

Fear and uncertainty of COVID-19 pandemic bring various psychiatric problems in society

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BACKGROUND

Fear and uncertainty of COVID-19 pandemic effects will bring new mental health problems to society. This review aims to describe how fear and uncertainty of COVID-19 pandemic effects bring various psychosocial impacts and psychiatric problems. The biggest psychiatric problem during the COVID-19 pandemic is suicide. People die not because of the virus, but it was caused by their fear. Financial problems forced people to seek the easiest way of hindrance, i.e. suicide. People should believe that this COVID-19 pandemic won't last forever. It is just a temporary condition. Online mental health surveys to assess and treat any possible new/worsening psychiatric problems must be done in collaboration.

CONCLUSION

Understanding what effects on the brain and mental health will help a lot in dealing with fear, uncertainty, stress, and psychiatric disorder during this hard pandemic time. Mentally affected populations are various such as health workers, children, productive age people, and the elderly. People have to adapt to new normal if they want to be healthy.

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INTRODUCTION

The coronavirus disease 2019 (COVID-19) emerged first in Wuhan, China, in December 2019. It became pandemic in March 2020. Some provinces of China started to begin school and working activities gradually. Other countries were still struggling to combat the COVID-19 pandemic. However, serious mental disorder threat is forgotten. Mental problem is secondary health effect of COVID-19 pandemic that should be tackled perpetually. The secondary effect means that the COVID-19 doesn't only cause the infection, but it also disturbs the mental health of uninfected people. A lot of uninfected medical staff had insomnia. They were afraid of getting infected while they were taking care of COVID-19 patients. They also get worried about transmitting the infection to their family at home.¹

In Indonesia, the COVID-19 outbreak began when the case of two people from West Java province tested positive for infection after coming into contact with someone from Japan while visiting Indonesia. This person from Japan was confirmed positive for COVID-19 when he was examined in Malaysia. Furthermore, positive cases of COVID-19 infection continue to increase until now. The increase in positive cases of COVID-19 infection has caused anxiety and fear in some Indonesians and some consider COVID-19 infection as a political conspiracy both domestically and abroad.²

Between September 2020 and February 2021 are the highest peak months for positive cases in Indonesia and the death rate has risen sharply, causing the Indonesian government to implement large-scale social restrictions to prevent an increase in the number of infected people. These restrictions prevent children

from attending school and studying online. Learning online creates many problems, including an increase in the cost of purchasing internet quotas, children are bored and find it difficult to concentrate on learning compared to learning offline. This restriction also causes the economy to decline, shops become empty of buyers and factory-produced goods are not selling well. There are many layoffs, causing unemployment to increase. This condition creates fear of losing a job and losing a source of income to finance family life. COVID-19 patients who undergo isolation or who are hospitalized in the intensive care unit (ICU) also experience depression, loneliness, anxiety, and even depression due to the scary atmosphere in the isolation room and ICU, including anxiety about the high cost of care. After recovering, still have to face the negative stigma from neighbors and relatives.³

Limitations of social and economic activities might trigger psychosocial problems. Insomnia, depression, alcohol or substance misuse, domestic violence, child abuse, cyberbullying, relationship breakdown, divorce, a severe form of existing disease, or insomnia could happen. Restrictions on work, mobility, and social support had poor effects on mental health for patients, health workers, and society. Blow up of COVID-19 news in social media causes amplification effects of this tiny virus in our memory and feelings.⁴ Zhang *et al.* did a multicenter survey of 1,563 medical staff to measure the Insomnia Severity Index score. The study result revealed that 36.1% of participants had a total score of more than 8. The factors that contributed to the score were worried about being infected, uncertain about disease control effectiveness, being a doctor, and working in an isolation unit. The depression prevalence was 50.7%. The anxiety prevalence was 44.7%. Stress-

related symptoms were 73.4%. Those numbers revealed that mental health should get a serious concern during the COVID-19 pandemic.(4) The Chinese Psychological Society, Association for Mental Health, the Chinese Psychological Society, the Chinese Psychiatrist Association, and the Chinese Society of Psychiatry, sent 430 psychiatrists to Hubei Province to support the local mental health service. There are some guidelines released by the National Health Commission. The guidelines include emergency psychological interventions for different populations, psychological assistance hotlines, psychological self-help, and related ethical issues.⁵

