Nutrition and Mental Health: Integrative Nutrition Approaches for Anxiety and Depression

A webinar with Integrative Mental Health and Gut Health Dietitian
Erica Golden, RDN, LD, IFNCP

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Disclosure to Participants

Notice of Requirements For Successful Completion

Please refer to learning goals and objectives

Learners must attend the full activity and complete the evaluation in order to claim continuing education credit/hours

Conflict of Interest (COI) and Financial Relationship Disclosures

No conflicts to disclose

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Erica Golden, RDN, LD, IFNCP

Erica Golden, RDN, LD, IFNCP is a registered dietitian nutritionist with a passion for mental health and gut health (and the interplay between the two).

Erica uses powerful integrative nutrition and lifestyle strategies to help her patients heal from the inside out. Through a weight-inclusive, trauma-informed approach, she helps her patients soothe and heal their digestive systems, fuel healthy hormones and neurotransmitters, support a calm and resilient nervous system, correct deficiencies and imbalances, and improve their relationship with food.

Erica specializes in conditions including depression, anxiety, IBS, and eating disorders. She authored the brand new book *Nutrition and Mental Health: Integrative Approaches for Diet, Dysfunction and the Gut-Brain Axis.*

As an integrative and functional dietitian, she works with people who want to improve their mental health and gut health. She believes that whether you are dealing with an eating disorder, a damaged or difficult relationship with food, abdominal pain or bloating, depression, anxiety, or migraines, the right nutritional counseling can make all the difference in the world.

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Learning Objectives

At the conclusion of this webinar, the learner will be able to:

1. Describe how to implement three principles of trauma-informed care in a nutrition care setting
2. State three ways in which the gut microbiome may contribute to the development of depression and anxiety
3. State five dietary approaches shown to positively impact mental health
4. State four nutrient deficiencies to consider in the management of depression
5. State five common traits among diets that boost BDNF production and stimulate neurogenesis
6. State two ways to reduce the toxic burden and promote detoxification and reduce inflammation

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Part 1:

Taking a Root-Cause Analysis Approach to Mental Health

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Contributing Factors to Mood and Anxiety Disorders

- Stress and autonomic nervous system dysfunction
- Gut-Brain axis dysfunction
- Inflammation
- Nutritional insufficiency
- Food sensitivities
- Detoxification impairment
- Trauma

(Amin et al, 2023; Hidese et al, 2019; Kunugi et al, 2015; Lamers et al, 2013; Losurdo et al, 2018; Michopoulos et al, 2017; Mikkelsen et al, 2017; Piasecka et al, 2020; Polloni & Muraro, 2020)

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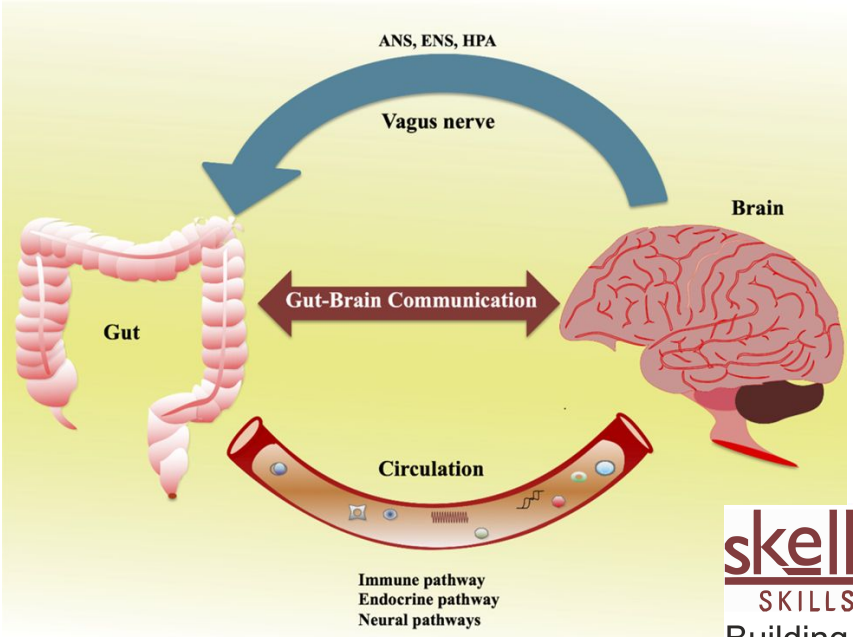
The Gut-Brain Connection

