

Sleep disturbances and cognitive functioning in elderly patients with COPD

Fiona A.H.M. Cleutjens, Claudio Pedone, Daisy J.A. Janssen, Emiel F.M. Wouters, Raffaele A.

Incalzi

SUPPLEMENTAL FILE

Tables

Table S1. Associations between nocturnal and early morning symptoms and sleep disturbances in the study population

Sleep disturbances	Nocturnal and early morning symptoms							
	Woken at night by shortness of breath		Woken at night by coughing		Coughing in the early morning		Expectoration in the early morning	
	χ^2	p-value	χ^2	p-value	χ^2	p-value	χ^2	p-value
COPD								
EPSE difficulty falling asleep	23.7	<0.001	18.1	0.001	5.3	0.255	3.3	0.505
EPSE nocturnal awakenings	17.5	0.002	15.8	0.003	5.3	0.260	6.0	0.198
EPSE morning tiredness	17.8	0.001	16.6	0.002	8.0	0.092	7.5	0.112
EPSE early awakenings	21.5	<0.001	8.1	0.087	3.2	0.530	3.8	0.430
EPSE total score	0.13†	0.003	0.16†	<0.001	0.03†	0.500	0.03†	0.528
GOLD I								
EPSE difficulty falling asleep	17.0	0.002	14.4	0.006	6.1	0.189	12.4	0.014
EPSE nocturnal awakenings	4.9	0.293	6.3	0.179	1.6	0.809	2.3	0.677
EPSE morning tiredness	3.7	0.445	10.9	0.028	3.9	0.415	5.2	0.268
EPSE early awakenings	7.5	0.113	6.5	0.165	1.4	0.838	2.0	0.735
EPSE total score	0.18†	0.014	0.18†	0.012	0.03†	0.697	0.09†	0.205
GOLD II								
EPSE difficulty falling asleep	6.2	0.186	8.4	0.080	2.2	0.697	4.1	0.394
EPSE nocturnal awakenings	8.2	0.086	10.6	0.031	6.8	0.149	7.0	0.138

EPSE morning tiredness	8.7	0.070	4.8	0.304	4.3	0.372	2.7	0.616
EPSE early awakenings	5.1	0.281	3.9	0.425	4.6	0.325	3.5	0.482
EPSE total score	0.11†	0.100	0.16†	0.016	0.00*	0.957	-0.01†	0.926
GOLD III								
EPSE difficulty falling asleep	13.6	0.010	14.4	0.006	5.0	0.284	4.5	0.347
EPSE nocturnal awakenings	13.3	0.010	9.2	0.057	5.4	0.246	5.7	0.219
EPSE morning tiredness	20.9	<0.001	10.5	0.033	2.4	0.663	4.2	0.386
EPSE early awakenings	13.6	0.009	20.3	<0.001	6.9	0.143	3.8	0.432
EPSE total score	0.24†	0.014	0.28†	0.005	0.22†	0.023	0.16†	0.094
GOLD IV								
EPSE difficulty falling asleep	3.1	0.546	2.3	0.672	2.8	0.585	6.3	0.177
EPSE nocturnal awakenings	4.5	0.338	1.6	0.805	2.0	0.736	2.8	0.589
EPSE morning tiredness	2.9	0.569	4.7	0.528	0.8	0.932	1.9	0.757
EPSE early awakenings	2.2	0.696	2.2	0.698	1.4	0.845	3.4	0.486
EPSE total score	-0.01†	0.974	0.03†	0.862	-0.04†	0.833	0.13†	0.457

Abbreviations: COPD, chronic obstructive pulmonary disease; EPSE, Established Populations for Epidemiologic Studies of the Elderly questionnaire. †, Correlation Coefficient (Pearson's r).

Table S2. Adjustment values for the MMSE total score, by age and years of education

Age (years)	Education (years)				
	0-3	4-5	6-8	9-13	>13
20-29	0.72	-0.17	-0.81	-1.41	-1.93
30-39	0.91	0.09	-0.58	-1.25	-1.90
40-49	1.10	0.31	-0.38	-1.11	-1.79
50-59	2.24	0.74	-0.03	-1.01	-1.69
60-69	2.99	1.27	0.53	-0.51	-1.54
70-79	5.24	2.03	1.20	-0.14	-1.15

Derived from: Measso G, Cavarzeran F, Zappalà G, Lebowitz BD, Crook TH, Pirozzolo FJ, Amaducci LA, Massari D, Grigoletto F: The mini-mental state examination: Normative study of an Italian random sample. *Developmental Neuropsychology* 1993, 9:77-85.

