Examining Social Determinants of Health in Alzheimer’s Disease Development, Progression, and Care

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ABSTRACT:

Background:

Alzheimer's disease (AD) is a neurodegenerative disorder with very fast progression and is the most common cause of dementia, which occurs in 5 million people, and its incidence is estimated to triple by 2050. AD, while mostly caused by aging, can be affected by social determinants of health. Education, socioeconomic status, geographical location, etc. have all been shown to impact the course of AD progression. The purpose of this paper is to illustrate SDOH influence on the Alzheimer's epidemic through the determination of populations at risk and structural transitions influencing long-term cognitive results for diverse communities.

Objectives:

To determine how social determinants of health (SDOH) influence Alzheimer's Disease risk, diagnosis, progression, and cost. The research aims to corroborate findings across recent studies to identify structural, medical, and environmental determinants that shape the trajectory and care for AD in the general population.

Methods:

A review of the literature was conducted through PubMed with terms combining "social determinants of health,” “Alzheimer's,” and “Dementia.” Inclusion criteria are studies from 2016 to 2025 in English, focusing on human trials and explicitly addressing SDOH in Alzheimer's or dementia. Studies using animal models or basic neuroscience without a social component were excluded.

Results:

Social determinants of health, in general, have a significant impact on AD development, diagnosis, caregiving, and cost. Deterioration of instrumental activities of daily living (IADL), caregiver type, and socioeconomic status have all shown to impact institutionalization and increase financial burden. Geographic disparity and impaired healthcare access exacerbate late-stage diagnoses. Behavioral mechanisms like education, smoking, and exercise also increase dementia risk.

Discussion:

AD’s course and societal burden are closely tied to social determinants of health. Inclusion of policy interventions promoting caregiver support, healthcare access, and economic protections is critical to reducing disparities and improving outcomes. The integration of social context into dementia care initiatives offers a necessary pathway to more effective and equitable long-term neurodegenerative disease care.

INTRODUCTION:

Alzheimer's disease (AD) is a progressive neurodegenerative disorder and the most common cause of dementia, affecting over 5 million Americans. The incidence of AD is expected to triple by 2050 [1]. AD is not only the leading cause of death in the U.S but also one of the most debilitating in terms of loss of function, loss of independence, and caregiver strain. Despite advances in understanding the pathology of the diseases, such as the buildup of amyloid plaques and formation of neurofibrillary tangles, effective treatments remain largely limited to symptom management, and therapies have not generally made significant changes on the course of the illness [2].

While aging is the most established risk factor for AD, new evidence suggests that social determinants of health (SDOH) are also critical in determining brain health throughout the lifespan. Social determinants of health are non-medical factors, such as environment, socioeconomic status, access to healthcare, education, etc., that influence one's health and well-being. These circumstances, which are often linked to systemic injustices, can quicken cognitive decline through their impact on early-life development, exposure to chronic stress, and access to health-promoting resources throughout adulthood [3]. For example, reduced education is linked with lower cognitive reserve, making the brain more susceptible to degenerative processes [3]. Similarly, poverty, poor access to healthcare, and language barriers delay diagnosis and treatment [3]. Demographic susceptibilities may also play a role in AD health outcomes.

The Latino population, in particular, is disproportionately affected. Latinos currently carry the highest proportion of Alzheimer's diagnoses among U.S. elders (12%) and are projected to see a nine-fold increase in AD cases by 2060 [1]. This disproportionate risk is compounded by the diversity of Latino subgroups, such as Mexicans, Puerto Ricans, and Caribbean Hispanics, who each face unique genetic, environmental, and social risk factors. In AD incidence comparisons by region, Latinos have consistently shown earlier onset age and more severe symptoms compared to non-Hispanic Whites, generally explained by lower education, higher prevalence of metabolic disease, and language barriers in healthcare systems [1]. The biological processes of AD have been the focus of most research and clinical practice, with less consideration given to the structural forces affecting disparities in cognitive health [2]. Interventions often overlook the upstream determinants, such as early-life adversity, neighborhood deprivation, and systemic racism, that shape trajectories of brain aging [3]. As a result, underserved groups remain underdiagnosed, undertreated, and underrepresented in most clinical research. This article argues that more knowledge about SDOH is key to better understanding the AD epidemic. By integrating life-course epidemiology and a health equity approach, we can better target risk groups, create culturally sensitive interventions, and implement structural reforms to improve long-term cognitive trajectories among vulnerable populations.

METHODS:

A systematic search of the PubMed database was conducted for this literature review. The key terms used in the search were: ((social determinants of health) AND (nervous system OR neuro OR brain)) AND (Alzheimer's OR Dementia OR Parkinson's). This combination of key terms and Boolean operators was selected to capture studies at the intersection of social, structural, and economic conditions and Alzheimer's disease. When considering articles for inclusion, several inclusion and exclusion criteria were applied to determine relevance and quality. Articles were included only if they were peer-reviewed and published during the period between the years 2016 and 2025. Studies were included if they were carried out in the English language, on human subjects, and investigated the relationship between social determinants of health– such as education, income, ethnicity, access to care– and cognitive health outcomes. Papers published before 2016, those that dealt only with animal models and/or basic neuroscience without an epidemiological component, review articles, and papers that did not address social determinants of health in relation to Alzheimer's disease or dementia specifically were excluded.

