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Review Article

Psychological Influence of Coronavirus Disease 2019 (COVID-19) Pandemic on the General Public, Medical Workers, and Patients With Mental Disorders and its Countermeasures



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Background: *Coronavirus disease 2019 (COVID-19) first broke out in Wuhan, Hubei Province, China, in 2019, and now it spreads in more than 100 countries around the world. On January 30th, the World Health Organization (WHO) declared COVID-19 a public health emergency of international concern. It was classified as a pandemic by the WHO on March 11, 2020. With the increase in the number of cases reported by various countries every day, the COVID-19 pandemic has attracted more and more attention around the world. At the same time, this public health emergency has caused a variety of psychological problems, such as panic disorder, anxiety, and depression. In addition, the Wuhan Mental Health Center's analysis of 2144 calls*

*from the psychological hotline from February 4 to February 20, 2020, showed that the general public accounted for 70%, medical workers accounted for 2.2%, patients with mental disorders accounted for 19.5%, and other personnel accounted for 8.3% (<https://mp.weixin.qq.com/s/lkmff1vnaLsT2d9xQkK5pwg>). **Conclusion:** Therefore, while controlling the pandemic, the government should also pay attention to the mental health of the general public, medical workers, and patients with mental disorders. Community mental health service systems, online mental health services, telemedicine, and other measures for patients with mental disorders may play a vital role during the pandemic.*

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Key words: mental health, anxiety, COVID-19, community mental health services, telemedicine, online mental health services.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) first broke out in Wuhan, Hubei Province, China, in 2019; it was caused by 2019 novel coronavirus (2019-nCoV) infection. COVID-19 spread in China from December 2019 to early 2020 and is now spreading in more than 100 countries around the world. On January 30th, the World Health Organization (WHO) declared COVID-19 as a public health emergency of international concern. It was classified as a pandemic by the WHO on March 11, 2020. This is another major pandemic

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TABLE 1. Statistics of Death of Medical Personnel During COVID-19 by April 3, 2020

Category	Number (n = 61)	Percent (%)
Gender		
Male	50	81.97
Female	11	18.03
Age		
Less than or equal to 40 y	19	31.15
41–50 y (contain 50 y)	16	26.23
51–60 y (contain 60 y)	15	24.59
Less than 60 y	10	16.39
Unknown	1	1.64
Cause of death		
Pneumonia	19	31.15
Overwork (including cardiac arrest, myocardial infarction, and other nonconfirmed diseases) accident (including car accidents, hotel collapses, accidental illness, and so on)	34	55.74
Date		
January	8	13.11
February	37	60.66
March	16	26.23
April	0	0

since severe acute respiratory syndrome in 2003. China defines it as a class B infectious disease and takes measures to prevent and control class A infectious diseases. According to the announcement of the National Health Commission of China (<https://news.qq.com/z2020/page/feiyang.htm>), as of April 3, 2020, COVID-19 had claimed 3331 lives in China, resulting in a total of 51,667 deaths worldwide. Among them, 61 Chinese medical workers were killed in different positions (https://mp.weixin.qq.com/s/ivJZZv-cAyxBO_5otNH_UQ). Some died because they were on the front line and were infected with COVID-19. Some died because of days of work and overwork in the fight against the pandemic, and some died accidentally during the antipandemic period (Table 1).¹ To control the spread of COVID-19 and to provide first aid for critically ill patients, central and local authorities have taken several effective measures, such as the establishment of emergency infectious disease hospitals and quarantine facilities to isolate suspected and diagnosed patients and their close contacts.² As countries report the number of new cases every day, the COVID-19 pandemic has attracted more and more attention around the world. New mental symptoms may occur in people without mental illness or the condition of those with preexisting mental illness may be aggravated

and cause suffering to caregivers of affected individuals.³ General public, medical workers, and patients with mental disorders are under insurmountable psychological pressure, which may lead to a variety of psychological problems.

