

## Psychological Complications Caused by the Spread of COVID-19 and Its Rehabilitation

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### Abstract

**Background and Purpose:** Considering that only one and a half years have passed since the epidemic of covid-19 and during this period the priority of the health and treatment system has been to pay attention to the symptoms and physical problems of this disease and to prevent its further spread, there is enough evidence about Mental problems caused by Corona are not available. The purpose of this review is to investigate the state of psychological problems caused by Corona among patients and medical staff and also to provide rehabilitation solutions to partially solve this problem.

**Materials and Methods:** Medline and Web of Science, PubMed and Scopus databases were searched by combining keywords related to covid-19 (e.g. coronavirus), restrictive measures (e.g. quarantine, isolation, social distancing) and psychological outcomes (e.g. psychosis, depression). ) and guidelines (such as guidance, management, rehabilitation) were performed. All the articles were written in English and their purpose was about mental disorders and factors related to the corona virus. Considering that only about a year and a half of the Covid-19 pandemic has passed, the period of the reviewed articles was chosen between 2019 and 2021.

**Findings:** In searching for related studies, 18 original articles were considered. Overall, the review of the literature showed that the Covid-19 disease has changed people's lifestyles. In addition to physical symptoms and mortality, this disease also has negative psychological effects such as anxiety, depression, loneliness, stress, fear and excitement. However, in most cases these symptoms are not very severe. Psychological problems can be more severe in certain groups, such as pregnant women or people with underlying problems. In countries that have had a history of facing epidemics, internet-based systems have been formed to evaluate and treat the psychological problems of patients with Covid-19. Rehabilitation interventions can also have a positive effect in improving conditions such as the patient's breathing and help reduce psychological symptoms.

**Conclusion:** In addition to physical symptoms, covid-19 can also cause mental problems for the patient. On the other hand, changes in people's lifestyles following the spread of Covid-19, such as travel restrictions, quarantine, social distancing, and the slowdown of businesses, may also contribute to the occurrence of mental disorders following the spread of Covid-19. Attention should be paid to the psychological problems caused by Covid-19 in some population groups such as pregnant women, medical staff, and children. Rehabilitation interventions and increasing public awareness can be effective in improving psychological symptoms.

**Keywords:** Covid-19, Anxiety, Depression, Fear, Worry, Rehabilitation, Intervention

### Introduction

With the unprecedented success of medical science, the death rate of people of all ages and in all countries has decreased significantly. Despite the tremendous development of medical science, the global health and well-being is currently plagued by the relapsing infectious disease of Covid-19 [1]. Covid-19 is an epidemic disease. On February 11, 2020, the World Health Organization officially announced the new name of the coronavirus as Covid-19 and expressed concern about the spread of the virus worldwide [1]. On January 30, 2020, the World Health Organization declared the outbreak of Covid-19 a public health emergency of international concern. The virus has already had a

direct impact on the physical health of millions of people and, in addition, can pose a major threat to mental health [2].

In natural conditions, people try to maintain their stable state, but when faced with an emergency event, people lose this state of stability and balance and try to face that situation with immediate physiological and psychological responses. These types of responses are considered stress. A suitable stress can help people pay enough attention to the epidemic and actively prevent and correct it. However, an overreaction can lead to people taking the problem too seriously and living in constant fear [3]. Psychological problems caused by Corona in some special groups,

such as pregnant women, should also be given special attention, because quarantine causes worry for pregnant women. On the other hand, depression and anxiety before and after childbirth may lead to adverse effects on the mother and child [4]. Studies also show that healthcare providers are particularly at risk of negative psychological effects during pandemics. Especially if they are working on the front line [5]. In addition, psychological problems caused by Covid-19 in children should also be taken into consideration.

