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Editorial

EDITORIAL

Insomnia and subjective cognitive decline in older adults: avenues for continued investigation and potential intervention

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Increased age is associated with sleep that is lighter, shorter, and more fragmented than in younger adults [1, 2]. Not surprisingly, older adults suffer from insomnia at extremely high rates [3, 4]. There is also general cognitive decline experienced with increasing age. This decline has been demonstrated to be pervasive, affecting many sub-domains of cognition including reaction time, sensory processing, attention, memory, reasoning, and executive control [5–8]. Subjective cognitive decline is often cited as a concern of aging [9, 10], and is a hallmark of Alzheimer's disease and related dementias (ADRD) [11]. Insomnia and poor sleep are associated with increased risks of subjective cognitive decline, objective cognitive decline, and Alzheimer's disease [12–17].

Accordingly, the Zhao et al. study [18] examining the associations between probable insomnia and subjective memory decline in middle-aged and older adults is an important and welcomed addition to the literature. Through secondary analyses of nearly 30 000 middle-aged and older adults enrolled in the Canadian Longitudinal Study on Aging, the authors examined whether individuals whose sleep worsened across time (i.e. transitioned from no insomnia to probable insomnia) also experienced subjective and objective memory decline, as well as whether various sleep trajectories (worsening, improving, or stable sleep) were associated with subjective and objective memory decline. The authors report a 70.4% increased risk of subjective memory complaint in older adults whose sleep transitioned to probable insomnia versus those who maintained no insomnia symptoms across a 3-year follow-up period. When participants were categorized based on sleep worsening, improving, or maintaining stability, a 22% increased risk of subjective memory complaints was observed for older individuals with worsening sleep as compared to those with either improving or stable sleep. Interestingly, though objective neuropsychological data were collected at both baseline and 3-year follow-up, no statistically significant associations were observed between changes in sleep and changes in objective cognitive performance [18]. This is not terribly surprising, as subjective cognitive complaints, a broader term encompassing subjective memory complaints, have been found to be unrelated to objective cognitive functioning in healthy older adults [19] and clinic-based samples of older adults [20]. Previous research has reported that mood symptoms and health conditions are strong predictors of subjective cognitive complaints [19, 20]. Importantly, the increased odds of subjective memory complaints reported above by Zhao et al. were computed after controlling for these important comorbidities. Given the discrepancy between results regarding subjective versus objective cognitive decline, one could wonder if there is utility in a continued investigation of subjective cognitive decline. Importantly, subjective cognitive decline is a risk factor for later development of objective cognitive decline, as well as progression to both mild cognitive impairment and ADRD, and is even associated with abnormal brain changes in late life [21–24]. As such, it has been suggested that subjective cognitive complaints may reflect currently healthy individuals' awareness of cognitive difficulties that are not yet detectable with conventional tests [23], making subjective cognitive complaints an important indicator for monitoring and intervention efforts aimed at slowing the progression of ADRD.

While the sample in Zhao et al. study was predominantly White (~95%), ADRD and subjective cognitive decline are more prevalent

in historically underserved populations. In fact, Black/African American older adults have been shown to have the highest rates of both ADRD [25] and subjective cognitive decline [26], which are believed to result from a combination of unequal distribution of health comorbidities and social determinants of health among racial/ethnic minority groups [26]. For example, nearly 80% of Black/African American adults with subjective cognitive decline reported the presence of at least one chronic health condition compared to approximately 64% of Whites with subjective cognitive decline and at least one chronic health condition. Similarly, Black/African American adults with subjective cognitive decline were more likely to have completed less than high school education (30.8%) compared to Whites with subjective cognitive decline (18.7%) [26]. Racial disparities regarding income level, living arrangement, and healthcare coverage also abound for Black/African Americans with subjective cognitive decline [26]. Disparities also exist regarding sleep, with Black/African American adults experiencing worse sleep continuity, duration, and more pronounced architectural changes than their White counterparts [27]. Future research focused on subjective cognitive decline would be well-positioned to recruit diverse samples, employ culturally sensitive measurements, and focus on potentially modifiable predictors, such as sleep.

Sleep remains plastic well into the last decades of life [28, 29] and has known associations with both objective cognitive functioning and subjective cognitive decline in older adults [12, 13, 16, 17, 30]. Older adults with symptoms of insomnia are 49% more likely to experience cognitive decline than their good sleeping counterparts [12], and demonstrate impaired performance across a host of cognitive domains [31]. Conventional wisdom would suggest that interventions known to improve sleep may also confer benefits for objective and subjective cognition in older adults. Cognitive-behavioral therapy for insomnia (CBT-I) has the strongest empirical grounding of all available treatment options for insomnia in older adults, resulting in large improvements in sleep in older adults with insomnia [1, 32, 33].

A small number of studies have investigated whether the treatment of insomnia leads to improvement in cognitive performance [34–37]. In one such study, a nonpharmacological insomnia intervention was employed with community-dwelling older adults with insomnia [35]. Treatment was found to improve sleep and was also associated with improved performance on complex vigilance tasks compared to a waitlist control [35]. An additional trial of behavioral insomnia treatment in older adults failed to find evidence of improved objective cognitive functioning associated with insomnia treatment [36]; however, a recent trial reported that behavioral insomnia treatment results in improved subjective cognitive functioning but not objective cognitive performance [38]. Finally, it has been reported that CBT-I delivered to older adults with mild cognitive impairment improves both sleep and executive functioning [34]. Future studies would be well-suited to include validated indicators of subjective cognitive decline, in addition to routinely assessed objective cognitive functioning, as outcomes in insomnia treatment trials aimed at improving late-life cognitive functioning. Given the known disparities in sleep and subjective cognitive decline, future work has the potential to engender equitable aging through thoughtfully delivered, targeted interventions.

Generally, additional attention towards the potential link between sleep and subjective cognitive decline in older adults is warranted, especially as it relates to racial and ethnic minority groups. Scholars should follow the suggestions offered by Alhasan and colleagues to advance sleep health disparities research [39]. Special attention towards the measurement of subjective cognitive decline, including whether single-item measures are able to accurately capture the complex phenomenon of subjective cognitive difficulties, is warranted. Additionally, the literature on subjective cognitive decline is riddled with disparate naming conventions, making synthesis across studies all the more difficult. Common naming should be adopted, whether that be subjective cognitive decline, memory complaints, metacognition, or others. Finally, as highlighted in Zhao et al. [18] paper, the timing of measurement is of critical importance. If changes in subjective cognitive decline are expected to precede changes in objective cognitive decline, measurement that is timed appropriately to capture both subjective and objective cognitive changes would be very informative.

Disclosure Statement

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