

Considerations on the mental health impact of the novel coronavirus outbreak (COVID-19)

Julio Torales¹, Marcelo O'Higgins¹, Carlos Miguel Rios-González^{2,3}, Iván Barrios¹, Oscar García-Franco¹, João Mauricio Castaldelli-Maia^{4,5}, Antonio Ventriglio⁶

1. Department of Psychiatry, School of Medical Sciences, National University of Asunción, Asunción, Paraguay
2. School of Medical Sciences, National University of Caaguazú, Coronel Oviedo, Paraguay.
3. National Institute of Health, Ministry of Public Health and Social Welfare, Asunción, Paraguay.
4. Department of Neuroscience, Medical School, Fundação do ABC, Santo André, SP, Brazil
5. Department of Psychiatry, Medical School, University of São Paulo, São Paulo, SP, Brazil
6. Department of Clinical and Experimental Medicine, University of Foggia, Foggia, Italy

Julio Torales. ORCID: <https://orcid.org/0000-0003-3277-7036>

Marcelo O'Higgins

Iván Barrios. ORCID: <https://orcid.org/0000-0002-6843-7685>

Oscar García-Franco

João Mauricio Castaldelli-Maia. ORCID: <https://orcid.org/0000-0001-9621-2291>

Antonio Ventriglio. ORCID: <https://orcid.org/0000-0002-3934-7007>

Correspondence:

Carlos Miguel Rios-González, carlosmiguel_rios@live.com

Abstract:

The current outbreak of a new strain of coronavirus in Wuhan, People's Republic of China, has made an impact on the global population. Resources are delivered in order to fight the spreading of the virus; however, the mental health impact of the epidemic must be considered in order to address the overall situation. This outbreak is causing mental health problems such as stress, anxiety, depressive symptoms, insomnia, denial, anger and fear. These mental health problems affect the patients and the general population and also have impact on the attention, understanding and decision-making capacity of medical staff, which could hinder the fight against COVID-19, but they could also have a lasting effect on their overall well-being.

Keywords: Outbreak; Coronavirus; Mental Health; COVID-19.

Introduction

In the last few weeks there have been circulating a tremendous amount of information about the outbreak of a new strand of coronavirus in the People's Republic of China (PRC). This information was extremely diverse and was coming from different origins: from freelance journalist to well-known epidemiologists, every one of them having something to share about the epidemic. Nevertheless, one important aspect of this outbreak has been neglected and that is the mental health impact it has on the patients, the medical team and general society.

The city of Wuhan in the PRC is the center of global attention due to an outbreak of a febrile respiratory disease due to a new strain of coronavirus (1). In December 2019, there was an outbreak of pneumonia of unknown cause in Wuhan, Hubei Province in China, with an epidemiological link with the wholesale seafood market in Huanan (2).

The Chinese health authorities have taken rapid public health measures, including intensive surveillance, epidemiological investigations and the closure of the market on January 1, 2020 (3). Severe acute respiratory syndrome due to coronavirus (SARS-CoV), Middle Eastern respiratory syndrome due to coronavirus (MERS-CoV), avian influenza, and other common respiratory viruses (4) were ruled out.

Chinese scientists were able to isolate a new coronavirus (SARS-CoV-2, initially named 2019-nCoV) from a patient in a short time on January 7, 2020 and perform the genome sequencing of this virus (5). The genetic sequence of SARS-CoV-2 was made available to the World Health Organization (WHO) on January 12, 2020 and this has made it easier for laboratories in different countries to produce specific PCR diagnostic tests to detect the new infection (6). SARS-CoV-2 was a previously unknown betacoronavirus. Different from both MERS-CoV and SARS-CoV, SARS-CoV-2 is the seventh member of the family of coronaviruses that infect humans (7). The recent outbreak of viral pneumonia groups due to the SARS-CoV-2 in the Wuhan market poses significant threats to international health and may be related to the sale of bush meat derived from wild or captive sources in the seafood market (8).

The WHO named COVID-19 to this new respiratory disease. Most of the infected patients were men, less than half had underlying diseases including diabetes, hypertension, and cardiovascular disease. Common symptoms at the onset of illness were fever, cough, and myalgia or fatigue. Less common symptoms were sputum production, headache, haemoptysis, and diarrhoea. Complications included acute respiratory distress syndrome, acute cardiac injury and secondary infection (9–11).