The Psychological Influence of COVID-19 on the General Public and its Countermeasures

As a Public Health Emergency of International Concern, COVID-19 has the characteristics of strong infectivity and rapid spread, as well as the limitations of the public's cognition of COVID-19 (Table 2). The overwhelming news related to the pandemic, the cognitive bias of this emergency, and other reasons caused public anxiety and fear and other emotions. In addition, increased loneliness and reduced social interaction, as well as caused uncertainty about the future, may cause or exacerbate fear, depression, and anxiety among the general public.⁴ Even a mild illness with symptoms similar to COVID-19, such as the common cold, will cause a persistent state of anxiety.⁵ A study conducted a large-scale nationwide survey of the psychological distress of the general population in China during the COVID-19 pandemic. The study received a total of 52,730 valid responses from 36 provinces, autonomous regions, and municipalities directly under the Central Government, as well as Hong Kong, Macao, and Taiwan. The results show that the COVID-19 pandemic has caused a variety of psychological problems, such as panic disorder, anxiety, and depression.² Another study surveyed the psychological status of 1210 respondents in China at the beginning of the COVID-19 pandemic. The results showed that more than half of the respondents rated the psychological impact as moderate to severe, about one-third of the respondents reported moderate to severe anxiety, and 16.5% reported moderate to severe depressive symptoms.⁶ Therefore, the psychological state of the public during the pandemic is very important. Timely provision of appropriate mental health care is essential.⁷ To reduce the impact of these negative emotions, the National Health Commission of the people's Republic of China issued guidelines for psychological crisis intervention and psychological adjustment during COVID-19 outbreak (China National Health Commission) on January 26, 2020. The public can also do so by limiting sources of stress (only looking at official

TABLE 2. Psychological Influence of COVID-19 on the General Public and Medical Workers and its Countermeasures

Category	Psychological influence	Countermeasures
General public	Depression, anxiety, panic disorder	Limit the sources of stress Break the isolation Keep a regular schedule Focus on the benefits of isolation Seek the help of professional psychiatrists Self-counseling and participation in society
Medical workers	Depression, anxiety, insomnia, traumatic disorder (The probability of anxiety and depression of front-line medical staff in respiratory department, emergency department, intensive care unit, and infection department is twice as high as that of nonclinical medical staff.)	Clinical psychological intervention for medical workers The government should provide basic materials and supplies, security, and work subsidies for front-line medical staff and their families Adjust sleep disorders of medical workers Establish and encourage communication between medical workers and their families

information and limiting time), breaking isolation (strengthening communication with friends, family, and loved ones), maintaining a regular schedule (extra money for physical exercise), focusing on the benefits of isolation (quarantine protects both themselves and others and can quickly end the pandemic), and seek the help of professional psychiatrists.^{4,8,9} With reference to a series of psychosocial reactions caused by previous outbreaks of infectious diseases, in the current social environment, our focus on the pandemic should be on the individual level, focusing on enhancing individuals' psychological response to society, obtaining psychological help, timely self-counseling, and participation in society activities.¹⁰ Comparitively, in a cross-sectional study in China, where the COVID-19 pandemic initially occurred, most of the 6910 participants were optimistic about the COVID-19 pandemic: 90.8% believed that COVID-19 would eventually be successfully controlled, and 97.1% were confident that China would win the battle against the virus.¹¹

The Psychological Influence of COVID-19 on the Medical Workers and its Countermeasures

The outbreak of COVID-19 not only causes psychological disturbance to the general population but also has a great impact on the mental health of the medical population (Table 2). Front-line health care workers, especially those in Wuhan, experience close contact with infected patients, overloaded work, lack of protective materials, death of managed patients, fear of infection, and fear of transmission to family and friends. In addition to physical exhaustion, they also suffer from great psychological pressure.^{12,13} Studies have shown that patients suspected or diagnosed with

