Taking a Closer Look at Nutrition's Role in Mental Health

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- Primary: Psychiatry
- Secondary: Nutrition Education

Disclosures

I have no relevant relationships with ineligible companies to disclose within the past 24 months. (Note: Ineligible companies are defined as those whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.)

Objectives

At the conclusion of this session, participants should be able to:

- Apply the basics of nutritional psychiatry in everyday clinical practice
- Summarize the role of gut microbiome in mental health conditions
- Identify and assess for potential nutrient deficiencies or eating habits that can contribute to mental health conditions like depression
- Manage nutritional deficiencies and concerning eating patterns which may contribute towards mental health disorders

Topics to be Covered

- The Role of Macronutrients
- The Role of (some) Micronutrients
  - B Complex
  - Vitamin D
  - Magnesium & Zinc
  - Vitamin C
  - Omega Fatty Acids
- Role of Gut-microbiome
- Assessing for deficiencies & concerning eating habits
- Managing deficiencies & concerning eating habits
- Other lifestyle opportunities to support mental health
- Future areas of research

Few people are aware of the connection between nutrition and depression while they easily understand the connection between nutritional deficiencies and physical illness.

Adan RAH, van der Beek EM, Buitelaar JK, et al. Nutritional psychiatry: Towards improving mental health by what you eat. *European Neuropsychopharmacology*. 2019;29(12):1321-1332. doi:10.1016/j.euroneuro.2019.10.011

Depression is the **leading cause of disability** WORLDWIDE

Anxiety and depression affect 61 million people in the United States

Sources NAMI Stats, NIMH Statistics NAMI About Mental Illness

The Role of Macronutrients

Carbohydrates

- Low carb diets
  - Precipitate depression
- Eating carbs
  - Release of insulin
  - Production of serotonin & tryptophan
- Insulin
  - Helps blood sugar be used for energy
  - Triggers tryptophan to enter the cell

Proteins

- Amino Acids (the 9 essential) – supplied by diet
- High quality proteins: meats, milk/dairy products, eggs & soy
- AA's are used to make neurotransmitters
  - Tyrosine → Dopamine
  - Tryptophan → Serotonin

Fats

- Trans fat intake - direct association with depression
  - And of course CVD risk factor
- Mono/Poly Unsat Fat – inverse association
- More about fats (Omega-3 Fatty Acids) later!

The Role of (some) Micronutrients

B12 & other B Vitamins

- B12 (cyanocobalamin) – delays onset of dementia
  - Enhances cerebral & cognitive functions in geriatrics
  - Borderline levels develop signs of cognitive changes in adolescents
  - Deficiency → fatigue, lethargy, depression, poor memory
    - Assoc w/ Manic & Psychosis

- B9 (folic acid)
  - Deficiency → neurodevelopment (in utero) AND ↑ risk of depression (adults)

B12 & other B Vitamins

- B12 & Folate deficiencies
  - ↑ homocysteine & ↓ *S*-adenosyl methionine
  - ↓ *S*-adenosyl methionine seen in depressed
  - ↑ homocysteine → neurotoxic agents → overactivates NMDA → depression
- Higher intake of both
  - Lower risk of depression
  - Does not reduce symptoms
- Too much Folate – masks B12 deficiency

B12 & other B Vitamins

- B1 (thiamine)
  - Deficiency → CNS changes (beriberi & Wernicke's encephalopathy)
- B3 (niacin)
  - Deficiency → Pellagra → Dementia
- B6 (pyridoxine)
  - Deficiency → confusion & depression & anxiety
  - Too much = neurotoxic

Vitamin D

- Levels of deficiency in the population
- Higher levels → improved attention & working memory (>65 yo)
- Improvement in depressive symptoms
- Low levels → depressive & anxiety sxs
- Not enough info yet

Magnesium & Zinc

- Mg = involved in inflammatory defenses
  - Depletion → NMDA overactivity → depression / sleep issues / inflammation / anxiety
  - Shortfall nutrient in US population
  - Supplementation = mixed results

- ZN = Helps protect from free radical damage
  - Clinical depression & anxiety = lower levels of Zn present
  - PO Zn can influence effectiveness of antidepressants
  - Possibly dampens NMDA overactivity