RESULTS:

Cognitive impairments affecting instrumental activities of daily living (IADLs), including financial management, medication, and transportation management were observed in individuals with Alzheimer’s disease (AD) [4]. In one study, money management difficulties were reported alongside increased vulnerability to financial exploitation. Longitudinal data indicated declines in credit scores and payment reliability in the years preceding a dementia diagnosis [4].

The type of caregiver was also associated with changes in institutionalization timing. Spousal caregivers provided the largest share of informal care and were associated with longer community-based residence. Care by non-spousal family or friends was associated with earlier transitions to institutional care [4]. Caregivers of individuals with moderate or severe functional impairment provided more hours of care per week and naturally reported higher strain [4].

The average cost of care for an individual with dementia in the United States in 2024 was reported as $377,000, with 70% of costs paid by family members through unpaid caregiving and out-of-pocket payments [4]. Medicare and Medicaid covered a portion of medical costs, while non-medical care, including home services, transportation, and home modifications, accounted for the largest share of expenses, borne by the families themselves [4].

In a cohort study of over 35,000 elderly individuals, factors such as living alone, decreased access to primary care , and limited mental health services were among the strongest non-clinical predictors of dementia onset [5]. Earlier and more severe cognitive decline was observed in individuals with fewer social supports and lower access to mental healthcare, independent of comorbidities and age [5]. Living conditions and insurance status were also associated with dementia risk [5].

Higher educational attainment (college or higher) was associated with reduced all-cause dementia risk [6]. External factors, like smoking and alcohol use disorder (AUD), were associated with increased dementia risk in men, regardless of cerebrovascular disease status, and elevated dementia risk in men with other neurological disorders[6].

Physical activity was associated with reduced AD risk [7]. In a lifestyle intervention study, older adults with less than six or more than nine hours of sleep per night were less likely to adhere to exercise recommendations, thereby affecting AD risk [7].

Geographic disparities were reported, with rural and medically underserved residents having less access to diagnostic services and lower participation in preventive care, resulting in later-stage diagnoses [5]. Higher local trust, civic participation, and area healthcare resources were associated with more favorable outcomes when it comes to AD [5]. In pediatric neurology study, White patients were nearly twice as likely as Black patients to receive genetic testing despite similar referral rates, a difference partly attributed to insurance denial rates and differences between public and private insurance [8]. In general, incidence rates of AD are higher in Black populations and other minorities than in White populations.

DISCUSSION:

This research found that social determinants of health (SDOH) like caregiver type, economic security, access to care, and community-based resources affect the clinical trajectory, timings of care, and financial opportunities of patients with AD. The most striking observation was the intersection among decline in motor function, susceptibility to financial exploitation, and earlier institutionalization in those remaining without strong informal caregiving networks. These results also further the theory that IADL decline represents not only a biological marker of disease progression but also a marker of environmental and structural conditions that go along with functional losses.

The data also shows that caregivers have a significant impact on the evolution of the disease, with spouse-caregivers significantly prolonging community-based residence, which is often correlated to better mental health. This confirms previous literature that stresses continuity and co-residence with caregivers as being protective against premature institutionalization, but also builds on previous knowledge of caregiver processes by situating these patterns in a context of availability of resources and caregiver strain [4]. Similarly, the finding that non-medical costs, primarily related to home care and supportive services, overshadow medical costs in late AD highlights the necessity to address structural inequities in the availability of services.

These findings were mostly expected, as literature on SDOH and dementia consistently implicates socioeconomic resources, social support networks, and access to healthcare as primary drivers of disease outcomes. However, the strong financial signal, i.e., the $377,000 lifetime expense with 70% of the costs borne by families, was overwhelming in its magnitude and hasn't been as well-documented in prior SDOH-focused studies. This highlights the compelling economic burden imposed on families, especially those without access to subsidized or community-based services.

This research confirms and expands on prior research linking social and behavioral determinants, such as educational attainment and lifestyle factors, to dementia risk. It confirms that modifiable SDOH influence not only disease incidence but also disease trajectory and cost, making them ideal candidates for intervention. The integration of financial stability metrics, such as pre-diagnosis credit score drop, and clinical results, yields a potential approach to identifying at-risk individuals earlier and estimating care needs.

In future studies, these findings can inform healthcare policy change and public health interventions. For example, incorporating financial well-being into primary care screening for older adults could provide an additional “early-warning” system for cognitive impairment. In addition, the creation of more caregiver support infrastructure, especially for non-spousal caregivers, could add time at home, reduce costs, and improve patient quality of life.

Limitations

The primary limitation of this review is the reliance on aggregated data from large-scale epidemiological reports, which may fail to consider individual variability and group-specific effects. The synthesis also incorporates results from a number of studies with varying methodologies and sampling structures, which limits effective comparability. Because this is a secondary analysis of existing literature, causational inferences cannot be drawn, and there is the possibility of unmeasured/undefined variables influencing the observed associations. Additionally, while financial data is robust at the national level, it may not reflect local differences in costs or region-specific policies.

Conclusion

This study confirms that AD trajectory and costs are shaped not only by the biological mechanisms, but also by SDOH. Caregiver type, financial status, and presence of supportive infrastructure emerged as critical factors that determined institutionalization timing, financial burden, and overall disease trajectory. These findings suggest that interventions that specifically address SDOH have the potential to improve outcomes for individuals living with AD. The broader implication of these findings is that dementia care strategies should be aligned with social policy initiatives that reduce inequities, support caregivers, and enhance community services.

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