



SOUND RESEARCH

Quality of Life Focus: Vision Loss Risk Awareness

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Reference Terms
DSI – dual sensory impairment
DSL – dual sensory loss
HL – hearing loss

INTRODUCTION AND PUBLIC HEALTH IMPORTANCE

A substantial portion of the information we use to function is captured through multiple senses and must be centrally combined and integrated to provide a coherent observation. Impairments in the capture of information are highly prevalent, particularly among the older population.¹

Hearing impairment, visual impairment and concurrent impairment have marked effects on cognitive, psychosocial and functional health and even on the risk of mortality. The correction of visual and hearing deficits improves quality of life and is associated with reduced risk of mortality, yet routine coverage for many of these services is not provided by Medicare.²

Visual loss impacts negatively on functional independence, mental health and cognition, and reduces quality of life, as well as increasing the need for support services.

Age-related hearing loss is more frequent and is associated with an increased risk of

depression, and impairs quality of life and the ability to conduct activities of daily living, as well as leading to an increased reliance on community and informal supports.³

As people age, declines in visual and hearing function are evident. The risk of hearing and vision impairments due to age-related disorders, such as macular degeneration and presbycusis, increases.³

Communication problems, which are a potential underlying cause of these effects, might be partly overcome by the right interventions. Watching the speaker's face helps to identify speech sounds in face-to-face conversations. However, in contrast to hearing-impaired patients with normal vision, **DSL patients are less able to compensate for their hearing loss by speech-reading as the decreased visual functioning affects their speech-reading ability.**⁴

KEY RESEARCH STATISTICS

The overall prevalence of hearing loss and vision loss was 3.3% and increased from 1.3% for participants aged 18-44 years to 16.6% for participants aged 80 years or older.

More than 16% of adults aged 80 years or older report hearing loss and vision loss and census projections indicate that the size of this segment of the U.S. population will increase 25% in the next 15 years.²

In the Epidemiology of Hearing Loss Study (EHLSS), the prevalence of audiometrically

measured hearing loss was 46% among adults 48 to 92 years of age. The cumulative incidence of visual impairment in subjects 75 years of age or older was 25% in a 15 year follow up of the Beaver Dam Eye Study (BDES).¹

They concluded that by 2030, based on population aging trends, between 3.5 and 14 million older people in the U.S. would develop DSL.⁵



In a cross sectional study of adults aged over 55 years, **Capella-McDonnell (2005)** estimated that of the 7.3% of the sample who experienced DSL, 35% experienced depression suggesting a significant relationship between DSL and depression.⁵

Among older adults, the prevalence of DSL ranges from 4.7% - 9.7% in the general population and from 20-45% in those in nursing homes, hospitals and low vision rehabilitation.⁶

KEY RESEARCH RESULTS AND DISCUSSION

Objectively measured, **DSI** was an independent predictor of total mortality in older adults. DSI was associated with a risk of death greater than that of either vision loss only or hearing loss alone. After multivariable adjustments, participants with DSI had a 62% increased risk of dying 10 years earlier compared to those without any sensory impairment. This result suggests a potential interactive effect of DSI on survival, that is, the negative effects of vision are multiplied by the effects from hearing loss.³

With increased level of hearing impairment, the likelihood of communication difficulties also increases, which in turn can cause increasing social isolation and also a higher likelihood of experiencing functional disability, factors that could negatively impact life expectancy.³

DSI, defined as moderate to severe impairment in both senses, was independently associated with 35% increased risk of 1-year mortality compared with non-DSI. Residents with DSI who were involved in activities did not have higher mortality, while residents with DSI who were not involved in activities had a 51% higher mortality than non-DSI residents.⁷

Residents with DSI who are not involved in activities compared to those without DSI who are involved in activities had an approximately