Vitamin C

- Anxiety benefits
  - Healthier young population
  - Type II Diabetic
- 2 weeks supplementation ↓ anxiety
- Vitamin C + E = ↓ anxiety in DMII pop

Omega Fatty Acids

- Bipolar Disorder
  - Low level Omega 3 (DHA) in Bipolar pop
  - Low rates in areas of high seafood consumption
- Lower levels of consumption
  - Increased rates of depression
  - Dietary = preventative & therapeutic effects
- Decrease anxiety sxs in some pops
  - College
  - SUD
- Atlantic Salmon consumption
  - ↓ emotional activation & cognitive worry
  - Nutrient dense

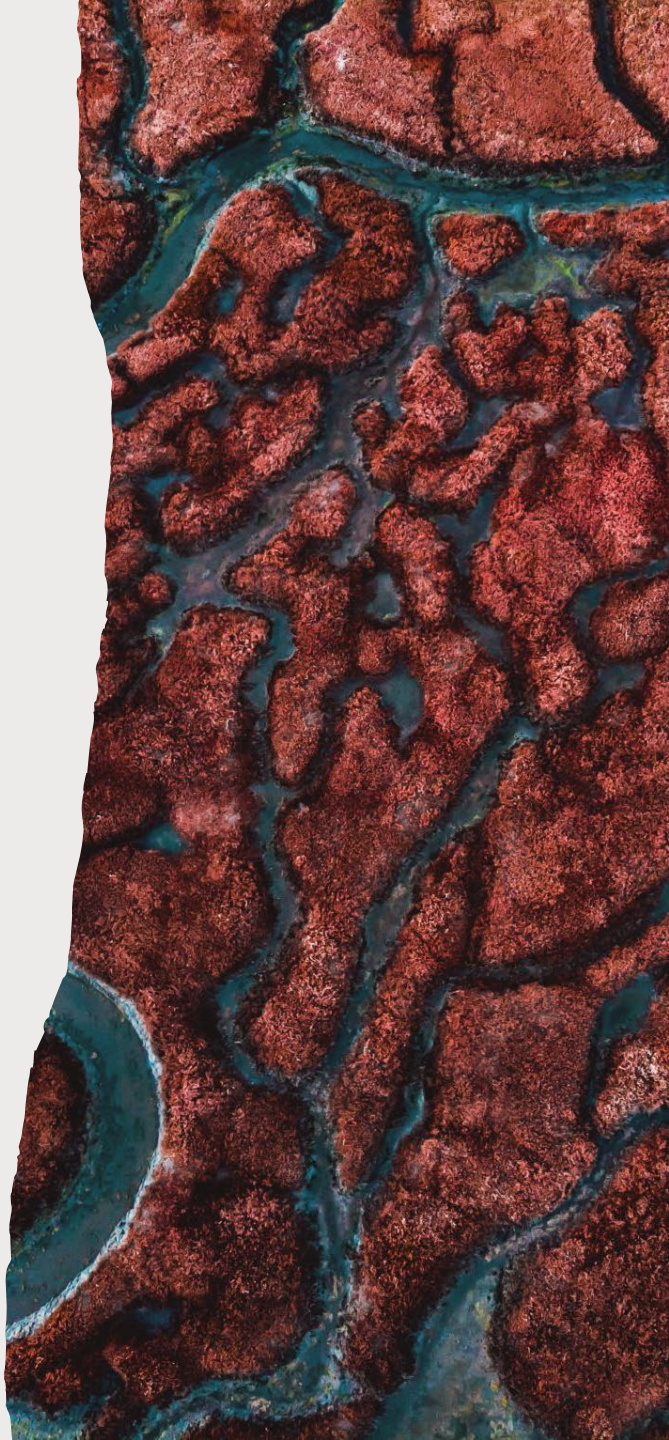
Others to consider

- Calcium
  - Decreased absorption to bones on SSRI
  - SSRI lower BP → falls → fx in certain pops
- Chromium
  - Association with depression
- Iodine
  - Role in thyroid function
- Iron
  - Fatigue & depression
  - Women of childbearing age = higher rates of depression
- Lithium
  - Lower risk of suicide
  - Reduction of aggression & impulsivity
  - Neuroprotective
- Selenium
  - Possible low intake associated with lower mood
  - Increased intake appears to improve mood & decreases anxiety

