

Multidisciplinary Approaches and Community-Based Interventions: Adaptable Strategies for Managing Sensory Impairments in Older Adults

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Abstract: Sensory impairments including hearing and vision loss are becoming increasingly prevalent among older adults worldwide, and are adversely affecting their quality of life, independence and cognitive health. This article focuses on the global rise of sensory impairments in the ageing population and evaluates the efficacy of multidisciplinary interventions for management and prevention, including assistive-technology-based medicine, exercise programs and cognitive strategies. Drawing from a wide range of studies, we emphasize the importance of developing globally adaptable, community-based solutions that not only address the direct challenges posed by sensory impairments but also their broader implications for cognitive decline. Additionally, we highlight the need for continuous international research to fine-tune these interventions, to ensure they are holistic and responsive to the diverse needs of older adults across different regions worldwide.

Keywords: sensory impairments, hearing loss, vision loss, older adults, multidisciplinary approaches, assistive-technology-based medicine, exercise programs, cognitive interventions, global perspective, healthy ageing

Introduction

The prevalence rates of sensory impairments such as vision and hearing loss are increasing as populations age worldwide.^{1–3} Recent studies have revealed that approximately one in three adults over the age of 65 years suffers from a significant hearing or vision impairment.^{2–4} The ramifications of this high prevalence are not just individual but societal, with healthcare systems and caregivers facing mounting challenges. Sensory impairments can significantly impact an individual's quality of life, social engagement and independence.^{1,5–7} A qualitative study conducted by Haanes et al in 2019 examined the experiences of the oldest recipients of home care with hearing and vision impairments.⁸ Many of the participants in that study experienced a loss of independence and social isolation due to their sensory impairments. This highlights the importance of addressing sensory impairments to improve quality of life and promote social engagement among older adults.

As the global population ages further, the prevalence of sensory impairments (especially vision and hearing loss) is expected to rise substantially.^{9–11} This article describes various aspects of sensory impairments in the elderly, from its prevalence to innovative interventions, and discusses the global implications.

Challenges of Self-Assessment vs Standardized Testing

While self-assessments can offer insights into how individuals perceive their own sensory capabilities,^{12–15} they are often less accurate than standardized testing.^{16–19} Many older adults underestimate the degree of their impairments, which can

delay necessary interventions.¹³ Standardized testing, on the other hand, provides an objective measure, but its accessibility can be inadequate in certain regions.²⁰ Therefore, effective management and prevention of these impairments are crucial for promoting healthy ageing.²¹

Multidisciplinary Interventions: Global Perspectives

Multidisciplinary approaches to assistive-technology-based medicine have emerged as a promising strategy for addressing sensory impairments in older adults living at home.^{22–30}

Diverse multidisciplinary approaches to address sensory impairments are being applied in various countries.^{31–35} From collaborative healthcare teams in Europe to community-based programs in Asia, these interventions emphasize a holistic approach that considers physical, emotional and social factors.

The variety of community-based interventions that can play roles in managing and preventing these impairments include the following:

- Peer support groups and local organizations offering assistance and guidance.
- Home- or community-center-based exercise programs and physical therapy, to enhance general health and thus indirectly help in managing sensory impairments.
- Educational programs for caregivers and patients to promote their understanding and effective management of the condition.
- Policy initiatives and advocacy to improve the accessibility and affordability of assistive devices and services.
- Cognitive interventions and lifestyle modifications that do not rely heavily on the healthcare system.

The need for a comprehensive approach to sensory rehabilitation within the healthcare system is a crucial part of this challenging situation. A broader dialog on this issue can stimulate further research and policy discussions on effective solutions.

A recent study conducted by Haanes et al in 2021 investigated the feasibility of preventive home visit (PHV) screening of hearing and vision among older adults in the Faroe Islands.²⁰ That study found that PHV screening was effective in identifying sensory impairments in this population, which demonstrates the potential of using multidisciplinary approaches to prevent and manage sensory impairments in older adults living at home.

Other research has also examined the role of multidisciplinary approaches in the management and prevention of sensory impairments in older adults. A study conducted by Kramer in 2008 investigated the problems faced by hearing-impaired people who were seeking help for occupational problems.³⁶ That report describes a vocational enablement protocol addressing the specific needs of people with hearing loss in the workforce. That protocol is characterized by an integrated multidisciplinary approach involving occupational physicians, otolaryngologists, audiologists, social workers/psychologists and speech-language pathologist, and addresses the management of hearing loss in both younger and older adults.

Sensory Impairments and Cognitive Decline: a Dual Challenge

One of the significant concerns surrounding sensory impairments in older adults is their potential link to cognitive decline.³⁷ For example, in 2013 Lin et al demonstrated an association between hearing loss and increased risks of cognitive decline and dementia in older adults.³⁸ Maharani et al subsequently found that both hearing and vision impairments are associated with accelerated cognitive decline in older adults, suggesting that the impact of these impairments extends beyond physical and social consequences to include cognitive ones.³⁹ This suggests that sensory impairments affect both the ability of an individual to interact with their environment as well as their cognitive health.