Prolonged insomnia due to constant fear amid uncertain conditions in the fields of education, health, and economy caused by the impact of the COVID-19 outbreak increases the incidence of suicide. In Canada, the projected suicide rates per 100,000 increased to 14.0 in 2020 and 13.6 in 2021 in a model of prediction.⁶ Suicide has been reported in India and Italy.(7,8) Two nurses committed suicide after getting infected by COVID-19.(8) This might be due to the highest prevalence rate of anxiety in Italy among other countries. Italia had an anxiety prevalence rate of 80-83%, while China, Iran, Turkey, and Spain had prevalence ranged between 7% to 64%. Italy also had the highest prevalence rate for depression (67%). China got an approximately 65% prevalence rate for depression among COVID-19 patients from some studies.⁹

The focus and purpose of this paper are to emphasize that fear and uncertainty feeling during the COVID-19 pandemic are normal. It is included all relevant kinds of literature during the COVID-19 pandemic. However, this feeling must be well managed to prevent the emerging mental problems and worsening of

preexisting mental disorders. When the fear and uncertainty feeling is not well recognized, then it can develop into psychiatric problems. The worse and significant problem is suicide. Therefore, while many countries must accompany the management and treatment of COVID-19 effort without forgetting mental health support systems.

RISK FACTORS OF SUICIDE AMONG THE POPULATION DURING THE COVID-19 PANDEMIC

Various psychosocial impacts and psychiatric problems during the COVID-19 pandemic were viewed from some data of the studies. Hao *et al.* did a case-control study in 76 psychiatric patients and 109 healthy control subjects from Chongqing, China in February 2020. PTSD-like symptoms in the COVID-19 pandemic were more obvious in psychiatric patients than in healthy controls (31.6% vs 13.8%, respectively). The anxiety prevalence was higher in psychiatric patients than healthy controls (23.6% vs 2.7%). More psychiatric patients had depressive symptoms than healthy controls (22.4% vs 0.9%). Risk factors of developing worsening symptoms in psychiatric patients were lack or delay of routine medication, consultation, and supply. These conditions might trigger suicidal thoughts in some psychiatric patients.¹⁰

About 29 percent of all hospitalized COVID-19 patients were health workers. Health workers are at increased risk of having psychological distress. They must save patients while protecting themselves from getting COVID-19 infection. Quarantined health workers were at increased risk of social isolation. They will face complicated emotional feelings and psychological distress. When they are in distress condition, they wouldn't be able to make the right clinical decision in treating the patients. The condition will further increase

the risk of getting COVID-19 infection for patients and health workers. The rising number of positive cases and death patients will further increase the burden for health workers.^{11,12}

Fear, uncertainty, panic, and distress might increase the risk of getting post-traumatic stress disorders (PTSD).¹²⁻¹³ PTSD prevalence was found in approximately 30% of the children who separated from parents during the COVID-19 pandemic. These disorders might have long effects after the pandemic has ended. Thus, the vicious cycle continues.¹³ The PTSD prevalence among COVID-19 patients was 93% in some studies in China, Iran, Italy, Turkey, and Spain. Untreated PTSD is a risk factor for suicide.⁹

STRESS AND ANXIETY TRIGGER SUICIDE

COVID-19 pandemic has great impacts on our daily life. Stress and anxiety of uncertainty might develop into a psychiatric problem. Stress activated the hypothalamus-pituitary-adrenal (HPA) system. It will disturb normal sleep. Later on, insomnia will also increase stress. Long-term insomnia might trigger psychiatric disorders. Vaccine, the number of positive cases, treatment, and prevention are the most common topic about COVID-19. However, mental health is forgotten. There are various psychosocial aspects of psychiatric problems. COVID-19 might impose irreversible psychological impacts. News and social media amplify the COVID-19 pandemic real condition. Sometimes the frightening term such as “end of the world” was used. Fear, uncertainty, depression, grief, anxiety psychosis, and suicide occur afterward. Psychiatric patients will have an increased risk of worsened symptoms and diseases.⁴

