CE

CONTINUING EDUCATION NUTRITION'S ROLE IN MENTAL HEALTH

BY TORI DEANGELIS

We know that what we eat affects our physical health—that a diet loaded with French fries and burgers is worse for our hearts and waistlines than one that includes regular helpings of steamed broccoli and brown rice.

Less well known are the ways in which food can influence our mental health—not just our immediate mood but also symptoms of depression, anxiety, attention-deficit/hyperactivity disorder (ADHD), and other conditions. These discoveries come from a growing line of research known as nutritional psychology or nutritional psychiatry, part of a scientific discipline that recognizes the importance of lifestyle factors such as exercise, spiritual practices, and social support in promoting mental health (Walsh, R., *American Psychologist,* Vol. 66, No. 7, 2011).

CE credits: 1

Learning objectives: After reading this article, CE candidates will be able to:

1. Explain how the right—or wrong—foods and nutrients affect mental health.
2. Discuss the biology behind good nutritional choices.
3. Describe which mental health conditions have the best research base and what that research is showing.

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Researchers in this emerging field have not had it easy: They have encountered skepticism and dismissiveness from many health care professionals and researchers, including psychologists, who tend to downplay the importance of diet in health and mental health or to take issue with various aspects of the research. But findings in the area are becoming sufficiently robust that it is time to start taking them seriously, said clinical psychologist Julia Rucklidge, PhD, who directs the Mental Health and Nutrition Research Lab at the University of Canterbury in New Zealand.

In her view, "psychologists can no longer avoid talking about the relationship between nutrition and mental health."

THE PSYCHOBIOLOGY OF GOOD NUTRITION

Examining the role of diet in mental health has been occurring since the late 1990s, when a cross-national comparison showed a correlation between high fish consumption in a given country and lower annual rates of major depressive disorder (Hibbeln, J. R., *The Lancet,* Vol. 351, No. 9110, 1998).

Since then, researchers have been exploring potential influences of food and diet types, dietary patterns, and micronutrients and other supplements on psychological health. In 2005, California-based wellness consultant M. Ephimia (Ephi) Morphew-Lu developed and taught the first course in nutritional psychology at John F. Kennedy University in Pleasant Hill, California, and in 2013, she and Australian psychologist Amanda Hull, PhD, cofounded the Center for Nutritional Psychology, an online repository of information on the topic. And in 2015, members of the International Society for Nutritional Psychiatry Research wrote an influential article, "Nutritional Medicine as Mainstream in Psychiatry," highlighting emerging evidence in the area (*The Lancet Psychiatry*, Vol. 2, No. 3, 2015).

Since then, researchers have been conducting a range of studies—observational, epidemiological, prospective, clinical, and even "proof of principle" studies for clinical drug development—to examine how diet and nutrition may impact mental health.

They are finding that the same foods that promote physical health foster positive mental health: foods that are whole (versus processed or ultraprocessed); diverse in vitamins and minerals, or micronutrients; and contain enough fiber to help the digestive system effectively process what it takes in. Micronutrient supplements can also be part of the healthy nutrition equation, researchers are finding. Conversely, poor diets that contain a lot of ultraprocessed foods with little nutritional variety or micronutrients appear to exacerbate depression and other mental health problems, according to recent data (see, for example, Lane, M. M., et al., *Nutrients,* Vol. 14, No. 13, 2022). Alarmingly, Americans now derive most of their calories in a less-than-optimal way: According to the U.S. National Health and Nutrition Examination Survey, U.S. adults obtain 57% of their calories from ultraprocessed foods

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like packaged pizza and sugary beverages, and for children and teens, that share rises to 67% (Wang, L., et al., *JAMA,* Vol. 326, No. 6, 2021; Juul, F., et al., *Clinical Nutrition*, Vol. 115, No. 1, 2022).

If our brain does not get the right nutrients, our mental health can suffer, noted research psychologist Bonnie Kaplan, PhD, a semi-retired professor at the University of Calgary's Cumming School of Medicine and co-author with Rucklidge of *The Better Brain: Overcome Anxiety, Combat Depression, and Reduce ADHD and Stress with Nutrition* (Houghton Mifflin Harcourt, 2021). "If you feed the brain what it needs every day, you will provide the foundation it needs for excellent functioning," she said.

An important aspect of her current work is educating health professionals and the public about how the brain processes nutrients. Otherwise, advice on healthy eating remains abstract and is easy to dismiss, Kaplan added. "You have to know *why* every bite that you put in your mouth feeds the metabolism of your brain," she said.

The brain uses nutrients to support the metabolic work of enzymes, the molecules that convert one chemical into another. Enzymes cannot do that work on their own: To perform their transformational feats, "they need an abundant supply of vitamins and minerals," also known as cofactors, Kaplan explained.

