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Original Study

Prevalence and Correlates of Hearing and Visual Impairments in European Nursing Homes: Results From the SHELTER Study



Yukari Yamada PhD^{a,b,*}, Martina Vlachova MD^a, Tomas Richter MD^a,
Harriet Finne-Soveri MD^c, Jacob Gindin MD^d, Henriëtte van der Roest PhD^e,
Michael D. Denking MD^f, Roberto Bernabei MD^g, Graziano Onder MD^g,
Eva Topinkova MD^a

^a Department of Geriatrics, First Faculty of Medicine, Charles University, Prague, Czech Republic

^b Department of Nursing, Faculty of Health Sciences, Palacky University, Olomouc, Czech Republic

^c National Institute for Health and Welfare, Helsinki, Finland

^d Centre for Standards in Health and Disability, Research Authority, University of Haifa, Haifa, Israel

^e EMGO Institute for Health and Care Research, Department of General Practice and Elderly Care Medicine, VU University Medical Centre, Amsterdam, The Netherlands

^f AGAPLESION Bethesda Clinic, Competence Centre of Geriatrics, University of Ulm, Ulm, Germany

^g Centro Medicina dell'Invecchiamento, Università Cattolica Sacro Cuore, Rome, Italy

A B S T R A C T

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Background: Visual and hearing impairments are known to be related to functional disability, cognitive impairment, and depression in community-dwelling older people. The aim of this study was to examine the prevalence of sensory impairment in nursing home residents, and whether sensory impairment is related to other common clinical problems in nursing homes, mediated by functional disability, cognitive impairment, and depressive symptoms.

Methods: Cross-sectional data of 4007 nursing home residents in 59 facilities in 8 countries from the SHELTER study were analyzed. Visual and hearing impairments were assessed by trained staff using the interRAI instrument for Long-Term Care Facilities. Generalized linear mixed models adjusted for functional disability, cognitive impairment, and depressive symptoms were used to analyze associations of sensory impairments with prevalence of clinical problems, including behavioral symptoms, incontinence, fatigue, falls, problems with balance, sleep, nutrition, and communication.

Results: Of the participants, 32% had vision or hearing impairment (single impairment) and another 32% had both vision and hearing impairments (dual impairment). Residents with single impairment had significantly higher rates of communication problems, fatigue, balance problems, and sleep problems, as compared with residents without any sensory impairment. Those with dual impairment had significantly higher rates of all clinical problems assessed in this study as compared with those without sensory impairment. For each clinical problem, the magnitude of the odds ratio for specific clinical problems was higher for dual impairment than for single impairment.

Conclusion: Visual and hearing impairments are associated with higher rates of common clinical problems among nursing home residents, independent of functional disability, cognitive impairment, and depressive symptoms.

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Visual and hearing impairments are among the most common conditions affecting older people. All types of visual and hearing impairments in old age have been found to be associated with poor health

outcomes,^{1–6} but there is a growing body of empirical evidence that when these 2 impairments are present simultaneously, the problems are even greater than with single impairments.^{7–18} Functional disability,^{3,15–17} cognitive impairment,^{5,6,16} and depression^{2–4,9,18} are among the most commonly investigated health problems in relation to the sensory impairment.

Possible reasons for this cumulative effect of dual sensory impairment as compared to single impairment have been discussed in different ways, although they are not mutually exclusive and may be operational. Some argue that it is because vision and hearing

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* Address correspondence to Yukari Yamada, PhD, Department of Nursing, Faculty of Health Science, Palacky University, Tr. Svobody 8, Olomouc, 771 11, Czech Republic.

E-mail address: yukari.yamada@upol.cz (Y. Yamada).

impairments affect different functions; vision mainly affects physical and spatial environment, whereas hearing affects social functioning.^{8,11,16} Others discuss that older people adjust to sensory decline gradually and learn to compensate for the decline by using information from the other nonimpaired sense, thus severe problems emerge when both are impaired.^{17,19,20} These 2 arguments assume an underlying cause-effect relationship that sensory impairment contributes to poor health outcome. An alternative argument does not assume cause-effect relationship in between, but assumes the relationship to be confounded through a third common factor, such as the brain-related physiologic and psychosocial changes.^{5,6,11} Some longitudinal studies imply an underlying cause-effect relationship; sensory impairment predicted subsequent poor health outcomes^{5,16,18} and untreated vision was a risk factor for developing dementia,²¹ although treating sensory impairment did not improve cognitive function in a longitudinal study.⁵

Despite the robust and consistent evidence about the relationship between sensory impairment and poor health outcomes in community-dwelling older people, evidence for nursing home residents is scarce, although sensory impairment is likely to be more common in nursing homes. Some relationships, such as between vision impairment and activities of daily living (ADLs),²² between the dual sensory impairment and acute confusion,²³ and between the combination of communication and visual impairment and low social engagement²⁴ have been reported. Sensory impairment is presumably also associated with functional disability, cognitive impairment, and depression in nursing home residents as seen in community-dwelling older people, and possibly further associated with other common clinical problems in nursing homes affecting the quality of life of residents and caregivers.

