

Covid-19, Social Isolation and Cognitive Decline

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COVID-19 not only brought ultimate risk to the human physical health but quick actions taken to curb the spread of this deadly virus lead to social isolation which augmented remarkable mental illnesses in our society. These mental illnesses include anxiety, depression, attempts to suicide, and bipolar disorder. The increasing level of mental complications especially in elderly population is alarming. Social isolation along with negative emotion of loneliness has aggravated the physical health. The unprecedented compounded pressure that social distancing has brought include financial burden and fear of disease.

Social isolation has caused critical negative effects on human brain along with increased incidence of obesity and cardiovascular problems. Elderly population has been severely affected by social isolation with increasing onset of dementia (1). Increased risk of cognitive decline, dementia, depression and anxiety has been associated well with social isolation. As per European Union statistics report, the frequency of meeting relatives and friends is less than once a year for almost 7 percent of their population. In addition, UK statistics unravel that loneliness has catered a way to half a million people's (age>60) lives as they generally spend every day alone. Human are social animal and we need others not just to survive but for the overall well-being of mental health.

Scientists measured verbal fluency and memory recall among a cohort of older people. They revealed that people, who were less socially connected and had fewer activities at the beginning of the study, were greatly affected by a cognitive decline (English Longitudinal Study of Ageing (ELSA) (2). In a recent study of ELSA with more than 11,000 participants, researchers found that both men and women who experienced increased levels of social isolation showed above-average memory decline within two years of the study (3). However, these studies don't establish that isolation causes malfunctioning of brain. It could be vice versa also and cognitive decline may encourage less social activities among some people. In addition, researchers claim that physical isolation and emotional isolation are quite distinct.

Some persons with lots of social connections still feel lonely while those with limited social connections do not. A recent prospective population based cohort study suggests that social isolation increased incidence of dementia among individuals with high genetic risk (4). Therefore, these results should be perceived with a pinch of salt.

Socially isolated or lonely people have been found to have reduction in prefrontal cortex, the area of brain involved in decision making and social behaviour (5). In rodent models, the social deprivation causes dysregulation of prefrontal cortex and exhibit behavioural deficits (6–8). Further, social isolation reduces the size of the brain region, hippocampus and lowers the levels of brain derived neurotrophic factor (BDNF) in the brain (9–11). These brain signatures are well associated with rapid fall in learning and memory. Stress hormone cortisol levels are also found to be elevated in socially isolated animals (12). A few molecular determinants of social isolation induced cognitive decline have been discovered (13,14). Scientists claim that loneliness induced stress and absence of social stimulation could act as contributing factors to the observed changes in brain structures.

Stimulation of brain is very important aspect of mental health as research on incarcerated people has shown dramatic negative consequences including hallucinations, cognitive decline, paranoid thinking and increased frequency of suicide. This seems to hold potential because neural stem cells, the stem cell population of brain, require constant triggering activities for their proliferation and differentiation function. These activities include but not restricted to playing Sudoku/app based games, eating healthy diet, regular exercise/meditation/yoga. Scientific research provides weight to the famous old idea “use it or lost it” which simply means the more you use your brain, the less are the chances of cognitive decline. Actually, constant triggering allows healthy functioning of neural stem cells and neurons. Though some researchers are in favour of pharmacological treatments to reduce the risk of cognitive decline associated with social isolation, many still focus on behavioural interventions. Enhancing mindful engagement in cultural activities such as visit to museums, galleries, or exhibitions or theatre performances, concerts, or operas have been found to reduce the risk of cognitive decline (15). An elder person can adopt such activities to lessen the risk of cognitive decline caused by social isolation.

The cognitive decline due to the social distancing may not be apparent today but it would have long term effects on normal brain power. Scientific studies of social isolation are still not comprehensive enough to conclusively connect the observations and actual biological outcomes. Still science has proven that the social isolation can reduce the genuine power to understand, think and assess.

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