

# Abstract

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## Effect of randomized supplementation with high dose olive, flax or fish oil on serum phospholipid fatty acid levels in adults with attention deficit hyperactivity disorder.

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**BACKGROUND:** Dietary intake of omega-3 fatty acids has been positively correlated with cardiovascular and neuropsychiatric health in several studies. The high seafood intake by the Japanese and Greenland Inuit has resulted in low ratios of the omega-6 fatty acid arachidonic acid (AA, 20:4n-6) to eicosapentaenoic acid (EPA, 20:5n-3), with the Japanese showing AA:EPA ratios of approximately 1.7 and the Greenland Eskimos showing ratios of approximately 0.14.

**OBJECTIVE:** It was the objective of this study to determine the effect of supplementation with high doses (60 g) of flax and fish oils on the blood phospholipid (PL) fatty acid status, and AA/EPA ratio of individuals with Attention Deficit Hyperactivity Disorder (ADHD), commonly associated with decreased blood omega-3 fatty acid levels.

**METHODS:** Thirty adults with ADHD were randomized to 12 weeks of supplementation with olive oil (< 1% omega-3 fatty acids), flax oil (source of alpha-linolenic acid; 18:3n-3; alpha-LNA) or fish oil (source of EPA and docosahexaenoic acid; 22:6n-3; DHA). Serum PL fatty acid levels were determined at baseline and at 12 weeks.

**RESULTS:** Flax oil supplementation resulted in an increase in alpha-LNA and a slight decrease in the ratio of AA/EPA, while fish oil supplementation resulted in increases in EPA, DHA and total omega-3 fatty acids and a decrease in the AA/EPA ratio to values seen in the Japanese population.

**CONCLUSIONS:** These data suggest that in order to increase levels of EPA and DHA in adults with ADHD, and decrease the AA/EPA ratio to levels seen in high fish consuming populations, high dose fish oil may be preferable to high dose flax oil. Future study is warranted to determine whether correction of low levels of long-chain omega-3 fatty acids is of therapeutic benefit in this population.

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