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Do social connections impact the health and functioning of persons with dementia?

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Commentary for Social Connections as a Determinant of Health and Cognition in Persons with Alzheimer's disease and other forms of dementia: Joshi et al (2024)

A recent scoping review by Joshi and colleagues in the multidisciplinary journal of *International Psychogeriatrics* reports on the existing empirical evidence of social connections as a possible social determinant of cognitive decline in adults with or at risk of developing ADRD (Alzheimer's disease and related disorders) (Joshi et al., 2024). They conducted a review of 11 meta-analyses and systematic reviews of social connections and cognitive decline in adults with or at risk of developing ADRD, and 8 systematic reviews of technology-based social intervention to enhance social connections for persons with ADRD. The authors concluded that social engagement and social activities *seem to be* the most consistent components of social connection for improving cognitive health in adults with or at risk for ADRD. Likewise, they reported that socially focused technology-based and other social support interventions only *aid in* improving social activities and connection in persons with ADRD. The limited empirical evidence supporting social connection as a significant determinant of health in adults at risk of ADRD, and the poor performance of interventions targeting social connectedness came as a surprise to Joshi et al. After discussing potential explanations for and limitations of such findings, the authors called for research to engage in relevant meta-analyses and systematic reviews to examine the role of social connection and isolation as social determinants of brain health in adults at risk of ADRD.

We agree with Joshi and colleagues (2024) that more interdisciplinary inquiry and randomized clinical controlled trial studies are necessary to understand the role of social connection as a protective behavioral strategy influencing the health of persons with or at risk of developing ADRD. Yet, this review raises as many questions as it answers. Despite the insufficient scientific evidence suggesting that social engagement lowers the risk of brain diseases, research has noted that meaningful social engagement and connections contribute to reduce cognitive decline in old age, under the premise that social engagement is associated with less cognitive decline in older adults (Global Council on Health Brain, 2017; Mattson, 2014; Smith, 2016). More recently, the National Institute on Aging has prioritized funding studies to examine structural and social determinants of health data across the network of Alzheimer's disease Research Centers (ADRCs). Moreover, based on Fundamental Cause Theory, Ecological Systems Theory, and the NIA Health Disparities Framework, Stites and colleagues (2022) have proposed to include several dimensions and specific domains of social conditions (concepts and measures) that may behave as social determinants of health and functional outcomes related to ADRD. This approach attempts to map the compounding influences of biology and lived experiences that represent potential impacts on health at the individual (micro), community (meso), society (macro) levels, and the life course (chrono) trajectory (see Table 1 and Figures 1 & 2 in Stites et al., 2022). Such an ambitious comprehensive set of constructs and measures across all levels is welcome. It represents an interdisciplinary pathway to understand the impact of social determinants on the brain health of adults. The Stites et al. framework also illustrates the complexity involved in recognizing and testing the influence of social connection and social support on the health of adults with or at risk of ADRD.

Furthermore, the recently published review in the *Annual Reviews of Public Health* by Holt-Lunstad (2022) proposes a systematic framework for cross-sector action to prioritize social connection and other social determinants of health. It also summarizes the cumulative evidence supporting the relevance of social connectedness (connection, social capital, social support, isolation and loneliness) for public health. Their research findings provide evidence of the influence that social connection and the lack of it (isolation and loneliness) exert on adult individuals, including epidemiological associations, pathways, and biological mechanisms. For example, lack of social connection (social determinant) is associated with poorer (structural

determinant) physical and mental health outcomes. Holt-Lunstad (2022) calls for researchers to translate the evidence into action by developing and implementing multi-sector targeted interventions on social connectedness, isolation and loneliness. The proposed framework is flexible in terms of being able to adapt to target different sectors and contexts. In addition, Holt-Lunstad suggests that this approach may contribute to advance greater health equity and reduce health disparities by including other structural and social determinants of health to examine mediating and moderating mechanisms that influence health outcomes of adults with or at risk of ADRD (see Figure 4, at Holt-Lunstad, 2022). We note that in this context, greater attention to the multidimensional nature of cognitive functioning, e.g., crystallized versus fluid ability (Horn & Hofer, 1992), memory process such as encoding, storage, and retrieval (Salthouse, 2019), executive functioning (Alzheimer's Association, 2023) would be advantageous in this regard in targeting the locus of cognitive decline among persons with ADRD. Also, helpful would be greater attention to the nature of caregiver-care recipient interactions as sources of influence on not only social isolation/loneliness, but also the cognitive functioning of persons with ADRD (Hayslip, Han, & Anderson, 2008; Segal, Qualls, & Smyer, 2018).