INSOMNIA AS EARLY DETECTION TO PREVENT SUICIDE

Mental problems that usually arise among health workers and society are extreme fear (phobia) of illness, alcohol/tobacco abuse, anxiety, active stress disorders, depression, divorce, hysteria, schizophrenia, and suicide.^{1,12} Phobia sometimes happens when listening, seeing, or reading anything related to the COVID-19 pandemic. Those negative reactions and emotions will inhibit daily activities. Therefore, it is essential to detect early signs of COVID-19 phobia. Precise and prompt diagnosis of COVID-19 phobia will prevent the next stage of complex mental problems. Nevertheless, due to the new condition of COVID-19 phobia, there is no specific assessment for it.¹⁴

Insomnia is an early risk factor for anxiety, depression, and suicidal behavior. To prevent suicide and psychiatric problems, insomnia should be treated aggressively. It should be done among individuals besides psychiatric patients. Insomnia patients should be assessed for suicidal ideation and suicide intent. Thus, suicidal death can be avoided.¹⁵

THE EFFECT OF STRESS ON IMMUNE SYSTEM DISORDERS AND SUSCEPTIBILITY TO COVID-19 INFECTION

Stress is a threatened homeostatic state upon exposure to extrinsic or intrinsic adverse forces. Stress is divided into acute stress and chronic stress. Acute stress only lasts for a few minutes or hours, while chronic stress can last for days, weeks, or months.¹⁶

The immune system is influenced by neuronal interactions via feedback mechanisms and complex connections and interactions between immune cells and the central nervous system. In the context of the COVID-19

pandemic, social disruption stress increases and lasts a long time. Prolonged stress will release some stress hormones by activation of the hypothalamic-pituitary-adrenal (HPA) axis and catecholamines through the autonomic nervous system (ANS). ANS consists of the sympathetic and parasympathetic nervous systems. The main neurotransmitters are norepinephrine (NE), epinephrine (E), and acetylcholine (Ach). Prolonged stress due to the COVID-19 pandemic makes the hypothalamus (paraventricular nucleus) release corticotropin-releasing hormone (CRH) and arginine vasopressin. The paraventricular nucleus stimulates locus coeruleus to send the signals to the sympathetic and parasympathetic preganglionic neurons. Decreasing of Ach and increasing of NE and E stimulate immune cells to release proinflammatory cytokines such as (TNF- α , IL-1 β , IL-6, and interferon). This condition decreases tryptophan and increases kynurenine. CD4⁺ and CD8⁺ T cells cannot work well. There is dysfunction of the Antigen Presenting Cells (APCs), in the form of decreased expression of Pathogen Recognition Receptors (PRRs). The failure of the PRRs expression causes a decrease the ability of phagocytosis and elimination of viruses by Natural Killer (NK) cells in the innate immune system whereas in the adaptive immune system it causes the inactivity of lymphocytes and inhibits the formation of neutralized antibodies. These conditions lead to susceptibility to COVID-19 infection. Besides, proinflammatory cytokines increase ACE2 via stimulation of the sympathetic nervous system and the renin-angiotensin system. Thus, people will easily get COVID-19 infection due to increased susceptibility. This pathway can be seen in Figure 1.¹⁷

