

The relationship between Sleep Quality and subjective and objective Cognitive Impairment in Multiple Sclerosis



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Background and aims:

Cognitive impairment is a frequent manifestation in people with Multiple Sclerosis (pwMS), encompassing both objectively measurable deficits and subjectively reported difficulties.

While poor sleep quality is commonly associated with fatigue and mood symptoms, its specific role in shaping subjective Cognitive Impairment (sCI) remains unclear. Recent evidence suggests that self-reported cognitive difficulties may occur independently of depression, anxiety, or objective Cognitive Impairment (oCI). This study aimed to investigate the relationship between sleep quality and objective and subjective cognitive functioning in pwMS, and to explore the potential influence of fatigue and mood.

Methods

Eighty-four people with MS (58 F, mean age = 43.30 ± 13.17 years) completed the Pittsburgh Sleep Quality Index (PSQI), the Modified Fatigue Impact Scale (MFIS), the Beck Depression Inventory (BDI), the Beck Anxiety Inventory (BAI), and three self-report questionnaires assessing subjective cognition: the Self-Management Assessment Scale for Cognition (SMAC), the Cognitive Failures Questionnaire (CFQ), and the Fatigue Symptoms and Impacts Questionnaire - Relapsing Multiple Sclerosis (FSIQ-RMS).

Objective cognition was evaluated using the Brief International Cognitive Assessment for Multiple Sclerosis (BICAMS) and Rao's Brief Repeatable Battery (RAO). Multiple linear regression models were used to assess associations between sleep quality and cognitive variables, adjusting for age, sex, and education. In order to disentangle the relationship between mood and fatigue and objective and subjective cognitive performance, a multiple regression analysis was applied.

Conclusion

In pwMS, Poor Sleep Quality is consistently associated with greater subjective cognitive complaints and higher fatigue/depressive symptoms, but it does not predict objective cognitive performance. Among fatigue dimensions, only the cognitive component significantly explains subjective cognitive difficulties, independently of sleep and mood. Fatigue is also related to worse verbal memory performance, suggesting effects beyond self-perceived difficulties on specific cognitive domains. These findings support a multidimensional cognitive assessment in MS that integrates subjective complaints with objective measures and carefully evaluates the clinical contribution of cognitive fatigue.

Results

No significant associations emerged between sleep quality and objective cognitive performance. Higher PSQI was significantly associated with higher SMAC ($\beta = .21, p = .03$), higher FSQI-RMS ($\beta = .24, p = .03$), higher total MFIS ($\beta = .32, p = .00$), higher physical MFIS ($\beta = .28, p = .01$), higher cognitive MFIS ($\beta = .26, p = .01$), higher psychosocial MFIS ($\beta = .36, p = .00$), higher BDI ($\beta = .34, p = .00$). Higher total MFIS was associated with lower CVLT ($\beta = -5.12, p = .02$). However, when fatigue and mood symptoms were entered in the model, only the cognitive subscale of the fatigue scale remained a significant predictor of subjective cognitive scores ($\beta = .61, p < .001$)

Bibliography



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