

LETTER TO THE EDITOR

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Sleep quality mediates the relationship between frailty and cognitive dysfunction in non-demented middle aged to older adults

We thank Dr. Kawada for his interest in our study “Sleep Quality mediates the relationship between Frailty and Cognitive Dysfunction in non-demented middle aged to older adults.” Using a nonparametric bootstrapping procedure, we found an indirect effect of frailty on measures of executive function, memory, and processing speed through poor self-reported sleep. This effect was apparent despite control for demographically relevant covariates (i.e. age, education, ethnicity).

Dr. Kawada points out that while the use of nonparametric bootstrapping is an adequate statistical approach, there is no definite way to confirm causality. In fact, we highlighted this as a primary limitation in our manuscript (Kaur *et al.*, 2019) and this critique applies to all observational studies. Nonetheless, we believe that our careful characterization of frailty and cognitive function in a diverse cohort of patients provides valuable data for future longitudinal studies.

An additional concern included the need to specify type of sleep disorder. While examination of the differential effects of sleep disorders on frailty and cognition would have been interesting, this was not the focus of the current study. Furthermore, we attempted to control for disordered sleep by evaluating the use of medication and score on the Epworth Sleepiness Scale, a measure of daytime somnolence known to significantly distinguish between patients with diagnosed sleep disorders such as obstructive sleep apnea, narcolepsy, and idiopathic hypersomnia

from control participants (Johns, 1991) as potential covariates in all analyses.

Finally, Dr. Kawada’s suggestion that individuals under 60 years of age may have psycho-social factors associated with poor sleep is well taken but a sub-analysis stratifying by age was not possible due to a limited sample size ($n = 154$). Instead, we attempted to control for this possibility by including age as a covariate in all analyses.

References

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