SCHOLARLY REVIEW

Barriers Towards Social Isolation and Neurodegenerative Disease for Geriatric Populations in Rural Mississippi

By Kushal Patel

Author Biography

Kushal Patel is a high school senior at Memphis University School in Memphis, TN. His passion lies in public health, specifically regarding health equity, an interest sparked by his extensive involvement with rural communities in Northern Mississippi. Notably, he has co-founded the Memphis Elderly Outreach Association, a nonprofit dedicated to providing visits to the elderly in rural Northern Mississippian nursing homes, with his experiences there eliciting his inception of this paper. He is also involved with the Delta Directions Program and has interned with the Aaron E. Henry Community Health Center in Clarksdale, Mississippi. Additionally, apart from excelling in eleven AP courses in the classroom, Kushal is captain of his school fencing team and has been recognized and selected as a Memphis Business Journal Next Gen Leader in his community.

Abstract

Rural elderly populations in Mississippi represent one of the most vulnerable demographics in the United States, especially regarding loneliness. This study explores the primary contributing factors towards social isolation among the elderly in rural Mississippi. Loneliness, a subjective feeling of social isolation, is linked to various adverse health conditions, with the most notable for the elderly being neurodegenerative diseases such as dementia. This research employs a review of the literature to explore the geographic challenges that lead to elderly loneliness stemming from the relative poverty of rural Mississippi and the interpersonal barriers caused by the unique cultural demographic of rural Mississippi. Findings indicate that rural elderly populations face compounded challenges due to poverty, transportation difficulties, and reduced access to healthcare professionals, obstacles which are magnified by fear of medical providers, prevention of disease being a low priority, and language barriers. Supportive policies can enhance current initiatives and initiate functional strategies to mitigate loneliness and its health impacts among this vulnerable demographic. The implications of this research underscore the urgent need for targeted interventions to break the cycle of social isolation and health deterioration in rural elderly communities in the U.S., particularly where this is felt the hardest - rural Mississippi.

Keywords: Social Isolation, Loneliness, Rural Mississippi, Elderly, Geriatric, Healthcare Barriers, Neurodegenerative Disease, Dementia, Interpersonal Barriers, Rural Poverty

Introduction

Rural elderly populations in Mississippi represent one of the most vulnerable demographics in the United States, especially to loneliness. Approximately 17% of Mississippi's population is elderly, and in the state's rural areas—comprising 65 of the 82 counties (79.3%)—17.6% of the population is elderly, creating an expansive demographic that is susceptible to loneliness in old age (Healthy Aging Data Report: Highlights from Mississippi, 2023; Mississippi - 2021 - III.B. Overview of the State, n.d.; U.S. Census Bureau QuickFacts, n.d.). In fact, geriatric loneliness and social isolation stand out in Mississippi, with this state having the highest prevalence of social isolation out of all states for the elderly (2023 Senior Report | AHR, n.d.).

Loneliness is a subjective feeling of social isolation, which can lead to various adverse health outcomes, including depression and cardiovascular diseases. The most devastating maladies shown to result from loneliness in the elderly are neurodegenerative diseases, conditions which erode patients' nervous systems and are particularly harmful to older adults. The most common neurodegenerative disease is dementia, caused by the degeneration of brain cells, and swift treatment is necessary for those suffering from extreme symptoms (Magierski et al., 2020; Newcombe et al., 2018). In rural areas in Mississippi, loneliness is often exacerbated by geographical isolation, limited access to healthcare, and inadequate social support networks, thus leaving the elderly in these regions particularly vulnerable to developing neurodegenerative disease and unable to remedy it, which further contributes to feelings of loneliness, creating a vicious cycle of social isolation and health deterioration. Despite Mississippi being mostly rural, the urban counties tend to have a higher concentration of health professionals, more local funding for hospitals, and interconnected infrastructures, all of which contribute to less loneliness and easier access to care (Mississippi - 2021 - III.B. Overview of the State, n.d.).

Through a systematic review of literature and policy analysis, this paper examines the primary contributing factors to geriatric loneliness in rural Mississippi and explores the biomedical impacts of social isolation, contributing towards neurodegenerative disease. With these barriers and provisions in mind, the paper offers policy recommendations to increase the impact of existing policies in rural Mississippi and identifies functional initiatives to establish a way to save this vulnerable group from loneliness.