COVID-19, close contacts, and front-line health professionals all have a high risk of mental health problems.¹⁴ At the beginning of the pandemic, a psychological survey of 994 medical workers in Wuhan showed that 36.9% had subthreshold mental health disorder (patient health questionnaire [PHQ]-9: 2.4), 34.4% had a mild disorder (PHQ-9: 5.4), 22.4% had moderate disorder (PHQ-9: 9.0), and 6.2% had a severe disorder (PHQ-9: 15.1).¹⁵ In another cross-sectional study, a survey of 1257 health care workers in 34 hospitals in many regions of China found that half of the respondents had mild depression and one-third had insomnia. About 14% of doctors and nearly 16% of nurses showed moderate or severe depressive symptoms, among which nurses, women, front-line staff, and Wuhan staff showed more serious symptoms of depression, anxiety, insomnia, and distress.¹⁶ Recent studies have reported that in the context of the current COVID-19 pandemic, it has brought not only major challenges to health systems around the world but also a lot of mental stress and work pressure to medical workers. It is possible to promote the occurrence of mental disorders such as anxiety, depression, or trauma disorders of medical workers and summarize the methods to alleviate the psychological pressure of medical workers.^{17,18} Other studies have shown that medical workers show more fear, anxiety, and depression than administrators. The probability of anxiety and depression of front-line medical staff in respiratory departments, emergency departments, intensive care units, and infection departments is twice as high as that of nonclinical medical staff.¹⁹ Similarly, stress, anxiety, depression, and overall stress levels were detected among health professionals in the context of previous

severe acute respiratory syndrome outbreaks.^{20–22} During a 3-year follow-up after the outbreak of severe acute respiratory syndrome, 23% of health care workers reported moderate or more severe depressive symptoms.²³ To alleviate the psychological pressure on front-line medical staff and infected patients in Wuhan and other areas, the People's Hospital of Wuhan University and Wuhan Mental Health Center have set up psychological intervention teams composed of 4 groups of medical staff. The psychological intervention team includes the psychosocial response team (composed of hospital managers and press officials to coordinate the work and publicity tasks of the management group), the psychological intervention technical support group (composed of senior psychological intervention experts responsible for formulating psychological intervention materials and rules and providing technical guidance and supervision), psychiatrist-based psychological intervention medical team (participating in clinical psychological intervention for medical staff and patients), and the psychological assistance hotline team (made up of volunteers trained in psychological assistance to deal with the 2019-nCoV pandemic) who provide telephone guidance and help deal with mental health problems. Hundreds of medical staff have responded well to these interventions, and their services are expanding to more people and hospitals.²⁴ In addition, the government should provide basic materials and supplies, security, and work subsidies for front-line medical staff and their families. Adjusting sleep disorders of medical staff and establishing and encouraging communication between medical staff and their families are of great help to alleviate their psychological pressure.²⁵

The Psychological Influence of COVID-19 on the Patients With Mental Disorders

In addition to medical workers and the general public, mental health services for patients with mental disorders are also facing great challenges. According to a report in China Newsweek on February 8, 2020, at least 50 inpatients with mental disorders and 30 mental health professionals in a large mental hospital in Wuhan, Hubei Province, China, were diagnosed with COVID-19.²⁶ On February 18, 2020, China's National Health Commission reported that 323 patients with severe mental disorders were diagnosed as COVID-19, and 43 were suspected of suffering from COVID-19,

mainly in Wuhan. The first COVID-19 outbreak in South Korea occurred in a local psychiatric ward. One hundred and two of the 103 patients in the psychiatric ward were infected.²⁷ The Italian Society of Epidemiological Psychiatry urgently issued guidelines for emergency operation of COVID-19 (patients), saying that providing services to people with mental illness is a public health responsibility.²⁸