- Vagus nerve: enables bidirectional communication of the gut-brain axis
  - Vital to proper gastrointestinal function & adequate nutritional intake
- Blood circulation also carries messages between the gut and the brain



(Suganya, K, and Koo, B-S, 2020; Waxenbaum et al, 2022)

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Stress and Autonomic Nervous System (ANS) Dysfunction

Sympathetic Nervous System: fight, flight, or freeze response

Chronic stress → overactivation of sympathetic nervous system

- Causes frequently or chronically elevated hormones
  - Chronic inflammation
  - Chronically ↓ GABA levels can lead to anxiety & depression
  - ↑ intestinal permeability
  - Maldigestion, potential nutrient deficiencies
- Stress has the potential to change the composition of the microbiome & overall gut function

(Asahina et al, 2013; Iordache et al, 2022; Kalueff & Nutt, 2007; Konturek et al, 2011; Lee et al, 2015; Maguire, 2018; Pongratz & Straub, 2014; Stevens et al, 2017)

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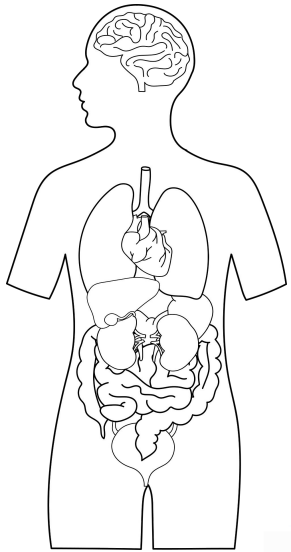
Gut-Brain Axis Dysfunction

- ↑ intestinal permeability/ “leaky gut”
  - Marked by ↑ levels of the endotoxin plasma lipopolysaccharide (LPS), its binding protein LBP, zonulin, intestinal fatty acid binding protein (FABP2)
- Blood brain barrier (BBB) permeability becomes compromised
  - → neuroinflammation
    - linked to neurological conditions, including the development of anxiety & depression



(Chey et al, 2015; Ghosh et al, 2020; Iordache et al, 2022; Rutsch et al, 2020; Stevens et al, 2017; Tavakoli et al, 2021)

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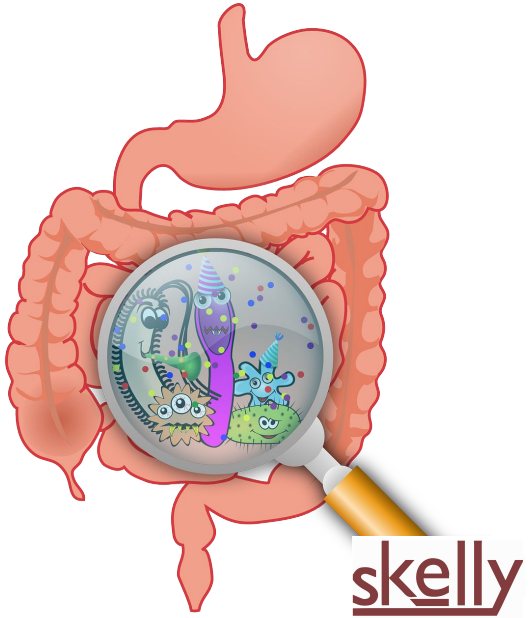
Gut Dysbiosis and Mental Illness

Gut microbiome may contribute to the development of depression & anxiety through:

- Activation of inflammatory pathways
  - Potentially d/t bacterial translocation with ↑ intestinal permeability caused by stress
  - Food allergies & hypersensitivity rxns
- Modulation of the HPA axis
- Alteration of metabolic pathways
- Neural signaling via the ENS, vagus nerve, modulation of neurotransmitter concentrations
- Changes in micronutrient production & bioavailability



(Barone et al, 2022; Jiang et al, 2015; Wang & Kasper, 2014)

