

The Role of Social Isolation and Loneliness in Worsening Depression

Samaira Mohini Jain

The Shriram Millennium School, Noida

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ABSTRACT

Depression is among the most common mental health illnesses across the world and it is often increased by loneliness and social isolation. There is an association between social isolation and loneliness and ill health, which is highly prevalent in the developed world. Proper knowledge of their implications is needed for their mortality and morbidity to gauge the extent of potential benefit of intervention and public health challenge. This study has conducted a systematic review of recent literature to find the wider effects of loneliness and social isolation and their impact on depressive symptoms.

This study highlights consistent evidence which has linked loneliness and social isolation to worsen mental health issues. There is a lack of clear evidence on the role of loneliness and social isolation on socio-economic consequences and other conditions. Further research is needed on the relationship between social isolation and loneliness with health behaviors, cancer, and impact across the course of life. Local and health government departments and policymakers must consider loneliness and social isolation as a significant factor affecting the mortality and morbidity rate because of their impacts on mental and heart health. They should develop prevention strategies in private and public sectors.

Keywords – social isolation, loneliness, depression, mental health, depressive symptoms, socio-economic consequences

1. Introduction

Depression is a serious public health concern which has affected more than 280 million people across the world (World Health Organization, 2021). This complex disorder results in various problems like psychological vulnerability, genetic predisposition, and socio-environmental triggers. Loneliness and social isolation have been widely known as serious contributors to the progression and onset of depression. Social isolation is known as the objective state of less social

contact and limited social relationships, while loneliness is the feeling of lacking companionship or being disconnected (Cacioppo & Hawkley, 2003). These constructs vary in impact and nature. Both are related to poor mental health effects like depression (Heinrich & Gullone, 2006).

Loneliness is highly prevalent among the elderly, while also affecting the youth (Griffin et al, 2020). Proper estimates are hard to obtain about the prevalence of social isolation and loneliness because of changes across the course of life, gender and cultural differences related to the preparedness of people to talk about them and use of various measurement scales. Some of them are based on self-structured questionnaires while others have more objective assessment of social networks or contacts (or both). Both social isolation and loneliness are associated with ill health. But it is not easy to determine causality as a lot of research consists of observational studies.

Researchers have focused majorly on the relation between mental and heart health and mortality. Biological pathways are used to explain the effect of social isolation and loneliness on health, such as, reduced protective hormones resulting in extreme effects on blood pressure, heart rate, and repair of blood vessels “(Cacioppo and Hawkley, 2003; Uchino et al, 1996; Heffner et al, 2011; Cacioppo et al, 2002). Lonely people are more likely to have harmful behaviors like over consumption of alcohol, smoking, transient sexual encounters, or overeating as an emotional relief. Then, they may retain these toxic behaviors if they are not exposed to healthy behavior or have limited access to health suggestions due to limited social contacts (Cacioppo and Hawkley, 2003; Lauder et al, 2006).

While connecting with family and friends can promote healthy behaviors, they may also lead to unhealthy behaviors to be normative (Christakis and Fowler, 2013). Due to perceived social isolation, stress responses can extremely precondition the neuroendocrine system and it might occur with genetic differences (Immordino-Yang et al, 2009). Socially isolated people may face more stress because of less social support and interaction and they may withdraw into themselves (Cacioppo and Hawkley, 2003). COVID-19 pandemic has further elevated this already-existing crisis, with a surge in depression due to enforced social distancing and quarantine measures (Loades et al, 2020). This study provides a complete insight by collecting secondary data.

2. Literature Review

Loneliness and social isolation are significant concerns for mental health. Whether they cause depressive symptoms or depressive symptoms lead to social isolation and loneliness has not been found completely. Luo (2023) determines the potential exchange in the relation between depressive symptoms and social connections among older and middle-aged adults. There is a unidirectional relation between depressive symptoms and social isolation and bidirectional relation between depressive symptoms and loneliness at personal level. Previous depressive symptoms

have predicted potential isolation. When adults have more frequent feeling of depression, they may face social disconnection later on.

Ge et al (2017) determined the relation between several indicators of social isolation and loneliness and associations between these indicators and depressive symptoms. They collected a baseline data from 21-year-old 1919 adults with a representative health survey conducted in Singapore. They assessed the relationship between indicators of social isolation (living arrangement, marital status, and social connectedness with friends and relatives) and 3-item UCLA Loneliness as well as their relation with depressive symptoms using the Patient Health Questionnaire-9. Findings of the study indicated unique and significant relation of various indicators of social isolation and loneliness with depression in 21 years old adults.