A cross-sectional epidemiological study showed that the weighted prevalence rate of mental disorders (excluding dementia) in China was 9.3% (95% confidence interval: 5.4–13.3) in the 12 months before the interview and 16.6% (13.0–20.2) in the lifetime before the interview.²⁹ And most mental health departments are not ready to deal with the current pandemic.^{30,31} Many psychiatric patients need continuous treatment in the outpatient clinic, and many patients need to repeatedly go to the inpatient ward for long-term hospitalization. However, strict isolation measures reduce the availability of timely psychological intervention, and routine psychological counseling is difficult to carry out in the current situation.³² For example, most general hospitals in Hubei Province and other areas in China have reduced the number of outpatients, specialist hospitals have reduced the size of general hospitalizations, and public transport has been disrupted in many areas, which has prevented psychiatric patients from getting treatment.^{31,33} Although the risk of COVID-19 transmission among individuals with mental illness is not clear, because of mental disorders, cognitive impairment, poor self-control and self-care, and lack of insight, and unhealthy lifestyles related to mental illness, they may not be able to take infection-control measures to protect themselves, so we can reasonably assume that this risk is higher than that in the general population. For example, studies have shown that such people are more likely to suffer from respiratory diseases.^{34–36} Second, patients with mental disorders are more likely to be affected by fear, anxiety, and depression caused by the COVID-19 pandemic, resulting in relapse or deterioration of existing mental health status.³⁷ In China, most psychiatrists do not receive adequate training in the prevention and treatment of infectious diseases and lack of mental hospitals, which also limits their clinical ability to control the potential spread of COVID-19 in mental hospitals. People with mental illness also face social exclusion and stigma, which when combined with the stigma shown by COVID-positive people may lead to double

TABLE 3. Suggestions on Technological Implementation During COVID-19

Technological implementation	Advantages	Limitation
Community mental health service system	Reduce the risk of infection Regular maintenance treatment is provided Reduce the pressure on general hospitals Increase the availability of psychological intervention Tailor-made the latest and accurate information and treatment plan about COVID-19	The working procedure is complicated Heavy workload Lack of standardized psychiatric or clinical psychological training. There is a shortage of psychiatrists, psychiatric nurses, and psychotherapists.
Online mental health service	Reduce the risk of infection High feasibility	Low utilization Unbalanced development of online mental health services Effectiveness has not been evaluated The quality of mental health service is difficult to be guaranteed
Telemedicine	Reduce the risk of infection High security	Most medical institutions are not equipped with telemedicine Lack of payment and regulatory structures, state permits, hospital-to-hospital certification, and program implementation
Structured letter therapy	Reduce the risk of infection	Inability to deal with sudden psychological crises, serious psychological and mental problems, and suffering from other underlying diseases

stigma.³⁸ The first case of COVID-19 diagnosed in Wuhan Mental Health Center was a patient with Alzheimer’s disease. This patient may have been infected by foreign objects brought by his family.³⁰ People with Alzheimer’s disease are mostly elderly people who have difficulties in obtaining accurate information about the COVID-19 pandemic and remembering protective procedures (such as wearing masks), and lack of adequate self-quarantine measures may expose them to a higher risk of infection.³⁹ In addition, we also need to pay attention to the elderly because they are vulnerable to this pandemic and receive less attention.⁴⁰ Especially some elderly people with physical and mental diseases are more likely to be infected.⁴¹

Community Mental Health Service System, Online Mental Health Service, Telemedicine, and Other Measures for Patients With Mental Disorders Play a Vital Role During the Pandemic.

