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## COVID-19 and Mental Health Disorders in General: A Literature Review

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### ABSTRACT

In December 2019, there was an outbreak of a respiratory disease in Wuhan, China. The outbreak was initially reported from a viral infection attributed to Novel Coronavirus ended up classified as a SARS CoV-2. The symptoms from this virus were vary due to the ACE2 Receptor located in many organs of the body, but mostly in lung epithelial cells. The diseases were flu-like type but commonly developed into severe acute respiratory syndrome if the inflammation was occurred progressively. Numbers of hospital admission were significantly higher due to the patients with COVID-19 that needs to be isolated and treated. Up until now, the pandemic still haunts us and living besides us. Our society was overwhelmed by the viral infection, due to the new mutations and variants of the SARS CoV-2. There were mental health disturbances such as anxiety and major depression, traumatic events and moral injury that experienced by public and healthcare providers which affected by this pandemic. In this article we would like to evaluate overall mental health conditions of general society. Early recognition may improve better outcomes for our society, so we can overcome this pandemic without having any mental health disturbances. Developing effective strategies in order to manage COVID-19 related tasks as general public, especially healthcare providers.

### 1. Introduction

In December 2019, there was an outbreak of a respiratory disease in Wuhan, China. The outbreak was initially reported from a viral infection attributed to Novel Coronavirus ended up classified as a SARS CoV-2. The virus itself has same attribute as SARS CoV, and MERS CoV but the condition of the illness was reported more severe than before. The spreading pattern of the virus was so quickly all over the world and becoming a pandemic state. Up until now, the pandemic still happens, and the virus mutated and developed a new variant, with many symptoms, even can caused death to the infected ones. All the society in the world, especially the commoners and healthcare providers were exhausted to fight this pandemic. Despite of many health protocol that was quickly given by each region, the pandemic still haunts us, affecting our mental health. Resulting in overwork, anxiety,

higher stress level, even depression on each individual who face this pandemic condition. In this article, we want to know how big the pandemic impact is can affect the mental health of all people in general, especially the healthcare providers. By collecting the data from many studies, we evaluate the mental health condition of all society (general public and healthcare providers) that affected by this novel coronavirus pandemic.

#### SARS CoV-2

Coronaviruses (CoVs) are enormous, enclosed viruses with a single stranded, non-segmented, positive sense RNA genome that spans around 30 kilobases, making it the biggest known genome of any RNA virus. Because they are RNA viruses, CoVs may easily develop through mutation and homologous and

non-homologous recombination, which broadens their host range and allows them to transcend species boundaries. Extensive animal reservoirs, particularly among bats, genetic recombination among CoVs, and their flexibility in terms of receptor usage make CoVs very efficient in host switching, sometimes across wide taxonomic distances.<sup>1</sup>

Sphere-shaped is the shape of coronaviruses. Spikes are the most obvious characteristic of the virus. There are four structural components in the viral membrane, including the spike (S), envelope (E), membrane, and nucleocapsid (N) protein. To determine host preference and pathogenicity of SARS-CoV and SARS-CoV2, the S protein is the key factor. In terms of immunological response and vaccine

design it is the primary target for neutralizing antibodies. In order to create the spike structure, homotrimers of S-glycoproteins are used.<sup>1</sup>

S1 has a hypervariable loop that varies considerably in size and sequence amongst betacoronaviruses. When the S protein is cleaved in two places, a host protease is used, causing the S protein to alter its shape irreversibly. As a result of antigen-antibody interaction, certain anti-SARS-CoV antibodies imitate receptor engagement, mimicking conformational changes in S protein. When compared to SARS-CoV, SARS-receptor CoV2's binding site amino acid sequence is 74% identical to that of SARS-CoV, indicating comparable or same cell entrance for both viruses.<sup>1</sup>

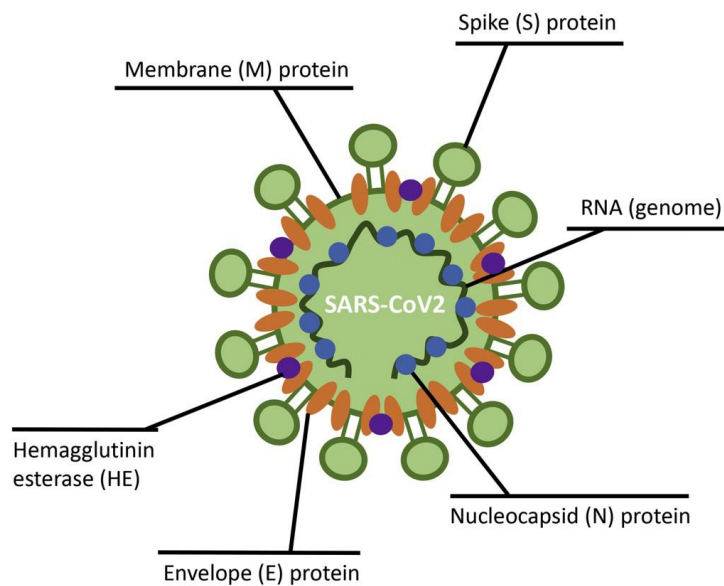


Figure 1. SARS CoV-2 Structures.<sup>1</sup>

The symptoms from this virus were vary due to the ACE2 Receptor (that SARS CoV-2 virus targeted) located in many organs of the body, but mostly in lung epithelial cells. The diseases were flu-like type but commonly developed into severe acute respiratory syndrome if the inflammation was occurred progressively. The most hospitalized patients with COVID-19 were having fever, cough, dyspnea. But in severe cases, it can cause death to the infected due to severe hypoxemia.<sup>1</sup>