CHRONIC STRESS MECHANISMS INCREASE THE RISK OF SUICIDE

In chronic stress conditions (for example depression), the sympathetic nervous system is activated continuously. There are also elevated levels of pro-inflammatory cytokines. Indoleamine 2,3-dioxygenase and tryptophan 2,3-dioxygenase convert tryptophan to kynurenine and will be converted into quinolinic acid. Therefore, quinolinic acid level is elevated. This condition causes three pathways, the first one is a high concentration of extracellular glutamate and persistent activation of excitatory neurons that result in excitotoxicity. The second pathway is selective activation of N-methyl-d-aspartate (NMDA) receptors, which will trigger the bond between neurotrophin (pro-BDNF) with receptor p75^{NTR}. These bonds will activate NF- κ B / c-Jun N-terminal kinases pathway that triggers apoptosis. NF- κ B is sequestered in the cytosol by their inhibitor I κ B and towards the cell nucleus to synthesize pro-inflammatory cytokines, one of which is TNF α . TNF- α will activate the apoptotic caspase by binding to the TNF- α receptor. C-Jun N-terminal kinases (JNKs) through a series of intermediates, activates p53 and p53 activates Bax which initiates apoptosis. Excessive stimulation of the NMDA receptor also causes an increase in the concentration of glutamate which can cause excitotoxicity. The third pathway is free radical formation. In chronic stress conditions, free radicals, both the reactive oxygen species (ROS) and reactive nitrogen species (RNS), are derived from endogenous sources (mitochondria, peroxisomes, endoplasmic reticulum, phagocytic cells, etc.). These free radicals cause oxidative and nitrosative stress, these conditions cause disturbances in neurotransmitters, especially serotonin. Excitotoxicity, apoptosis, and decreasing

serotonin cause neurodegeneration and mood disorders. Reduction in Glial fibrillary-associated protein (GFAP) may cause atrophy of astrocytes and trigger downregulation of other astrocytic genes including EAAT. Alterations in levels of GFAP may reflect

pathological regulation of neuronal function and survival as well as abnormal synaptogenesis and neurotransmission. Reduction GFAP is related to mood disorders that cause a person to become depressed and have suicidal thoughts (Figure 2).¹⁷

Figure 1 Interaction among stress, autonomic nervous system, and immune system. Stress can increase susceptibility to COVID-19 infection through stimulation of the renin-angiotensin system and release of pro-inflammatory cytokines. ACE2 = Angiotensin-Converting Enzyme 2, NE = Norepinephrine, E = Epinephrine, Ach = acetylcholine, TNF- α = Tumor Necrosis Factor α , IL = Interleukin, CD = Cluster of Differentiation

