

# **Poor Sleep Quality and Daytime Fatigue Are Associated With Subjective But Not Objective Cognitive Functioning in Clinically Relevant Hoarding**

## *Supplement*

### **Supplemental Methods**

#### *Mental and Physical Health*

Participants were asked to self-report lifetime history of major depressive disorder (MDD), anxiety disorders (generalized anxiety disorder, panic disorder, or specific phobia), attention deficit/hyperactivity disorder (ADHD), and substance or alcohol use disorders (SUD/AUD). Given that hoarding symptoms have been found to increase odds of poor cardiovascular health<sup>1</sup>, participants were further asked about lifetime diagnoses of a cardiovascular and metabolic conditions, including stroke, heart disease, high blood pressure (HBP), high cholesterol, diabetes, and obesity.

#### *Objective Cognitive Functioning*

Participants completed the well-validated CogState Brief Battery, an internet-based cognitive assessment consisting of four tasks designed to measure processing speed (Detection test; DET), attention (Identification test; IDN), working memory (One-Back test; ONB), and visual memory (One Card Learning test; OCL)<sup>2</sup>. Participant reaction time (i.e. speed of correct responses) was extracted from all four tests, as was the proportion of correct responses on both the One-Back and One Card Learning tests. For the six outcome measures, cognitive functioning was dichotomously classified by subtracting two sample standard deviations from the sample mean (i.e.  $\mu_{\text{DET}} - 2(\sigma_{\text{DET}})$ ). Six separate cut-point values were determined, with scores below the respective cut point indicative of reduced objective cognitive functioning.

### *Subjective Cognitive Functioning*

The Everyday Cognition scale was used to assess self-reported changes to cognitive functioning and perceived impairment in memory, language, visuospatial abilities, planning, organization, and divided attention<sup>3</sup>. The 39-item scale asks participants to rate everyday functioning as compared to 10 years earlier using a 4-point Likert scale. For each of the six domains, items were summed and dichotomously classified using the criteria described above (i.e.  $\mu_{\text{DET}} - 2(\sigma_{\text{DET}})$ ). Six cut-point values were determined, with scores below the respective cut point indicative of reduced subjective cognitive functioning.

Additionally, participants were asked to self-report lifetime history of diagnoses of mild cognitive impairment and dementia (Alzheimer's disease, unspecified dementia, frontotemporal dementia, or Lewy body dementia). Participants were classified into one of three categories: (1) neither mild cognitive impairment nor dementia, (2) mild cognitive impairment and no dementia, or (3) dementia (i.e. Alzheimer's disease, dementia, frontotemporal dementia, or Lewy body dementia).

### *Quality of Life*

Participants completed the 36-item Short-Form Health Survey (SF-36), a well-validated measure of general health status assessing physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional well-being, social functioning, energy and vitality, and perception of general health<sup>4-6</sup>. Individual items were recoded to a 100-point scale, with higher values indicating more a favorable health state. For the eight separate health constructs of interest, relevant items were combined in calculation of an unadjusted mean score. Each respective measure was then dichotomously classified by subtracting two sample standard deviations from the sample mean – those with

average scores below the respective cut-point were classified as having a less favorable health state for the domain of interest.

### Supplemental References

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2. Maruff, P., Thomas, E., Cysique, L., Brew, B., Collie, A., Snyder, P. and Pietrzak, R.H., 2009. Validity of the CogState brief battery: relationship to standardized tests and sensitivity to cognitive impairment in mild traumatic brain injury, schizophrenia, and AIDS dementia complex. *Archives of Clinical Neuropsychology*, 24(2), pp.165-178.
3. Farias, S.T., Mungas, D., Reed, B.R., Cahn-Weiner, D., Jagust, W., Baynes, K. and DeCarli, C., 2008. The measurement of everyday cognition (ECog): scale development and psychometric properties. *Neuropsychology*, 22(4), p.531.
4. Ware Jr, J. E., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical care*, 473-483.
5. Ware, J.E., Kosinski, M. and Keller, S., 2001. SF-36 physical and mental health summary scales. *A user's manual*, p.1994.
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