Loneliness and social isolation have always been the risk factors for increased mortality and poorer mental and physical health. They also affect physical activity and dietary behavior which may cause obesity. There is a lack of data on the effect of social isolation due to COVID-19 where social distancing is a serious component of public health programs. Heinberg and Steffen (2021) examined the relation between loneliness, social isolation, weight, and mental health due to COVID-19 pandemic. Obese individuals are at serious risk to worsen the course of pandemic, and obesity can cause hospitalization and death. Obese individuals are also more likely to face dietary consequences due to social distancing, lockdown, and isolation. The pandemic has also caused serious disruptions in lifestyle. Previous studies have focused majorly on cross-sectional data. Future studies should study the effect more strictly, especially among people at higher risk.

Donovan et al (2017) examined the mutual relationships of cognitive function and loneliness in older adults. They analyzed the data from 8382 adults who are above 65 years old in the "US Health and Retirement Study" from 1998 to 2010. They have been through "biennial assessments of loneliness and depression (classified as no, low or high depression) determined by the Center for Epidemiologic Studies Depression scale (8-item version), cognition (a derived memory score based on a word list memory task and proxy-rated memory and global cognitive function)". They have used constant measures to determine the reciprocal relationship between cognitive function and loneliness in individual models to control for social network, socio-demographic factors, depression, and health conditions. They examined longitudinal data in wide range of symptoms of depression, loneliness, and cognitive abilities which seem to be risk factors for low cognitive function and worsening cognition.

2.1. Research Gap

Even though actual causal pathways are still not clear, it is worth having proper knowledge of their effects on society and people due to the prevalence of loneliness and social isolation. There is

growing evidence on the effect of loneliness and social isolation over the past decades. To provide the evidence to the decision-makers they should have to tackle and determine challenge related to public health related to poor social relationships, this study has conducted review on health consequences of social isolation and loneliness.

2.2. Research Objectives

- To discuss the health consequences of social isolation and loneliness during COVID-19
- To discuss the impact of social isolation and loneliness on mental health

3. Research Methodology

This study has adopted a qualitative approach to collect secondary data using a systematic review of current meta analyses, peer-reviewed articles, and longitudinal studies until 2024. We collected data from articles published in databases like Google Scholar, PubMed, PsycINFO, Scopus, and Web of Science. We have used keywords like “loneliness, social isolation, mental health, depression, and depressive symptoms.”

Inclusion criteria for this study includes –

- Studies published from 2000 to 2024;
- Articles available in English language
- Data collected from review papers, meta analyses, and empirical studies
- Focus on adolescent and adult populations

Here are some of the exclusion criteria –

- Studies not focused majorly on impact of social isolation and loneliness
- Studies not published in peer-reviewed journals
- Case studies without having data that can be generalized

We have conducted a thematic analysis to identify existing findings, patterns, and conclusions along with quality assessments for study selection.

4. Results

4.1. Health consequences of social isolation and loneliness

Social isolation is an objective condition when a person is alone and generates the feeling of loneliness. Some may be socially isolated but consider it as a healthy and natural state in normal circumstances. Long-term exposure to social isolation, especially in unnatural conditions due to pandemic can be a harmful situation for overall health (Holt-Lunstad et al, 2015; Hämmig, 2019). Loneliness is a different but same case when an individual feels inadequate social connections, even with having significant social network. Both social isolation and loneliness are related to social connections and retaining healthy support network. As quarantine has been used widely to control the social connections of people during the pandemic, there has been a rise in studies to report negative effect of quarantine on both loneliness and social isolation (Ahmed et al, 2020; Losada-Baltar et al, 2021; Lei et al, 2020; Li et al, 2020).

Table 1 lists psychological and physiological health conditions caused by social isolation. It is worth noting that a lot of factors are usually comorbid and related to each other and these are health risks for other conditions like consuming alcohol may cause depression (Bazargan-Hejazi et al, 2008).