The world has seen several large outbreaks of diseases such as SARS in 2003, or Ebola in 2013. But these diseases were largely stopped by quarantine. While in the case of Covid-19, despite the quarantine, the spread of the disease did not stop [6]. The rapid and widespread spread of covid-19 caused the prevention of the spread of covid-19 to be one of the main priorities of health and treatment systems. In line with this priority, the media also tried to encourage people to observe health measures by expressing the dangers of Covid-19. However, in some cases, the media had great effects in increasing mental distress [7]. For example, some media had used the term "the end of the world", which had led to increased public concern [8]. Unfortunately, most of the news spread about Covid-19 is depressing and increases the level of anxiety [9]. On the other hand, if psychological interventions are delayed in a crisis, the people involved may suffer significant psychological damage [10]. Usually, the focus of the media and the health system in general is on the spread of the epidemic, and most studies have focused only on clinical data, with less attention paid to psychological disorders, such as anxiety and depression [11]. In this way, mental health problems that occur simultaneously with the disease are largely ignored. Although the first priority in Iran is still to prevent the spread of this disease as much as possible, mental health should not be neglected; Because the prevalence of mental disorders, especially anxiety, reduces people's resistance to disease and may cause irreparable economic, social, cultural and psychological problems for people in the future [9]. Covid-19 caused a lot of damage to the global and national economy. These economic damages can easily have negative effects on people. Unemployment, reduction of incomes and remaining expenses and even the addition of new expenses such as the cost of medicine and hospitalization due to Corona are among these effects. Economic problems can cause people to not be able to perform some tasks or expectations that others expect from them, and the living environment will no longer be safe and suitable. This in turn causes social problems. In addition, the feeling of danger and worry of contracting Covid-19, psychological stress caused by the death of others, forced stay at home and compliance with quarantine, and increasing the possibility of confrontation and aggression between family members and creating tension between spouses, changing lifestyles, excessive irritability Limiting communication with relatives due to the fear of disease transmission also aggravates psychological problems. Therefore, it should be noted that when talking about the spread of Corona, these psychological problems cannot be ignored [12]. Therefore, the current review study was conducted with the aim of identifying as many psychological problems as possible and paying attention to the relative role of rehabilitation in reducing some problems.

## Materials and Methods

In this review article, the psychological effects of covid 19 were investigated with regard to anxiety and depression as well as rehabilitation interventions. Considering that only about a year and a half has passed since the epidemic of Covid-19, the period of the reviewed articles was chosen between 2019 and 2021. Medline, Web of Science, PubMed, and Scopus databases were searched using keywords related to covid-19 (e.g., coronavirus), restrictive measures (e.g., quarantine, isolation, social distancing), and psychological outcomes (e.g., psycho, depression) and guidelines (e.g., guidance, management, rehabilitation) were done. All articles were written in English. The inclusion criteria included studies whose purpose was on psychological disorders caused by corona, factors related to these disorders, and rehabilitation interventions for these patients. Exclusion criteria included studies that evaluated disorders other than psychological disorders.

## Findings and discussion

In the search for related studies, finally 18 articles were considered to investigate psychological problems associated with Covid-19. In total, we considered four topics including 1. types of mental disorders related to covid-19, 2. the cause of mental disorders following the covid-19 epidemic, 3. challenges facing therapeutic interventions, 4. rehabilitation therapeutic interventions.

### Types of psychological disorders related to Covid-19

Mental disorders related to Covid-19 mainly appear as anxiety, depression, loneliness, stress, fear and excitement or a combination of all these, and these symptoms can also overlap [3].

#### Anxiety

Anxiety manifests itself in different ways. People who are quarantined are often worried and hope to get out of quarantine as soon as possible. People who are not infected fear that they may be infected by others. Some people tend to be more clean, such as frequent hand washing, or they are too trusting of medical staff or too sensitive to changes in their body. An increase in irritability and violence is also observed in some people. Restlessness, insomnia, heart palpitations, tremors, and frequent urination are other symptoms of anxiety [4]. On the one hand, anxiety can be protective and help adopt health-promoting behaviors. On the other hand, excessive anxiety can be harmful and lead to high panic and dangerous behaviors [13].

#### Depression

Clinical manifestations of depression include dullness and feeling weak. Appetite, weight loss, loss of interest and irritability are other symptoms of depression. Some people may feel uncomfortable and lose confidence in treatment when the pathological aspects of the disease and its risks are exaggerated [4].

#### Loneliness

To prevent the spread of infection, patients are mostly admitted to separate departments and a long period of quarantine. These patients may be alone for a long time and suffer from loneliness. On the other hand, people who are not infected are kept indoors and quarantined to prevent infection [4].

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## Stress and Fear

Patients are afraid of the disease itself. When the medical staff are wearing thick clothes that isolate them from others, the sense of intimacy that the patient should feel with the medical staff may be replaced by fear [4].

## Thrill

Some patients become emotional after the symptoms of the disease appear and when they learn about their infection. Such patients experience impulsivity and aggression. They do not cooperate with their treatment, deny their illness, or refuse to isolate themselves. Some patients refuse to be quarantined, repeatedly demanding to be released or trying to escape from the hospital [3].

