

Journal Pre-proofs

Using psychoneuroimmunity against COVID-19

Sung-Wan Kim, Kuan-Pin Su

PII: S0889-1591(20)30391-3
DOI: <https://doi.org/10.1016/j.bbi.2020.03.025>
Reference: YBRBI 4004

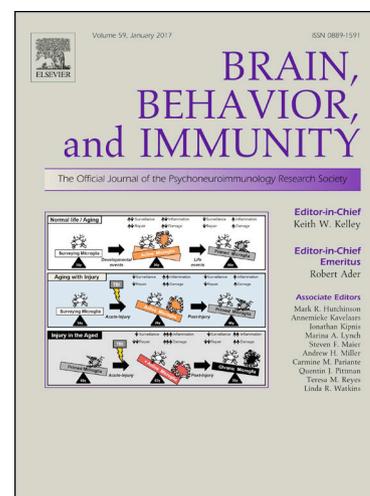
To appear in: *Brain, Behavior, and Immunity*

Received Date: 23 March 2020
Revised Date: 25 March 2020
Accepted Date: 25 March 2020

Please cite this article as: Kim, S-W., Su, K-P., Using psychoneuroimmunity against COVID-19, *Brain, Behavior, and Immunity* (2020), doi: <https://doi.org/10.1016/j.bbi.2020.03.025>

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2020 Elsevier Inc. All rights reserved.



Viewpoint

Using psychoneuroimmunity against COVID-19

Sung-Wan Kim^a, Kuan-Pin Su^{b,c*}

^a Department of Psychiatry, Chonnam National University Medical School; Mindlink, Gwangju Bukgu Community Mental Health Center; Gwangju Mental Health Commission, Gwangju, Republic of Korea

^b Department of Psychiatry & Mind-Body Interface Laboratory (MBI-Lab), China Medical University Hospital, Taichung, Taiwan

^c College of Medicine, China Medical University, Taichung, Taiwan

^d An-Nan Hospital, China Medical University, Tainan, Taiwan

***Address correspondence to:**

Prof. Kuan-Pin Su

Department of Psychiatry,
China Medical University Hospital
No. 2, Yuh-Der Road, Taichung 404, TAIWAN
Telephone number: 886-4-22062121 ext. 1076
Fax number: 886-4-22361230
E-mail: cobolsu@gmail.com

Abstract

The worldwide outbreak of coronavirus disease 2019 (COVID-19) raises concerns of widespread panic and anxiety in individuals subjected to the real or perceived threat of the virus. Compared to general populations, patients who are institutionalized in a closed unit are also very vulnerable to COVID-19 infection and complications. This crisis touched on difficult issues of not only psychiatric care and ethics, but also psychological impacts to psychiatric care givers. In this Viewpoint, we address both physical and biopsychosocial aspects of this infection, as well as the psychoneuroimmunity of preventive strategies of healthy lifestyle, regular exercise, balanced nutrition, quality sleep and a strong connection with people. Social distancing and wearing masks might help us from pathogen exposure, yet such these measures also prevent us from expressing compassion and friendliness. Therefore, all forms of psychological support should be routinely implemented not only to consider psychological resilience but also to enhance psychoneuroimmunity against COVID-19.

The World Health Organization has declared that the outbreak of coronavirus disease 2019 (COVID-19) is a worldwide pandemic, raising concerns of widespread panic and increasing anxiety in individuals subjected to the real or perceived threat of the virus. Our life style and pattern are changing drastically and the effect of the COVID-19 pandemic is infiltrating every aspect of daily routines. Unlike infections such as the flu and other agents, media coverage has highlighted COVID-19 as a unique threat, which further exaggerates the panic, stress, and the potential for hysteria.