Table 1 – Social isolation and its Psychological and Physiological Health Problems

Physical system	Physiological	Psychological	References
Muscle Protein metabolism	Higher risk of poor metabolism, mortality, and reduced functions	Depression	Matias et al, 2020; Xiang et al, 2020
	Destruction of muscle protein synthesis	Psychotic signs	
Neuropsychology	Psychomotor pleasure	Rise in alcoholism	Ahmed et al, 2020; Matias et al, 2020
	Panic attacks	Overall decline of mental health	
Neuromuscular system	Muscle loss (because of sedentary lifestyle)	Loneliness	Brooks et al, 2020; Baker and Clark, 2020
	Muscle damage	General anxiety	
Glucose homeostasis	Decline in muscle insulin sensitivity	Suicidal thoughts	Matias et al, 2020; Xiang et al, 2020;

			Brooks et al, 2020
	Skeletal muscle causing insulin resistance due to inactivity	Delirium	
	Insulin resistance (changing body composition and muscle atrophy)	Symptoms of PTSD	
Cardiorespiratory health	Impaired oxygen pathways	Boredom	Nariciet al, 2021
	Poor cardiorespiratory health	Confusion	
	Decline in VO2max	Anger	
Sympathetic nervous system	Rise in stress levels affecting sleep, immunity and heart health	Insomnia	Xiao et al (2020)
Digestive system	Overeating causing weight gain, inflammation in body, obesity, muscle loss, and eating disorders	Psychological issues	Bacon and Corr, 2020; Matias et al, 2020
	Quarantine/bedrest causing rapid muscle loss and declined energy intake	Insomnia	

Due to lockdown, stress and anxiety leads to psychological conflict in people where they do panic shopping and stocking supplies, affecting two basic physiological needs – drink and food. Though these behaviors are adopted to ensure comfort with food and beverages, these effects cause obesity, eating disorders, and weight gain (Bacon and Corr, 2020; Matias et al, 2020). Another common physiological need which is affected during isolation due to pandemic is sleep (Xiao et al, 2020). As sleep is important for healthy repair and maintenance of the body, reducing amount of sleep or quality of sleep increases risk for weakened immune function and physiological deterioration (Watson et al, 2015).

In addition, along with harmful effects on sleep, rising tendency for inactive lifestyle has a lot of physiological consequences on endocrine, metabolic, and cardiovascular systems, leading to

further health effects (Table 1) (Narici et al, 2021). The fear of death and infection apart from poor self-protection cause intense feelings of insecurity of not being able to protect family or themselves (Matias et al, 2020). The frustration leads to extreme behaviors and health outcomes when people cannot meet the need for self-protection in isolated situations. Recent studies have suggested several health effects in vulnerable people during lockdowns. Conditions like rise in consumption of alcohol, poor mental health, anxiety, depression, and risk of suicide have been increased (McIntyre and Lee, 2020a; 2020b). In addition, these factors cause irritability, insomnia, and aggression, which is caused by rise in suicides and homicides during the pandemic (Matias et al, 2020; Campbell, 2020).

