Nutrition and Mental Health: We Are What We Eat

By
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Brief Bio
Angela Dailey is a Licensed Clinical Social Worker who has been practicing in the private and public sectors as a therapist and educator for 21 years. She is currently in private practice as owner and operator of Teton Counseling in north central Montana and teaches Psychology as an adjunct professor at the University of Great Falls and at Montana State University College of Technology.
Learning Objectives

• After completing this offering the participant will be able to list three causes of mental illness
• After completing this offering the participant will be able to list at least three common mental illnesses that may be improved with proper nutrition
• After completing this offering the participant will be able to identify mental symptoms of nutrition deficiency
• After completing this offering the participant will be able to identify behavioral symptoms of nutrition deficiency
• After completing this offering the participant will be able to identify nutrients that are known to improve symptoms of mental illness
• After completing this offering the participant will be able to identify common foods that contain nutrients that are known to improve symptoms of mental illness
• After completing this offering the participant will be able to list the benefits of a nutritious diet
Introduction:

Each year in America, an estimated one in four adults will suffer from a diagnosed mental disorder. While the causes of mental illness can include many things like genetic predispositions and trauma, the link between nutrition and mental health is one that is well documented but often overlooked. Nutritional deficiencies are indicated in several mental disorders including depression, bipolar disorder, schizophrenia and obsessive-compulsive disorder (OCD). Diets high in refined sugar that predict heart disease and diabetes are also linked to the outcome of schizophrenia and depression. The most common nutritional deficiencies seen in mental disorder patients are of omega-3 fatty acids, B vitamins, minerals, and amino acids which effect neurotransmitters. Essential vitamins, minerals, and omega-3 fatty acids are often deficient in the general population of America and other developed countries; and are exceptionally deficient in patients suffering from mental disorders. Studies have shown that daily supplements of vital nutrients often effectively reduce patient's symptoms. Supplements that contain amino acids also reduce symptoms, because they are converted to neurotransmitters that alleviate depression and other mental disorders. Based on emerging scientific evidence, this form of nutritional supplement treatment may be appropriate for controlling major depression, bipolar disorder, schizophrenia, anxiety disorders, eating disorders, attention deficit disorder/attention deficit hyperactivity disorder (ADD/ADHD), addiction and autism (Lakhan & Vierra, 2008).

The benefits of good nutrition go far beyond providing the body with the nutrients it needs to grow, maintain healthy bones and fight off disease and germs. Good nutrition also contributes to proper organ function. Proper nutrition is
needed for the heart and liver, as well as many other organs, even the eyes, to function optimally. We need to remember that the brain is an organ also and what we feed it will largely determine how it functions. When the brain functions as it is intended, we feel good; we have energy, clarity of thought, our memories are sharp and moods are stable. We interact with, and respond to, our environment appropriately.

NEUROTRANSMITTERS

What are neurotransmitters? Neurotransmitters are the chemical messengers in the brain that transmit information by activating neurons (brain cells). Information is transmitted between neurons via specific chemical neurotransmitters. A neuron releases a neurotransmitter, which is then picked up by neighboring neurons that have receptor sites designed, like a lock and key, to receive that particular neurotransmitter. When the neuron receives the chemical, it causes an electrical impulse to travel from neuron to neuron. Without these chemical couriers, the brain would be completely inactive. It is these chemicals that cause all of our brain activity.

Neurotransmitters exist not only in the brain but also in the spinal cord, the peripheral nerves, and certain glands. Through their effects on specific nerve circuits, these substances can affect mood, memory, and overall well-being. The nature of the effect depends on the amount of neurotransmitter being released, its location, and the type of receptor it binds with.

Here are a few of the better understood neurotransmitters and their effects:
Serotonin affects neurons involved in sleep, appetite, sensory perception, temperature regulation, pain suppression, and mood. Serotonin is often called the “mood regulator.”

Dopamine affects neurons involved in voluntary movement, learning, memory, emotion, pleasure or reward, and response to novelty.

Acetylcholine affects neurons involved in muscle action, cognitive functioning, memory, and emotion.

Norepinephrine affects neurons involved in increased heart rate and the slowing of intestinal activity during stress, and neurons involved in learning, memory, dreaming, waking from sleep, and emotion.