**COVID-19 and mental health disorder in general public**

Covid-19 infections has disturbed everyone's mental health for like 2 years. Many health protocols were given and followed by each individual, yet the Covid-19 still stands beside us. Many symptoms are developed by this infection, especially in psychological. Such as, anxiety, burnout, higher stress level, depression and even suicidal thought. The cause of this psychiatric disorder, relatively multifactorial. Fear of the disease caused by many misleading

informations, and poor knowledge. The stress of our family isolated and hospitalized due to the infection. And the viral terror itself that can caused death reportedly taking thousands of people's life. The study from Den J, et al shows 34% of patients with COVID-19 experience sleep disturbances, 47% of patients experience anxiety, and 45% patients experience higher level of depression especially the ones with severe illness.<sup>2</sup> Choi EPH, et al reported that 19% sample of their study experienced Depression with (PHQ-9 Score  $\geq$  10) and 14% of their sample experience Anxiety (GAD Score  $\geq$  10).<sup>6</sup> The Study from Ozdin S, and Ozdin SB shows that the COVID-19 Pandemic has greater impact on women, individuals with comorbid chronic disease, individuals with past psychiatric disease, and the ones who living in urban areas.<sup>3</sup> The study from Giorgi G, et al shows that there is a higher likelihood that mental health difficulties connected to the public health emergency will affect healthcare employees. This is especially true for individuals on the frontlines, migrant workers, and law enforcement personnel who come into touch with the public daily. Some of these difficulties are connected to the high level of job stress, the worry of becoming infected and being a vector of the disease to one's family, as well as possible prejudice and stigma. Job insecurity, a hostile work environment, extended quarantine and isolation times, abuse of workers' rights as well as anxiety about the future exacerbate this psychological state.<sup>4</sup> The study from Chen F, et al shows that from age group female adolescent has greater risk of depression and anxiety during Covid-19 pandemic. The elder adolescents were more depressed compared to the younger ones. Basically, children are left at home without any companions due to their parents that isolated caused by COVID-19 infections.<sup>5</sup> Mazza MG, et al reported in their study that COVID-19 survivors developed secondary mental health disorder or psychiatric sequelae such as PTSD, anxiety, major depression from 55% of their sample.<sup>7</sup> Shader, RI has reported psychiatrics side effect on COVID-19 treatment with Chloroquine, and Hydroxychloroquine such as delirium, psychosis, and personality

changes.<sup>8</sup> Overall, in general public and all society has overwhelmed by the COVID-19 pandemic. All of misleading information, poor knowledge to the disease, fear of the terror must be removed for better outcomes. Our mental health must have been considered despite all the causes during this pandemic.

### **COVID-19 and mental health disorder in healthworkers**

Healthcare providers such as doctors, nurses, hospital administrator, and all of the healthcare center employee were in burnout condition due to the SARS CoV-2 pandemic. There was significantly greater number at hospital admission number caused by COVID-19 patients that needs to be isolated and treated. Raudenska J, et al reported in their study that, there is an emotional trauma, moral injury, mass traumatic events which arises for healthcare providers during COVID-19 pandemic and even developed into PTSD.<sup>9</sup> The burnout feeling that healthcare providers experienced may caused due to the overwork, society disbelief of the disease and mass death that caused by this viral infection. They burden other people health and safeties first, rather than their health itself. They were overwhelmed by the high number of hospital admission while the facility itself lacking resources. The study from Elbay RY, et al. shows that healthcare workers who works in frontline were having psychological disturbances due to the excessive workload (increased number of the patients that has been took care off, higher working hours, double shift work), lower support from logistic, and lower support from their supervisors while doing COVID-19 related tasks.<sup>10</sup>

### **2. Conclusion**

COVID-19 pandemic has overwhelmed most of all individuals in this world, from frontliners, healthcare professionals, healthcare workers, and general public. It develops traumatic events and mental health conditions such as anxiety, higher stress level, major depression even suicidal thoughts to all groups (age,

gender, occupation, etc.) that affected by COVID-19. The burnout conditions, emotional trauma, and disturbed mental health of all individuals that affected by this pandemic are our concern from now on. Further investigations are needed across the world, so we can have better views on mental health conditions in general society during this novel coronavirus pandemic.

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