



Sleep Disturbances and Their Association with Cognitive Status in a Population Based Sample of Older Adults: The Cache County Memory Study

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Introduction

- Sleep disturbances increase with aging and up to 25% of older adults report having insomnia.
- Insomnia and other sleep disturbances have been associated with cognitive decline.

Objective

- To examine whether sleep disturbances are associated with cognitive decline in a population-based sample of older adults

Methods

- Study participants were enrolled in the Cache County Study on Memory in Aging¹ (CCSMA).
- The CCSMA was a longitudinal, multi-staged, population based study that focused on identifying risk factors for Alzheimer's Disease (AD) and other dementias.
- 5092 (90%) of county residents aged 65 and older were initially enrolled
- Study participants were primarily Caucasian
- Cognition was measured with an adapted version of the Modified Mini-Mental State Exam² (3MS) at 3-4 year intervals for up to 12 years (4 triennial visits).
- Sleep disturbances were ascertained at each wave through self-report of having sleep problems or insomnia in the context of medication history,
 - the question asked: Now I would like to ask you about problems people often have with sleep, their nerves, or their mood. Have you ever had sleep problems, insomnia?
- Linear mixed models were used to examine the association between sleep-disturbance (time-varying) and cognitive status (3MS performance).
- Covariates included age, gender, education, and Apolipoprotein E (APOE) genotype.

Participants

- Of the 5092 participants enrolled, those who were missing APOE genotype or missing education were excluded from these analyses.
- The total number of participants included in these analyses was 4736.

Demographics at Baseline (N=4736)

Age in Years Mean (SD)	74.6 (6.48)
Female (%)	57.20%
MMSE Mean (SD), max=100	89.20 (9.62)
Education Mean (SD)	13.19 (2.89)
Reported Sleep Disturbance (%)	39.10%
APOE (1 or more E4 alleles) (%)	43%

Number of Participants Who Completed 3MS

Wave #	Number who completed	Mean	SD
Wave 1	4736	88.72	9.25
Wave 2	3302	90.73	8.15
Wave 3	2188	89.05	8.91
Wave 4	1418	90.97	6.40

- There was dropout between wave 1 and wave 4 on the number of participants who completed the 3MS. The majority of dropouts were due to mortality. Those who converted to dementia at a given wave were not followed in the subsequent wave.

Results

Score on Mini Mental State Exam

Parameter	Estimate	Std. Error	df	t	Sign.	95% Confidence Interval	
						Lower	Upper
Intercept	125.92	1.58	4319.41	79.51	0.0001**	122.81	129.024
Age at Baseline	-0.65	0.02	4382.40	-39.67	0.0001**	-0.68	-0.62
Gender (Female)	1.99	0.23	4186.46	-8.50	0.0001**	-2.44	-1.53
Education	0.77	0.04	4158.92	18.93	0.0001**	0.69	0.85
Time	-0.072	0.04	4575.05	-1.78	0.075	-0.15	0.01
Presence of Sleep Disturbance	0.28	0.13	6888.056	2.16	0.031*	-0.54	-0.03
Time squared	-0.04	0.00	3564.75	-9.08	0.0001**	-0.04	-0.03
No APOE E4 allele*	3.87	0.74	4154.06	5.26	0.0001**	2.43	5.32
One APOE E4 allele*	2.08	0.75	4153.85	2.77	0.0006**	0.61	3.56

* Reference is 2 E4 alleles

- The results indicated that those who reported sleep disturbances were associated with higher scores on the 3MS across all waves.
- There were no differences in the rate of change in 3MS across time.

Conclusions

- Individuals endorsing sleep disturbances were more likely to perform *better* on the 3MS compared to those who did not report a sleep disturbance
- The counterintuitive results may reflect differential dropout of participants with sleep disturbance who died or developed dementia (and therefore were not followed)
- Alternatively, the results may indicate some potential benefit to the use of sleep medications or other factors associated with sleep disturbance that were not examined in the analyses
- Future work will examine the role of sleep medications as well as other health conditions that may impact both sleep and cognitive functioning in late life.

Citations

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