GABA (gamma-aminobutyric acid) is the major inhibitory neurotransmitter in the brain.

Glutamate is the major excitatory neurotransmitter in the brain; it is released by about 90 percent of the brain’s neurons.

Harmful effects can occur when neurotransmitter levels are too high or too low. Abnormal GABA levels have been implicated in sleep and eating disorders and in convulsive disorders, including epilepsy. Loss of brain cells responsible for producing acetylcholine have been linked to Alzheimer’s Disease which helps account for the devastating memory loss associated with that disease. A loss of cells that produce dopamine is responsible for the tremors and rigidity of Parkinson’s Disease. Low levels of serotonin have been
linked to depression and high levels of dopamine have been linked to schizophrenia.

In other words, these disorders are associated with what is commonly referred to as a “chemical imbalance” in the brain. Most often, we treat these chemical imbalances with medication designed to restore the balance that will ensure proper brain function. *It is important to know that ordinary foods can also influence the availability of neurotransmitters in the brain.* Many readily available foods contain substances that are converted to neurotransmitters. Likewise, deficiencies can contribute to the underproduction or overproduction of neurotransmitters necessary for learning, memory, and mood regulation.

**JUNK FOOD AND MENTAL ILLNESS**

America’s love of junk food and fast food and the high incidence of mental illness compared to many other countries may be more than coincidence. America’s 26% of the population currently diagnosed with mental illness is in stark contrast to the worldwide prevalence of 4.3% (Demyttenaere K. et al., 2004). This could, in part, be attributed to a difference in diagnostic criteria but could also be due to a lack of nutrients in processed food compared to diets richer in less processed foods in other parts of the world. People who follow a Mediterranean diet which emphasizes fresh fruits, vegetables, and fish and limits red meat and dairy products have lower rates of Parkinson’s Disease and Alzheimer’s (Zeratsky, 2011).
Researchers in Britain followed 3,000 middle-aged office workers over a period of 5 years monitoring their diets and reported levels of depression. Those who ate a diet high in junk food including processed meat, chocolate, sweet desserts, fried food, refined cereals, and high-fat dairy products were more likely to report depression. Those who ate a diet rich in fruits, vegetables, and fish were less likely to report being depressed (Zeratsky, 2011).

**B VITAMIN DEFICIENCY**

A deficiency in certain B vitamins can cause the psychiatric disorders of dementia and psychosis with symptoms including depression, a lack of self-control, paranoia, immodesty and hallucinations, according to Roger Simon, M.D., et al. in a 2009 article published in "Clinical Neurology." A vitamin B12 deficiency can cause dementia and psychosis, as explained by Dr. Simon. The symptoms of dementia include various memory problems, not being able to concentrate and focus, and a difficulty with mathematical calculations. People with this vitamin deficiency have manic mood swings, where they are depressed or overconfident. They are quick to anger, impulsive, paranoid, and immodest in their dress or behavior. They may also hear voices and hallucinate.

Niacin is vitamin B3, and a deficiency in this vitamin can also lead to psychiatric disorders, explains Larry Johnson, M.D., Ph.D., attending physician at the Central Arkansas Veterans Healthcare System. People may become psychotic, have problems with their memory and create stories to fill in their gaps of memory loss, a phenomenon referred to as confabulation. They can become very confused and
disoriented. Some may show signs of paranoia and depression, or become impulsive, extremely happy and full of self-importance (Coleman, 2010).

Deficiencies in niacin can also cause headaches, irritability, and inability to sleep.

Niacin can be found in enriched (fortified) grains, meat, fish, wheat bran, asparagus, and peanuts. The body can also make niacin from tryptophan (see more about tryptophan under the section DEPRESSION AND ANXIETY).

A deficiency in vitamin B-6, also known as pyridoxine, is rare but can be induced by certain drugs, including some antidepressants. A vitamin B-6 deficiency is characterized by mental changes such as fatigue, nervousness, irritability, depression, insomnia, dizziness, confusion, and nerve changes. These mental changes are related to the body’s decreased ability to manufacture neurotransmitters. Vitamin B-6 is needed by the body to produce most of the brain’s neurotransmitters.