The values were added to the observed MMSE total score of a subject in order to remove the effects of age and education from his or her performance on the test.

Figures

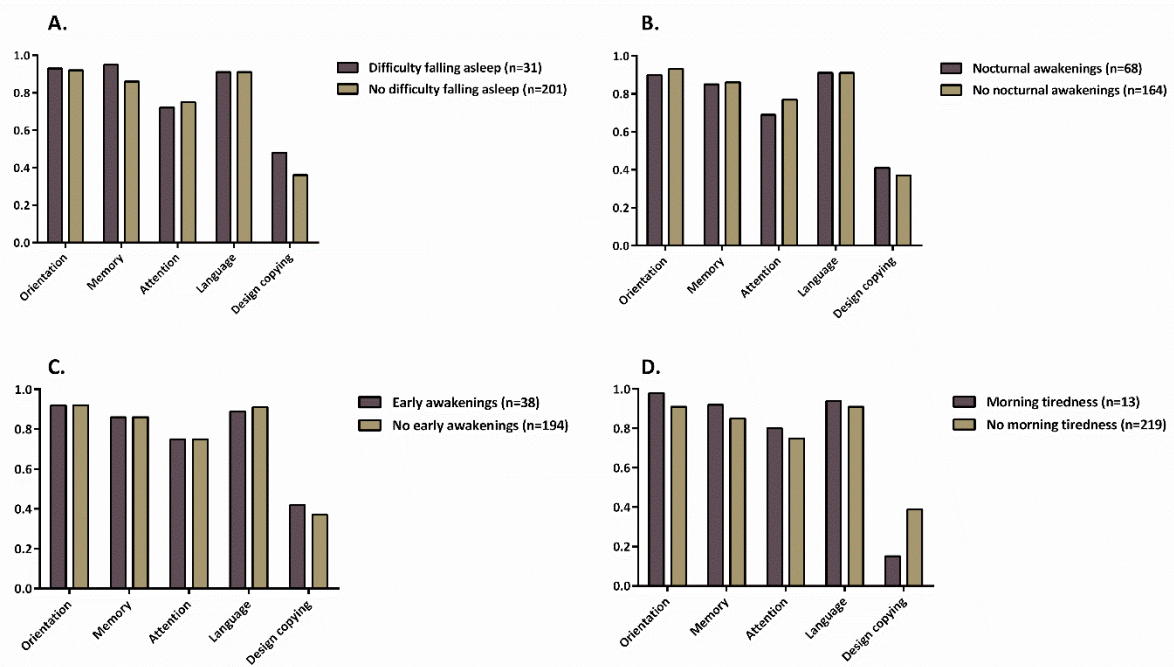


Figure S1. Percentage correct cognitive functioning scores (y-axis) per cognitive domain (x-axis) in patients with COPD GOLD II with and without difficulties to fall asleep (A), nocturnal awakening (B), early awakening (C), and (D) morning tiredness. For the domain copying ability, percentages of patient who failed (y-axis) are depicted. $P > 0.05$ unless otherwise indicated.