Methods

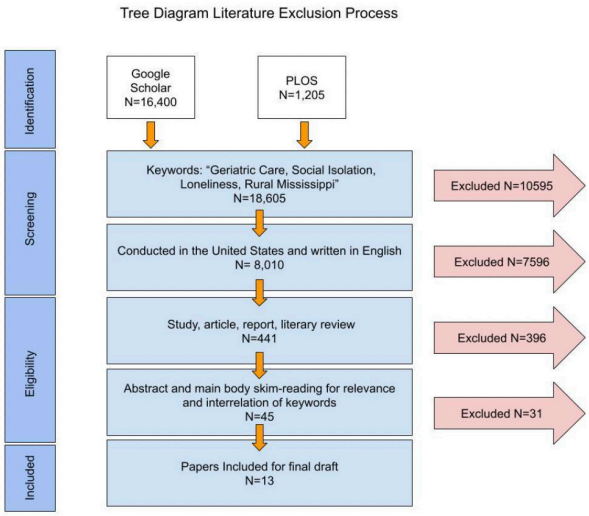
A systematic literature search was performed using Google Scholar and PLOS as the primary search engines. The following keywords were used to conduct the search: Geriatric Care, Social Isolation, Loneliness, Rural Mississippi. In Google Scholar, the keywords were searched together; in PLOS, each keyword was individually entered in a single search.

The study and article selection was conducted by one reviewer (the P.I.). The inclusion criteria for the articles were as follows: (1) Type of studies or article: original research studies and articles from trusted sources; (2) Participants: study or article either included or referenced rural-dwelling older adults, broadly defined as subjects older of than 65 years, specifically the elderly in Rural Mississippi being examined; (3) Publishing information: study or article is in English and conducted in the US.

Selection of articles and studies for relevancy was based on the following criteria: (1) Authors and year of publication; (2) Study design; (3) Population of subjects; (4) Geographical region of subjects (Rural Mississippi specific or not); (5) Policy focus of article or study; and (6) Primary Conclusion. Not every study or article contained information for these criteria, meaning that such information was irrelevant. Inclusion of an author was based on the authority and credibility of their work in the field of rural geriatric care and social isolation, and only publications from 2008-2024 were considered.

Due to the heterogeneity of the study designs and outcome measures, no meta-analysis was conducted. Instead, a narrative data synthesis was performed.

Figure 1: Tree Diagram Literature Exclusion Process:



Results

The literature search produced 8 articles and 5 reports. One results table was assembled, detailing the name of the literature, its author (if applicable), the organization of publication, the year of publication, the type of literature, whether it is related directly to Rural Mississippi, and the thematic area/policy which it addresses. Other sources were also referenced (see Bibliography), but only essential sources were chosen to be highlighted in Table 1.

Table 1: Related Literature

Name (Author)	Organization (Year Published)	Literature type	Rural MS specific	Thematic Area
Funding and Service Delivery in Rural and Urban Local US Health Departments in 2010 and 2016 (Beatty, Heffernan, Hale, Meit)	American Journal of Public Health (2016)	Journal Article	No	Access to healthcare in Rural Areas
Rural-urban disparities in health outcomes, clinical care, health behaviors, and social determinants of health and an action-oriented, dynamic tool for visualizing them (Weeks, Chang, Pagan, Lumpkin, Michael)	PLOS Global Public Health (2023)	Journal Article	No	
Poverty in the United States: 2021 (Creamer, Shrider, Burns, Chen)	US Census Bureau (2022)	Report	No	Background to Rural Mississippian Elderly
Assessing Nutrition Risk and Sociodemographic Characteristics of Low-Income Older Adults Living in Mississippi (Lokken, Byrd, Hope)	Journal of Nutrition for the Elderly (2008)	Journal Article	Yes	
2022 State Report: Mississippi	University of Wisconsin (2022)	Report	Yes	
U.S. Literacy Rates by State 2024	World Population Review (2024)	Report	Yes	
America's Health Rankings Senior Report 2023	United Health Foundations (2023)	Report	No	
Social isolation, health literacy, and mortality risk: findings from the English Longitudinal Study of Ageing (Smith, Jackson, Kobayashi, Steptoe)	Health Psychology (2018)	Journal Article	No	Implications of Social Isolation
Barriers to Healthcare Seeking and Provision Among African American Adults in the Rural Mississippi Delta Region: Community and Provider Perspectives (Connell, Wang, Crook, Yadrick)	Journal of Community Health (2019)	Journal Article	Yes	Interpersonal Barriers
More than Tuskegee: Understanding Mistrust about Research Participation (Scharff, Mathews, Jackson, Hoffsuemmer, Martin, Edwards)	Health Psychology (2010)	Journal Article	No	
Regional tau pathology and loneliness in cognitively normal older adults (d'Oleire Uquillas, Jacobs, Biddle, Properzi, Hanseeuw)	Translational Psychiatry (2018)	Journal Article	No	Neurodegenerative Disease
Inflammation: the link between comorbidities, genetics, and Alzheimer's disease (Newcombe, Camats-Perna, Silva, Valmas, Huat, Medeiros)	Journal of Neuroinflammation (2018)	Journal Article	No	
Fiscal Year 2024 Budget in Brief	United States Health & Human Services (2024)	Report	No	Promising Initiative against Loneliness