Community psychological intervention and support may have a certain effect on reducing the symptoms of posttraumatic stress disorder, depression, and anxiety in these stress events.⁴² A Chinese health care model called the severe Mental Disorders Management and Treatment Plan is one of the largest community mental health projects in the world (Table 3). To establish community-based mental health services nationwide, the project integrates the resources of mental hospitals

with existing community mental health services and trains mental health professionals in the development of personal service plans. Over the past decade, the project has provided regular maintenance treatment for millions of community patients with severe mental disorders.⁴³ In addition, some articles suggest that the implementation of the following strategies in community-based health care services can better reduce the impact of the pandemic on patients with severe mental illness: (1) Considering the poverty, unstable living conditions, and cognitive impairment of patients with severe mental illness, they need to be tailored to the latest and accurate information about the pandemic; (2) Funds and policies support them to maintain healthy habits, including diet and physical activity, as well as self-management of chronic mental and physical health; (3) When making treatment plans for them, it is necessary to take into account the effects of anxiety and depression symptoms that are common during a pandemic; (4) Patients with infected mental disorders may face double stigma related to their infection and their mental health status.⁴⁴ However, the outbreak of the pandemic found that there are still many aspects of the community mental health service system that need to be strengthened. For example, owing to complicated work procedures, heavy workload, and the lack of standardized psychiatric or clinical psychological training, community health service staff can not give patients professional psychological

counseling. In addition, the number of licensed psychiatrists, psychiatric nurses, and psychotherapists is still insufficient to meet the needs of patients with mental disorders.⁵ Therefore, to address these challenges, future reform of the community mental health system is necessary to rebalance the system by reallocating resources from hospital-centric services to community-based primary health care services and promote community supportive psychological interventions globally.⁴⁵ In 2013, the World Health Assembly approved an action plan, the WHO Mental Health Action Plan for 2013–2020, with a key recommendation to transfer health services from institutions to communities.

With the development of artificial intelligence technology in the clinical environment, accelerating the construction of online mental health services (Table 3), the development of Internet technology, and the development of telemedicine are all valuable for the provision of mental health services during the pandemic.³³ During the pandemic, online mental health services, such as hotlines and mobile application platforms, were also widely used in China.⁴⁶ For example, the Chinese Psychological Association has also issued the work Guide to the Psychological Assistance Hotline during the COVID-19 outbreak⁴⁷ and the Network Psychological Counseling work Guide during the special pandemic period⁴⁸ to provide professional assistance for network psychological services. The study suggests that a nationwide collaborative network of psychiatrists, psychotherapists, researchers, and community volunteers combine Internet technology with the whole process of psychological intervention. It can better serve children's mental health.⁴⁹ Online mental health service has been established as a basic measure to solve the mental health needs in the pandemic because of its high feasibility, but there are also the following problems: (1) low utilization of online mental health services (As low as 3.7% of participants have used mental health services since the outbreak of COVID-19.); (2) unbalanced development of online mental health services may widen the mental health gap in China (Individuals at the lower socioeconomic status have lower access to online mental health services.); (3) the effectiveness of online mental health interventions in low- and middle-income countries has not been evaluated; (4) the quality of online mental health services in low-income and most middle-income countries is difficult to be guaranteed.⁵⁰

The rapid spread of the virus between people hinders traditional face-to-face psychological intervention. By contrast, it is safe to provide telemedicine services (through video conferencing, e-mail, phone, or smartphone applications). Telemedicine can classify patients before they arrive in the emergency room and can carry on the effective screening of the patient (Table 3). This is both patient-centric and conducive to self-isolation and protecting patients, clinicians, and communities from infection.⁵¹ A team of psychiatrists in Paris successfully carried out teletherapy and telecommuting. And patients, psychiatrists, and psychologists have accepted this mode of treatment very well. Even the team may permanently implement this way of working.⁵² In Siena, Italy, psychiatrists have converted more than 90% of outpatient clinics' mode of consultation to telemedicine. Most patients use the telephone for consultation. For patients with apps such as WhatsApp (Facebook, California) or FaceTime, they consult via video calls, both of which work well. For the most seriously ill patients, they continue to conduct face-to-face visits.⁵³ In addition, many studies have shown that telemedicine services are effective in providing mental health services in cases of depression, anxiety disorders, and posttraumatic stress disorder.^{54–56} During the COVID-19 global pandemic, the United States Department of Health and Human Services also relaxed many rules and regulations on telemedicine.⁵⁷ A study shows that telemedicine may play an important role in establishing national strategic planning and coordination of psychological first aid for major disasters.² However, telemedicine currently has the following problems: Most medical institutions are not equipped with telemedicine, payment and regulatory structures, state permits, hospital-to-hospital certification, and program implementation.⁵¹ Other studies have shown that structured letter therapy is also a feasible method of psychological intervention during a pandemic, but it needs to be further improved in dealing with sudden psychological crises, serious psychological and mental problems, and suffering from other underlying diseases.³²

