

More Evidence Confirms Diet's Link to Mental Health

Could an Apple a Day Really Keep Depression and Anxiety Away?

Caroline Cassels

October 14, 2011 — In a new and burgeoning area of research, 2 new studies from Australian investigators show that diet quality can have a significant effect on mental health outcomes and may potentially have a role in preventing and treating such common illnesses as depression and anxiety.



Dr. Felice Jacka

In their latest study, [published online](#) September 21 in *PLoS One*, principal investigator Felice Jacka, PhD, and colleagues from Deakin University and the University of Melbourne in Australia found that better diet quality was associated with better mental health in adolescents cross-sectionally and over time.

Importantly, said Dr. Jacka, these findings suggest it may be possible to prevent teenage depression by ensuring adolescent diets are sufficiently nutritious, and improving diet quality may help treat depressive symptoms in this population.

She noted that three quarters of lifetime psychiatric disorders emerge in adolescence or early adulthood, and that a recent national survey showed more than 22% of adolescents aged 13 to 18 years had already experienced a clinically significant mental health problem.

"In this study we show that a good-quality diet at baseline predicts better mental health at follow-up, even after adjustments for diet quality at follow-up, sociodemographic variables, exercise, and most importantly, mental health at baseline," Dr. Jacka told *Medscape Medical News*.

In addition, changes in diet quality over the course of 2 years were matched by changes in mental health during the same time, so children whose diets got worse had a worsening in their mental health, and those whose diet improved had improved mental health. "This was independent of every variable I could think to adjust for," she added.

Better Nutrition, Better Mental Health

The longitudinal, prospective study included 2054 Australian adolescents aged 11 to 18 years at baseline who were participants in a project known as *It's Your Move*, aimed to increase the capacity of schools to promote healthy eating and physical activity.

Study participants were sampled in 2005 to 2006, and again in 2007 to 2008. Students completed an 84-question survey designed to provide information on key behaviors such as nutrition, mental health and well-being, physical activity, and perceptions of home and school environment. Trained researchers

measured students' height and weight.

The investigators used a healthy diet score that was based on one previously developed and validated in adults to assess participants' diet quality and correlated it with the emotional functioning subscale of the Pediatric Quality of Life Inventory, an assessment measure for children's mental health.

A healthy diet was defined as one that included fruit and vegetables as "core food groups" and included both 2 or more servings of fruit per day and 4 or more servings of vegetables, as well as general avoidance of processed foods including chips, fried foods, chocolate, sweets, and ice cream.

An unhealthy diet was high in snack and processed foods.

The investigators found that higher healthy diet scores at baseline predicted higher (better) Pediatric Quality of Life Inventory scores at follow-up, whereas higher "unhealthy" baseline scores predicted poorer mental health.

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The investigators also found during the 2-year study period, adolescents who improved the quality of their diets also experienced improved mental health. In contrast, those whose dietary quality deteriorated experience a worsening of their mental health status.

More Processed Foods, Greater Anxiety

These latest findings come directly on the heels of [another recent study](#) by the same team of investigators that also examined the effect of diet and mental health.

Published in the July issue of *Psychosomatic Medicine*, this earlier study revealed a significant link between better-quality diets and improved mental health outcomes, and specifically depression and anxiety, in a cohort of Norwegian adult men and women.

"The dietary data we had in this study were very good, and we were able to see there were clear dietary patterns: a healthy pattern, an unhealthy pattern, and a 'traditional' dietary pattern that is indicative of the culture. In this case we had a distinct Norwegian traditional dietary pattern," said Dr. Jacka.

The investigators constructed an a priori dietary score so that all participants received a value, and then compared that score against mental health outcomes, using the hospital anxiety and depression scale.

"We found individuals with better quality diets were less likely to be depressed, whereas a higher intake of processed and unhealthy foods was associated with increased anxiety," the researchers write.

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The findings from both articles mirror results of a [previous](#)

study from 2010, conducted by Dr. Jacka and colleagues and reported by *Medscape Medical News* at that time, which examined diet and mental health outcomes in a cohort of Australian women across a wide range of ages.

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Similar to the other 2 more recent papers, the findings from this large, cross-sectional study showed that women who regularly consumed a "whole" diet consisting of vegetables, fruit, whole grains, and high-quality meat and fish cut their risk for major depression, dysthymia, and anxiety disorders by more than 30%.

