International Journal of Nursing Studies xxx (2014) xxx–xxx

Contents lists available at ScienceDirect

International Journal of Nursing Studies

journal homepage: www.elsevier.com/ijns

Screening for hearing, visual and dual sensory impairment in older adults using behavioural cues: A validation study

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ARTICLE INFO

Article history:
Received 14 June 2013
Received in revised form 7 February 2014
Accepted 11 February 2014

Keywords:
Dual Sensory Loss
Hearing loss
Nursing
Psychometric
Screening
Visual loss

ABSTRACT

Objective: This study investigated the psychometric properties of the Severe Dual Sensory Loss screening tool, a tool designed to help nurses and care assistants to identify hearing, visual and dual sensory impairment in older adults.
Design: Construct validity of the Severe Dual Sensory Loss screening tool was evaluated using Crohnbach's alpha and factor analysis. Interrater reliability was calculated using Kappa statistics. To evaluate the predictive validity, sensitivity and specificity were calculated by comparison with the criterion standard assessment for hearing and vision. The criterion used for hearing impairment was a hearing loss of $\geq$40 decibel measured by pure-tone audiometry, and the criterion for visual impairment was a visual acuity of $\leq$0.3 diopter or a visual field of $\leq$0.3°. Feasibility was evaluated by the time needed to fill in the screening tool and the clarity of the instruction and items. Prevalence of dual sensory impairment was calculated.
Results: A total of 56 older adults receiving aged care and 12 of their nurses and care assistants participated in the study. Crohnbach's alpha was 0.81 for the hearing subscale and 0.84 for the visual subscale. Factor analysis showed two constructs for hearing and two for vision. Kappa was 0.71 for the hearing subscale and 0.74 for the visual subscale. The predictive validity showed a sensitivity of 0.71 and a specificity of 0.72 for the hearing subscale; and a sensitivity of 0.69 and a specificity of 0.78 for the visual subscale. The optimum cut-off point for each subscale was score 1. The nurses and care assistants reported that the Severe Dual Sensory Loss screening tool was easy to use. The prevalence of hearing and vision impairment was 55% and 29%, respectively, and that of dual sensory impairment was 20%.
Conclusions: The Severe Dual Sensory Loss screening tool was compared with the criterion standards for hearing and visual impairment and was found a valid and reliable tool, enabling nurses and care assistants to identify hearing, visual and dual sensory impairment among older adults.

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http://dx.doi.org/10.1016/j.ijnurstu.2014.02.006
0020-7489/

What is already known about the topic?

- In health care management of older adults, the consequences of hearing, visual and dual sensory impairment are often overlooked, and the mutual negative influence of sensory impairment, cognitive functioning and depressive feelings is neglected.
- If sensory impairment is recognized, older adults can be supported fairly easily by nursing staff, who has a key role in maximizing communication and functional opportunities for sensory impaired older adults.
- Several tools for identifying a hearing or visual impairment have been validated, but few have focused on specific and visible behaviour that can be observed by nurses and care assistants during daily contacts.

What this paper adds

- The Dual Sensory Loss screening tool is a valid, reliable and concise and easy-to-use tool for nurses and care assistants to identify hearing, visual and dual impairment, and can be used separately or in addition to diagnostic tools or treatment programs for cognitive impairment or depression.
- This study found a prevalence of 20% of dual sensory impairment among aged care clients.

1. Background

Sensory impairment is widespread among older adults; however the consequences for daily life are often overlooked. The percentage of hearing and visual impairment in the group aged 80 and older was found to be 78% and 31% respectively; 25% of them suffered a dual sensory impairment (DSI), i.e. the combination of a hearing and a visual impairment. The highest percentages were found among older adults living in residential care settings (Vaal et al., 2007). Although age-related sensory impairment is often viewed as a normal ageing process, the consequences are far-reaching, as hearing, visual and dual sensory impairment are associated with functional decline (Brennan et al., 2006), loss in social participation (Crews and Campbell, 2004), loss of quality of life (Dalton et al., 2003; Wahl et al., 2008), depressive feelings (Hallberg et al., 2008; Lamoureux et al., 2009; Lupsakko et al., 2002; McDonnall, 2009), and cognitive decline (Lin et al., 2013).; Lin and colleagues showed that older adults with hearing loss demonstrated a 30–40% accelerated rate of cognitive decline. In daily life, hearing impairment disrupts communication, visual impairment impedes orientation and mobility, and dual sensory impairment is connected with problems of communication and mobility as well as problems in accessing information (Moeller, 2005).

Usual care aims at medical treatment and the use of technical aids. Although technical devices and equipment are important, sensory impaired older adults need additional measures and special support from professional and informal caregivers (Hardin, 2012; Park and Song, 2005; Smith et al., 2011). In case of dual sensory impairment, specific communication, interpreting and mobility support and environmental alterations are required (Roberts et al., 2007; Saunders and Echt, 2007). Nursing staff can play a key role in supporting the sensory impaired older adult by maximizing communication (Jupiter, 2012; Pryce and Gooberman-Hill, 2012; Tolson et al., 2002) and functional opportunities in a way that promotes autonomy (Bodsworth et al., 2011; Deremeik et al., 2007; Hong et al., 2013).

In healthcare settings, there is limited awareness of sensory impairments and their effects (Iezzoni et al., 2003; Sinoo et al., 2012). Despite the substantial evidence of the negative associations between sensory impairment, depression and cognitive decline, and despite the findings that change in sensory impairment could predict change in cognitive impairment (Valentijn et al., 2005), the influence of sensory impairment is often disregarded when diagnosing or addressing depressive behaviour or cognitive decline (The Dutch College of General Practitioners, 2012).

There is need for a tool which can identify hearing and visual impairment, and, once identified, they can be addressed relatively easily, especially by nurses and care assistants during their daily contacts.

A range of screening tools have been developed to help identify the perception of the sensory impaired individual, such as the widely used Hearing Handicap Inventory Scale for the Elderly (HHIE) (Ventry and Weinstein, 1982) and the 25-Item National Eye Institute Visual Function Questionnaire (NEI-VFQ) (Mangione et al., 2001). However, these are self-report screening tools and therefore are not applicable as observational tools for care staff. We only found one instrument developed to support nurses and care assistants when observing behaviour related to sensory impairment: the Severe Dual Sensory Loss in Old Age screening tool (SDSL screening tool). This tool, developed by Lyng and Svingen, is a nurse-rated checklist with a subscale of six questions on hearing-related behaviour, and a subscale of six questions on visual-related behaviour (Lyng and Svingen, 2006). The items focus on participation and daily activities and were selected by Lyng and Svingen as being behavioural consequences and adaptations to the age-related decline of the auditory and visual system and its neurological processes. For example, they assumed that a decline in visual contrast perception causes difficulties in recognizing other persons, and a decline in aural discrimination frustrates participation in group conversations. The tool was developed as the first step in a protocol to detect and address dual sensory impairment among 719 Norwegian older adults receiving long term care. Sixty five individuals were screened as dual sensory impaired; thirty three of them participated in the second step, i.e. an auditory and visual assessment and an interview on problems and needs. Although Lyng and Svingen did not estimate the validity and reliability of the SDSL screening tool separately, it has been used widely and translated for use in several European countries and by different authors. Until now, no validation studies have been published.

The aim of this study is to assess the reliability, validity and feasibility of the SDSL screening tool.

Please cite this article in press as: Roets-Merken, L.M., et al., Screening for hearing, visual and dual sensory impairment in older adults using behavioural cues: A validation study. Int. J. Nurs. Stud. (2014), http://dx.doi.org/10.1016/j.ijnurstu.2014.02.006