Studies show that some demographic groups are more severely exposed to the psychological problems of Covid-19. It has been reported that health care workers who were under quarantine had more severe stress symptoms than the general population who were under quarantine. In addition, healthcare workers felt more tired, showed more avoidance behaviors after quarantine, and were more psychologically affected [14].

Psychological problems in pregnant women should also be considered. Some of the unwanted complications caused by psychological disorders during pregnancy include miscarriage, premature birth and low birth weight [15]. Clinical manifestations of Covid-19 pneumonia in pregnant women were similar to non-pregnant adult patients with Covid-19 pneumonia [16]. Perinatal depression and anxiety may lead to preterm delivery and delayed cognitive-emotional development of the infant [17]. In order to investigate the clinical, psychological and knowledge effects of pregnant women regarding the spread of covid-19, a study was conducted in 7 cities of Colombia using a questionnaire. The questions of this questionnaire assessed the demographic information, awareness, psychological symptoms and attitude about the epidemic of covid-19 in pregnant women. The results showed that the covid 19 epidemic has wide psychological consequences. So that about 50% of the whole group reported symptoms of anxiety and insomnia and 25% reported symptoms of depression [18]. Children and teenagers are also one of the groups that should pay attention to their psychological problems. The Covid-19 quarantine has affected more than 860 million children and adolescents worldwide. In their study, Orgiles et al. investigated the emotional impact of quarantine on children and adolescents in Italy and Spain, two countries affected by Covid-19. Participants were 1,143 Italian and Spanish parents of children aged 3 to 18 who completed the study by providing information about the impact of quarantine on their children and themselves, compared to before confinement at home. The results of the research showed that 85% of parents have observed changes in the emotional and behavioral state of their children during quarantine. The most common symptoms included: lack of concentration (76%), boredom (52%), irritability (39%), restlessness (39%), nervousness (38%), feeling lonely (31%), restlessness (30%) and worry (30 percent). Spanish parents reported more symptoms than Italians. As expected, children in both countries used monitors more, spent less time doing physical activity, and slept more hours during quarantine [19].

The psychological problems caused by Covid-19 can range from severe to mild. In cases where there are symptoms, but not to the extent of being considered as a mental illness, it is considered as a subsyndrome. Subsyndromal psychological problems are a common response to the covid-19 pandemic. The term subsyndrome is used when there are symptoms, but these symptoms are not enough to justify the initial diagnosis [20].

## The cause of mental disorders following the covid 19 epidemic Wide spread of infectious diseases

Evidence shows that following the widespread spread of infectious diseases, psychological problems also appear. Psychological reactions to epidemics include maladaptive behaviors, emotional distress, and defensive responses, such as anxiety, fear, hopelessness, loneliness, anger, boredom, depression, stress, and avoidance behaviors [21]. The Covid-19 pandemic is a major health crisis that has affected many countries. Therefore, it can be expected that such a widespread prevalence is associated with adverse mental health outcomes [22]. Pandemics have always been a fundamental part of human history, with only the Spanish flu (1920-1918), the Asian flu (1956-1957), severe acute respiratory syndrome (SARS, 2002-2003), swine flu (2009) occurring in the last century alone. ), and Ebola (2013-2014) affected the people of the world.

## Health measures

The health and treatment measures that are carried out to deal with the Covid-19 disease can also help in the occurrence of psychological problems. Studies show that measures that limit people, such as quarantine, isolation, and social distancing, affect people's psychological health as well as emotional reactions to the pandemic. For example, the results of an online research in China showed that after the Covid-19 epidemic, the prevalence of anxiety, depression and mental problems is higher than usual [1]. Some sources consider mental disorders related to Covid-19 to be the result of biological, social and psychological factors [3].

## Biological factors

Biological agents include the virus, its metabolites, and the body's overactive immune response to these foreign substances, leading to fever, shortness of breath, and other clinical symptoms. This can lead to brain hypoxia or carbon dioxide retention, edema, vascular dysfunction, and other pathological changes. This, in turn, can disrupt higher neural activity in the brain. In addition, some drugs used in treatment, such as antiviral drugs, can cause drug-induced psychotic disorders. For example, glucocorticoids can lead to excitement, depression, tension, insomnia, hallucinations, and other symptoms [3].

## Social factors and education level

The mental state of people is often very fragile during the outbreak of infectious diseases. In addition to this fragile mental state, inappropriate or excessive information by television, radio, newspapers, magazines, or the Internet and other media sources that cause panic can have a negative effect on the mental state of the population. From the perspective of communication psychology, in such times, people tend to accept negative, threatening or unofficial news and information and doubt positive news.