Vitamin B-6 is found in chicken, fish, pork, whole wheat products, brown rice, green vegetables and squash, tropical fruits, grapes, and avocado.
TRACE MINERALS

Trace minerals, found in many foods and unprocessed “natural” salt, like sea salt, are very important for many aspects of health including mental health.

Copper is a trace mineral involved in iron metabolism in the body and in brain function. Deficiency of copper causes anemia and inadequate oxygen delivery to the brain and other organs. Copper deficiency also impairs brain functioning and immune system response, including changes in certain chemical receptors in the brain and lowered levels of neurotransmitters.

The richest sources of copper in the diet are organ meats such as heart and liver, seafood, nuts, seeds, whole grain breads and cereals, and chocolate.

Zinc is involved in maintaining cell membranes and protecting cells, including brain cells, from damage. Zinc deficiency can cause neurological impairment, influencing appetite, taste, smell, and vision. It has also been associated with apathy, irritability, jitteriness, and fatigue.

Zinc can be found in red meat, liver, eggs, dairy products, most vegetables, and some seafoods.
SCHIZOPHRENIA

A 1988 study by Christensen and Christensen found a more positive course and outcome in treating schizophrenia with a diet low in saturated fats (animal fats) and high in omega-3 fats. Omega-3 fats are found in seafood such as salmon, herring, sardines, albacore tuna, and mackerel as well as lake trout, flaxseeds, flaxseed oil, and walnuts.

DEPRESSION AND ANXIETY

Tryptophan is an amino acid (a building block of protein) that is essential for the production of serotonin. People who suffer from depression often have low levels of serotonin. Increasing the intake of tryptophan could relieve the symptoms of depression and increase the effectiveness of medication by increasing the level of serotonin in the brain. Higher serotonin levels in the brain enhance mood and have a sedating effect. Tryptophan is found abundantly in turkey. It is also found in red meat, dairy products, some fish such as salmon and halibut, bananas, soy, and chocolate. Tryptophan also induces sleep, which may be why we feel drowsy after eating a meal with turkey or why warm milk has been recommended for generations before bed to help aid in sleep.

Magnesium relaxes the muscles and has an overall calming effect that can reduce feelings of anxiety and has been shown to help people recover more quickly from depression. Magnesium is found in leafy green vegetables, nuts, and avocados.
Folic acid and vitamin B-12 are related to dopamine and noradrenaline. People who are depressed often don’t have enough of these chemicals. As with tryptophan and the production of serotonin, increasing levels of folic acid and vitamin B-12 may help alleviate symptoms of depression and increase the response to medicines that treat depression. Folic acid can be found in leafy greens, brown rice, peas, broccoli, orange juice and bananas. It is also in cereals and breads that have been “fortified” with folic acid. Vitamin B-12 is found in fish, shellfish, meat and dairy products.

Deficiencies in magnesium, folic acid and vitamin B-12 have all been linked to depression. Several controlled trials and case studies involving the addition of these supplements have shown very rapid recovery from depression (Lakhan & Vieira, 2008).

**BIPOLAR DISORDER**

Lithium has been a long-time common treatment for bipolar disorder. Numerous current studies have demonstrated that lifestyle changes, including dietary, can be very effective in treating bipolar disorder. In a double-blind study by Naylor and Smith (1981) both manic and depressed patients were significantly better following a single 3 g dose of Vitamin C than following a placebo. Other recommended dietary changes include the addition of omega-3’s, tryptophan, and B vitamins.
OBSESSIVE COMPULSIVE DISORDER

Obsessive Compulsive Disorder (OCD) has historically been successfully treated with selective serotonin reuptake inhibitors (SSRI’s). Nutrients, such as tryptophan, that increase the production of serotonin are indicated for reducing the symptoms of OCD. A commonly available herb, St. John’s Wort, has been found to be significantly more effective in treating OCD than fluoxetine (Prozac) and superior to a placebo (Fava, et al., 2005).

ALCOHOL CONSUMPTION

Alcohol has a depressant effect on the brain. It is also a toxin that has to be processed through the liver. This detoxification process uses thiamin, zinc, and other nutrients and can deplete the body’s reserves, especially if the diet is poor. Alcohol can also act as an appetite suppressant putting heavy drinkers at even greater risk of poor nutrition. Thiamin and other vitamin deficiencies are common in heavy drinkers and can cause depressed mood, irritability and/or aggressive behavior.

