

PERSPECTIVE**Loneliness and Its Impact: An Overlooked Epidemic**Cathy Chi, BS,¹ Farzana Hoque, MD, MRCP, FACP, FRCP²¹Saint Louis University, School of Medicine, Saint Louis, MO, USA²Associate Professor of Medicine, Saint Louis University, School of Medicine, Saint Louis, MO, USA

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Approximately half of U.S. adults report experiencing measurable levels of loneliness.¹ Loneliness is the feeling of being alone, irrespective of social contact, while social isolation is a lack of social connections. Therefore, social isolation may lead to loneliness for some, while others can feel lonely without being socially isolated. Both loneliness and social isolation are increasing exponentially. The U.S. Surgeon General, Dr. Vivek Murthy, recently declared loneliness and isolation as an underappreciated public health crisis, equating its impact on physical health to that of smoking 15 cigarettes per day.² The primary method for measuring loneliness uses self-report surveys, where individuals evaluate their loneliness and social isolation by responding to statements about social interactions and emotions, indicating their agreement or frequency of these experiences. The UCLA Loneliness Scale is one of the most widely used tools which has 20 items, allowing individuals to subjectively assess their feelings on a scale from 1 to 4, covering aspects such as feeling excluded or having companionship. Scores ranging from 20 to 34

indicate a low level of loneliness, 35 to 49 indicate a moderate level, 50 to 64 reflect a moderately high level, and 65 to 80 indicate a high level of loneliness.³ Loneliness is inherently subjective, and individuals' perceptions of what constitutes loneliness can vary widely.

Neurobiology of Loneliness

Humans are social creatures, and the formation and maintenance of social bonds are key factors to survival through physical and mental well-being. Neuropeptides such as oxytocin, vasopressin, and neurotransmitters such as dopamine and endorphins are released to promote social-seeking behaviors.⁴ Loneliness is interpreted by the body as an acute stressor, triggering the release of stress-related neuropeptides such as glucocorticoids and corticotrophin-releasing hormones and downregulation of the release of neuropeptides and neurotransmitters associated with social-seeking behaviors.⁴ Lonely individuals show higher salivary and plasma cortisol levels and are at greater risk for dementia, anxiety,

depression, and suicidal ideation.⁴ One study found that 11-18% of cases of depression in individuals over 50 can be attributed to loneliness.⁵

Impact on Physical Health

A study published in JAMA Neurology suggested that loneliness is associated with an increased risk of developing Parkinson's disease.⁶ The conclusions were drawn from a prospective cohort study involving 491,603 participants followed up for up to 15 years. After meticulously adjusting for various variables, including demographic factors, socioeconomic status, social isolation, genetic predisposition, smoking, physical activity, body mass index, diabetes, hypertension, stroke, myocardial infarction, depression, and psychiatric consultation, the study revealed that individuals frequently experiencing loneliness had a heightened risk of subsequent Parkinson's disease diagnosis.⁶ We commonly link lifestyle-related factors such as hypertension, obesity, and smoking with the risk of cardiovascular disease. However, loneliness significantly amplifies the risk of cardiovascular disease and mortality, independently of well-established factors, as indicated by a 9-year longitudinal study involving over 4,000 patients.⁷ A meta-analysis, encompassing 148 studies and over 300,000 participants, reached the same conclusion.⁸ The overall odds of mortality attributed to loneliness and isolation are akin to those associated with light smoking, surpassing the risks associated with obesity or hypertension. Furthermore, studies indicate that loneliness triggers oxidative stress and inflammation, contributing to dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis and an elevated risk of cardiovascular disease. Chronic stress also plays a role in glucocorticoid resistance, resulting in the hyperactivity of corticotrophin-releasing hormone and

sympathetic nervous system pathways, subsequently leading to the development of hypertension, atherosclerosis, and diabetes mellitus.⁸ The findings further underscore loneliness as a key psychosocial determinant impacting overall health.

Mental Health Outcomes

Loneliness is a social determinant of mental health, contributing to the onset of depression and anxiety.⁸⁻¹⁰ Depression and loneliness are intertwined since depressed individuals are more likely to isolate themselves socially. Simultaneously, prolonged loneliness can act as a trigger for the onset of depression over time.⁹ Childhood loneliness has long-term detrimental effects on mental health. Two studies found that loneliness was associated with increased anxiety and depression in adulthood.^{8,9} These studies analyzed the presence of any anxiety symptoms or any depression symptoms and did not isolate either variable.^{9,10} Loneliness contributes to higher probabilities of alcohol abuse and smoking, alongside a decrease in physical activity. Fortunately, multiple studies demonstrate how increased social connection and support can blunt or reverse the effects of these mood disorders.^{8,9}