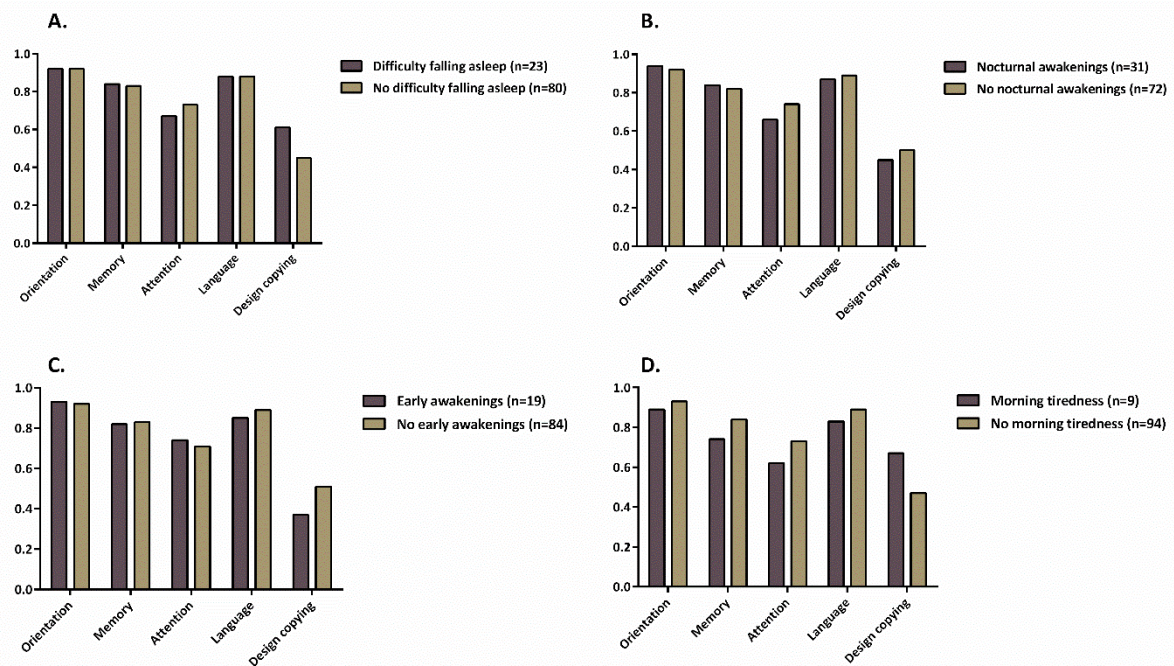


Figure S2. Percentage correct cognitive functioning scores (y-axis) per cognitive domain (x-axis) in patients with COPD GOLD III with and without difficulties to fall asleep (A), nocturnal awakening (B), early awakening (C), and (D) morning tiredness. For the domain copying ability, percentages of patient who failed (y-axis) are depicted. $P > 0.05$ unless otherwise indicated.

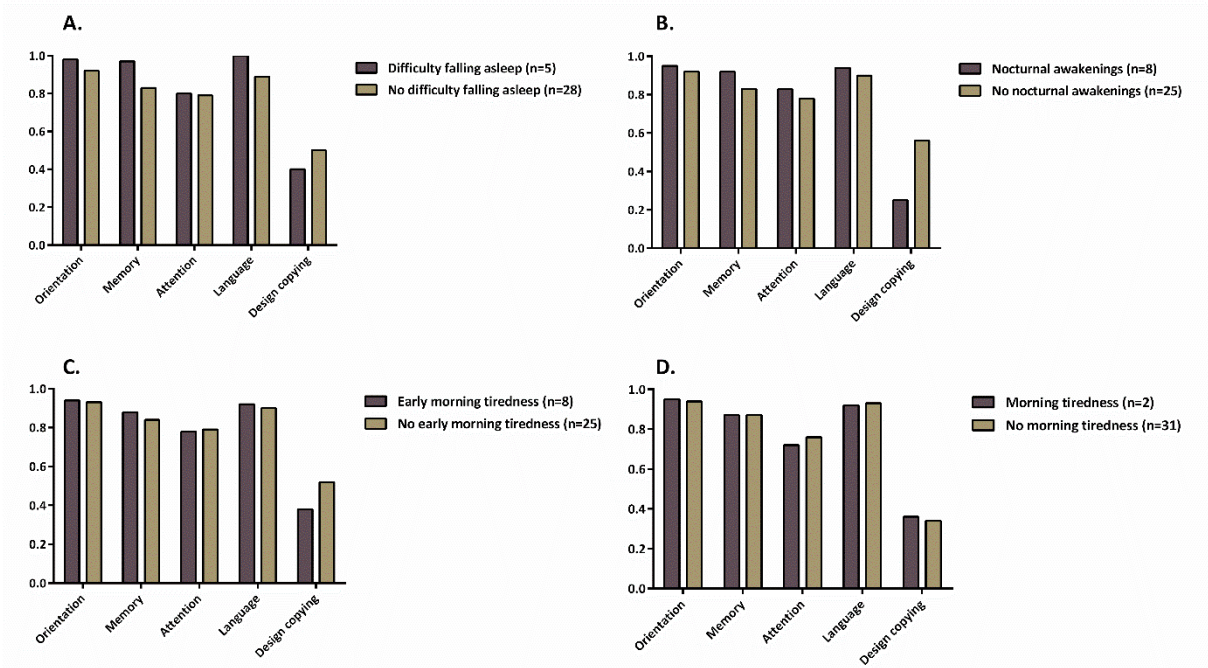


Figure S3. Percentage correct cognitive functioning scores (y-axis) per cognitive domain (x-axis) in patients with COPD GOLD IV with and without difficulties to fall asleep (A), nocturnal awakening (B), early awakening (C), and (D) morning tiredness. For the domain copying ability, percentages of patient who failed (y-axis) are depicted. $P > 0.05$ unless otherwise indicated.