In this study, we examine the prevalence of sensory impairment in nursing home residents, and whether sensory impairment is related to common clinical problems in nursing homes, including behavioral symptoms, incontinence, fatigue, falls, and problems with balance, sleep, nutrition, and communication, mediated by functional disability, cognitive impairment, and depressive symptoms.

Methods

Sample and Study Setting

This study was based on data from the Services and Health for Elderly in Long Term Care (SHELTER) study conducted from 2009 to 2011, which has been described in detail elsewhere.²⁵ Briefly, the study sample consisted of 4156 nursing home residents in 59 facilities of 7 European Union (EU) countries (the Czech Republic, England, Finland, France, Germany, Italy, and the Netherlands) and 1 non-EU country (Israel). In each country, study partners identified nursing homes that were willing to participate in the study; thus, participating nursing homes were not intended to be representative of all nursing homes in each country. Older people residing in participating nursing homes at the beginning of the study and those admitted in the 3-month enrollment period after the initiation of the study were assessed using the interRAI instrument for Long-Term Care Facilities (interRAI LTCF). The interRAI LTCF is a comprehensive assessment instrument for LTCFs containing more than 350 items that are primarily based on the clients' condition in the last 3 days before the assessment day.²⁶ The data collection was completed by study researchers or nursing home staff who were trained to use a variety of information sources, such as direct observation, interviews with the person under care, family, friends, or formal service providers, and review of clinical records, both medical and nursing. Residents who remained in the same nursing homes were assessed again 6 months and 12 months later. Ethical approval for the study was obtained in all countries according to local regulations.

Measurements

All variables used in this study were derived from the interRAI LTCF baseline data.

Sensory impairment

In the interRAI LTCF vision and hearing, each is coded on a scale from 0 (*adequate*) to 4 (*no vision/hearing present*).²⁷ Vision impairment was defined in this study for residents experiencing *minimal difficulty* seeing with glasses or other visual appliance normally used (seeing large print, but not regular print in newspapers/books) to *no vision* at all (coding 1 or higher). Hearing impairment was defined as experiencing *minimal difficulty* (difficulty hearing in some environments, eg, when a person speaks softly and is more than 6 feet away), with hearing aid normally applied to *no hearing* at all (coding 1 or higher). Sufficient levels of test-retest reliability and interrater reliability of both vision and hearing items have been proved.²⁵ Dual sensory impairment was defined as having both vision and hearing impairments.

Functional disability, cognitive impairment, and depressive symptoms

Validated scales embedded in the interRAI LTCF were used. For measuring functional disability, the ADL Hierarchy scale (ADLH) was used.²⁸ The ADLH uses 4 items on self-performance of personal hygiene, locomotion, toilet use, and eating, ranging from 0 (no impairment) to 6 (total dependence). The ADLH was grouped as follows: independent (ADLH 0, 1), assistance required (ADLH 2–4), and dependent (ADLH 5, 6). For cognitive function, the Cognitive Performance Scale (CPS) was used.²⁹ The CPS uses 5 items, including comatose status, short-term memory, cognitive skills for decision making, making self understood, and eating problems to group residents into 7 hierarchical cognitive performance categories. Cognitive impairment was categorized as follows: intact (CPS 0, 1), moderate (CPS 2–4), and severe (CPS 5, 6). The Depression Rating scale (DRS) was used to assess depressive symptoms. The DRS is a summation of the 7 items on mood states, including making negative statements and persistent anger with self or others, ranging from 0 to 14. The presence of depressive symptoms was defined as the DRS scores of 3 or higher.^{30,31}

Clinical problems

A communication problem was defined as experiencing difficulty either in expression or comprehension. Behavioral symptoms were present if the participant exhibited 1 or more of the following symptoms every day: wandering, verbally abusive, physically abusive, socially inappropriate behavior, and active resistance of care. Incontinence was defined as being incontinent in the past 3 days either in urine or in stool. Fatigue was defined if the person was unable to finish or even start normal day-to-day activities because of diminished energy. Falls were defined as a sudden loss of balance causing the contact of any part of the body above the feet with the floor occurring in the 90 days before the assessment. A balance problem was defined as exhibiting (1) difficulty in standing, (2) difficulty turning around, (3) dizziness, or (4) unsteady gait. Nutritional problems were defined as 1 of following conditions: (1) weight loss of 5% or more in past 30 days or 10% or more in the past 180 days, (2) dehydrated or blood urea nitrogen/creatinine ratio greater than 25, (3) fluid intake less than 1000 mL per day, and (4) fluid output exceeded input. A sleep problem was defined as 1 of following conditions: (1) difficulty falling asleep or staying asleep, waking up too early, restlessness, nonrestful sleep, or (2) excessive amount or sleep that interferes with a person's normal functions.

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