Discussion

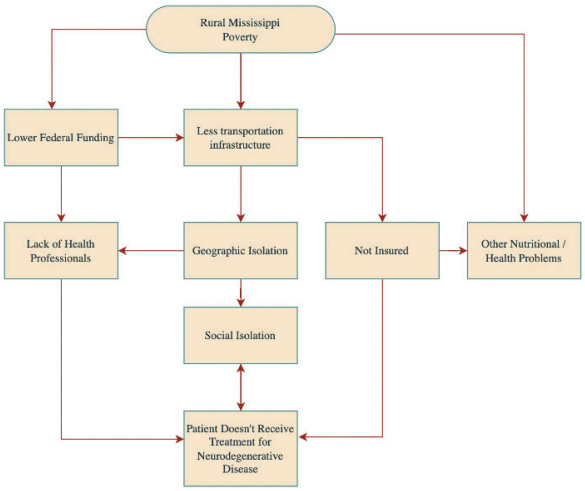
Primary Contributing Factors to Geriatric Loneliness

Geographic challenges (rural, lack of transport, distance)

Geriatric loneliness and dementia in Rural Mississippi is caused and exacerbated by numerous issues stemming from the relative poverty of rural areas, as mapped by Figure 2. With a high poverty rate, the elderly often lack insurance, transport, and medical professionals, leaving them without the means to counter loneliness and dementia.In Mississippi, which has the highest poverty rate in the country of 18.1%, 15.4% of rural Mississippian elderly live in poverty (Creamer et al., 2022; Healthy Aging Data Report: Highlights from Mississippi, 2023). This poverty rate often bars the elderly from consuming nutritionally valuable foods. For example, rural Mississippi grocery stores provide limited amounts of fresh fruits and vegetables, depriving communities of necessary sources of vital vitamins and minerals (Lokken et al., n.d.). Instead, rural Mississippians must depend on cheaper, processed foods often high in cholesterol, sugar, and fat, resulting in higher blood pressures and sedentary lifestyles, which have led to 40% of the Mississippi elderly being obese (Lokken et al.,

n.d.). Many elderly rural Mississippians already face a multitude of health issues, such as cardiovascular disease, that complement obesity, resulting in their lower quality of living. Greater policy attention is given towards food malnutrition as the primary cause of disease in the region rather than the stress, loneliness, and isolation that accompany it.

Figure 2: Implications of Relative Rural Mississippi Poverty on Social Isolation for the Elderly



Furthermore, Mississippi has an 8.1% unemployment rate, leaving countless families unable to provide money nor make visits to their older family, a financial and social seclusion that contributes towards feelings of loneliness (University of Wisconsin, 2022). With a significant portion of Mississippi in poverty or unemployed, 15% of adults under the age of 65 do not have health insurance, a proportion that is higher than the national health uninsurance rate of 11% (University of Wisconsin, 2022). Notably, less rural Mississippi adults under 65 are uninsured than those in urban areas (Weeks et al., 2023). Not being insured before becoming eligible for Medicare indicates lack of financial stability or lack of awareness of health insurance that could lead to late enrollment for Part B of Medicare at the age of 65. Elderly Mississippians with dementia or other diseases, because they do not have insurance or money to pay for treatments, don't seek treatment, even if it is necessary (Connell et al., 2019).

