# LETTER TO THE EDITOR

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## Sleep quality, frailty and cognition in middle aged to older adults

Kaur *et al.* (2019) investigated the effect of sleep quality on the relationship between frailty and cognition in 154 adults aged between 50–90 years. Linear regression models were adopted for the analysis. Poor sleep quality predicted poorer executive function, lower processing speed, difficulty of learning and delayed recall. In addition, poor sleep quality mediated the inverse relationship of frailty with executive function, learning, recall and processing speed. The authors recommended interventions of improving sleep quality to prevent cognitive decline in frail older adults. I have some concerns about their study.

First, the authors adopted nonparametric bootstrapping procedures to evaluate the level of statistical mediation. Although statistical approach is adequate, fundamental problems exist that there is no definite way to confirm causa direction between frailty and cognition. I suppose that aging-related factors might affect the levels of frailty and cognitions. Poor sleep quality would be counted as one of the symptoms by aging. Taken together, intervention of improving sleep quality is difficult in combination with improving the quality of life in adults (Jeste, 2019; Siriwardhana *et al.*, 2019).

Second, there is a need of specifying the type of sleep disorder. Although prevalence of poor sleep quality might increase by aging, ability in perception of poor sleep quality also degrades. As an example, obstructive sleep apnea is closely associated with poor sleep quality and also relates to cognitive decline (Gosselin *et al.*, 2019), which was improved by appropriate treatment (Ju *et al.*, 2019). As obstructive sleep apnea is closely associated with metabolic disorders such as hypertension and type 2 diabetes mellitus, complicated inter-relationship might be existed among sleep quality, frailty and cognition. Taken together, prospective and/or interventional studies are needed to verify the mediation effect of sleep quality on the association between frailty and cognition.

Finally, Kaur *et al.* handled nondemented middle aged to older adults for their analysis. Subjects under 60 years of age might have more psychosocial factors concerning to working environment, and I recommend subanalysis of classifying by age to simplify the mediation effect.

## Conflicts of interest

None.

## References

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