CONCLUSIONS

At present, COVID-19 is a global pandemic, bringing physical, mental, and psychological harm to people all over the world, as well as huge losses in

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property. Special attention should be paid to the mental health of the general public, medical staff, and patients with mental disorders. Under the strict epidemic prevention and control policy, community mental health service system, online mental health service, telemedicine, and other measures may play an important role in this pandemic because of their advantages such as reducing the risk of infection. However, there are also some restrictions on these measures, which is exactly what we need to improve in the future. The development of telemedicine technology is closely related to the progress of communication and information technology, but it is still restricted by technology, law, and cognition in

China. Telemedicine is widely used in developed countries, and it has been proved in many literatures that telemedicine plays an important role in the field of mental health services. This review can provide support and reference for other countries to implement psychological intervention.

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References

1. Li W, Zhang J, Xiao S, Sun L: Characteristics of health worker fatality in China during the outbreak of COVID-19 infection. *J Infect* 2020; 81(1):147–178
2. Wang C, Horby PW, Hayden FG, Gao GF: A novel coronavirus outbreak of global health concern. *Lancet* 2020; 395:470–473
3. Kelvin DJ, Rubino S: Fear of the novel coronavirus. *J Infect Dev Ctries* 2020; 14:1–2
4. Fiorillo A, Gorwood P: The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. *Eur Psychiatry* 2020; 63:e32
5. Duan L, Zhu G: Psychological interventions for people affected by the COVID-19 epidemic. *Lancet Psychiatry* 2020; 7:300–302
6. Wang C, Pan R, Wan X, et al: Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health* 2020; 17
7. Wang Y, Di Y, Ye J, Wei W: Study on the public psychological states and its related factors during the outbreak of coronavirus disease 2019 (COVID-19) in some regions of China. *Psychol Health Med* 2020:1–10
8. Usher K, Durkin J, Bhullar N: The COVID-19 pandemic and mental health impacts. *Int J Ment Health Nurs* 2020; 29:315–318
9. Banerjee D: The COVID-19 outbreak: crucial role the psychiatrists can play. *Asian J Psychiatr* 2020; 50:102014
10. Chew QH, Wei KC, Vasoo S, Chua HC, Sim K: Narrative synthesis of psychological and coping responses towards emerging infectious disease outbreaks in the general population: practical considerations for the COVID-19 pandemic. *Singapore Med J* 2020; 61(7):350–356
11. Zhong BL, Luo W, Li HM, et al: Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *Int J Biol Sci* 2020; 16:1745–1752
12. Xiang YT, Jin Y, Wang Y, et al: Tribute to health workers in China: a group of respectable population during the outbreak of the COVID-19. *Int J Biol Sci* 2020; 16:1739–1740
13. Cao J, Wei J, Zhu H, et al: A study of basic needs and psychological wellbeing of medical workers in the fever clinic of a tertiary general hospital in Beijing during the COVID-19 outbreak. *Psychother Psychosom* 2020:1–3
14. Qiu J, Shen B, Zhao M, et al: A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *Gen Psychiatr* 2020; 33:e100213
15. Kang L, Ma S, Chen M, et al: Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: a cross-sectional study. *Brain Behav Immun* 2020; 87:11–17
16. Lai J, Ma S, Wang Y, et al: Factors associated with mental health outcomes among health care workers exposed to Coronavirus disease 2019. *JAMA Netw Open* 2020; 3:e203976
17. Xiang Y-T, Yang Y, Li W, et al: Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiatry* 2020; 7:228–229
18. Bao Y, Sun Y, Meng S, Shi J, Lu L: 2019-nCoV epidemic: address mental health care to empower society. *Lancet* 2020; 395:e37–e38
19. Lu W, Wang H, Lin Y, Li L: Psychological status of medical workforce during the COVID-19 pandemic: a cross-sectional study. *Psychiatry Res* 2020; 288:112936
20. Wu P, Fang Y, Guan Z, et al: The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. *Can J Psychiatry* 2009; 54:302–311
21. Wong TW, Yau JKY, Chan CLW, et al: The psychological impact of severe acute respiratory syndrome outbreak on