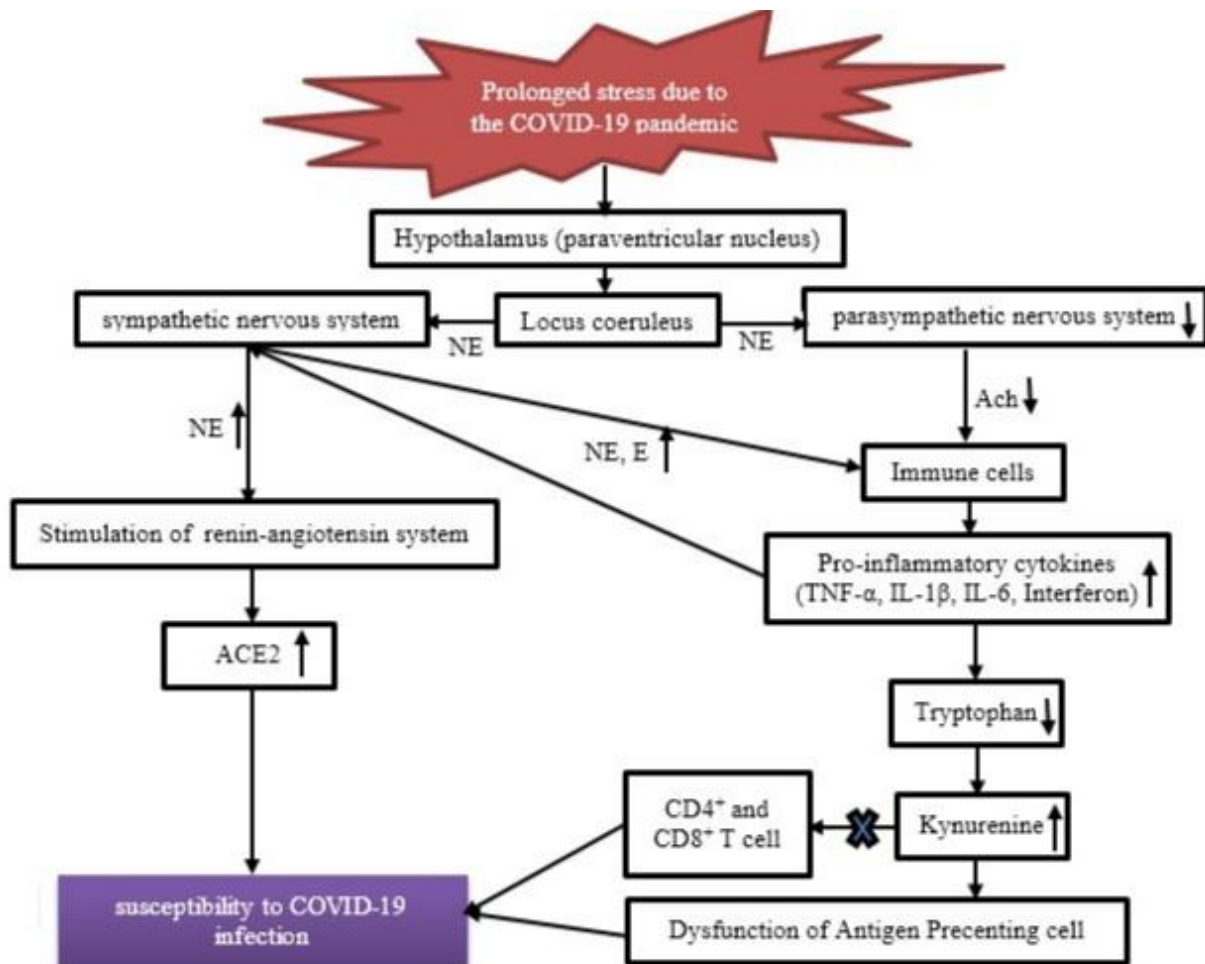
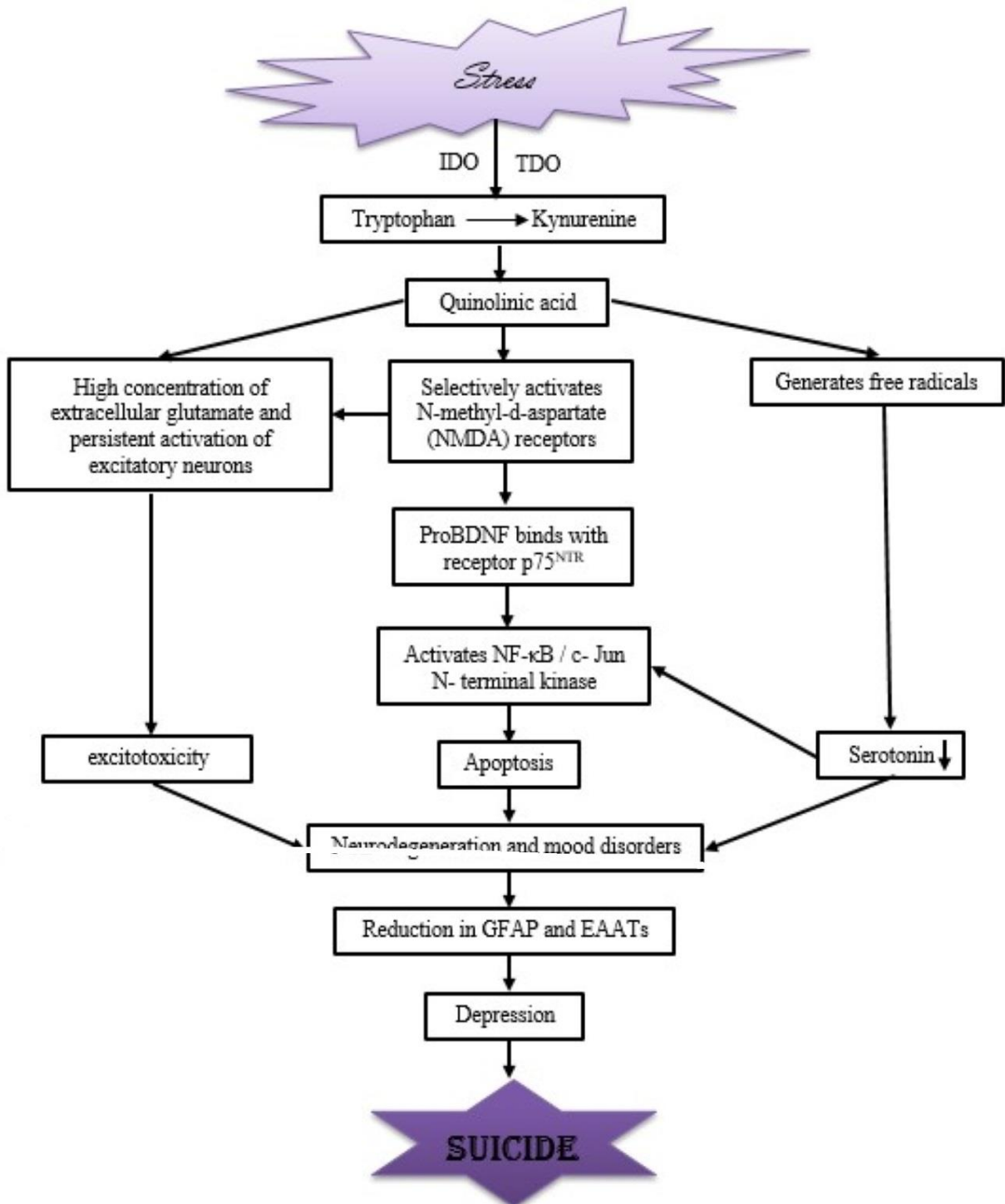