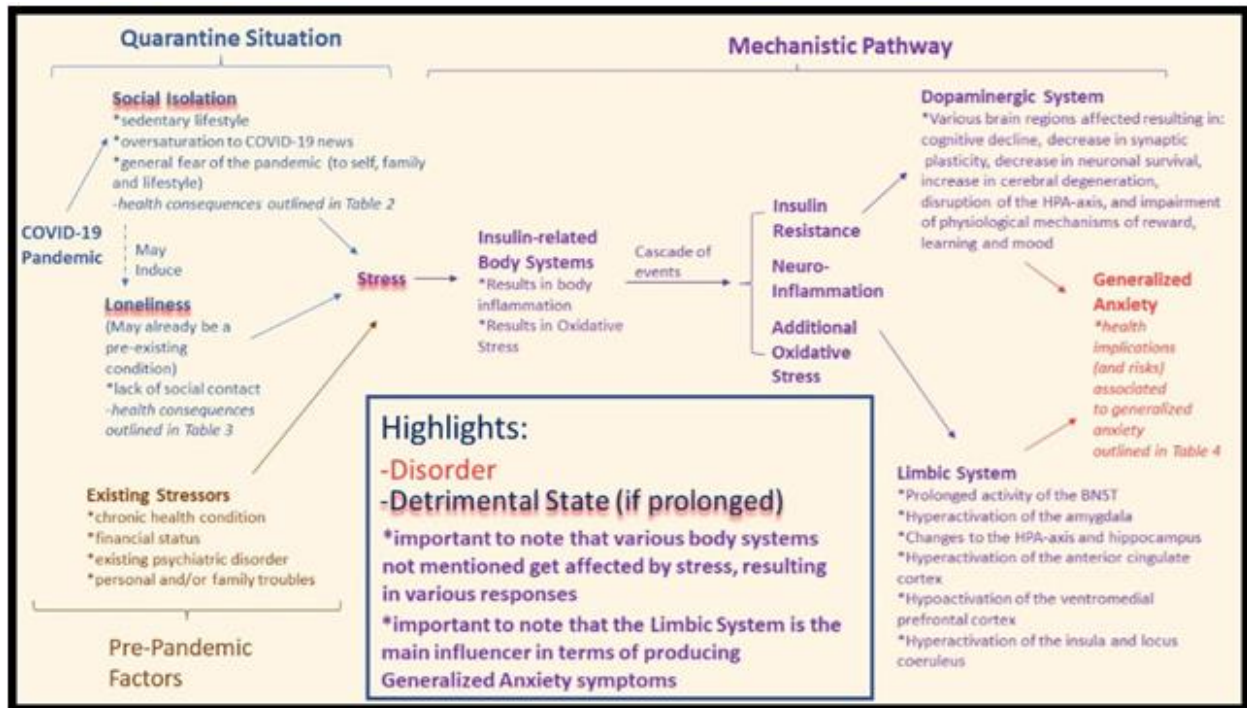
The rising health issues related to social isolation lead to rise in emphasis on factors placing people at risk. There are several stressors related to those outcomes of social isolation, such as, longer duration of isolation, frustration, fear of being infected, boredom, lack of information, lack of supplies, financial loss, and disinformation related to illness (Brooks et al, 2020). There is a need to address these stressors to reduce any potential health outcomes related to social isolation and treat any consequence or behavior associated with such outcomes like depression, alcoholism, anxiety and loneliness. With apparent risks of social isolation, recent research has observed a lot of vulnerable subgroups in common population. The elderly is more likely to have psychological illnesses because of increased mortality rate amidst the global pandemic (Qiu et al, 2020; Bacon and Corr, 2020).

4.2. Impact of social isolation and loneliness

Usually, there is an association between social isolation and physical inactivity. Due to this reason, younger population is more likely to face loneliness because they are widely inactive (Pinto et al, 2021). It is worth understanding these consequences or mental or physical health, groups vulnerable to social isolation, and stressors as it informs them about association between anxiety and existing situation of pandemic. Figure 1 illustrates a construct of association between social isolation and symptoms of anxiety during the epidemic.

In Figure 1, the pathway is formulated by physiological concepts. It shows how COVID-19 has led to social isolation with a lot of health concerns related to stress. Social isolation may induce loneliness or make existing condition worse and is related to stress (blue). Pre-pandemic factors are also responsible for social isolation (brown). The stress is related to cascade of events (purple) ending with association with generalized anxiety. Figure 1 illustrates a construct of association between social isolation and other straining conditions and symptoms of anxiety during the pandemic.

Figure 1 – Proposed Pathway affected by several psychological factors during COVID-19
 Source – Wilkialis et al (2021)



It is observed that the rise in cortisol levels (stress response) because of COVID-19 caused overall unusual stress response which adversely affects health issues (Hwang et al, 2020). For instance, social isolation has been associated with subjective feeling of loneliness, which has had a huge effect on physical and mental health, causing adverse health outcomes (Table 2) (Gori et al, 2020). It is worth noting that a lot of issues are related to secondary conditions and are comorbid.

Table 2 – Psychological and Physiological Health Issues caused by loneliness

Physical Health Risks	Mental Health Risks	Reference
Increased risk of cardiovascular disease	Waking up frequently after disturbed sleep	Hwang et al, 2020; Cacioppo et al, 2002
Elevated systolic blood pressure	Poor sleep quality or reduced time spent sleeping	Berg-Weger and Morley (2020)
Higher risk of stroke	Rise in depressive symptoms	Lee et al (2019)

Reduced vision	Poor health	Lee et al (2019)
Mental and physical disabilities	Perceived adverse change in quality of life	Lee et al (2019)
Poor quality of life	Impaired cognition	Hwang et al (2020)
Stress	Suicidal tendencies among elderly	Fässberg et al, 2012
Increased healthcare service usage	Anxiety	Gori et al, 2020;
Rise in mortality	Anxiety	Cacioppo and
Institutionalization	Anxiety	Cacioppo, 2018; Holt-Lunstad et al, 2010

