**Supplementary Material**

*Participants*

We recruited 50 male retired maritime pilots. Maritime pilots guide large international ships into their final docking position in Dutch harbors. This profession has a unique working schedule leading to irregular/unpredictable working hours, which, in our group, led to >25 years of irregular sleep. Details of the maritime pilot occupation are described in previous publications (1). For recruitment, information was sent to all retired maritime pilots through the secretariat of the Dutch Maritime Pilot Association. In total 54 retired maritime pilots responded and received detailed information. We received responses from two spouses of retired maritime pilots, reporting early retirement of their husbands due to cognitive impairment. One was diagnosed with frontotemporal dementia and died in 2019. The second had dementia (etiology unknown) and lived in a nursing home. After screening for inclusion criteria, four of the 54 participants were excluded, due to age and logistical reasons, leaving a total sample of 50. This sample includes approximately 10% of the whole retired maritime pilot population and was representative in terms of broad variety in age, location of employment, and duration of employment

*Measures*

We used a series of questionnaires to collect information about subjective cognitive decline, early dementia symptoms, current sleep quality, quality of life, and mood.

*Cognitive Failure Questionnaire (CFQ):* This questionnaire is used to detect daily disruptions of cognitive functions. Participants were confronted with 25 statements andhad to indicate how often they experienced the situation that is described in the statements with a score between 0 (never) and 4 (very often), leading to a maximum score of 100. Normative values for the Dutch population have been validated in the 2006 Maastricht Aging Study (MAAS), which resulted in a mean score of 31.1 and a standard deviation (SD) of 11.9 for a normal population (Mag*e*=73.8) (2). A score of ≥ 54.9 or higher indicates cognitive problems (more than 2 SD above the mean). Ponds et al. introduced four validated different subscales within the CFQ: confusion, confusion in social situations, names/words and orientation.

*Early Dementia Questionnaire (EDQ):* The EDQ is a validated questionnaire that detects early symptoms of dementia. The questionnaire is divided into six subcategories: memory, concentration, physical issues, emotional issues, sleep, and other issues. The questionnaire is usually administered twice, once for the subject and once for the subject’s informant, we used the subject’s questionnaire only. The maximum score is 60. To measure the presence of dementia-related symptoms, all subcategory scores were added up and a median was calculated. A cut-off score of a median of ≥ 8 is indicative of early dementia symptoms (3).

*Sleep assessments (PSQI, sleep-wake diary):*We assessed current sleep quality to investigate the extend of recovery from exposure to work-related sleep loss. The PSQI provides information on individual sleeping patterns and sleep related complaints over the past month. The PSQI is divided into seven subcategories: sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. The maximum score for the PSQI is 21 and a total score of 5 was used as cut-off to indicate sleep problems (the higher the score, the more sleep problems are present) (4). Complementary to the PSQI, we included a sleep-wake diary. The diary offers an opportunity to gain insights in to the different sleep routine habits and the night-to-night differences in sleep routine, which was not covered by the PSQI. In the diary, participants kept track of their bed time, subjective total sleep time (TST), wake up time, their sleep onset latency (SOL), and the number of awakenings they experienced per night. All participants were instructed to maintain the diary for ten consecutive days.

*Quality of Life (EQ-5D):* The EQ-5D is a validated quality of life scale. It is divided into five subcategories: mobility, self-care, daily activities, pain/discomfort, and emotional state (anxiety and depression). The score on each subcategory ranges between 1 (no discomfort) to 3 (much discomfort). The maximum score on each subcategory is 3, which indicates low quality of life. After completion of the questions, a profile was created in which all scores from each category were represented. A score like 11111 for instance, indicates no subjective health problems. Furthermore, a utility score was calculated, ranging from 1 (no discomfort) to -0.33 (high discomfort). This score was composed by distracting certain numbers for each profile score unequal to 1. A score < 0 indicates a health state worse than death (5). The EQ-5D also includes a scale (VAS scale) from 0% to 100% on which participants mark their state of health, with 0% being the worst possible health status and 100% being the best possible health status (5).

*Hospital Anxiety and Depression Scale (HADS):* The HADS is a well-validated questionnaire that measures states of anxiety and depression within a clinical setting. It has been proven a valid instrument for detecting the severity of those states. Within the HADS, participants indicated how often they encountered anxiety or depressive emotions over the last week. The maximum score for each component is 21. A score of 0 – 7 is normal, whereas a score of ≥ 11 indicates severe mood problems (6).

*Observer Rating (OPS):*We used the OPS to monitor reliability of the participant’s subjective questionnaire entries, because participants may underestimate their health-related problems, especially participants with a cognitive disorder. The OPS was primarily developed to investigate the fitness to drive of the older population with possible indications of early dementia (7). It includes observations about participants’ orientation, practical skills, and social skills (OPS, developed by the Neuropsychology department at the University of Groningen, 2000). These three domains are affected first in dementia. Every domain of the OPS includes three questions. Questions related to forgetfulness, confusion, and disturbed orientation are examined in the orientation category. Slowing of reaction time, troubles with everyday actions, and neglected appearance is examined in the practical skills category and distraction, inappropriate personal contact, and divergent self-assessment is enclosed in the social skills category. For each item a score between 1 and 3 was given. A score of 1 indicates problems, 2 means doubtful, and 3 implies no problems at all. A score between 3 and 9 was scored for each category indicating problems on each item (score of 3) or no problems at all (score of 9). We used a study that was conducted in a Dutch population (7) as guidance for interpreting the OPS scores. In the Withaar study, participants almost had the same mean age (74.3 years, SD = 5.02) and scored a mean of 26.7 (SD = 0.95) on the OPS score. Withaar et al. used a cut-off point of ≥ 24 points to indicate no abnormalities.

**References**

1. Thomas J, Ooms S, Verbeek M, Booij J, Rijpkema M, Kessels RPC, et al. Sleep-Cognition Hypothesis In maritime Pilots, what is the effect of long-term work-related poor sleep on cognition and amyloid accumulation in healthy middle-aged maritime pilots: methodology of a case–control study. BMJ Open. 2019;9(6):e026992.

2. Ponds R, Van Boxtel M, Jolles J. De Cognitive Failure Questionnaire als maat voor subjectief cognitief functioneren. Tijdschrift voor neuropsychologie. 2006;1(2):37-45.

3. Arabi Z, Aziz NA, Aziz AFA, Razali R, Puteh SEW. Early Dementia Questionnaire (EDQ): A new screening instrument for early dementia in primary care practice. BMC Fam Pract. 2013;14(1):49.

4. Buysse DJ, Reynolds III CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res. 1989;28(2):193-213.

5. Oppe M, Devlin NJ, Szende A. EQ-5D value sets: inventory, comparative review and user guide: Springer; 2007.

6. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361-70.

7. Withaar FK. Divided attention and driving: The effects of aging and brain injury: Rijksuniversiteit te Groningen; 2000.