Compared to general populations, COVID-19 is more serious and fatal for elderly people and those with underlying physical illnesses and serious mental illnesses. Patients who are institutionalized in a closed unit are also very vulnerable population. In China, National Health Center announced at 17 Feb 2020 that more than 300 patients with serious mental illness were infected with COVID-19 (<http://www.nhc.gov.cn>, 2020). In Korea, the first COVID-19 outbreak occurred at a local psychiatric ward. Out of 103 patients held in the psychiatric ward, 102 were tested positive of the deadly virus. Seven, all in their 50s and 60s, died within one week. The mortality rate was about 7%, much higher than that of 1% in the general Korean population (<http://ncov.mohw.go.kr>, 2020). This crisis touched on difficult issues of not only medical care and ethics, but also psychological impacts to psychiatric care givers.

Firstly, community-dwelling people with schizophrenia exhibit poor physical health literacy and unhealthy lifestyles (Kim et al., 2019). Patients with severe mental illness may neglect prevention of infection due to cognitive decline. The reduced regular activity and exercise due to a fear of infection as well as negative symptoms further compromise patients' physical health and immunity. More worse, the psychiatric inpatient unit is a perfect breeding ground for the virus. Therefore, patients with serious mental illnesses are very vulnerable,

both environmentally and physically, to infectious diseases.

Secondly, patients free from COVID-19 infection are also psychologically impacted by the COVID-19 pandemic. The dramatic increases of public fears and decreases in social and economic activities may trigger psychosocial sequelae. Those who are quarantined may experience depression, fear, guilt, and anger (Brooks et al., 2020). Finally, mental healthcare professionals are also at risk of mental health problems. During the time of pandemic viral infection, mental health providers could run out of energy and attention by concentrating on the treatment and prevention of COVID-19, rendering their patients more vulnerable. Such professionals aiding epidemically infected patients are at high risk of post-traumatic stress disorder (Lee et al., 2018). During pandemic upheavals, many people may require psychiatric care. For example, in Korea, about 9,000 persons were infected by COVID-19 to late March 2020 (<http://ncov.mohw.go.kr>, 2020). Patients with mild COVID-19 symptoms are isolated in special general hospitals or quarantine facilities. The Korean Psychiatry Society is offering regular free counseling for them through telephone sponsored by Korean government. Crisis intervention is being conducted for patients with acute stress reactions and suicidality along with excessive guilty and depression. Moreover, mental health care services to the general population for COVID-19 outbreak are provided by national hospitals and community mental health centers throughout the country (Park and Park, 2020). In Taiwan, the Taiwan Association Against Depression and Taiwanese Society (TAAD: <http://www.depression.org.tw/>) for Nutritional Psychiatry Research (TSNRP: www.tsnpr.org.tw/) has been launching several mental supportive programs since early February, as well as the very early official regulation about the borders, setting the price of masks, using government funds and military personnel to increase mask production, and integrating national health insurance database with the immigration and customs database to

begin the creation of big data for analytics, which has been considered an example of how a society can respond quickly to reduce anxiety and panic response (Wang *et al.*, 2020). In summary, infected patients, uninfected quarantined individuals, and medical professionals working in pandemic areas all require mental health supporting strategies. Epidemiological studies of potential long-term psychiatric sequelae in such groups are essential.

We should address both physical and biopsychosocial aspects of this infection.

Psychiatric morbidity is an important concern, as the virus may affect the central nervous system and provoke systemic inflammation (Arabi *et al.*, 2015). A recent paper reported that COVID-19 infection triggers the release of pro-inflammatory cytokines, including interleukin (IL)-1b and IL-6 (Conti *et al.*, 2020). Furthermore, psychosocial stresses imposed by societal changes in response to this epidemic viral infection may increase psychiatric problems. Over 50% of patients infected by SARS and MERS experienced psychological distress (Mark *et al.*, 2009; Kim *et al.*, 2018). Although the psychological impact of COVID-19 remains unclear, infected patients may experience anxiety, depression, guilt, stigma, and anger. The emotional problems thus may reduce immunity and compromise recovery.