Adding to this complex situation, dementia can further exacerbate sensory impairments. According to the Groningen Longitudinal Aging Study, people with dementia often experience sensory difficulties that can be disorienting and distressing.¹⁸ This reciprocal relationship indicates the need for comprehensive multidisciplinary interventions that address both sensory and cognitive health. Haigh et al (2016) found that attending to sensory needs of people with dementia can positively affect their emotional wellbeing and their ability to engage in occupations.⁴⁰

Assistive Technologies for Addressing Sensory Impairments

The rise of assistive technologies offers promising avenues for addressing sensory impairments. From digital hearing aids to voice-activated software, these tools can substantially improve the lives of those with hearing or vision loss, enabling greater independence and improved communication.^{41,42} Similarly, devices such as magnifiers and adaptive lighting can improve visual function in older adults with vision loss.

The effective use of assistive-technology-based medicine requires a multidisciplinary approach that involves medical professionals from various disciplines. For example, hearing aids may require adjustments and maintenance by audiologists, while visual aids may require input from ophthalmologists or poor-vision specialists. Additionally, the use of these devices may need to be integrated into a broader rehabilitation program that involves physical therapy or occupational therapy to improve functional outcomes. Wittich et al (2022) claim that sensory interventions should include considerations across three domains: changes in behaviors and attitudes, use of technological, and environmental modifications.⁴³

Despite the potential benefits of assistive-technology-based medicine, research has also highlighted some challenges in the effective use of these devices. For example, a study conducted by Solheim et al in 2012 found that many older adults with hearing loss do not use hearing aids due to factors such as cost, stigma and difficulty adjusting to the devices.⁴⁴ Similarly, Haanes et al found in 2015 that many older adults with visual impairments do not use visual aids due to factors such as lack of awareness, difficulty using the devices and low perceived need.⁴⁵

The fall-prevention program reported by Gallagher et al in 2001 used a multidisciplinary approach to prevent falls in older adults with sensory impairments.⁴⁶ The program applied different approaches that included physical therapists and occupational therapists. Those authors found that this multidisciplinary approach was effective in reducing fall-related injuries and improving functional outcomes among participants.

The integration of medical disciplines in the management and prevention of sensory impairments in older adults can have significant benefits. For example, a multidisciplinary approach can help to identify and manage sensory impairments, prevent falls, and improve quality of life and social engagement. Medical professionals from various disciplines, such as audiologists, ophthalmologists, primary-care physicians and physical therapists, can work together to provide effective comprehensive care for older adults with sensory impairments.

Additional Strategies and Approaches

Beyond assistive technologies, there are numerous strategies and interventions that can benefit older adults with sensory impairments. Rehabilitation programs, counselling and environmental modifications such as improved lighting and soundproofing etc. can all play pivotal roles in enhancing quality of life.⁴⁷

The challenges associated with sensory impairments suggest that the effective use of assistive-technology-based medicine requires a multidisciplinary approach that considers the individual needs and preferences of each patient. Medical professionals from various disciplines must work together with the affected older patients and their caregivers to ensure that devices are chosen, customized and used effectively to address the sensory impairments.

In addition to multidisciplinary approaches and assistive-technology-based medicine, other strategies including home-based exercise programs, cognitive interventions and preventive screenings have also been investigated for managing and preventing sensory impairments in older adults. For example, a pragmatic randomized controlled trial conducted by Bates et al in 2022 examined the impact of a home-based exercise program on fall prevention in community-dwelling people aged 65 years and over.⁴⁸ The primary aim was to determine the effect of this approach on the fall rate among older community-dwelling people over a 12-month period. Secondary outcomes included the proportion of people falling, fear of falling, physical activity, lower limb strength, balance and quality of life. The program significantly reduced the fear of falling and improved gait speed.

Similarly, in 2023 Moradi et al analyzed data obtained in the large cross-sectional HUNT studies conducted in Norway to investigate the association between hearing loss, hearing-aid use and subjective memory complaints.⁴¹ That study revealed that hearing loss was associated with subjective long-term memory complaints but not with subjective short-term memory complaints. The study also found that hearing-aid use affected the relationship between hearing status and subjective long-term memory complaints.

These studies highlight the importance of considering a range of strategies for managing and preventing sensory impairments in older adults. Multidisciplinary approaches, assistive-technology-based medicine, exercise programs and cognitive interventions can all play roles in improving quality of life and promoting healthy ageing in older adults with sensory impairments.

In conclusion, managing sensory impairments in older adults is crucial for maintaining their quality of life, social engagement, independence and cognitive health. Multidisciplinary approaches, assistive-technology-based medicine, exercise programs and cognitive interventions may play significant roles in providing comprehensive care to older adults with sensory impairments, thereby helping to mitigate their cognitive decline and its consequent challenges. Further research on a global scale, such as the comprehensive review by Binns et al performed in 2012, is needed to quantify the potential of these strategies and identify optimal approaches for managing and preventing sensory impairments in older adults.⁴⁹ The integration of perspectives from various research domains will ensure a more-holistic understanding of these impairments and inform more-effective interventions.

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