In comparison, their counterparts who consumed a so-called Western diet, which was high in refined or processed foods and saturated fats, had a 50% increased likelihood of depression.

Diverse Populations, Highly Consistent Data

Although all of these studies have been conducted in different populations, the findings are "remarkably similar," said Dr. Jacka.

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"These observational data, including effect sizes, are highly consistent, which is unusual in a new area of study in psychiatry, or any other area of medicine for that matter. We've seen this right across the world: in Australia, the United Kingdom, Japan, Spain, the United States, and now in Norway. We are seeing it in adolescents as well as adults; in males as well as females. It is very consistent."

Although the underlying mechanisms are not clear, there are several hypotheses.

"We know that diet quality has a real impact on your immune system and oxidative stress. It affects gene expression, and it has a potent impact on the neurotrophic factors, including brain-derived neurotrophic factor, which we know are particularly relevant in psychiatric illness. We think it is plausible that through dietary change we can modulate these biologic factors and, over time, modulate the risk for depression and anxiety," she said.

With 5 papers on diet quality and mental health published since early 2010, Dr. Jacka and colleagues are arguably the world's leaders in this new research area. However, there have been other recent noteworthy studies supporting a link between diet and mental health.

For instance, another study published earlier this year in *PLoS ONE* and reported by *Medscape Medical News* showed that consumption of trans fats was linked to a significant increased risk for depression, whereas monounsaturated fatty acids and polyunsaturated fatty acids lowered depression risk.

New Approach to Mental Illness?

This growing body of evidence, said Dr. Jacka, hints at the possibility of an exciting new approach to preventing and treating common mental illnesses, including depression and anxiety.

At this time, only about 30% of patients with depression respond to antidepressant medication, and a similar proportion respond to psychotherapy, said Dr. Jacka.

"Given that the majority of mental health problems start before age 25, and the enormous burden of illness of depression and anxiety in young people, and given that nutrition is so critical to adequate development, we think these data have enormous significant implications for public health," she said.

However, before physicians can feel confident about treating common mental illnesses with diet, there's an "enormous research gap" that needs to be filled.

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During the past year there also have been a couple of intervention studies suggesting that long-chain omega-3 polyunsaturated fatty acids may be beneficial in preventing psychosis and treating anxiety.

Most notably, results of a 2010 [randomized placebo controlled trial](#) conducted by Paul Amminger, MD, from the Oxygen Research Centre in Melbourne, Australia, [and reported by Medscape Medical News](#), showed that fish oil supplements prevented conversion from a subthreshold psychotic state to full-blown schizophrenia.

Another recent [randomized controlled trial](#) study by investigators at the Ohio State University College of Medicine in Columbus suggested that omega-3 supplements may help reduce anxiety.

Are You What Your Mother Ate?

Dr. Jacka noted that her team has applied for funding to conduct a randomized controlled trial of diet and mental health outcomes.

"So far we know exercise is a very effective treatment strategy for depression, but we have yet to determine whether dietary improvement is an effective treatment strategy," she said.

However, she added, even in the absence of intervention studies, it is not too soon for physicians to raise the issue of diet with patients suffering from anxiety and depression.

"We already know that a good diet and exercise are critical in the treatment and prevention of cardiovascular disease and obesity, both of which are extremely common in people with mental illness. So for these reasons alone, diet and exercise should be at the top of the list of things physicians discuss with their patients.

"Also, based on this very consistent literature that has emerged over the last 18 months, I think we are pretty safe in saying diet is important in mental health. The only thing we don't know for sure is whether diet can improve mental health outcomes. But certainly, based on what we know from epidemiological evidence, I'd be quite confident in recommending physicians address lifestyle in patients with depression and anxiety," she said.

Dr. Jacka also plans to study prenatal nutrition and early childhood diet as they relate to mental health outcomes in offspring.

"I'd like to think that in the not-too-distant future we may be able to say whether or not the diet that a mother eats when she is pregnant and the diet children eat in those first few years has an influence on whether a child will go on to develop depression and anxiety in their teens," she said.

In addition, the investigators hope to receive funding to examine biomarker data in the cohort of Australian women to determine whether diet influences biological markers of depression including oxidative stress, proinflammatory cytokines, and peripherally circulating brain derived neurotrophic factor, and whether these findings correlate with mental health outcomes.

"We hope to continue to develop this evidence base and work towards a public health message on primary prevention of depression and anxiety," she said.

Dr. Jacka and colleagues have disclosed no relevant financial relationships.

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