The findings by Joshi and colleagues (2024) on social connections and health, and the reported conflicting results for social isolation and perceived loneliness among adults at risk of ADRD (Rafnsson et al., 2020) are a reminder to the scientific community to address pervasive conceptual and methodological difficulties. There is no sufficient evidence yet to identify what combination of structural and social determinants of health are best to improve social support (informal and/or formal), and social connectedness. Likewise, evidence is limited regarding the mechanisms (social, biological, epidemiological, psychological) at work for those interventions to significantly improve the health of adults with or at risk of ADRD. Thus, it is imperative to enhance the efficacy of interventions on social connections, social isolation and loneliness to offer reliable tools by which to support the health and functioning of adults with or at risk of ADRD, related comorbidity (depression, cardiovascular disease, etc.) and premature mortality outcomes. Furthermore, we feel it is important to address conceptual and methodological limitations reported in the literature on social support, social connectedness, isolation and loneliness, develop theory-based interventions, and generate hypothesis for examination and testing by using best practices and brainstorming from different perspectives. We also have yet to build collaborative research teams to engage in longitudinal designs aimed at age-related

changes in physical and psychosocial characteristics, specifying both mediators and moderators of such changes, as well as adjusting by potential confounding effects of cohort, and time of measurement effects.

A recurrent finding from meta-analysis and systematic reviews on the influence of social connections and health refers to the omission of theoretical frameworks in studies examining the role of social connectedness and health in adults at risk of ADRD (National Academy of Sciences, Engineering & Medicine, 2020). Most studies refer to general concepts with implicit connections to the causal mechanisms at work. However, the lack of a theoretical framework to guide interventions in research studies obstructs our ability to contextualize empirical findings and limits generalizability to other contexts, making it uncertain that the observed data represent the true population explanation. Likewise, theory-based hypotheses are invaluable tools to select and identify relevant pathways to address the combined influence of social and structural determinants of health. Multidisciplinary research teams need to build a scientific foundation based on a theoretical grounds and generation of hypotheses that may contribute to our understanding of the conditions, mechanisms and markers that significantly influence brain health in adults with or at risk of ADRD.

When theory is not readily available, we may nevertheless generate hypotheses and test a conceptual initial model including variables found significant in previous research. For example, Sundström and colleagues (2020) conducted a longitudinal prospective population-based research study to examine whether perceived loneliness (measured up to 20 years prior to dementia diagnosis) increases the risk of all-cause dementia. After justifying the need for the study and reviewing the literature, the authors reported how living alone is a known risk factor for social isolation and loneliness, affecting health and well-being. They noted that loneliness increases the risk of all-cause mortality, and decided to examine two dimensions of social connectedness: perceived loneliness and social isolation, observing that someone can be socially isolated without feeling lonely (and vice versa), reflecting the Weiss (1973) distinction between social and emotional loneliness. Next, they examined significant associations of social isolation and loneliness with other social determinants (e.g., loneliness with physical health, risk of cardiovascular disease, mortality, or metabolic responses to stress). Results indicated that in several studies social isolation was reported as a risk factor for dementia (Sundström and

colleagues, 2016), but results for perceived loneliness were inconsistent, with some studies showing no association between loneliness and dementia (Penninkilampi, 2018), whereas in others, loneliness was associated with increased risk of developing dementia (Rafnsson et al., 2020). This inconsistency may result from the lack of distinction between social and emotional loneliness as influences on domain-specific cognitive functioning in later life (Hayslip, Maiden, & Greil, 2023). The results of their study suggested that perceived loneliness is an important risk factor for all-cause dementia and in particular for Alzheimer's disease but not for vascular dementia.

Sundström and colleagues (2020) also address potential methodological challenges across studies (different diagnosis methods, conceptualization and measures, research design differences, and/or adjustment for confounding factors). One of them is associated with the long pre-clinical period of dementia, and the large and variable effect from cognitive decline on perceived loneliness and social interaction. Collecting additional data during the pre-clinical stage of dementia will help to assess risk of dementia, as the cognitive decline consequences may prevent accurate estimates of social isolation and loneliness. For example, if the study collects measures of social interaction and loneliness long before or close to the dementia diagnosis, the results will be difficult to interpret, since results could be a consequence rather than causative of dementia (Sundström et al., 2020), reflecting the bidirectional nature of their relationship to one another, as pointed out by Joshi et al. (2024). In addition to methodological challenges discussed by Joshi and colleagues and the National Academy of Sciences, Engineering & Medicine (2020), there is a consensus about enhancing intervention studies addressing social connection, isolation and loneliness by incorporating a theoretical framework such as Socioemotional Selectivity Theory (Carstensen, 2021), or Evolutionary Theory of Loneliness (Cacioppo & Cacioppo, 2018). Other challenges are associated with the unit of analysis (individuals and family) choice of design (cross-sectional and sequential), standardized measures, target population, etc.

We feel that this review by Joshi et al. (2024) thus serves as an excellent starting point in not only advancing our understanding of the social determinants of health and cognitive functioning among persons with ADRD, but also in laying the groundwork for research clarifying this relationship as well as in making possible the design and implementation of interventions targeting persons with ADRD.

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