APPROACHES TO BETTER NUTRITION

A dietary assessment at intake will give the clinician a good idea of what the client normally eats. This assessment doesn’t have to be laborious; simply asking what the client normally eats throughout a given day will suffice. Does the client eat 3 meals a day? Snacks? Do those meals and snacks include whole grains, fresh fruits and vegetables? Do
most days involve eating high fat “fast food,” sugary or other processed food? Does the client often skip meals? These things can all be valuable clues is detecting possible nutritional deficiencies.

There are many ways in which most everyone can begin eating a more nutritious diet. As you have probably noticed in what you have read so far, most beneficial nutrients are found in whole, or unprocessed, foods. In other words, whole grains, meats, poultry, fish, dairy, fruits, and vegetables.

Learning to concentrate on preparing these foods and avoiding high fat and sugary foods is a great first step. How this is accomplished will vary from individual to individual, depending on their lifestyle and circumstances.

Educating clients about the symptoms of nutritional deficiencies and the power of nutritional balance in healing mental and emotional disorders can be very motivating in making dietary changes. Sometimes people just need to know “why” it is important to snack on apples and carrots instead of potato chips in order for them to take those steps. Taking a good multi-vitamin-mineral supplement could be a valuable addition to a daily regimen. If a client cannot afford to buy vitamins, a doctor’s prescription for a good multiple vitamin supplement will often be covered by insurance, including Medicaid.

Make the changes manageable. Include small dietary changes as part of the overall treatment plan. Add more changes as new, better, habits are established. Begin with adding a whole grain cereal for breakfast or substituting a whole grain cereal for a high-sugar less nutritious one. Help the client identify more vegetables, especially green leafy ones, they can add to their daily regimen. Find ways of
encouraging the client to develop more interest in cooking whole and fresh foods.

Gardening is highly therapeutic and can be a great way to grow highly nutritious foods inexpensively. Container gardening works very well for people with limited space and many varieties of vegetables including lettuces, spinach, radishes, bell peppers, peas, and many other things will produce an abundance of produce in a small space or container. There are special “patio” variety tomatoes that work well also.

Most communities have resources for gardening information and supplies available through the local colleges and universities. Also, in many places gardening supply stores such as Ace Hardware and Home Depot among others, offer free classes to help get people started growing gardens, big or small.

Community gardens are an option in many places as well for people who lack space. Community gardens can provide space to grow a great variety of fresh, healthy vegetables as well as a low-key social connection with other gardeners in the area, which can be beneficial as well. Community gardening can be a beneficial family activity as well.
CONCLUSION

In conclusion, research supports the idea that proper nutrition may alleviate symptoms of mental illness. Several different nutrients affect levels of chemicals in the brain called neurotransmitters. Neurotransmitters transmit nerve impulses from one nerve cell to another, and they influence mood, sleep patterns, and thinking. Deficiencies of certain vitamins or minerals can damage nerves in the brain and interfere with nerve conduction, causing changes in memory, limiting problem-solving ability, and impairing brain function.

Recommended dietary changes and nutritional supplements do not have the adverse side-effects that are common among prescription drugs used to treat mental illness. Side effects of medications can include weight gain making healthy eating habits even more imperative to good physical and mental health.

When treating a patient for mental illness, a dietary assessment should be considered as part of the intake assessment and dietary changes considered as part of the treatment plan.

Encouraging clients to grow their own food can be highly therapeutic as well as nutritiously advantageous. Container gardening with something as simple as tomatoes and bell peppers can be grown by someone with very limited space and can be highly prolific, producing fruits in abundance. Experiencing the gratification of eating food picked directly from plants grown from seeds or seedlings, as well as tasting fresh picked vegetables that are more flavorful than mass produced produce found in most grocery stores, can
easily lead to a desire to grow even more if space allows. This can be a great step towards an interest in eating healthier foods.

Taking care of ones body is a powerful first step towards mental and emotional health. The mind and body are linked. When you improve your physical health, you’ll automatically experience greater mental health. The benefits of a proper nutritious diet will result in a higher energy level, a decreased level of depression and anxiety and an increased overall sense of well-being, both physically and mentally.
References

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