The Role of Gut-Mircobiome

The Brain, The Gut, & Our Mood

- Bidirectional between brain and gut
- Microbiome affected by:
  - Genetics
  - Antibiotics
  - Food?
- Proposed role on Mental health:
  - Emotion-like behavior in rodents
  - MDD in humans assoc with gut microbiome changes
  - Txr of fecal from depressed humans to rodents



Assessing for Deficiencies & Concerning Eating Patterns

- Nutritional Assessment
  - 24-hour dietary recall
  - Food journal
- Medical Evaluation
- Assessment of financial & social support
- Quality of foods

24-Hour Recall

- Ask patient about **ALL** food & drinks consumed in a 24-hour period
- Use a ‘typical day’ or yesterday
- Questions to ask
  - What do you eat at your first meal? Second? Third? Any snacks?
  - What did you specifically eat? What did you drink?
  - Estimate the portion size of each food/drink item
  - Ask specifics of how foods are prepared
  - Do you ever fast or skip meals for any reason?
  - Is this a typical day? If not, how does it differ?

24-Hour Recall

- What was your first meal of the day?
  Breakfast
- What did you have for breakfast?
  Eggs and toast
- How many eggs did you have, and how were they cooked?
  2 eggs scrambled
- How many pieces of toast? What type of toast?
  2 pieces of toast, whole wheat
- Did you put anything on your toast?
  Yes, jelly
- How much butter?
  About 1 tablespoon between two slices
- Did you have anything to drink?
  Yes, black coffee
- Did you have anything to drink?
  Yes, small dab of butter

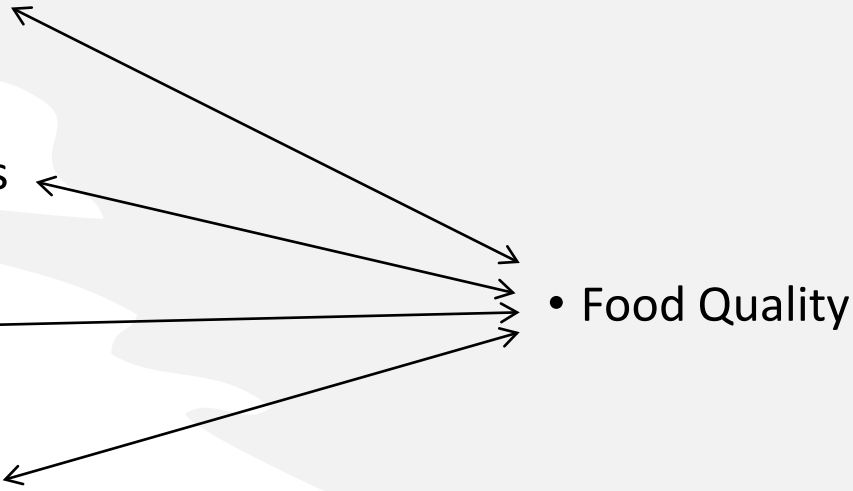
These questions would be similar for each meal, and the interviewer would subsequently inquire about snacks and desserts.

Medical Evaluation

- Labs: CBC, CMP, Vitamin D, B12/Folate, TSH, etc
- Hx or Concern for:
  - Celiac, IBD
  - Nutritional Disorders
  - Dental/oral disorders or complaints
- Past Surgical History: bariatric or other GI surgeries
- Under or over weight; hx of major weight change

Psychosocial Evaluation

- Living situation
- Financial status
- Job/career
- Social Support
  - In home
  - Outside of home



- Food Quality

Managing Deficiencies & Concerning Eating Habits

- Mediterranean-style diet vs supplementation
- Elderly & Homebound population
  - Meals on Wheels
  - Mom's Wheels
  - Local/State programs
- Food support programs
  - WIC, SNAP, TEFAP, etc
  - Check for local programs (ex 912 FoodFarmacy)
- Cooking, gardening, and other group classes

Other Lifestyle Opportunities to Support Mental Health

- Exercise
- Mindfulness techniques
- Socialization

Future Areas of Research

- More studies!
- More controlled dietary intervention studies
- Longer duration
- Larger sample size
- Anxiety and diet

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Questions?