In addition, during the outbreak of the disease, rumors and speculations increase. Authorities in endemic areas are taking emergency measures, such as restricting entry and exit to cities and closing roads. There is little traffic on the street and the passages are quiet. Economic problems appear gradually and people rush to get their necessities [3]. A study conducted in 2020 to assess the level of anxiety in the Iranian population during the outbreak of Covid-19 through an online questionnaire on more than 10 thousand people in 31 provinces (Iran) shows that the level of anxiety in women and in people who receive news They follow more related to Corona. Also, the age group of 21 to 40 years showed more pain. In addition, the level of anxiety was higher among people who had at least one family member or relative who was infected with Covid-19. This research showed that the level of anxiety increases with the increase in education, and the reason for this has been introduced by the higher number of educated women [9].

### Psychological factors

The Covid-19 virus is a serious threat to health and life. The existence of the disease, the incubation period and the rapid onset of the disease and infection are all factors that cause mental problems and stress for people. This excessive and continuous stress can lead to mental disorders that primarily manifest as anxiety and depression [3].

### Challenges of therapeutic interventions

The unprecedented Covid-19 crisis has created major challenges for mental health services.

#### The challenge of lack of resources and manpower

One of these challenges to deal with Covid-19 is the lack of resources and human resources. The population of low-income countries is large and the existing health services, including infrastructure and manpower, are insufficient to maintain health in critical situations. In addition, while adequate manpower for the intensive care unit is lacking, there is also an alarming shortage of mental health personnel. Attention should also be paid to the organization and management of psychotherapy measures. Sometimes different departments perform psychotherapy separately and without knowing each other's work, which causes a waste of resources and delays the timely diagnosis of patients, their follow-up and treatment.

#### Access to medication and appropriate mental health care

During an epidemic, access to appropriate health and treatment centers is associated with problems. At such times, most psychiatric centers and outpatient departments are inactive, and travel restrictions add to the problems. Availability of psychotherapeutic drugs and drugs for other treatments is another challenge. Because it becomes difficult to get medicine in times of crisis and epidemic.

#### Private sector participation

How the private sector participates and the role of non-governmental organizations in dealing with the Covid-19 epidemic is another challenge that should be considered [23].

### Therapeutic interventions

Therapeutic interventions in psychological disorders related to Covid-19 include general interventions and rehabilitation interventions.

#### General therapeutic interventions

General therapeutic interventions: The environment of hospitals should be comfortable, bright and spacious. It is also important to provide scientific and appropriate information to reduce anxiety, pessimism and other issues among people. Medical staff must communicate with patients. In addition, providing secure means of communication, such as telephone and Internet access, is essential to ensure that patients are able to maintain contact with relatives and friends outside the hospital. Therefore, the patient's feeling of loneliness is reduced. People with psychological problems should be able to consult with clinical psychologists to get to know them and to be able to share their issues with them.

Therapeutic interventions with the help of the Internet: In some countries, such as China, which have experienced major problems such as earthquakes and SARS, the mental health service system has improved, and in the process of dealing with these crises, various forms of psychosocial intervention services have been developed. One of these services is the use of a mental crisis intervention model using Internet technology. In this new model, which has been carried out in a Chinese hospital, doctors, psychiatrists, psychologists and social workers use the Internet to provide psychological interventions to patients and their families [24]. In the same way, we can think of similar protocols in Iran. Online access to social networks, internet, telephone and media can be a suitable platform for providing these psychological protocols. The target population of these protocols includes hospitalized patients and their families, medical staff from hospitals and their families, and the general population [25]. In Iran, several telephone lines have been set up to answer people. 1480 phone line is intended to provide psychological and counseling services. Also, a small number of governmental and non-governmental organizations in the field of counseling, psychology and social work independently provide psychological services to their target groups. However, the activity of these centers has not expanded much [9].

Paying attention to daily life activities: Considering that the mental state of a person affects the body's performance and physiology [4], it is necessary for people to be informed about common stress reactions such as insomnia, panic attacks, anxiety, fear of illness or substance abuse [26]. Things like paying attention to proper physical activity at home, studying, eating and sleeping planned and maintaining a normal life will help to reduce stress. Also, necessary training should be provided regarding general measures to deal with stress, such as having a plan to do things, exercising, establishing social connections and avoiding long-term loneliness, and relaxation techniques [26].