Take the example of serotonin, the "feel good" neurotransmitter that is the target of many antidepressants. To manufacture this neurotransmitter naturally, the brain's chemistry must undergo a complex chain of metabolic steps that depend on the presence of dozens of cofactors, including vitamin B1, riboflavin, copper, and calcium. That same general principle applies to the biochemical manufacturing process for all neurotransmitters, each of which needs its own set of specific cofactors to work efficiently.

Foods that are promoted in the Mediterranean and Japanese diets can have a positive impact on many conditions, including depression.

KEY POINTS

1. **Growing evidence suggests that consuming healthy foods and micronutrients fosters better mental health, while poor-quality diets diminish it.**
2. **Depression and attention-deficit/hyperactivity disorder have the best evidence so far to support this link.**
3. **At a basic level, diets for mental health include whole foods, foods diverse in vitamins and minerals, and plenty of fiber—information that is safe to share with patients without concerns about scope of practice.**

Proper "feeding" of the brain leads to better mental health, because the right fuel enables it to perform better all around. Eating a healthy, whole-foods diet also reduces excessive inflammation in the body; enhances the activity of the mitochondria, which produce ATP (adenosine triphosphate), the compound that provides cells with energy; and helps the gut microbiome by feeding it healthy digestive microbes, which in turn reduce the number of unhealthy microbes. All these systems are linked to brain health and are therefore probably good for mental health as well, Kaplan said. As one practical example, if therapy patients can think more clearly, they will be better able to understand and act on therapy interventions.

"When people understand that consuming minerals and vitamins enables all their pathways to work in their brains," Kaplan said, "then they're more motivated to pay attention to what they eat."

DIET, DEPRESSION, AND ADHD

Researchers are taking this basic information and studying how different diets impact various mental health conditions. They are finding that diets that feature whole foods and contain diverse nutrients—like those promoted in the Mediterranean, Japanese, and Norwegian diets—can have a positive impact on many conditions. They are also finding that high-quality vitamin and mineral supplements—as well as amino acids, herbal formulations, and probiotics—can help as well. (For recent clinical guidelines on this topic, see Sarris, J., et al., *The World Journal of Biological Psychiatry,* Vol. 23, No. 6, 2022).

Depression is the most widely examined condition in this research, with studies showing that improved nutrition can help people with both nonclinical and clinical levels of the disorder. For example, a meta-analysis of 16 randomized controlled trials—mostly with samples of people who had nonclinical depression—found that dietary interventions significantly reduced depressive symptoms though they had less effect on anxiety, found Joseph Firth, PhD, of the University of Manchester in the United Kingdom, and colleagues (*Psychosomatic Medicine*, Vol. 81, No. 3, 2019).

Similarly, a randomized controlled trial conducted by South Australia–based psychologist Natalie Parletta, PhD, and colleagues found positive effects of a healthy diet intervention for adults with self-reported depression. Ninety-five participants received either 3 months of biweekly cooking classes featuring a Mediterranean diet and 6 months of fish-oil supplements, or 3 months of biweekly

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fun and stimulating social groups along with 3 additional months of fish-oil supplements.

The moods of all participants improved by the end of 6 months, but the diet group did better: Their depression scores fell by 45% compared with 26.8% in the social group. In addition, the diet group's reduced depression was related to specific types of food intake, including eating a diversity of vegetables, consuming nuts, and adhering to a Mediterranean diet overall (*Nutritional Neuroscience*, Vol. 22, No. 7, 2019).

High-quality diets also appear to have a positive effect on people with major depressive disorder, other studies are finding. In a randomized controlled trial known as SMILES (Supporting the Modification of Lifestyle in Lowered Emotional States), psychiatric epidemiologist Felice N. Jacka, PhD, director of the Institute for Mental and Physical Health and Clinical Translation (IMPACT)'s Food & Mood Centre at Deakin University in Victoria, Australia, and colleagues tested two interventions on adults with major depressive disorder. Thirty-three participants received seven individual nutritional consulting sessions delivered by a clinical dietician, and 34 other participants received seven visits from trained personnel who "befriended" them—who chatted with them about subjects of interest and engaged with them in fun and positive activities. After 12 weeks, 32.3% of those in the dietary group had no reported symptoms of depression, compared with 8% of those in the social support group (*BMC Medicine,* Vol. 15, No. 1, 2017). Similar results were found in a randomized controlled trial by Jessica Bayes, PhD, of the University of Technology Sydney in Australia, and colleagues, who showed that a 12-week Mediterranean diet intervention improved moderate to severe depression symptoms in young men more than a befriending intervention (*The American Journal of Clinical Nutrition,* Vol. 116, No. 2, 2022).

Another condition that is showing promise with nutritional interventions is ADHD, a major focus of Rucklidge's work. In 2014, she and colleagues conducted the first blinded randomized controlled trial to examine the effects of a micronutrient supplement on adults with ADHD.

