

**The Association Between COVID-19 and Cognitive Disorders**

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## **Abstract**

COVID-19 has been a severe public health problem since early 2020. The most susceptible population is the elderly, who are also more likely to have cognitive disorders. As COVID-19 continues to affect our daily lives, it raises the question of how those with cognitive disorders are affected by COVID-19. This literature review will examine how and why cognitive disorders increase the risk and worsen the impact of COVID-19. It will also discuss how to prevent the spread of infectious diseases.

### **CDs increase the risk of COVID-19**

Since the elderly are the most susceptible to both COVID-19 and cognitive disorders, there is a high chance of the elderly having both. Since the beginning of the pandemic, much research has been done on the connection between COVID-19 and cognitive disorders. Many studies concluded that cognitive disorders increase the risk of COVID-19. Zhou et al. conducted a study in 2020 to examine cognitive disorders as a risk factor for COVID-19 and the correlation between COVID-19 and cognitive disorders. Other risk factors of COVID-19 were also taken into account and briefly considered, but it was found that COVID-19 had the most significant association with cognitive disorders. Many types of cognitive disorders, such as Alzheimer's, Dementia, and Delirium, were prevalent in those with COVID-19, especially Dementia. According to a study conducted in 2020 by Yu et al., Parkinson's is another cognitive disorder that is significantly associated with COVID-19 (along with Alzheimer's and Dementia). It was shown that those with Dementia, Alzheimer's, and Parkinson's have a much higher risk of COVID-19. Toniolo et al. conducted a study in 2021 and similarly found that rates of COVID-19 infection were higher in those with Dementia and Alzheimer's compared to the general population. Furthermore, it was concluded that cognitive disorders and COVID-19 have a

bidirectional relationship. Liu et al. (2020) also found a significant causal bidirectional association between COVID-19 and Alzheimer's. A commonality across these studies aside from the connection between COVID-19 and cognitive disorders is that Alzheimer's shows up the most when looking at what cognitive disease is correlated with COVID-19. Due to the high risk of cognitive disease and COVID-19 in the elderly, it has been found that being cognitively impaired increases the risk of getting COVID-19.

### **Do CDs worsen the impact of Covid?**

Cognitive disorders increasing the risk of COVID-19 has repeatedly been proven, which begs the question, do the cognitive disorders worsen the effect of COVID-19? A few studies have shown that cognitive disorders increase the risk and severity of COVID-19. Yu et al. did a cohort study in 2020 which revealed that elderly patients with Alzheimer's have a high rate of COVID-19-related mortality. Parkinson's patients, on the other hand, had a high risk of COVID-19, just like Alzheimer's patients, but not mortality from it. Results from a meta-analysis study done by Toniolo et al in 2021 showed that those with Dementia were more likely to have severe COVID-19 and higher mortality rates. On the contrary, a study that was done by Li et al showed that the severity between Alzheimer's patients and non-Alzheimer's patients was not significantly different. The results also indicated that there was no significant difference in the outcome of survival and death between Alzheimer's patients and non-Alzheimer's patients. The results from these studies are conflicting, and further research is necessary to obtain a more accurate conclusion. Further research should focus on how impactful cognitive disorders are on the severity of COVID-19.

### **Why are COVID-19 infection rates so high in CD patients?**

Since cognitive disorders increase the risk of COVID-19, the COVID-19 infection rates in those patients are higher. This is especially true in patients that live in long-term care facilities; cognitive disorders are more prevalent in the elderly, who are also more likely to be in these nursing homes. The high rates of COVID-19 infections in cognitive disease patients may be attributable to exacerbated germ spread in care facilities. A study done by Thompson et al. in 2020 showed that many of the residents that had cognitive disorders needed extra help doing daily activities, so the interaction between residents and staff is longer, thus increasing the risk of contamination. Another reason for the rapid spread of infectious diseases in long-term care facilities is the large number of residents that live close together and share the same resources. A study done by McMichael showed that factors that were most likely the reason for the vulnerability of long-term care facilities were inadequate standard precautions. Many of these facilities have limited COVID-19 testing, delayed detection of COVID symptoms, and insufficient use of personal protective equipment (PPE). Staff members might work with symptoms or even work at multiple places, which contribute to the spread. Kostas et al. also conducted a study that demonstrated similar reasons for the increased spread of COVID-19. Working while asymptomatic, working with mild symptoms, low access to PPE, and difficulty recognizing COVID-19 symptoms are all factors that cause the infection rates in long-term care facilities to skyrocket. The lack of precautions, limited testing, and close nature of long-term care facilities create a good environment for infectious diseases to spread rapidly, especially to those who are most vulnerable: cognitive disorder patients.

### **How can we prevent infection spread in care facilities?**

With the elderly population being so fragile, especially with regards to cognitive diseases and COVID-19, more needs to be done to prevent the spread of infections in care facilities. In a

study done by Dosa et al. in 2020, it was found that one way to contain COVID-19 is by limiting the number of visitors to the long-term care facility. By restricting visits to only family/close friends, the risk of contamination is reduced. Another way to decrease contamination is by requiring staff to wear proper PPE, including gloves and masks. Staff and visitors should also have their temperature checked to screen for mild COVID-19 symptoms. Likewise, mild symptoms should be frequently examined in residents since early detection can help prevent further infection spread. Also, proper hand washing should be encouraged and taught to the staff, residents, and visitors to help stop infection transmission. Furthermore, frequently touched surfaces should be cleaned with hospital-grade cleaning supplies to ensure the cleanliness of the care facility. According to a study done by Kostas et al., not only should the temperature of residents be checked often, but also the respiratory rate, oxygen saturation, and other signs of COVID. It is also recommended that if anyone in the facility has tested positive, then everyone, staff and residents, should be tested too. A study done by Richards said that another way to stop the spread of infections is through infection control programs. These programs include a trained infection control professional that will lead the program, an infection control committee, and a written infection control plan. When the infection control committee has nurses, doctors, and other medical professionals, the infection control program is more effective, especially if a well-thought-out plan is followed. All these steps are critical to having quality infection control and minimizing infectious outbreaks.

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