- healthcare workers in emergency departments and how they cope. *Eur J Emerg Med* 2005; 12:13–18
22. Maunder R, Hunter J, Vincent L, et al: The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *CMAJ* 2003; 168:1245–1251
 23. Liu X, Kakade M, Fuller CJ, et al: Depression after exposure to stressful events: lessons learned from the severe acute respiratory syndrome epidemic. *Compr Psychiatry* 2012; 53:15–23
 24. Kang L, Li Y, Hu S, et al: The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *Lancet Psychiatry* 2020; 7:e14
 25. Huang J, Liu F, Teng Z, et al: Care for the psychological status of frontline medical staff fighting against COVID-19. *Clin Infect Dis* 2020:ciaa385
 26. China News Weekly: Hospital-Acquired Infection in Wuhan Mental Health Center: Around 80 Medical Staff and Patients Were Diagnosed With 2019-nCoV Pneumonia (in Chinese). Available from: <https://news.sina.com.cn/c/2020-02-08/doc-iimxste9892538.shtml>; 2020
 27. Kim SW, Su K P: Using psychoneuroimmunity against COVID-19. *Brain Behav Immun* 2020; 87:4–5
 28. Starace F, Ferrara M: COVID-19 disease emergency operational instructions for mental health departments issued by the Italian Society of Epidemiological Psychiatry. *Epidemiol Psychiatr Sci* 2020; 29:e116
 29. Huang Y, Wang Y, Wang H, et al: Prevalence of mental disorders in China: a cross-sectional epidemiological study. *Lancet Psychiatry* 2019; 6:211–224
 30. Zhu Y, Chen L, Ji H, et al: The risk and prevention of novel coronavirus pneumonia infections among inpatients in psychiatric hospitals. *Neurosci Bull* 2020; 36:299–302
 31. Yang Y, Li W, Zhang Q, Zhang L, Cheung T, Xiang Y-T: Mental health services for older adults in China during the COVID-19 outbreak. *Lancet Psychiatry* 2020; 7:e19
 32. Xiao C: A novel approach of consultation on 2019 novel coronavirus (COVID-19)-related psychological and mental problems: structured letter therapy. *Psychiatry Investig* 2020; 17:175–176
 33. Cui LB, Wang XH, Wang HN: Challenges facing coronavirus disease 2019: psychiatric services for patients with mental disorders. *Psychiatry Clin Neurosci* 2020; 74(6):371–372
 34. Joukamaa M, Heliövaara M, Knekt P, et al: Mental disorders and cause-specific mortality. *Br J Psychiatry* 2001; 179:498–502
 35. Fukuta Y, Muder RR: Infections in psychiatric facilities, with an emphasis on outbreaks. *Infect Control Hosp Epidemiol* 2015; 34:80–88
 36. Wang XH, Yu A, Zhu X, Yin H, Cui LB: Cardiopulmonary comorbidity, radiomics and machine learning, and therapeutic regimens for a cerebral fMRI predictor study in psychotic disorders. *Neurosci Bull* 2019; 35:955–957
 37. Yao H, Chen J-H, Xu Y-F: Patients with mental health disorders in the COVID-19 epidemic. *Lancet Psychiatry* 2020; 7:e21
 38. Kaufman KR, Petkova E, Bhui KS, Schulze TG: A global needs assessment in times of a global crisis: world psychiatry response to the COVID-19 pandemic. *BJPsych Open* 2020; 6:e48
 39. Wang H, Li T, Barbarino P, et al: Dementia care during COVID-19. *Lancet* 2020; 395:1190–1191
