

## Selenium Intake is Related to Beck's Depression Score

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### Dear Editor,

Depression, common throughout the world, is a state of low mood and aversion to activity that can affect a person's thoughts, behavior, feelings, and sense of well-being (1, 2). Depression is typically thought of as strictly biochemical or as rooted in emotions. However, nutrition can play a key role in the onset as well as the severity and duration of depression (3, 4). Selenium is an essential trace element that may alter levels of neurotransmitters in the brain (5). Several studies have suggested that a diet high in selenium significantly improves mood scores (6, 7). The purpose of this study was to investigate the relationship between selenium and depression, assessed by the Beck's scores of subjects living in Mashhad, in northeastern Iran. This work began in 2007 - 2009, when 7,172 subjects (2,725 males and 4,447 females) were recruited from an urban population in and around Mashhad, using a stratified-cluster method that was derived from the mashhad stroke heart atherosclerosis disorder (Mashhad study). None of the subjects had a past history of a cardiovascular event (e.g. unstable angina, Myocardial infarction (MI) or stroke), heart failure, or peripheral vascular disease, including transient ischemic attack, or a history of any previous cardiovascular interventions or surgery. Persons with any major comorbidity, such as cancer or autoimmune, infectious, and inflammatory diseases, were excluded. All subjects gave informed, written consent to contribute to the survey, which was approved by the Mashhad University of Medical Science Ethics Committee. In this study, symptoms of

depression were assessed using the beck depression inventory (BDI). This questionnaire contained 21 items and measured the severity of several symptoms associated with depression. Participants answered each question using a 4-point scale, from 0 to 3. If the subject's total score was under 14, the subject was regarded as non-depressed (normal), while those scoring 14 - 19 were considered to be mildly, 20 - 28 moderately, and > 29 severely depressed, respectively (8, 9). Dietary intake was assessed by means of a questionnaire that was designed based on a 24h dietary recall; dietary analysis was performed using Diet Plan 6 software (Forestfield Software Ltd., Horsham, West Sussex, UK). The means (and SD) for age were 49.3 ± 8.2 years for the male and 48.1 ± 8.0 years for the female subgroups. Multiple logistic regression analysis was performed to assess the relative importance of the selected parameters in determining the presence of moderate and severe depression. Total energy-adjusted intake of selenium proved to be a significant predictor of moderate depression (Table 1;  $P < 0.001$ ), with selenium being negatively associated with the relative risk of a high depression score. Interventional studies with selenium have revealed that selenium improved mood and diminished anxiety (10). In another study, low selenium status was associated with a significantly greater incidence of depression and other negative mood states, such as anxiety, confusion, and hostility (11). Our project confirmed that selenium intake is associated with the low risk of depression.

**Table 1.** Regression Logistic Between Severe and Moderate Depression Subjects With Selenium in Both Crude and Energy-Adjusted Nutrient Intake

	Variable	Odds Ratio (95% CI) <sup>a</sup>	
		Moderate Depression	Severe Depression
Crude intake	Selenium	0.999 (0.996 - 1.002)	0.998 (0.994 - 1.002)
Total energy-adjusted intake	Selenium	0.998 (0.995 - 1.001)	0.996 (0.992 - 1.000) <sup>b</sup>

<sup>a</sup>Adjusted odds ratios with 95% confidence intervals (95% CI) obtained from multiple logistic regressions.

<sup>b</sup> $P < 0.01$ .

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