



UNC SON **ECHO** for MOUD

Addiction and Behavioral Clinic for Medication for Opioid Use Disorder Treatment

Nutritional Considerations and Substance Use Disorders

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SCHOOL OF NURSING



University of North Carolina
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Disclosures

NONE

Objectives

The participant will be able to list 3 vitamins that are often deficient in people with a substance use disorder.

The participant will be able to state 2 minerals that are commonly deficient in people with a substance use disorder.

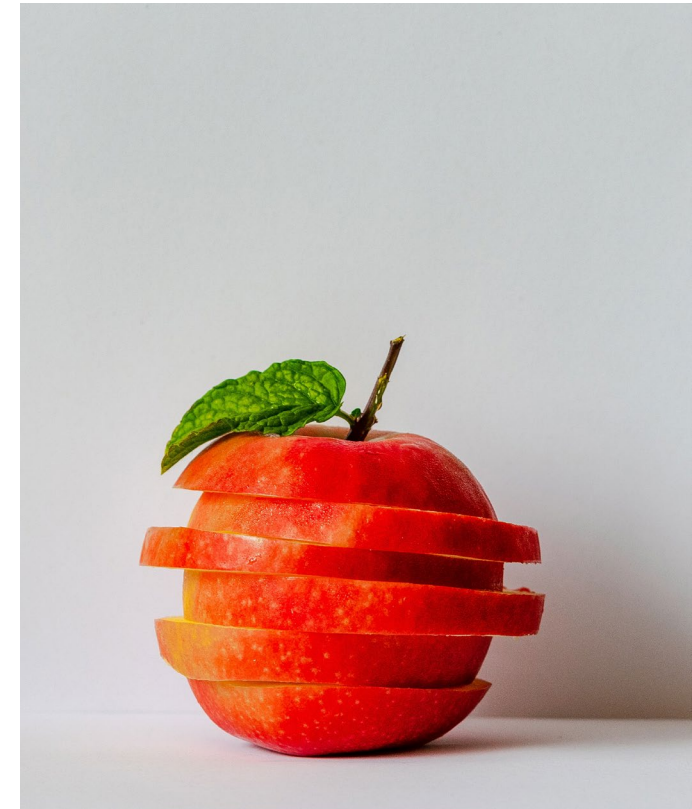
The participant will be able to address the potential impact of neuroinflammation and drug seeking behavior.

The participant will be able to state 3 considerations when assessing nutritional status of the individual with substance use disorder.

Nutrition as an adjunct to care?

Nutrition can play a key role in the treatment and recovery from substance use disorders, although commonly overlooked.

- Malnutrition is a common occurrence in this population.
- Malnutrition can increase drug-seeking behaviors.
- Addiction and appetite have similar impacts on the brain in terms of motivating behaviors.
- Several studies have demonstrated greater efficacy when nutritional support is incorporated into treatment approaches. (Jeynes and Grant, 2017; Cowan and Devine, 2012).



Substance Use Disorder and Nutritional Health

Chronic substance use and abuse impacts the individual's nutritional choices, nutritional status and body composition due to poor food choices, decreased and increased food consumption, nutrient absorption issues, and alterations of hormones that alter the mechanisms of food intake and sense of satiety. (Mahboub et al, 2021).

Drug Use leads to increased risk of infectious illnesses, mental health disorders, cancer, stroke and chronic diseases of the liver, lungs and cardiovascular system.

Substance Use often compromises the user's nutrition and dietary decisions. Decision making is often compromised by decisions to use funds for substances over nutritional needs as well as altered states affecting undereating and overeating.

Nutrition and Neuroplasticity

Nutrition is important to neuroplasticity. Adequate nutrition can improve neuroplasticity by helping the brain to replenish normal amounts of neurotransmitters.

Increasing evidence demonstrates the role of neuroinflammation as having a role in several mental and cognitive disorders including substance abuse (Peng et al, 2021).

Carbohydrates- raise serotonin levels> stabilize mood, improve sleep and reduce cravings for drugs and alcohol.

Amino Acids-the brain uses to produce dopamine. Low dopamine levels are associated with negative mood changes, more severe cravings and increased aggression.

Dietary Fats-needed for neuroplasticity and to decrease neuroinflammation and protect cell membranes. Polyunsaturated fatty acids (PUFAs)/Omega 3's are critical regulators of the central nervous system.



Plasma nutrient deficiencies in PWUD

People with use disorders (PWUD) may have:

- Low selenium and low potassium levels due to low muscle mass related to malnutrition.
- Iron deficiencies and iron deficiency anemia especially in women
- Low A, C, D, E
- Some plasma levels may be elevated including phosphorus, sodium and magnesium which may also be related to dehydration.
- Copper and zinc may be elevated which may be related to inflammation, acute fasting and smoking.
- Certain medications for SUD can cause magnesium deficiency.



