

# Abstract

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## Serum Folate, Vitamin B-12, and Homocysteine and Their Association With Depressive Symptoms Among U.S. Adults.

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**OBJECTIVE:** To examine, in a nationally representative sample of U.S. adults, the associations of serum folate, vitamin B-12, and total homocysteine (tHcy) levels with depressive symptoms. Several nutritional and physiological factors have been linked to depression in adults, including low folate and vitamin B-12 and elevated tHcy levels.

**METHODS:** Data on U.S. adults (age, 20-85 years; n = 2524) from the National Health and Nutrition Examination Survey during the period 2005 to 2006 were used. Depressive symptoms were measured with the Patient Health Questionnaire (PHQ), and elevated symptoms were defined as a PHQ total score of  $\geq 10$ . Serum folate, vitamin B-12, and tHcy were mainly expressed as tertiles. Multiple ordinary least square (OLS), logistic, and zero-inflated Poisson regression models were conducted in the main analysis.

**RESULTS:** Overall, mean PHQ score was significantly higher among women compared with men. Elevated depressive symptoms (PHQ score of  $\geq 10$ ) were inversely associated with folate status, particularly among women (fully adjusted odds ratio [tertiles T3 versus T1] = 0.37; 95% confidence interval, 0.17-0.86), but not significantly related to tHcy or vitamin B-12. No interaction was noted between the three exposures in affecting depressive symptoms. In older adults ( $\geq 50$  years) and both sexes combined, tHcy was positively associated with elevated depressive symptoms (fully adjusted odds ratio [tertiles T2 versus T1] = 3.01; 95% confidence interval, 1.01-9.03), although no significant dose-response relationship was found.

**CONCLUSIONS:** Future interventions to improve mental health outcomes among U.S. adults should take into account dietary and other factors that would increase levels of serum folate.

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