However, many questions remain about the new coronavirus, although it seems to be transmitted to humans through animals, it is necessary to identify specific animals and other reservoirs, the route of transmission, the incubation period and the characteristics of the susceptible population and survival rates. The rapid identification and containment of a new coronavirus virus in a short period of time is a tremendous effort being made by China's public health authorities and reflects the growing global capacity to detect, identify, define and contain new outbreaks (6).

Implications and consequences for mental health

One way to consider the impact of this epidemic in the psychological areas can be observed by looking into the past experiences dealing with coronavirus infections. During the Korean MERS-CoV outbreak in 2015 there were patient groups that must undergo hemodialysis treatment in an isolated environment. In a study with these patients, they showed a decreased value in their hematocrit, calcium and phosphorus levels after two weeks of isolation. The levels of circulating cell-free genomic DNA (ccf-gDNA) and circulating cell-free mitochondria DNA (ccf-mtDNA), which are indicators of the level of stress a patient is having, were significantly delayed in their normalization in hemodialyzed patients compared with the response in the control group. This implies that medical isolation during the Korean MERS outbreak caused extreme stress in hemodialyzed patients (12). This should be noted considering that the Chinese government is undergoing one of the biggest lockdowns in public health history (13) and security measures on the ground that are resulting in near isolation conditions of great segments of the population. This kind of measures is often seen after other kinds of disasters such as terrorist attacks and there have been previous experiences with increases in the manifestation of different kinds of mental health issues during these events. For example, there was a 3.4-fold increase in incidence of functional neurological symptom

disorder after the city-wide lockdown following the Boston Marathon bombings. Care providers must be aware of functional neurological symptom disorders after stressful community events particularly in individuals with prior psychiatric diagnoses (14).

The prevention of mental health problems even six months after release from isolation might be done by providing mental health support to individuals with prior vulnerable mental health status, providing accurate information as well as appropriate supplies for the patients, including food, clothes, and accommodation (15).

If the medical staff is on consideration, their mental health wellbeing should be considered a priority. In the 2003 SARS-CoV outbreak in Singapore, 27% of healthcare workers reported psychiatric symptoms (16). Medical staff that performed MERS-related tasks showed the highest risk for post-traumatic stress disorder symptoms after the Korean outbreak of 2015. The risk increased even after home quarantine. The use of early and continuous psychiatric intervention was suggested by a mental health team that intervened during that outbreak, and that this is needed in the occurrence of high mortality infectious disease outbreaks (17). During the Ebola outbreaks in Sierra Leone in 2014 and in the Democratic Republic of the Congo in 2018, medical staff reported high levels of anxiety and the impact of stigma among those who were in direct contact with infected patients (18).

During the 2003 SARS-CoV outbreak in Taiwan, most of the staff in the emergency department and in the psychiatric ward had post-traumatic stress disorder (PTSD). Emergency department staff had more severe PTSD symptoms than staff in the psychiatric ward (16). The main differences between these two groups were the feeling of interpersonal isolation and the fear that they would transmit the virus to their relatives. An important issue was the lack of proper ways of communication between the medical team. Medical staff stated that the use of heavy protective suits and N95 masks make communication between staff very difficult (16). During this incident good psychological adaptation was reported among health personnel who have access to well-equipped and structured environment. During the 2015 Korean MERS-CoV outbreak the influences of stigma and hardness had a direct impact on mental health on health personnel working on public hospitals (19).

In the fight against COVID-19, medical workers in Wuhan have faced enormous pressure, including a high risk of infection and inadequate protection against contamination, overwork, frustration, discrimination, isolation, patients with negative emotions, a lack of contact with their families and exhaustion (20). The serious situation is causing mental health problems such as stress, anxiety, depressive symptoms, insomnia, denial, anger and fear (21). These mental health problems not only affect the attention, understanding and decision-making capacity of medical workers, which could hinder the fight against COVID-19, but they could also have a lasting effect on their overall well-being (20).

Considering the general population, in the occurrence of other disasters or episodes of civil unrest there has been recorded increases of mental health problems following those events. The prevalence in the general population of PTSD ranged from 4% to 41%, the prevalence of major depression increased by 7% after these situations. There are some factors that increase the risk of developing these conditions in the occurrence of these situations that are: female sex, lower socioeconomic status, interpersonal conflicts, frequent social media use and lower resilience and social support (22).

