

Omega-3 Supplementation Lowers Inflammation and Anxiety in Medical Students: A Randomized Controlled Trial

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Abstract

Observational studies have linked lower omega-3 (n-3) polyunsaturated fatty acids (PUFAs) and higher omega-6 (n-6) PUFAs with inflammation and depression, but randomized controlled trial (RCT) data have been mixed. To determine whether n-3 decreases proinflammatory cytokine production and depressive and anxiety symptoms in healthy young adults, this parallel group, placebo-controlled, double-blind 12-week RCT compared n-3 supplementation with placebo. The participants, 68 medical students, provided serial blood samples during lower-stress periods as well as on days before an exam. The students received either n-3 (2.5 g/d, 2085 mg eicosapentaenoic acid and 348 mg docosahexanoic acid) or placebo capsules that mirrored the proportions of fatty acids in the typical American diet. Compared to controls, those students who received n-3 showed a 14% decrease in lipopolysaccharide (LPS) stimulated interleukin 6 (IL-6) production and a 20% reduction in anxiety symptoms, without significant change in depressive symptoms. Individuals differ in absorption and metabolism of n-3 PUFA supplements, as well as in adherence; accordingly, planned secondary analyses that used the plasma n-6:n-3 ratio in place of treatment group showed that decreasing n-6:n-3 ratios led to lower anxiety and reductions in stimulated IL-6 and tumor necrosis factor alpha (TNF- α) production, as well as marginal differences in serum TNF- α . These data suggest that n-3 supplementation can reduce inflammation and anxiety even among healthy young adults. The reduction in anxiety symptoms associated with n-3 supplementation provides the first evidence that n-3 may have potential anxiolytic benefits for individuals without an anxiety disorder diagnosis. ClinicalTrials.gov identifier: [NCT00519779](#).

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Figures

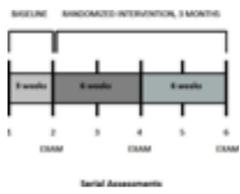


Figure 1 Schematic of the study protocol...



Figure 2 Screening, randomization, and participant flow...

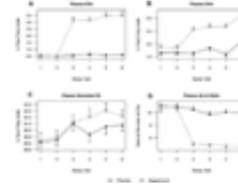


Figure 3 Mean plasma concentrations (+/- SEM) of...

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