50-90% higher risk of mortality.⁷

Social isolation experienced by residents with DSI stem from not only the loss of social interaction, but also loss of more solitary leisure activities such as reading, listening to the radio, or watching television; consequently, it is conceivable that the most socially isolated individuals reap significant benefits from social engagement.⁸

In relation to the development of depression and depression symptoms, McDonnell found a significant increase in depression at the first report of DSL, with depression increasing at a significantly faster rate following DSL.⁵

Notably, the elevation in depressive symptoms associated with DSL was almost twice that of HL indicating that co-occurring problems with vision and hearing contribute additional burden to mental health over and above the effects of a single sensory loss. **On this evidence, audiometric **HL** appears to be the main driver of the association between clinically defined DSL and increased depressive symptoms.**⁹

Especially among visually impaired elderly, DSL is highly common. Of all the related difficulties, communication is perhaps the most challenging and it may negatively affect a patient's health and wellbeing.⁶



PRACTICAL AND CLINICAL APPLICATIONS

Sensory deprivation can result in a diminished quality of physical, emotional and social functioning for years to come. The negative effects of sensory impairment are independent of the influence of physical and mental health comorbidities and may be abated through appropriate intervention. The overall results support thorough assessment and rehabilitation of sensory impairments have the potential to make a positive impact on the later years of life.¹

Our study could have potential public health implications, as it suggests that identifying and targeting DSI in older adults could be a potentially useful strategy for preventing a decline in their life expectancy. Specifically, regular assessment of presence of DSI in older persons could lead to earlier detection and facilitation of rehabilitation and therapy that could reduce the negative impacts of DSI.³

Correction of visual and hearing impairment could improve survival; strategies including the provision of corrective lenses, hearing aids, and assistive devices, as well as rehabilitative services such as visual, auditory and communication training, should be encouraged and/or implemented by clinicians in order to promote both longevity and an improved quality of life in their older sensory impaired patients.³

Our finding that DSI has an impact on greater cognitive decline when accompanied with reduced social engagement supports the “sensory deprivation” hypothesis in which a sensory-impaired individual is isolated socially, leading to cognitive decline.⁸

A key outcome of this study was the identification of explanatory factors that attenuate the association between sensory loss and depressive symptoms, and can be targeted by interventions. Thus, older adults may be at increased risk of depression if they do not have sufficient resources available to cope with the restricted independence and communication difficulties caused by sensory declines.⁹ It is likely that the progression of sensory loss will differ across individuals and could occur suddenly or unfold gradually over time.⁹

The principal contribution of audiometric HL to increased depressive symptoms suggests that hearing-assistive technology and hearing rehabilitation may help to reduce the impacts of DSL. This evidence base can reform the public health policy to encourage improved awareness and screening of sensory loss and comorbidities among older adults.⁹

Hearing impairment in the elderly occurs more frequently than visual impairment. Therefore, DSL in audiology rehabilitation is less common, so that more patients need to be screened to detect patients with DSL. **Besides special treatments for DSL, there is a need for more collaboration between low vision and audiology by, for example, making greater use of referrals.** To facilitate this, rehabilitation professionals working in low vision and audiology need interdisciplinary training, to enable them to detect problems associated with DSL and to refer patients as required.⁶

Given that one in four people aged 80+ years experiences DSI, it is important that professionals working in both vision and hearing services are able to recognize cases of DSI, tailor rehabilitation solutions accordingly and coordinate multidisciplinary input as required.¹⁰

Most DSL patients have residual vision and residual hearing, which can be optimized through rehabilitation. However, because of the multiplicative effect, the current “unisensory” rehabilitation practice may not be sufficient for DSL patients.⁴

Disclaimer: Research excerpts provide helpful references for those interested in learning more about these important healthcare topics. They are intended to empower providers, patients and loved ones with additional input for personal consultation. For those seeking additional educational references, it is suggested they research specific topics of interest via publicly available resources such as pubmed.gov or Google Scholar.

Please personally consult with expert health providers to make well-informed decisions.

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