Loneliness Dynamics

Loneliness is often misunderstood as an issue primarily affecting older individuals. Contrary to this popular belief, a 2022 study showed that loneliness is the highest among young adults (<30 years) and the oldest adults (>70 years).¹⁰ U.S. young adults, especially those under 25 years of age, are as lonely as the oldest adults.¹¹ There was a significantly higher likelihood of loneliness in those with only a high school education compared to those with a bachelor's degree.¹³ For middle-aged adults, predictors of loneliness included work status, income, and caregiving

responsibilities.^{11,12} Work status and income were protective factors against loneliness. Conversely, caregiving responsibilities led to less available time to spend socializing with friends and families, ultimately causing loneliness.¹² Lastly, older individuals were vulnerable to experiencing losses of their spouse, family, friends, and social status, leading to an increase in anxiety and depression.¹¹

Across all ages, greater loneliness was associated with not having a spouse or partner, anxiety, greater sleep disturbances, lower pro-social behaviors, and smaller social networks. Women are socialized to maintain larger and more active social networks than men. In addition, men underreport loneliness due to the stigma they experience. Most assume that women report more loneliness than men across all ages.¹¹ In a BBC-conducted online survey with voluntary participation, 68% of respondents were women, out of over 40,000 participants.¹¹ The findings revealed that women were more inclined to report higher levels of loneliness. Conversely, only 32% of the participants were men, suggesting the possibility that the higher reported loneliness among women could be influenced by the gender distribution of the survey respondents.¹¹ Predictors of loneliness for older women, and for men to a lesser degree, included widowhood, living alone, chronic illness, disability, and functional limitations. However, a meta-analysis consisting of surveyed participants from over 237 countries found no gender differences in loneliness, with no effects of either age or culture.¹¹

Studies on loneliness across cultures reveal mixed evidence, with some suggesting lower loneliness in individualistic societies compared to collectivist ones, yet discrepancies exist due to methodological and theoretical challenges. The complexity of cross-cultural comparisons and the varying

impact of culture on loneliness by age contribute to these mixed findings.¹¹

Combating Loneliness

The U.S. Surgeon General's Advisory outlines a comprehensive framework to develop a National Strategy for Advancing Social Connection, based on six foundational pillars.¹² The first pillar emphasizes the need to enhance social infrastructure, underscoring that connections are not solely shaped by individual interactions but also by the physical elements of a community and the policies in place. The second pillar advocates for pro-connection public policies at the national, state, local, and tribal levels, such as accessible public transportation or paid family leave. The third pillar highlights the crucial role of the health sector in identifying and addressing loneliness and isolation as risk factors for various health conditions. The fourth pillar calls for a critical evaluation and reform of digital environments to ensure that digital interactions do not hinder meaningful connections. The fifth pillar emphasizes the necessity for a more robust research agenda to deepen understanding of the causes and consequences of social disconnection. Finally, the sixth pillar stresses the importance of cultivating a culture of connection in everyday life, as the norms and practices significantly influence the quality of relationships. Collectively, these pillars aim to establish a comprehensive and effective approach to fostering social connection across the nation.¹²

Healthcare workers should assess loneliness as a standard part of preventative care and respond to their health-relevant social needs by linking individuals to community-based resources that can increase social connection. On a larger scale, public health organizations can track the prevalence of loneliness, promote the best practices, and advance solutions for the community. Most

research studies on interventions to treat loneliness involve encouraging socialization or social prescribing. These ranged from exercising in a group setting, befriending volunteers, and participating in community programs.¹³ Because face-to-face interactions may present logistical difficulties, some studies utilized technology so that participants would regularly video call friends and family members. Research has shown that social connectedness can reduce the negative symptoms associated with loneliness. However, these social prescriptions may not always lead to meaningful friendships and may cause social anxiety. A comprehensive review, encompassing 70 studies involving 8,259 participants, conducted a meta-analysis of 44 studies focusing on loneliness outcomes.¹³ The findings unveiled that interventions such as animal therapy, multicomponent approaches, exercise, technological interventions, and various forms of therapy, including cognitive behavioral therapy and psychotherapy, were consistently linked to noteworthy reductions in both loneliness and social isolation.

Conclusion

Loneliness is a social determinant of health, negatively impacting not only mental health outcomes, but also increasing the risk for heart disease, stroke, and dementia. It presents a unique challenge compared to other health epidemics, as its recognition and seeking help are still hindered by social stigma. Further investigation is essential to deepen our understanding of the biological and sociocultural mechanisms of loneliness and to develop effective interventions for its treatment.

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