COVID-19 is highly contagious because most persons lack immunity against this novel virus. Current COVID-19 therapy involves only treatment of symptoms, supportive care and prevention of complication, but no targeted medication is yet available. Therefore, the best strategy remains prevention, namely the reduction of pathogen exposure and enhancing individual immunity. Studies have shown that a healthy lifestyle, regular exercise, balanced nutrition, quality sleep and a strong connection with their families and communities are all associated with a boost to the immune system. During this outbreak, social distancing or wearing masks might help us to prevent infection, yet don't let these measures prevent us from expressing compassion and friendliness. Indeed, all forms of psychological support

should be routinely implemented not only to consider psychological resilience but also to enhance psychoneuroimmunity against COVID-19.

Acknowledgements: The authors of this work were supported by the following grants: the Basic Science Research Program through the National Research Foundation of Korea (NRF-2017R1A2B4010830); the MOST 106-2314-B-039-027-MY3, 108-2320-B-039-048, 108-2813-C-039-133-B and 108-2314-B-039-016 from the Ministry of Science and Technology, Taiwan; NHRI-EX108-10528NI from the National Health Research Institutes, Taiwan; MYRG2018-00242-ICMS from University of Macau, China; CMRC-CMA-3 from Higher Education Sprout Project by the Ministry of Education (MOE), Taiwan; CMU108-SR-106 from the China Medical University, Taichung, Taiwan; and CRS-108-048, DMR-108-216 and DMR-109-102 from the China Medical University Hospital, Taichung, Taiwan.

References

- Arabi ,Y.M., Harthi, A., Hussein, J., Bouchama, A., Johani, S., Hajeer, A.H., Saeed, B.T., Wahbi, A., Saedy, A., AlDabbagh, T., Okaili, R., Sadat, M., Balkhy, H., 2015. Severe neurologic syndrome associated with Middle East respiratory syndrome corona virus (MERS-CoV). *Infection* 43, 495-501.
- Brooks, S.K., Webster, R.K., Smith, L.E., Woodland, L., Wessely, S., Greenberg, N., Rubin, G.J.. 2020. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet* 395, 912-920.
- Conti, P., Ronconi, G., Caraffa, A., Gallenga, C.E., Ross, R., Frydas, I., Kritas, S.K., 2020. Induction of pro-inflammatory cytokines (IL-1 and IL-6) and lung inflammation by COVID-19: anti-inflammatory strategies. *J. Biol. Regul. Homeost. Agents* 34 [Epub ahead of print].
- Kim, S.W., Park, W.Y., Jhon, M., Kim, M., Lee, J.Y., Kim, S.Y., Kim, J.M., Shin, I.S., Yoon, J.S., 2019. Physical health literacy and health-related behaviors in patients with psychosis. *Clin. Psychopharmacol. Neurosci.* 17, 279-287.
- Lee, S.M., Kang, W.S., Cho, A.R., Kim, T., Park, J.K., 2018. Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. *Compr. Psychiatry* 87, 123-127.
- Mak, I.W., Chu, C.M., Pan, P.C., You, M.G., Chan, V.L., 2009. Long-term psychiatric morbidities among SARS survivors. *Gen. Hosp. Psychiatry* 31, 318-326.
- Park, S.C., Park, Y.C., 2020. Mental Health Care Measures in Response to the 2019 Novel Coronavirus Outbreak in Korea. *Psychiatry Investig.* 17, 85-86.

Wang, C. J., Ng, C. Y. & Brook, R. H. (2020). Response to COVID-19 in Taiwan: Big Data Analytics, New Technology, and Proactive Testing. JAMA.

http://ncov.mohw.go.kr/bdBoardList_Real.do?brdId=1&brdGubun=11&ncvContSeq=&contSeq=&board_id=&gubun= Accessed 21 March, 2020

<http://www.nhc.gov.cn/jkj/s3577/202002/f315a6bb2955474c8ca0b33b0c356a32.shtml>
Accessed 21 March, 2020