Another factor contributing to isolation is the lack of transportation as a result of rurality serves as a barrier for the elderly suffering from social isolation or dementia. With many rural elderly people not being able to afford personal transportation, they often must pay neighbors or others to go to a doctor's office, an expenditure which ranges from $30 to $40 (Connell et al., 2019). This high cost of transportation deters many unwell elderly people from seeking treatment, leading to the worsening of their conditions. Out of those Mississippians who can drive, 85% drive alone to work every day, a lonely and tiring task, which takes more than 30 minutes for 33% of these drivers (University of Wisconsin, 2022).

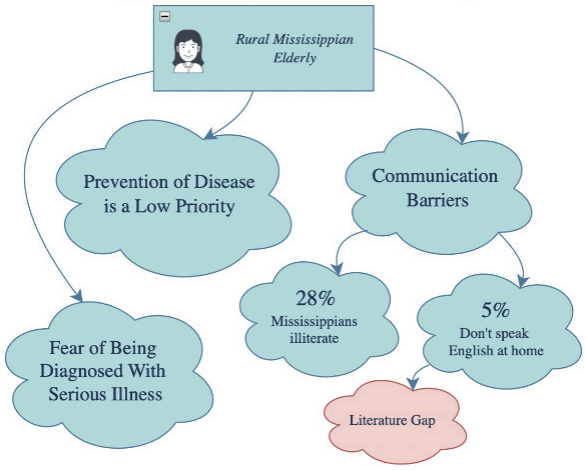
Indeed, the remoteness and lack of public transportation of rural Mississippi leads to a lower access to health professionals. There is one mental health provider out of every 540 people in Mississippi, a ratio which is lower than the national average at one out of 340 (University of Wisconsin, 2022). This inequality of access to mental health professionals prevents some elderly people who face social isolation or dementia from receiving treatments promptly. Finally, rural hospitals and clinics receive lower levels of local funds than urban hospitals, resulting in rural hospital workers being paid less and the hospitals depending more on federal revenue sources (Beatty et al., 2016). Because of lower pay and a geographical barrier, health professionals are less incentivized to work in rural areas. The shortage of health professionals in rural areas results in a higher demand for care compared to urban settings, forcing many elderly residents to travel long distances to urban centers for treatment, a journey which many are unable to make. To address health professional shortages, 88 incentification programs have been introduced in Southern States, such as Loan Repayment Programs, J-1 Visa Waiver Programs, and a variety of Scholarship programs, but despite these efforts, rural physician shortages persist and are predicted to worsen (Arredondo et al., 2023).

Interpersonal Barriers

Additionally, geriatric social isolation and dementia in rural Mississippi is magnified by interpersonal barriers characteristic to rural Mississippi, such as fear of medical providers, prevention of disease being a low priority, and language barriers, all of which are portrayed in Figure 3. First, rural Mississippians, particularly African Americans, are often too intimidated to go to the doctor in fear of learning the seriousness of

their illness; indeed, one rural Mississippian declared that "[the Mississippian] don't want to go [to the doctor] 'cause it might be bad news" (Connell et al., 2019). Some research has correlated this fear in African American elderly with racial discrimination (Scharff et al., 2010). Another interpersonal barrier to seeking care for loneliness and dementia is the feeling of responsibility to provide for others and not to seek help. As the head of the family, the elderly have provided for their sons and daughters for most of their life, so seeking aid is a deviation from their traditional role (Connell et al., 2019). Many elderly will not seek healthcare to avoid a stigma of weakness as the established head of the family. This behavior is especially harmful for elderly dementia patients who need support as soon as possible.