Plasma nutrient deficiencies in PWUD

Symptoms of Magnesium deficiency can include:

- Irritability
- Sleep problems
- Fatigue
- Poor Memory
- Neck pain
- Muscle cramps and spasms
- Constipation

Plasma nutrient deficiencies in PWUD

- Magnesium reduces the intensity of addiction to psychostimulants including nicotine, cocaine, amphetamines and others and opiates.
- Magnesium has moderate effect on stimulating the reward system.
- Magnesium can decrease the intensity of opioid addiction.
- Chronic smoking decreases the level of serum magnesium and supplementation decreases the number of smoked cigarettes as well as nicotine addiction.
- Magnesium aspartate may help to decrease benzodiazepine addiction including the reduction of anxiety related to benzodiazepine discontinuation. (Hantouche et al., 1998).
- Magnesium has the ability to produce a moderate stimulation of the brain reward system (Nechifor et al., 2010) and its capacity to reduce the activity of glutamatergic substances, importantly involved in compulsive use disorders.

Plasma nutrient deficiencies in PWUD

“We consider that one of the mechanisms by which magnesium reduces the consumption of some highly addictive substances is its moderate effect of stimulating the reward system. However, other main mechanisms involved in magnesium’s action are the reduction of dopamine and glutamate release at presynaptic terminals in the brain, the decrease of NO synthase activity, the stimulation of GABAergic system activity, the reduction of postsynaptic NMDA receptor activity, and the reduction of some neuro-mediators released by Ca²⁺ and acting at calcium channels. Apart from the action of magnesium ions during emerging addiction, administration of this cation after the appearance of withdrawal syndrome reduces the intensity of the clinical symptoms. There are data that show that stress increases the vulnerability of people to develop addiction to different substances, and also reduces drug-free time and increases the incidence of relapse in heroin addicts. Stress increases catecholamine release and stimulates magnesium release from the body. This decrease in magnesium concentration is one of the important factors that hastens relapse.” (Nechifor M, 2011).

Nicotine

- ↓ Beta carotene
- ↓ B vitamins
- ↓ Vit C, D, E
- ↓ Selenium
- ↓ Zinc
- ↓ Omega 3

High dose Omega-3 fatty acid supplementation appears to reduce cigarette craving and oxidative stress index in heavy-smoker males. (Sadeghi-Ardekani et al, 2018)



Alcohol

↓ A

↓ B vitamins especially Thiamine/B1, B6, Folic Acid

↓ Vit C

↓ Vit E

↓ Amino acids

↓ Zinc

**Wernicke Korsakoff Syndrome is due to severe lack of thiamine and often malnutrition.

Opioids

↓ Vit C

↓ B vitamins

↓ Vit D (strongly exaggerates craving and effect of opioids → ↑ risk of dependence and addiction)(Fischer 2021).

↓ potassium

↓ selenium

↓ zinc

↓ calcium

↓ magnesium

↓ decreased food consumption

↓ GI motility



Stimulants

Often includes binges of substances → ↓ food and fluid intake → dehydration and electrolyte imbalances.

May also lead to cognitive issues (confusion, problem solving), heart rate and rhythm disturbances, low body temp, muscle wasting and weight loss.

After binging/stopping may experience strong spike in appetite.



Heroin and Cocaine

↓ energy

↓ protein

↓ B vitamins (esp. thiamin, riboflavin, pyridoxine, and folate)

↓ Vit D, C

↓ magnesium

↓ iron, copper and zinc

↓ calcium

Consistent with lower intake of nutrient dense food, majority of vitamins and minerals are low.

Considerations for the health care provider

- Malnutrition is common among people with substance use disorders.
- Proper nutrition can aid the healing process, potentially reduce cravings and drug seeking behaviors.
- Treatment may be more effective when nutritional support is incorporated. Offering adequate nutrition tools in the recovery process has been shown to support behavior change during the recovery process (Cowan & Devine, 2012; Jeynes & Gibson, 2017).
- Nutrition as an adjunct to support recovery is not well utilized. Less than 7% of treatment centers utilize a nutritionist and only half involve nutritional education. (Wiss, et al., 2019; Reid, 2014).
- Macro and micronutrient deficiencies can lead to symptoms of depression, anxiety and low energy, which may lend to use of drugs or triggering a relapse.

Considerations for the health care provider

Do you currently do any nutritional assessment or inquiry as part of your assessment for persons dealing with a substance use disorder?

Do you have nutrition professionals available to your practice (RDN, health coaches)? Available in specialty substance abuse treatment?

Given the information provided would you change your approach to caring for these patients?

Do you currently recommend any vitamins, minerals or supplements for those dealing with a substance use disorder?

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