 40. Lloyd-Sherlock PG, Kalache A, McKee M, et al: WHO must prioritise the needs of older people in its response to the covid-19 pandemic. *BMJ* 2020; 368:m1164
 41. Lobo-Escolar A, Saz P, Marcos G, et al: Somatic and psychiatric comorbidity in the general elderly population: results from the ZARADEMP Project. *J Psychosom Res* 2008; 65:347–355
 42. Purgato M, Gastaldon C, Papola D, et al: Psychological therapies for the treatment of mental disorders in low- and middle-income countries affected by humanitarian crises. *Cochrane Database Syst Rev* 2018; 7:CD011849
 43. Ng CH, Ma H, Yu X, et al: China Australia-Hong Kong tripartite community mental health training program. *Asia Pac Psychiatry* 2009; 1:90–97
 44. Druss BG: Addressing the COVID-19 pandemic in populations with serious mental illness. *JAMA Psychiatry* 2020; 77(9):891–892
 45. Torales J, O'Higgins M, Castaldelli-Maia JM, Ventriglio A: The outbreak of COVID-19 coronavirus and its impact on global mental health. *Int J Soc Psychiatry* 2020; 20764020915212
 46. Liu S, Yang L, Zhang C, et al: Online mental health services in China during the COVID-19 outbreak. *Lancet Psychiatry* 2020; 7:e17–e18
 47. Chinese Psychological Society: Work Guideline for the Psychological Assistance Hotline During the COVID-19 Outbreak (draft) (in Chinese). Available from: <https://mp.weixin.qq.com/s/VIH5Bc0we6qG21neDzdOyQ>. [Accessed 16 February 2020]
 48. Chinese Psychological Society: Guidelines for Internet Psychological Counseling During Special Epidemic Period(1) (in Chinese). Available from: <https://mp.weixin.qq.com/s/mA5m39z2sHILhrbwloz3gw>. [Accessed 16 February 2020]
 49. Liu JJ, Bao Y, Huang X, Shi J, Lu L: Mental health considerations for children quarantined because of COVID-19. *Lancet Child Adolesc Health* 2020; 4:347–349
 50. Yao H, Chen JH, Xu YF: Rethinking online mental health services in China during the COVID-19 epidemic. *Asian J Psychiatr* 2020; 50:102015
 51. Hollander JE, Carr BG: Virtually perfect? Telemedicine for COVID-19. *N Engl J Med* 2020; 382:1679–1681
 52. Corruble E: A viewpoint from Paris on the COVID-19 pandemic: a necessary Turn to telepsychiatry. *J Clin Psychiatry* 2020; 81
 53. Fagiolini A, Cuomo A, Frank E: COVID-19 diary From a psychiatry department in Italy. *J Clin Psychiatry* 2020; 81
 54. Turgoose D, Ashwick R, Murphy D: Systematic review of lessons learned from delivering tele-therapy to veterans with post-traumatic stress disorder. *J Telemed Telecare* 2018; 24:575–585

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55. Fairchild RM, Ferng-Kuo SF, Rahmouni H, Hardesty D: Telehealth increases access to care for children dealing with suicidality, depression, and anxiety in rural emergency departments. *Telemed J E Health* 2020; 26(11)
56. Garcia-Lizana F, Munoz-Mayorga I: Telemedicine for depression: a systematic review. *Perspect Psychiatr Care* 2010; 46:119–126
57. Calton B, Abedini N, Fratkin M: Telemedicine in the time of coronavirus. *J Pain Symptom Manage* 2020; 60(1):e12–e14