

# Abstract

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## Vitamin D deficiency is associated with low mood and worse cognitive performance in older adults.

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**BACKGROUND:** Vitamin D deficiency is common in older adults and has been implicated in psychiatric and neurologic disorders. This study examined the relationship among vitamin D status, cognitive performance, mood, and physical performance in older adults.

**METHODS:** A cross-sectional group of 80 participants, 40 with mild Alzheimer disease (AD) and 40 nondemented persons, were selected from a longitudinal study of memory and aging. Cognitive function was assessed using the Short Blessed Test (SBT), Mini-Mental State Exam (MMSE), Clinical Dementia Rating (CDR; a higher Sum of Boxes score indicates greater dementia severity), and a factor score from a neuropsychometric battery; mood was assessed using clinician's diagnosis and the depression symptoms inventory. The Physical Performance Test (PPT) was used to measure functional status. Serum 25-hydroxyvitamin D levels were measured for all participants.

**RESULTS:** The mean vitamin D level in the total sample was 18.58 ng/mL (standard deviation: 7.59); 58% of the participants had abnormally low vitamin D levels defined as less than 20 ng/mL. After adjusting for age, race, gender, and season of vitamin D determination, vitamin D deficiency was associated with presence of an active mood disorder (odds ratio: 11.69, 95% confidence interval: 2.04-66.86; Wald  $\chi^2(2) = 7.66$ ,  $df = 2$ ,  $p = 0.022$ ). Using the same covariates in a linear regression model, vitamin D deficiency was associated with worse performance on the SBT ( $F = 5.22$ ,  $df = [2, 77]$ ,  $p = 0.044$ ) and higher CDR Sum of Box scores ( $F = 3.20$ ,  $df = [2, 77]$ ,  $p = 0.047$ ) in the vitamin D-deficient group. There was no difference in performance on the MMSE, PPT, or factor scores between the vitamin D groups.

**CONCLUSIONS:** In a cross-section of older adults, vitamin D deficiency was associated with low mood and with impairment on two of four measures of cognitive performance.

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