Considering the implication of both loneliness and social isolation, there are different adverse outcomes and differences on both mental and physical health. Nevertheless, it is worth noting that both effects are intertwined with comorbid implications (Novotney, 2019; Han et al, 2018). Due to pandemic, social isolation has caused rise in loneliness, requiring combined effects on both mental and physical health (Van Tilburg et al, 2021; Bu et al, 2020). These effects include a lot of risk factors with both indirect and direct relation to Generalized Anxiety Disorder (GAD) (Table 3). Recent studies suggest evidence which support this relationship by confirming the rise in symptoms of psychological distress and anxiety during the lockdown (Ahmed et al, 2020; Lei et al, 2020; He et al, 2022). The health implications of loneliness and social isolation play a vital role in increased anxiety level.

When it comes to gender, it is observed that males are more likely to consume alcohol during lockdown and women are more vulnerable to generalized anxiety and stress related to overall health (Ahmed et al, 2020; Özdin and Bayrak Özdin, 2020; Qiu et al, 2020). Elderly people are highly vulnerable to pandemic because of social isolation and loneliness where exposure to media, radio, and TV can induce anxiety, fear, and depression (Baker and Clark, 2020). It affects even those people suffering from social isolation and loneliness (Hwang et al, 2020). Further findings observed that people with higher education, with existing psychiatric illness or previous illness, chronic illness, living in urban areas, and existing COVID-19 patients are more likely to have mental health consequences (Qiu et al, 2020; Hao et al, 2020; Özdin and Bayrak Özdin, 2020). These factors and their effects are associated with GAD, directly and indirectly. Especially in vulnerable population, it is important to understand these effects to clarify the relation between loneliness and social isolation with anxiety during the pandemic.

Table 3 – Direct and Indirect effects of social isolation and loneliness

Direct effects	Indirect Effects	Reference
Panic attacks	Depression	Qiu et al, 2020; Xiang et al, 2020
Anxiety	Consumption of alcohol	Ornell et al, 2020; Shigemura et al, 2020
Distress, fear, and GAD	Suicidal tendencies	Matias et al, 2020; Xiang et al, 2020
Insomnia	Fear of mortality	Matias et al, 2020; Baker and Clark, 2020
Delirium	Anger, boredom	Xiang et al, 2020; Ornell et al, 2020
Higher mortality due to different causes	Running out of life-saving medical care or supplies	Qiu et al, 2020; Hwang et al, 2020
Dementia	Overconsumption of social media, news channels, etc.	Qiu et al, 2020; Baker and Clark, 2020
Financial loss/unemployment	Cardiovascular disease	Gori et al, 2020; Shigemura et al, 2020
Poor health condition	Higher risk of death due to coronary heart disease	Hwang et al (2020)
Recurrent or induced psychiatric history	Chronic heart disease	Özdin and Bayrak Özdin, 2020

There is a rise in data suggesting that people are more vulnerable to symptoms of GAD during quarantine. Increased rates are expected during quarantine along with increasing cases of mental health illnesses after pandemic. In addition, symptoms of anxiety are related to several morbidities because of comorbid nature, such as substance abuse disorders, depressive disorders, somatic symptoms, mood disorders, respiratory illnesses, heart disease, etc.” (Gale and Davidson, 2007). Given the implications of generalized anxiety, loneliness, and social isolation, there is a blend of health effects for people affected. These hazards will cause chronic and acute morbidities, causing potential premature death. It is important to outline the combined and individual health effects of

loneliness and social isolation to address this problem and their relation with anxiety disorder.

5. Discussion and Conclusion

For policymakers and health practitioners, the key takeaway from this study is to acknowledge that there will be a rise in mental health risks in post-pandemic world. Especially when a lot of companies want employees to work for a longer time, mental health should be the serious concern. Future studies may focus on other biological factors which may be vital in proposed construct. All the scales of loneliness are subjective till date and they don't report the patient's state accurately.

It is important to improve outcome scales reported by patients to reflect the condition of anxious and lonely patients to gain better understanding of how they feel lonely for better response. Loneliness and social isolation are found to be the risk factors for individuals to develop symptoms of depression and anxiety. Overall findings of the study support the risks of other psychological and physiological conditions. Future studies may explain the association of loneliness and social isolation with symptoms of anxiety in conditions like quarantine.

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