#### Rehabilitation therapeutic interventions

If a person is unable to do even the most normal daily tasks, he will suffer from psychological problems due to his disability. Now, if he is suffering from an acute respiratory disease,

for example, his psychological problems will be aggravated. For example, if a patient with covid-19 cannot sit independently, this inability along with covid-19 disease complications prepares the ground for psychological problems. Or if the patient is not independent in terms of personal care and daily life activities and has a lot of dependence, he will be emotionally disturbed and acute disability is stressful for the patient and his family.

Rehabilitation intervention refers to a longitudinal process that focuses on minimizing the debilitating effect of a person's injuries, promoting and optimizing functional independence in daily life activities, and maximizing opportunities for participation in society. Rehabilitation should be performed by rehabilitation specialists in multidisciplinary teams with broad skills to support psychosocial functioning. It is recommended that patients who have recovered from Covid-19 disease go to the inpatient rehabilitation department to optimize their performance before being discharged from the hospital and entering the community. Patients presenting for rehabilitation should not have any signs and symptoms of infection or fever. Because usually the patients who visit the inpatient rehabilitation department are vulnerable people. These people are probably older and their immune systems may be weakened. Given that the complications of COVID-19 are usually prolonged, it is expected that multidisciplinary rehabilitation follow-up will be required for these outpatients long after hospital discharge [27].

Patients who are severely infected with Covid-19 suffer from various degrees of functional impairment, especially respiratory failure and cognitive problems, in both the acute and convalescent stages. The goal of early rehabilitation intervention is to reduce breathing problems and relieve symptoms, thereby reducing anxiety and depression. In addition, with the help of rehabilitation, the patient can return to sitting independently. When the patient achieves independent sitting balance, he can be prepared for the next step, standing up from a sitting position. Finally, with the help of rehabilitation, the patient can walk and move away from the bed. This not only improves the function of the muscles and the respiratory system, but also improves the mental state of the patient [27].

The principles of rehabilitation treatment for Covid-19 patients include these [28, 29]: a) individualization: treatment should be done according to the different stages, complications and underlying diseases of each person; b) Integration: the treatment should not only consider the respiratory function, but also the function of other parts, such as the heart, nervous system, motor system and psychological factors; c) Careful observation: pay attention to different rehabilitation methods, especially the patient's reaction to each method during and after activities and exercises; d) Gradual progress: All treatment steps should be done with a comprehensive and safe assessment. Especially for severe patients, a comprehensive assessment of their consciousness, respiratory, cardiovascular and musculoskeletal status should be performed.

In the process of rehabilitation, some sources have recommended that standing is the best posture for breathing while resting, which can effectively increase the patient's respiratory efficien-

cy and maintain lung volume. As long as the patient feels well, allow the patient to stand and gradually increase the standing time. Exercise can open the lungs, helps to expel respiratory secretions from the pulmonary alveoli and respiratory tracts to the large airways so that these secretions are expelled and phlegm does not accumulate in the lungs. Breathing exercise also increases vital capacity and strengthens lung function. Combining slow breathing and chest-opening breathing with shoulder-opening exercises is the key to breathing exercises. The three recommended breathing exercises are as follows:

1. Slow and deep breathing: When breathing, the patient should make an effort to actively move the diaphragm. Breathing should be deep and slow to prevent reduction of respiratory efficiency following shallow breathing. Compared to chest breathing, diaphragmatic breathing requires less muscle power, but has more volume.
2. In order to increase lung ventilation, while the person breathes slowly and slowly (Dam), he should open his shoulders and return to the first position during exhalation. Be careful not to hold your breath for a long time, because it increases the functional load of the heart and puts pressure on it. Set the breathing rate to 12-15 times per minute.
3. Another breathing technique is called "active breathing technique cycle". This technique can facilitate the exit of respiratory secretions from the bronchi and improve lung function without aggravating hypoxemia and obstructing the airflow in the respiratory tract. Performing this technique consists of three steps: breathing control, chest expansion and exhalation. This technique should be adjusted according to the patient's condition.

## Conclusion

The evidence collected so far confirms that the Covid-19 pandemic has a huge psychological impact on people. People experience psychological distress in terms of anxiety, depression and post-traumatic symptoms in the initial stage of the disease. Most of these disorders are mild, while those with severe symptoms were in the minority. In addition to anxiety, depression, and stress, which are the most reported cases, things like insomnia, anger, and worry about one's and family's health, sensitivity to life problems, dissatisfaction with life, panic, avoidance behavior, and compulsive obsessions have also been observed. It is necessary to pay attention to the psychological problems caused by Covid-19 in some population groups such as pregnant women, medical staff, and children. Informing people and some rehabilitation interventions have positive effects in reducing psychological symptoms.

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