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Depressive symptoms in the oldest-old: The role of sensory impairments

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ABSTRACT

Background: While a fair amount of research has investigated the impact of sensory impairments on the mental health of young older adults (65–79 years of age), only a few studies have focused on the associations of sensory impairments with mental health outcomes in the oldest-old (80 years and older). To close this gap, this study examined the separate and combined effects of self-reported vision and hearing impairment for depressive symptoms in a sample of oldest-old individuals, controlling for other mental health risks (e.g., functional disability, health interference, and loneliness).

Methods: Centenarians and near-centenarians (N = 119; average age = 99) were recruited from the community and geriatric healthcare organizations. In-person interviews were conducted at participants' place of residence.

Results: Vision impairment and its interaction with hearing impairment as well as functional disability, health interference with desired activities, and loneliness were significant predictors of depressive symptoms in hierarchical regression analyses. Hearing impairment alone was not associated with depressive symptoms, but follow-up analyses clarifying the interaction effect showed that individuals with poor vision had the highest levels of depressive symptoms, if they had a concurrent hearing impairment. Thus, a concurrent presence of poor vision and poor hearing resulted in an increased vulnerability for depressive symptoms.

Conclusions: Given that a majority of oldest-old has sensory impairments which can result in mental health issues, it is important to facilitate this population's access to vision and audiological treatment and rehabilitation.

1. Introduction

Research investigating the prevalence of depression among the oldest-old (i.e., 80 years and older) is limited to date, but some findings suggest that compared to other older age groups, the oldest-old may have an elevated rate of depressive symptoms, ranging from 11% to 40% among community-dwelling individuals and 43% among institutionalized individuals (Bulut, 2009; Moon, Adams, & Roberts, 2013). For example, Sjöberg et al. (2017) found in a sample of older adults aged 60 to 104 years old, that 5% of those aged 60 to 78 met criteria for significant depressive symptoms, while 18% of those aged 81 to 104 met criteria for significant depressive symptoms based on the Geriatric Depression Scale (GDS; Yesavage, 1988). Furthermore, the World Health Organization (World Health Organization, 2016) reported that depressive symptoms among older adults are being under diagnosed, which may hinder receiving treatment (Arokiasamy et al., 2017).

Studies on the mental health of the oldest-old are important because these individuals are confronted with a higher number of age-related, progressively worsening chronic illnesses when compared to younger age groups, potentially making them particularly vulnerable to depressive symptoms (Chou & Chi, 2005). Gaining more information about depressive symptoms in very old age and fostering our understanding on underlying causes is particularly important as the oldest-old are the fastest growing segment of the population in developed countries around the world (Herm, Cheung, & Poulain, 2012). For instance, in 2013 the United Nation's Department of Economic and Social Affairs estimated a total number of 441,000 centenarians worldwide and projected that this number will rise to 3.4 million in 2050 and 20.1 million in 2100 (United Nations, Department of Economic & Social Affairs, Population Division, 2013).

Following this trend in the population growth of very old

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individuals, especially that of near-centenarians and centenarians, research involving this age group has been emerging over the past decade across the globe (e.g., Andersen-Ranberg, Schroll, & Jeune, 2001; Jopp & Rott, 2006; Sachdev et al., 2013; Samuelsson et al., 1997; see Jopp, Boerner, Cimarolli et al., 2016; Jopp, Boerner, Ribeiro, & Rott, 2016; Jopp, Boerner, & Rott, 2016; Jopp, Park, Lehrfeld, & Paggi, 2016, for an overview). These research efforts have, for example, focused on the health status and the functional decline experienced by centenarians, but sensory issues have been rarely addressed. This is surprising, as vision and hearing issues represented the leading health problem reported by a large majority, namely 94% of the centenarians, as for example, in the Heidelberg Centenarian Study (Jopp, Boerner, Cimarolli et al., 2016; Jopp, Boerner, Ribeiro et al., 2016; Jopp, Boerner, Rott et al., 2016; Jopp, Park et al., 2016). Also, only few studies have investigated sensory impairments – that is perceived vision and hearing impairments - as a risk factor for depression in the oldest-old, despite the fact that very old individuals report substantial negative consequences from the experience of sensory loss (Jopp, Boerner, Cimarolli et al., 2016).

