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PERSPECTIVE

Hearing loss and cognitive decline: Prioritizing equity in a world in which hearing health matters

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Abstract

Alzheimer's disease and related dementias (ADRDs) and age-related hearing loss are the intersection of two major public health challenges. With age as the primary risk factor for both disease processes, the burden of ADRDs and age-related hearing loss is growing, and each field maintains significant barriers to broadscale identification and management that is affordable and accessible. With the disproportionate burden of ADRDs among racial and ethnic minority older adults and existing disparities within hearing care, both areas face challenges in achieving equitable access and outcomes across diverse populations. The publication of the Aging and Cognitive Health Evaluation in Elders (ACHIEVE) trial in July 2023 marked a significant moment in the fields of brain and hearing health. The ACHIEVE trial was the first randomized controlled trial to examine whether providing hearing intervention, specifically provision of hearing aids, compared to an education control, would reduce cognitive changes over 3 years. The participants most at risk for cognitive decline, with lower education, lower income, more likely to identify as Black, and have more cardiovascular risk factors, were the participants who benefited most from the hearing intervention and are also the least likely to be represented in research and the least likely to obtain hearing care. With growing evidence of the interconnection between cognitive and sensory health, we have an opportunity to prioritize equity, from purposeful inclusion of diverse participants in trials to influencing the emerging market of over-the-counter hearing aids to supporting expanded models of hearing care that reach those who have traditionally gone unserved. No longer can hearing go unrecognized by clinicians, researchers, and advocates for brain health. At the same time, the fields of brain and hearing health must center equity if we are going to meet the needs of diverse older adults in a world in which hearing health matters.

KEYWORDS
cognitive decline, dementia, health equity, hearing loss, sensory impairment

1 | INTRODUCTION

The global population is aging along with the associated burden of age-related conditions, which includes Alzheimer's disease and related dementias (ADRDs) and age-related hearing loss.[1–3] ADRDs and age-related hearing loss mark the intersection of two major global public health challenges.[3,4] As a precursor to ADRDs, cognitive impairment represents the spectrum of changes that can be experienced by individuals. Risk factors for cognitive impairment include less education, hypertension, diabetes, smoking, social isolation, among other things and these factors are unequally distributed in populations.[4] In the United States, Black and Hispanic older adults experience higher prevalence of cognitive impairment than White older adults.[5] The disproportionate burden among racial and ethnic minority older adults has been attributed to social and structural determinants of health, like education and income, which in turn can also influence the risk of conditions that contribute to dementia, such as cardiovascular disease and stroke.[5–7] Understanding the social and structural determinants of health in ADRD research and intervening requires representation within clinical trials and interventions that are accessible.[8] With recent advances in pharmacological interventions in ADRD, these lessons have gone unheeded.[7] As the field of ADRD research looks to new pharmacological interventions as well as potentially modifiable risk factors, centering health equity is essential to ensuring that the science represents those most affected by ADRDs and the solutions do not exacerbate existing disparities.

Moving to a focus on primary prevention of dementia, in the search for potentially modifiable risk factors, hearing loss is the largest potentially modifiable risk factor for dementia at a population level, given the prevalence of hearing loss and the degree of association.[4] Like ADRDs, the largest risk factor for hearing loss is age and the burden is unequal, with low- and middle-income countries bearing the largest burden, and that burden is expected to grow.[2] Hearing loss is almost universal with age: two thirds of adults ≥ 70 years have a clinically significant hearing loss, increasing to > 80% among adults ≥ 80 years.[9,10] Globally, 1.57 billion are estimated to have hearing loss, a number expected to increase to 2.45 billion by 2050.[2]

Hearing loss can be readily identified and, for most, managed through low-risk non-pharmacological interventions, using a combination of sensory management (e.g., hearing aids) and aural rehabilitation. While treatment options exist, few older adults use hearing aids, only ≈ 20% to 25% of older adults with a clinically significant hearing loss use hearing aids.[9,11] Disparities in hearing care exist by race, ethnicity, and socioeconomic position: Only 10% of Black older adults with hearing loss use hearing aids.[9,12,13] Hearing aid uptake has remained stagnant for decades and gaps in care have persisted.[14] Furthermore, hearing-related research is hampered by the limited inclusion of racial and ethnic minorities within hearing-related trials.[15] Only ≈ 13% of hearing-related trials in the United States in the past three decades reported race and/or ethnicity and, among those that reported race and/or ethnicity, only five trials included > 30% racial or ethnic minority representation.[15]

The persistence of hearing care disparities is increasingly unacceptable as epidemiological evidence grows regarding the importance of hearing loss within the context of healthy aging.[3] Age-related hearing loss can no longer be viewed as a benign part of the aging process. Beyond cognitive impairment, age-related hearing loss has been independently associated with negative outcomes across almost every aspect of healthy aging, including falls, depression, social isolation, hospitalization, and increased health-care expenditure.[16–20] In moving toward intervention, major questions remain regarding whether hearing interventions, such as the use of hearing aids, can change the trajectory of aging.