Compared with 38 participants who took a placebo, 42 participants who took the formula reported having fewer ADHD symptoms, including inattention, hyperactivity, and impulsivity, at the end of 8 weeks. Moreover, among participants who had moderate to severe depression at the beginning of the study, those who took the supplement were much more likely to report improved mood at the end of the study than those taking the placebo. But there were no differences between groups on clinician ratings of ADHD (*The British Journal of Psychiatry,* Vol. 204, No. 4, 2014).

In a second blinded randomized controlled trial, Rucklidge and colleagues compared how nonmedicated children diagnosed with ADHD fared over 10 weeks when they received a placebo or a broad-spectrum micronutrient formula.

At the end of the study, 32% of the children taking the supplement showed clinically meaningful improvement on symptoms of inattention, compared with 9% of kids taking the placebo. They also had greater improvements in emotional regulation, aggression, and general functioning (*The Journal of Child Psychology and Psychiatry,* Vol. 59, No. 3, 2018).

Those findings were replicated in another randomized controlled trial headed by psychologist Jeanette M. Johnstone, PhD, of the Oregon Health & Science University in Portland. Over the course of 8 weeks, 135 nonmedicated children with ADHD at three sites—Portland, Oregon; Columbus, Ohio; and Alberta, Canada—received either a placebo or a broad-spectrum multinutrient containing all known vitamins and essential minerals.

More than half of those who received the formula—54%—showed improved symptoms overall, compared with 18% of controls, based on blinded clinician ratings. The findings suggested another potential benefit as well: Children on the formula grew 6 millimeters taller over 8 weeks than kids on placebo

RESOURCES

Mental Health and Nutrition
A free, six-part online course on mental health and nutrition
www.edx.org/course/mental-health-and-nutrition

Food & Mood Academy
Online courses exploring the links between diet, brain, and mental health
https://foodandmoodcentre.com.au/academy/online-courses/

Center for Nutritional Psychology
Comprehensive research library, scholarship program, resources, and continuing education courses
www.nutritional-psychology.org



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when other basic factors were controlled for. That is a potentially important finding because suppressed height may be a concern with standard ADHD medications, Johnstone noted (*Journal of the American Academy of Child & Adolescent Psychiatry*, Vol. 61, No. 5, 2022).

Others are investigating the effects of nutritional interventions on more serious conditions as well, including bipolar disorder, eating disorders, and psychotic disorders, as well as autism. They are also looking into the effects of particular kinds of diets and foods on some of these disorders. These include potential impacts of the ketogenic (low-carb, high-fat) diet on bipolar disorder (Campbell, I. H., & Campbell, H., *BJPsych Open,* Vol. 5, No. 4, 2019) and Alzheimer's disease (Phillips, M. C. L., et al., *Alzheimer's Research & Therapy,* Vol. 13, No. 51, 2021), and of a gluten-free diet as an adjunctive treatment for people with schizophrenia (Levinta, A., et al., *Advances in Nutrition,* Vol. 9, No. 6, 2018). While there is some promise in all these areas, more research is needed to demonstrate their effectiveness, according to these studies.

Researchers conducting this work also comment that it raises questions about what constitutes good treatment in general, including about the kinds of outcomes providers should be looking for.

For example, while Rucklidge's study on children with ADHD found improvements on symptoms like inattention, there were no group differences on parent and teacher reports of hyperactivity and impulsivity, some of the main hallmarks of the disorder. But parents and teachers did see a rise in other positive outcomes that are not specifically related to ADHD symptoms, such as reduced anger and a greater ability to regulate emotions and cope with stressors.

In addition, children in the study did not have to cope with side effects that can sometimes occur with traditional ADHD medications, such as dizziness, moodiness, loss of appetite, and trouble sleeping. Instead, by applying nutritional interventions that do not have these side effects, some kids can improve functioning and learn better. "So, when we think about treatments for these kids, I really do encourage a more holistic approach," Rucklidge said. In fact, she has applied for and received approval from Pharmac, New Zealand's equivalent of the Food and Drug Administration, for practitioners to prescribe the micronutrient formula used in her studies as a second-tier treatment. So if conventional medications have not worked or have intolerable side effects, practitioners can try these supplements instead. (There are still many steps that need to occur before Pharmac will actually pay for the use of the formula, however, Rucklidge noted.)

MICROBIOME RESEARCH

In another line of inquiry, mental health investigators are entering the "hot" research area of the gut microbiome, finding early evidence that a good diet may influence the microbiome, which in turn may influence mental health.

Because of the microbiome's potential in the area, many of the studies at Deakin University's Food & Mood Centre include examining changes in the microbiome before and after a given intervention, mainly via stool samples, said research psychologist Amy Loughman, PhD, who heads the microbiome research team there.