Figure 3: Interpersonal Barriers Faced By Rural Mississippian Elderly to Seek Medical Help



Finally, communication barriers in healthcare are prevalent in Mississippi, preventing thousands from seeking care, receiving understood diagnoses, or attending follow-up appointments. In 2023, more than 117,587 people in Mississippi spoke a language other than English at home, with approximately two-thirds of this demographic speaking Spanish, a figure which is amplified when considering undocumented immigrants (U.S. Census Bureau). Notably, there is a stark literature gap regarding the population of non-English-speaking elderly Mississippians and their access to healthcare services. However, a more common communication barrier is illiteracy, with 28% of Mississippians lacking basic prose literacy skills in 2024 (World Population Review, 2024). This illiteracy stifles the health literacies of patients and the ability to make health appropriate decisions, especially affecting the elderly (Smith et al., 2018). Because of lack of incentives to stay, the Mississippi workforce loses young, highly educated health professionals who are able to communicate effectively with this population, leading to many patients being neglected (Ostrovsky, 2019). Notably, those who are not well-versed in English are prevented from vital communication. They are unable to connect with their neighbors, leading to increased loneliness and dependence on the family as a social unit; this dependence is a problem as the rural elderly in Mississippi rarely see their family due to the geographical divide and lack of transportation.

Neurodegenerative Disease: A Biomedical Product of Loneliness

Neurodegenerative diseases are conditions that gradually attack and erode patients' nervous systems, especially in the brain. These disorders typically affect the aging population, with dementia, specifically Alzheimer's Disease (AD), being the most common: AD affects 10% of individuals over the age of 65 and 33% of those over 85 (Newcombe et al., 2018). The way that AD degenerates the condition of the brain begins with an accumulation of a toxin (amyloid-β, Aβ) and pathogenesis of a neuron-based protein (tau, which becomes 'abnormal tau'). Aβ accumulation leads to plaques, which disrupt synaptic function and activate immune cells (microglia) in the brain, leading to inflammation and oxidative stress.

This toxic environment contributes to neuronal damage, cognitive decline, and, ultimately, death (Hampel et al., 2022). Among the elderly who report a lack of companionship or are suffering from chronic loneliness, higher levels of both abnormal tau and amyloid-β have been detected (d'Oleire Uquillas et al., 2018). Thus, loneliness is a discerning marker of neurodegenerative disease development as well as a major source of psychological stress. This trend explains why in Mississippi, a predominantly rural state with thousands of elderly at risk of loneliness, has a 12.9% rate of Alzheimer's disease for Medicare beneficiaries age 65 and older, slightly higher than the national rate of 10.9% (Alzheimer's Disease Facts and Figures, n.d.; Healthy Aging Data Report: Highlights from Mississippi, 2023).

Conclusion

Why should policy and social resources pay more attention to the elderly, particularly in Mississippi? Today's elderly population were dominantly born during the baby boom era (from the 1940s to the 1960s), known for the major increase in birth rate (especially following a century of fertility decline in the US), primarily attributed to post-World War II economic prosperity, increased marriage rates, and a societal emphasis on family and domestic life (Bouvier, 1980). By 2030, over 20% of Americans will be at least 65 years old (Connell et al., 2019).

Thus, now is the time to address the needs of this massive population, especially in rural Mississippi where the elderly are more likely to suffer from poverty, loneliness, and chronic diseases, including neurodegenerative disease (Coburn et al., 2016). Support of pre-existing national policies that work to counteract elderly isolation, such as the Older Americans Act (OAA) and the Affordable Care Act (ACA), is paramount. Under the ACA, Medicaid Expansion would insure the thousands of low income rural elderly in Mississippi with mental health services, including counseling and therapy (Breslau et al., 2020), and investment in the ACA's Accountable Care Organizations, provider-run groups that tailoring to patients' specific social determinant needs to provide better and more accessible care, would streamline the process for elderly to receive care (Rhubart et al., 2021).

On the other hand, the OAA, which provides funding towards elderly supportive services, does not yet allow grants directly towards addressing loneliness as they are not yet considered disease prevention and health promotion services, an exclusion which is being pursued in Congress (Older Americans Act: Overview and Funding, 2023; Sorbe, 2024). A more local solution to combat rural elderly loneliness and neurodegenerative disease is to increase funding and support for telehealth infrastructure, including subsidies for broadband internet expansion and telehealth equipment, along with grants for community workshops on technology use (Perrin, 2017; Turrini et al., 2021). Through these combined efforts, it is possible to significantly reduce geriatric loneliness, enhance the quality of life for the elderly in rural Mississippi, and set a precedent for other regions facing similar challenges.

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