer to reality and more sustainable in the long term. Thousands of people can access it anywhere, anytime, without having to adhere to a therapist's schedule or geographic location. Digital interventions have also been found to be effective in

preventing new-onset major depression in adult patients with subclinical depression[22].

In response to the widespread fear and anxiety triggered by overexposure to negative news, governments and social media platforms should collaborate to make sure that the information shared with the public is appropriate, reliable, scientific, and useful. More importantly, it is the responsibility of authorities and health experts to debunk and clarify myths in a timely manner and suggest appropriate response strategies for information epidemics.

In addition, during an epidemic, there is a greater need for special care for those who are under sequestration. For those who go through it, quarantine is frequently an unpleasant experience. Sometimes the bad impacts of being away from loved ones, losing one's freedom, not knowing the disease's prognosis, and boredom are irrevocable. And for this population, previous research has given more effective ways to reduce the psychological impact of isolation: (1) Inform people what is going on and why, let them know how long it will last. (2) Provide meaningful activities for them to do while in isolation. (3) Offer those in quarantine clear communication, a phone line, or an online service. (4) Assure the availability of essential supplies (such as food, water, and medical equipment), staff health care workers. (5) Reinforce the sense of altruism that people should properly feel[23].

### 3.2 Selective preventive interventions

A selective approach is to target subgroups at increased mental health risk. During a pandemic, specific populations are more vulnerable, and therefore mental health interventions ought to be tailored to their specific needs. For example, frontline healthcare professionals, COVID-19 patients, children, and the elderly, etc.

For frontline healthcare professionals, hospitals should ensure comprehensive manpower distribution, proper protective equipment, and the availability of mental health teams. And it's necessary to arrange for counsellors to visit break areas regularly to listen to staff's difficulties or stories at work and provide appropriate support to minimize anxiety and depression levels of healthcare professionals. Some necessary spiritual healing is also important, and a study from Italy reported the beneficial effects of music therapy (MT) as a support intervention to reduce stress and improve the mental health of clinical staff working with COVID-19 patients[24].

The mental health of new coronavirus patients requires special attention. A study demonstrated that social media-based individual counselling was effective in reducing psychological symptoms in patients with new crowns. The intervention consisted of a 10-minute consultation with an on-site nurse twice daily, with the nurse offering guidance and comfort, the findings of the study revealed that moods of patients improved[25]. Progressive muscular relaxation can also help COVID-19 patients feel less anxious and have better quality sleep[26].

Children and the elderly are also high-risk groups. For children, parents need to reduce unnecessary separation from their children. And if separated from their parents, the children should have alternative caregivers who are able to contact their parents on a regular basis. The caregivers are responsible to avoid exposing children to news in the media that causes panic, and ensure children spend some time outside or engage in physical activity each day[27]. For the maintenance of mental health in older adults, previous studies have also given clear guidelines for intervention: (1) Think about interacting with loved ones via social media, telephone, and the Internet during periods of social distance. (2) Continue your normal religious activities and interactions with the neighbourhood. Think about pandemic scenarios, go to religious gatherings, speak to believers, and keep in touch with the neighbourhood via SNS and online. (3) Where and how to receive therapy and other support services should be made known in advance. (4) If you experience signs of sadness, depression, or anxiety, let your close relatives and friends know. (5) Find fun activities to do during your free time, have a regular routine, and eat a balanced diet[28].

### 3.3 Indicated preventive interventions

An indicated approach is designed for individuals who are at very high risk or who are already experiencing psychological symptoms. Most of them may not seek help because they fear the stigma associated with psychotherapy or for other reasons. Therefore, individuals who are at high risk or who are already experiencing mental health problems need special attention. It is important to notice the onset of psychological problems and to intervene early to prevent worsening of psychological symptoms or more dangerous situations. Psychological First Aid (PFA) has all the elements of an effective approach, and more trained mental health professionals need to be trained in the community and in hospitals to provide psychosocial support to people in distress[29]. Beyond this, research has shown that cognitive behavioural therapy (CBT) provided by the Internet can be effective in alleviating symptoms such as depression and anxiety[30].

## 4. Conclusion & Looking forward

Greater cultural and economic investments need to emerge to support mental health maintenance programs, because "there is no health without mental health". This paper reviews the mental health effects on the population since the onset of the new crown epidemic and summarizes the corresponding interventions proposed for the population at different stages. The overview and synthesis of psychological symptoms and interventions provide directions for future research on mental health influences and prevention of psychological problems during the epidemic. More awareness and guidance are needed to make people realize that the new coronavirus is not only harmful to physical health, but also has a significant impact on mental health.



Some patients may view mental illness as a stigma, fear the scrutinizing eyes of others, and be too ashamed to express their confusion to others to seek medical attention. This is also due to the stigma that has been attached to people with mental illness, who are seen as "abnormal". This prejudice is a major obstacle to psychological treatment. People should change this perception and realize that psychological problems are illnesses, not just emotional problems.

Besides, existing psychological diagnostic methods leave much to be desired. Some studies have used mood scales to determine the psychological status of respondents. The diagnosis in this way is subjective to the patient and may also suffer from recall bias, and the results obtained are not sufficiently rigorous. The definition of some psychological symptoms is also rather vague. How to develop a gold standard for the diagnosis of mental illness should be the direction of future research.

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