The Aging and Cognitive Health Evaluation in Elders (ACHIEVE) study is the largest randomized controlled trial (RCT) of a hearing care intervention to be conducted and it examined the efficacy of a hearing intervention on cognitive decline, among multiple secondary outcomes.[21] The ACHIEVE trial is also the first RCT to evaluate whether a hearing intervention can reduce cognitive decline. The trial was a multicenter, parallel-group RCT that included older adults, aged 70 to 84 years, with hearing loss and without cognitive impairment. Individuals were recruited from the community and from existing participants within the Atherosclerosis Risk in Communities (ARIC) cohort, an ongoing observational study of cardiovascular health.[21] Participants were randomized to receive a hearing intervention versus a health education control. The hearing intervention, which equates to the gold standard in terms of clinical interventions, included bilateral hearing aids fit by an audiologist along with education and counseling and supporting assistive technology with booster visits every 6 months.[21] The primary outcome was change in a global cognition score from baseline to 3 years postintervention. Over the course of almost 2 years, 977 participants were recruited and randomized, with 739 *de novo* community volunteers and 238 participants from the ARIC study.[21] A total of 112 participants self-identified as Black, which represents 11% of the cohort, but makes up one of the largest cohorts of Black older adults with hearing loss in a US-based hearing-related trial, to the authors' knowledge.

Overall, the ACHIEVE trial was a null trial. There was no statistically significant difference in cognitive decline over 3 years between the group that received the hearing intervention and the group that received the health education control.[21] However, a prespecified sensitivity analysis examined the difference in 3-year cognitive change between the group recruited from the community and participants recruited from the ARIC cohort. Among participants from the ARIC cohort, the hearing intervention was significantly associated with a 48% reduction in cognitive decline at 3 years compared to the health education control.[21] Comparing participants from the ARIC cohort versus community volunteers, the ARIC participants had a lower cognitive score at baseline, faster rate of cognitive decline, and more risk factors for cognitive decline. ARIC participants were more likely to live alone, have lower education, lower income, more likely to identify as Black, and have more cardiovascular risk factors—the same individuals who are also the least likely to be represented in hearing-related trials and the least likely to access hearing care.[21] As with ADRD research

more broadly, we see the same consequences of decades of research that has largely failed to consider health equity.

Despite limitations, findings from the ACHIEVE trial are a substantial contribution to understanding the potential role of hearing care in the primary prevention of dementia. Moreover, the results provide a critical opportunity to center health equity and raise the question of how to support brain health and hearing health in a way that advances the health of all older adults, including those who have historically gone unserved by hearing health care. For those most at risk for cognitive decline, a hearing intervention may slow cognitive decline and can no longer be considered optional, reserved for only those who are able to afford and navigate the hearing health-care system. Hearing care must be considered an essential tool for aging well.

To advance equity in hearing care for older adults, action is needed beyond the usual but very much needed calls to expand Medicare coverage for hearing aids. The prioritization of hearing health affords a renewed opportunity for continued advocacy for legislative changes that expand coverage of devices and services. Policy solutions are required alongside changes in research, industry, and the health-care system. Like ADRD research more broadly, greater inclusion of individuals from diverse backgrounds is required, including racial and ethnic diversity, gender diversity, and those individuals of low socioeconomic position. Intentional, community-engaged recruitment and retention approaches are needed that draw upon well-established best practices within public health. This will require intentional collaboration across disciplines and within under-resourced communities. From industry, the convoluted and hesitant marketplace that is over-the-counter hearing aids in the United States is young, but the opportunity exists to envision an expanded hearing aid market, not solely focused on select hearing aid users who are tech connected and middle aged. An expanded market affords the opportunity to drive down costs while pushing for features that are responsive to the needs of the full spectrum of older adults, including individuals aging with cognitive impairment. Furthermore, the opening of the over-the-counter hearing aid market extends hearing care beyond the confines of specialized clinics and toward models of care that can integrate into primary care and partner with community health workers to embrace task sharing.

The ACHIEVE trial represents an important moment for advocates, clinicians, and researchers—an opportunity to realize a world in which brain health and hearing health matter. To realize this world, we must prioritize those who we have failed to prioritize in the past. If we are going to make progress in reducing the burden of ADRDs and age-related hearing loss, equity must be our guide.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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