Figure 2 Molecular mechanism of suicide induced by chronic/prolonged stress. Stress can increase quinolinic acid concentration. This condition leads to apoptosis, excitotoxicity, and serotonin depletion. Neurodegeneration and mood disorders take place. Depression occurs. Severe depression induces suicide. IDO = indoleamine 2,3-dioxygenase, TDO = tryptophan 2,3-dioxygenase, BDNF = Brain-derived neurotrophic factor, NMDA = N-methyl-d-aspartate, NF- κ B = nuclear factor kappa-light-chain-enhancer of activated B cells, GFAP= Glial fibrillary associated protein, EAATs = Glial-specific excitatory amino acid transporters.



LIMITATION OF THE LITERATURE

This paper described the fear and uncertainty feeling that cannot be abandoned. It is a normal feeling. However, cohort studies were not found. For example, when the researcher found that the anxiety and depression scores were high in some population, the population were not followed in a specific time, whether they will have any suicide or not. Further cohort researches are recommended to study psychiatric disorders in the future that are derived from fear and uncertainty feelings.

CONCLUSION

Mental health building is a key component in eradicating psychiatric problems due to the COVID-19 pandemic. Failure to recognize the loss and grief feeling might lead to suicide. Various psychosocial impacts of psychiatric problems in society can be prevented if fear and uncertainty are decreased. Emotional and mental health problems could decrease

immunity and inhibit the recovery of COVID-19 infection. Each individual has their feelings and struggles. Therefore, the strategy should be flexible enough to meet every person's problem. Excessive social media browsing about COVID-19 should be stopped. People should eat a healthy diet, maintain a positive lifestyle, build a positive relationship with family and friends. Adaptation to a new normal life should be done. Positive thinking, obeying government guidelines, and doing indoor sport might help increasing endorphin for happy feelings. Long-term mental health care management must be a priority in surviving. Psychiatrists and psychologists should be strengthened by online training during this pandemic period to minimize new psychiatric disorders. Psychological first aid and online mental health survey must be applied continuously. Suicide prevention is a critical issue. Financial support, early detection of mental problems, and labor support are essential steps.

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