In the case of information, during crisis events, people often seek out event-related information to stay informed of what is happening. However, when information from official channels is lacking or disseminated irregularly, people may be at risk for exposure to rumors that fill the information void. In a study of an University lockdown after a shooter incident in the United States, those who indicated receiving conflicting information about the lockdown reported greater acute stress (23). Those who reported direct contact with close others via phone text

messages and used social media for critical updates during the lockdown were exposed to more conflicting information. Higher acute stress was reported by heavy social media users who trusted social media for critical updates. This study highlights the importance of releasing substantive updates at regular intervals during a crisis event and monitoring social media for rumors to mitigate rumor exposure and distress (23). Fear of the unknown increases the anxiety level in both healthy people and those with pre-existing health mentally, this fear public manifests as discrimination, stigmatization and scapegoat of population specific ones, authorities and scientists (24).

Although studies related to mental health in patients with COVID-19 are scarce, several authors highlight that it is possible to predict more or less the expected consequences in mental and physical health of the most vulnerable parts of the population (20).

About the possible response to these situations, psychological therapies could have large or moderate effects in reducing PTSD, depressive, and anxiety symptoms in adults who are subject of these kinds of crisis. More research evidence is needed, particularly in the impact of these therapies in children and adolescents over longer periods of follow-up (25).

Firstly, people's emotional responses are likely to include extreme fear and uncertainty, and negative social behaviors will often be driven by fear and distorted perceptions of risk; and experience can evolve to include a wide range of issues of public mental health, reactions of anxiety (insomnia, anger, fear end to the disease even in non exposes), health risk behaviors (increased use of alcohol and tobacco, social isolation), mental health disorders (PTSD, anxiety disorders, depression, somatization), and decreased perceived health, that is why it is essential that mental health professionals provide support for those exposed and for those who provide care.

Secondly, special efforts should be direct to vulnerable populations that includes: 1) Infected and sick patients, their families and colleagues, 2) Individuals and their relationships with the community, 3) Individuals with preexisting medical conditions (both physical and/or mental), 4) Healthcare providers, especially nurses and doctors who work directly with sick or quarantined people. Finally, the degree of psychological stress that health professionals and others could face and the rights of vulnerable populations should serve as references when making decisions in these times of crisis.

Conclusion

The current model of intense focus on the transmission of the disease can disregard the impact of trauma and the psychosocial consequences of the outbreak in the individuals and in the general population. The emergence of mental health problems related to this kind of disasters could evolve in long-lasting health problems and stigma. There should be an integrated response in order to identify and to mitigate the trauma that is involved in this situation. The measures that are often taken by health organizations during this kind of outbreak could be psychosocial stressors, particularly the use of isolation, quarantine and even the use of biohazard suits by health personnel.

With the emergence of new strains of viruses and other kinds of health-related emergencies worldwide, a comprehensive and inclusive response should be deployed by the health care providers on the ground. This response must include the consideration of the mental health impact on patients, the health care personnel and society in general

References

1. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus – Infected Pneumonia. N Engl J Med [Internet]. 2020; Available from: <https://dx.doi.org/10.1056/NEJMoa2001316>

