

New study shows strong link between selenium levels and depression

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Dr Tamlin Conner

A new University of Otago study has found that selenium levels that are both too high in the body, and worse, too low, can place young people at greater risk of depression.

Otago's Department of Psychology co-author and study lead Dr Tamlin Conner says the research reinforces links between both low and high [selenium](#) status and adverse health effects in humans – including on mood, which is her main area of expertise.

A total of 978 young adults aged 17 to 25 were asked to complete a depression questionnaire and track their mood daily over the Internet for two weeks. Blood tests were also taken to determine their selenium levels.

The results of this research, a collaboration between the University's Psychology and Human Nutrition departments, and published in the prestigious *Journal of Nutrition* today, suggests that there is a relationship between selenium concentration and depressive symptoms and negative mood among young adults. Young adults with either too low, or too high, levels of selenium showed the highest risk of depressive symptoms and poorer mood. However, lower concentrations of selenium were found to be even more detrimental to these outcomes.

"Our strongest finding was that [young adults](#) with the lowest selenium concentrations reported the most depressive symptoms. Although we did not test the physiological mechanisms, other research shows that oxidative damage to the brain and nervous system contributes to the development of depression. Adequate [selenium intake](#) is required for optimal antioxidant defences to protect body tissues from oxidative damage, through glutathione peroxidase, which is a key antioxidant enzyme," says Dr Conner.

"New Zealand has a well-known history of low selenium intake, with many people having intakes below what is required for maximum antioxidant defences. The average blood-serum selenium concentration observed in our study was below what is required for maximum glutathione peroxidase activity, so this suggests many young people in the South Island have intakes of selenium that are too low for optimal selenium status, and could benefit from increasing intakes."

However, whether increasing selenium intakes in young people with low intake could reduce the risk of depression still needs to be tested in

clinical trials, Dr Conner adds.

Co-author Dr Jody Miller, a Research Fellow with Otago's Department Human Nutrition, says there is a narrow window of benefit for selenium, and intakes that are too high may also be detrimental to health.

"Some studies show associations between very high selenium intakes and increased risk of diabetes, prostate cancer, and mortality – usually in older adults.

"Our observation that higher selenium concentrations above a certain level were associated with poorer mood means that recommendations to increase selenium intake should be made with caution. Changes in dietary patterns to increase selenium intake without risk of adversely high intakes should be encouraged – supplementation is not recommended because of the risk of excess intake."

"Safe ways to ensure a good selenium intake without the risk of consuming too much include choosing breads made with whole grains, and increasing the consumption of other high selenium foods such as canned fish, nuts and seeds, poultry, and eggs. Brazil nuts are a particularly rich source of selenium, and one or two brazil nuts per day could safely increase selenium intakes without risk of too high an intake."

Dr Miller says the main source of selenium in the New Zealand diet is bread, followed by fish/seafood, then poultry, and eggs. Bread and bakery products in the North Island are mostly made from Australian wheat, which has high selenium content. For the South Island, most breads and bakery products are made with locally grown wheat.

"New Zealand soil is low in selenium, and so the levels of selenium in NZ-grown wheat are low. Therefore, bread would make a greater

contribution to selenium intake in the North Island," she says.

New Zealand soil is low in selenium and so locally grown foods tend to be low in selenium. This is the main reason why the selenium intakes of New Zealanders have historically been amongst the lowest in the world.

More information: "Optimal Serum Selenium Concentrations Are Associated with Lower Depressive Symptoms and Negative Mood among Young Adults." *J. Nutr.* jn.114.198010; first published online November 5, 2014. [DOI: 10.3945/jn.114.198010](https://doi.org/10.3945/jn.114.198010)

Provided by University of Otago

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