Vision loss due to age-related eye diseases and hearing loss are common chronic conditions increasing with age. About 15–20% of adults aged 65 and older and more than one fourth of those aged 75 and older have functional problems due to age-related vision loss (Ryskulova et al., 2008). Similarly, the prevalence of hearing loss doubles with each age decade and is experienced by about 20–40% of older adults, including the oldest-old (Agrawal, Platz, & Niparko, 2008; Cimarolli & Jopp, 2014; Gopinath et al., 2009). Both age-related vision and hearing loss are associated with a heightened risk for functional disability (e.g., Bookwala & Lawson, 2011; Dalton et al., 2003; Kempen, Ballemans, Ranchor, van Rens, & Zijlstra, 2012), reduced social interactions and loneliness (e.g., Bookwala & Lawson, 2011; Dalton et al., 2003; Heikkinen & Kauppinen, 2004; Kempen et al., 2012). Furthermore, older adults with vision impairments are at greater risk for falls (e.g., Patino et al., 2010), hip fractures (e.g., Cummings et al., 1995), cognitive decline (e.g., Nguyen, Black, Ray, Espino, & Markides, 2002) and even mortality (e.g., Lee, Gómez-Marín, Lam, & Zheng, 2002). Tseng, Liu, Lou, and Huang, (2018) in a review conclude that hearing and vision impairment are associated with decreased quality of life (QoL) in older adults and that when compared to having a single impairment (vision or hearing impairment only) those with dual sensory impairment (concurrent vision and hearing impairments) have worse QoL. In particular, prior research has shown a consistent link between age-related sensory impairments and increased risk for depression among older adults in general (e.g., Carrière et al., 2013; Kiely, Anstey, & Luszcz, 2013; Wang, Singh, & Lin, 2012).

For very old age, various factors have been identified that seem to be related to depression, including financial strain, poor self-rated health, loneliness, heart disease, and neuroticism (e.g., Chou & Chi, 2005; Margrett et al., 2011). More recently, research has started to consider sensory impairment as a risk factor for mental health problems of the oldest-old. For example, Toyoshima, Martin, Sato, & Poon, 2018) examined visual impairment as a predictor of depression among centenarians and found that those with low visual capacity reported higher levels of depression even when they had high social support. Furthermore, Liu et al. (2016) found that for individuals age 95 and older, visual impairment, but not hearing impairment, was associated with decreased life satisfaction, as well as decreased positive affect and poorer affect balance. However, to date the literature on the effects of sensory impairments for the mental health of the oldest-old is sparse. Moreover, this important sensory impairment research involving the oldest-old has not examined both the separate and combined effects of vision and hearing impairments on psychological well-being. Furthermore, past research has not included loneliness, which represents an important predictor of depressive symptoms in the oldest-old. Loneliness is an important variable to include not only because of its association with depression (e.g., Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006), but also because loneliness, for instance, is more prevalent among older adults with vision impairment when compared to their sighted counterparts (La Grow, Yeung, Alpass, & Stephens, 2015).

Hence, the purpose of our study was to explore the separate and combined effects of self-reported vision and hearing impairment for depressive symptoms in a sample of the oldest old – a group of near-centenarians and centenarians. The study aimed to expand prior research on the relationship of sensory impairments and depression in the aging population by investigating the importance of dual sensory impairment for mental health in the very old population. We relied on the World Health Organization's (World Health Organization, 2001) model of functioning, disability and health as the conceptual framework for studying the effects of sensory impairment status on depressive symptoms. The model postulates that how an individual can function in the social, physical, and psychological domains depends on interactions between health conditions (e.g., diseases or injuries), body functions and structures (e.g., physical impairments), activity limitations (e.g., functional disability), participation or involvement in life situations (e.g., participation restrictions due to impairments), and contextual factors. Contextual factors include external environmental factors (e.g., social structures) and internal personal factors (e.g., gender). Guided by the model, we examined the unique contributions of vision and hearing impairments (separate and combined) in predicting levels of depressive symptoms when controlling for other factors identified in the model, including other impairments (cognitive impairments), participation restriction (degree of interference of health with desired activities and levels of loneliness), as well as contextual factors (personal and environmental factors).

2. Material and methods

2.1. Procedures

Data from the Fordham Centenarian Study were used (see Jopp, Boerner, Cimarolli et al., 2016; Jopp, Boerner, Ribeiro et al., 2016; Jopp, Boerner, Rott et al., 2016; Jopp, Park et al., 2016, for details). Primarily, we recruited individuals 95 years old or older living in three diverse boroughs of New York City from a list provided by the Voters Registry. We used this approach with the goal to obtain a more representative sample of the true population of the oldest-old, reducing positive self-selection bias. Also, as we were interested in self-reports in this study, individuals with very poor cognitive capacity were not able to participate. We invited 320 eligible target individuals, and 116 (47%) agreed to participate. Main reasons for refusal included being too busy, too sick, or being concerned that participation would be too tiresome. This recruitment approach resulted in 101 interviews (as several potential participants experienced illness downturns or died before the interview could be conducted), and data of 93 interviews were used (data from seven individuals had to be excluded due to cognitive restrictions impacting reliability). Since our recruitment approach made it somewhat more difficult to get in touch with individuals living in institutionalized care settings (e.g., these individuals often have no personal phone number), we recruited an additional 18 individuals with the support of four collaborating geriatric health care organizations. The final sample included 119 individuals with ages ranging between 95 and 107 years.

All study procedures and protocols were approved by relevant Institutional Review Boards. All participants provided written consent after being read the details of study procedures, potential risks and benefits, and the use of data. After participants provided consent, interviews were scheduled in two sessions and conducted at the participants' place of residence. Participants were compensated for their study participation.