2. Chen Y, Liu Q, Guo D. Emerging coronaviruses: Genome structure, replication, and pathogenesis. *J Med Virol.* 2020;92(4):418–23.
3. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *The Lancet.* 2020;395(10223):507–13.
4. CDC. Coronavirus Disease 2019 (COVID-19) [Internet]. Centers for Disease Control and Prevention. 2020 [cited 2020 Feb 24]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/index.html>
5. Lu H, Stratton CW, Tang Y. Outbreak of pneumonia of unknown etiology in Wuhan, China: The mystery and the miracle. *J Med Virol.* 2020;92(4):401–2.
6. Corman VM, Landt O, Kaiser M, Molenkamp R, Meijer A, Chu DK, et al. Detection of 2019 novel coronavirus (2019-nCoV) by real-time RT-PCR. *Eurosurveillance.* 2020;25(3):pii=2000045.
7. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A Novel Coronavirus from Patients with Pneumonia in China, 2019. *N Engl J Med.* 2020;382(8):727–33.
8. Cui J, Li F, Shi Z-L. Origin and evolution of pathogenic coronaviruses. *Nat Rev Microbiol.* 2019;17(3):181–92.
9. Su S, Wong G, Shi W, Liu J, Lai ACK, Zhou J, et al. Epidemiology, Genetic Recombination, and Pathogenesis of Coronaviruses. *Trends Microbiol.* 2016;24(6):490–502.
10. Weiss SR, Leibowitz JL. Coronavirus Pathogenesis. In: *Advances in Virus Research* [Internet]. Elsevier; 2011 [cited 2020 Feb 24]. p. 85–164. Available from: <https://linkinghub.elsevier.com/retrieve/pii/B9780123858856000092>
11. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet.* 2020;395(10223):497–506.
12. Kim YG, Moon H, Kim S-Y, Lee Y-H, Jeong D-W, Kim K, et al. Inevitable isolation and the change of stress markers in hemodialysis patients during the 2015 MERS-CoV outbreak in Korea. *Sci Rep.* 2019 Apr 5;9(1):5676.
13. Guerriero RM, Pier DB, Gusmão CM de, Bernson-Leung ME, Maski KP, Urion DK, et al. Increased Pediatric Functional Neurological Symptom Disorders After the Boston Marathon Bombings: A Case Series. *Pediatr Neurol.* 2014;51(5):619–23.
14. Jeong H, Yim HW, Song Y-J, Ki M, Min J-A, Cho J, et al. Mental health status of people isolated due to Middle East Respiratory Syndrome. *Epidemiol Health.* 2016;38:e2016048.
15. Lin C-Y, Peng Y-C, Wu Y-H, Chang J, Chan C-H, Yang D-Y. The psychological effect of severe acute respiratory syndrome on emergency department staff. *Emerg Med J.* 2007;24(1):12–7.
16. Lee SM, Kang WS, Cho A-R, Kim T, Park JK. Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. *Compr Psychiatry.* 2018;87:123–7.

17. Shantanu S, Kearsley S. How Should Clinicians Integrate Mental Health Into Epidemic Responses? *AMA J Ethics*. 2020;22(1):E10-15.
18. Park J-S, Lee E-H, Park N-R, Choi YH. Mental Health of Nurses Working at a Government-designated Hospital During a MERS-CoV Outbreak: A Cross-sectional Study. *Arch Psychiatr Nurs*. 2018;32(1):2–6.
19. Shigemura J, Ursano RJ, Morganstein JC, Kurosawa M, Benedek DM. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry Clin Neurosci* [Internet]. 2020 [cited 2020 Feb 24]; Available from: <https://dx.doi.org/10.1111/pcn.12988>
20. Kang L, Li Y, Hu S, Chen M, Yang C, Yang B. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *The Lancet Psychiatry* [Internet]. 2020 Feb; Available from: <https://linkinghub.elsevier.com/retrieve/pii/S221503662030047X>
21. Jones NM, Thompson RR, Dunkel Schetter C, Silver RC. Distress and rumor exposure on social media during a campus lockdown. *Proc Natl Acad Sci*. 2017;114(44):11663–8.
22. Mowbray H. In Beijing, coronavirus 2019-nCoV has created a siege mentality. *BMJ* [Internet]. 2020 [cited 2020 Feb 24]; Available from: <https://doi.org/10.1136/bmj.m516>
23. Purgato M, Gastaldon C, Papola D, van Ommeren M, Barbui C, Tol WA. Psychological therapies for the treatment of mental disorders in low- and middle-income countries affected by humanitarian crises. Cochrane Common Mental Disorders Group, editor. *Cochrane Database Syst Rev*. 2018;(7):CD0111849.
24. Mowbray H. In Beijing, coronavirus 2019-nCoV has created a siege mentality. *BMJ* [Internet]. 2020 Feb 7; Available from: <http://www.bmj.com/lookup/doi/10.1136/bmj.m516>
25. Purgato M, Gastaldon C, Papola D, van Ommeren M, Barbui C, Tol WA. Psychological therapies for the treatment of mental disorders in low- and middle-income countries affected by humanitarian crises. *Cochrane Database Syst Rev*. 2018 05;7:CD011849.