A study by Samantha Dawson, PhD, also of Deakin University, Loughman, and colleagues, for example, tested the diets and gut microbiome diversity of 213 women in their third trimester of pregnancy and then looked at child outcomes at age 2. Children of women with greater gut microbiome diversity in pregnancy had fewer anxious, depressive, and withdrawn behaviors than toddlers whose moms had less diverse gut microbiomes during



Variables such as genetics, medication use, and stress can influence the amount and types of nutrients a particular individual needs.

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pregnancy. In addition, the team found that women with greater gut microbiome diversity had eaten healthier prenatal diets than women with less diverse gut microbiomes (*eBioMedicine*, Vol. 68, No. 103400, 2021).

Another recently completed study at the center involves "fecal transplantation"—taking bacteria from the gut of a healthy donor and transferring it into a person with depression. The procedure has been used successfully to treat medical patients with Clostridioides difficile (C. diff.), a painful intestinal condition associated with an unhealthy gut microbiome. Their study concluded that the intervention was possible to do and acceptable to participants, but that more research on larger sample sizes is needed to determine efficacy (*Canadian Journal of Psychiatry*, online first publication, 2023).

As these studies show, work on the microbiome is promising but still in the nascent stages, Loughman noted. "It's a balance between people being excited about the microbiome and seeing it as a different avenue through which to impact mental health and not getting swept up in the hype that we should all test our microbiomes and that's how we're going to do therapy from now on," she said.

PUTTING IT INTO PRACTICE

Other areas of nutritional psychology and psychiatry need more investigation as well. One emerging area of interest is examining how to tailor micronutrients to specific individuals. That is because many variables—genetics, medication use, stress, and more—can influence the amount and sometimes types of nutrients a particular individual needs. In a similar vein, researchers are starting to examine how different types of diets may benefit different types of individuals.

That said, there is enough good information available that clinicians can safely incorporate it into their practices without concerns about scope of practice, particularly if they are giving general advice or guidance, these researchers added. (Understanding specialized diets and problems requires more expertise and study.)

"Psychologists can learn the basics of nutrition really simply," said Rucklidge, through continuing-education classes or other vetted online courses. Having conversations with patients about ultraprocessed foods and poorer mental health, she noted, is akin to talking about the harmful effects of alcohol or other substances.

Kaplan suggests starting by saying, "There is increasing evidence that what we eat affects how we feel," and then noting the health benefits of a whole-foods diet. She then recommends asking patients to describe what and how they eat—how many times a day or week they think they consume key elements of healthy or less healthy diets such as sugary drinks, refined carbohydrates, green vegetables, or fruit. "Don't evaluate or score this in any way," she said, "but ask them where they think they might want to make some changes."

Next, point out that eating whole foods does not need to be expensive, a common myth. Have patients keep track of weekly food expenses for 2 weeks, and then have them do the same after shopping for a whole-foods diet, she suggested. Beans, rice, and veggies are likely to be less expensive than a few trips to a fast-food chain, for example.

Some psychologists are opting for training in nutrition to further amplify this aspect of their practices. Lauren Broch, PhD, who also incorporates behavioral sleep medicine and other lifestyle approaches into her private practice at Greenwich Hospital in Greenwich, Connecticut, earned a master's degree in nutritional science to support her patients around nutrition. She uses psychoeducation on the basics of a healthy diet and lifestyle, as well as behavioral approaches like having patients keep food logs and use feedback systems to start changing their eating patterns.

She is seeing gratifying results: "Over time, people notice that they just feel lighter—less bloated, with fewer digestive issues," she said. "They also have better moods and report that they're sleeping better."

"We're starting to realize that what we eat is not just about the calories—it's also about the nutrition and the information that's in that nutrition," Broch added. "Food is information, and it's also medicine. Helping patients take advantage of that knowledge is an invaluable part of my practice."

A three-part APA continuing-education webinar series on this topic is available at https://on.apa.org/3zww71A.

FURTHER READING

The better brain: Overcome anxiety, combat depression, and reduce ADHD and stress with nutrition
Kaplan, B. J., & Rucklidge, J. J. Houghton Mifflin Harcourt, 2021

Nutrition provides the essential foundation for optimizing mental health
Rucklidge, J. J., et al. *Evidence-Based Practice in Child and Adolescent Mental Health*, 2021

Clinical guidelines for the use of lifestyle-based mental health care in major depressive disorder
Marx, W., et al. *The World Journal of Biological Psychiatry,* 2022

Diet and mental health
Loughman, A., et al. In Cowan, C. S. M., & Leonard, B. E. (Eds.), *Microbes and the Mind: The Impact of the Microbiome on Mental Health* Karger, 2021

Efficacy of low carbohydrate and ketogenic diets in treating mood and anxiety disorders: Systematic review, implications for clinical practice
Dietch, D., et al. *BJPsych Open*, 2023