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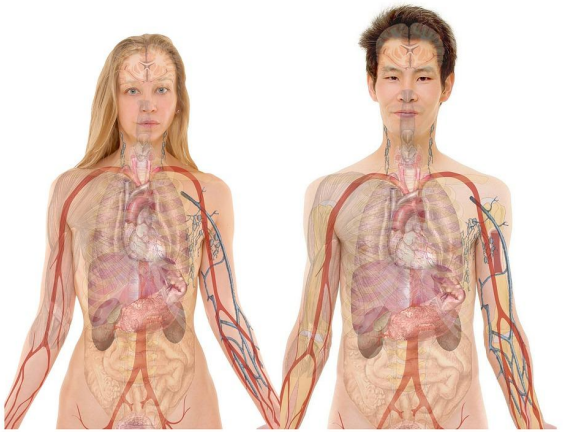
Detoxification Impairment

Metabolic Detoxification: The process by which metabolic byproducts, hormones, & toxic substances are removed from the body

Poor or insufficient detoxification → Inflammatory & psychiatric consequences

- Much of the process occurs in the liver
- Toxins can be:
  - xenobiotics (pesticides, pharmaceuticals)
  - produced endogenously



http://commons.wikimedia.org/wiki/File:Female_with_organs.png
http://commons.wikimedia.org/wiki/File:Male_with_organ

(Aronica et al, 2022; Ventriglio et al, 2020)

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Trauma

Individual trauma results from an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening & that has lasting adverse effects on the individual's functioning & mental, physical, social, emotional, or spiritual well-being

- Adverse childhood events (ACEs)
- Trauma as an adult
- Trauma stemming from grief & loss
- Historical & intergenerational trauma

Trauma Hx is associated with ↑ risk of mental illness (incl depression & substance use) & chronic physical health conditions (DM, obesity, CVD, COPD)

(Anda et al, 2008; Bonomi et al, 2007; Covington, 2008; Figley et al, 2017; Fortuna et al, 2022; McFarlane, 2010; SAMHSA, 2014)

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Part 2:

Nutrient Deficiencies and Mental Health

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Anxiety, Depression, and Dietary Patterns

- Veg & whole grain intake tend to be ↓ in those with greater severity of depression & anxiety
  - ↓ fruit & veg intake are associated with poorer mental health
- Omega-3 fatty acid intake ↓ among people with anxiety
  - ↓ intake of fish associated with ↑ risk of depression

(Aucoin et al, 2021; Gibson-Smith et al, 2020; Głąbska et al, 2020; Khanna & Aeri, 2020; Lopez, 2022)

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Poll Question

Deficiency of which nutrient may present as cracks in the corner of the mouth?

a) Thiamine
b) Zinc
c) Magnesium
d) Vitamin B6

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Thiamine Deficiency and Depression

Thiamine (vitamin B1) is an essential B complex vitamin

- Deficiency causes neurological Sx, including depression
  - → neuroinflammation, neuronal cell death, cognitive decline, emotional dysregulation
- 300 mg daily for 12 wks as an adjuvant therapy along with SSRI improved depressive sx faster than placebo
  - If suspicion of compromised absorption, benfotiamine (lipid-soluble formation) is shown to have superior bioavailability

(Borges-Vieira & Cardoso, 2023; Ghaleiha et al, 2016; Mikkelsen et al, 2017; Xie et al, 2014)

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Vitamin B6 Deficiency and Depression

Vitamin B6 (pyridoxine) def is known to present as depression in severe cases

Deficiency Symptoms:

- Skin rashes
- Mental status changes
- Cracks in the corners of the mouth
- Swollen tongue
- Normocytic anemia
- Subclinical def may be more difficult to identify

(Brown et al, 2022;
Kris-Etherton et al, 2021)

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Vitamin B6 Supplementation

- Can measure serum pyridoxal-5'-phosphate to evaluate for def
- Some autoimmune diseases (ex: RA) are known to ↑ vitamin B6 requirements
- Long-term high-dose supplementation not recommended d/t potential for toxicity
- Plays a role in
  - macronutrient metabolism
  - nervous system function
  - production of neurotransmitters (serotonin, dopamine, GABA)
  - Conversion of homocysteine (Hcy) to cysteine & production of glutathione
    - If deficient: Hcy can accumulate→depressive sx

(Borges-Vieira & Cardoso, 2023; Brown et al, 2022; Field et al, 2022; Mikkelsen et al, 2017)

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Folate Deficiency and Depression

Vitamin B9

- Modulates norepinephrine & serotonin receptors in the brain
- Plays important role in Hcy metabolism to prevent Hcy accumulation
  - ↑ Hcy is a risk factor for depression
- Status is linked to patients' responsiveness to antidepressant meds
  - ↓ rates of depression reported in populations with with ↑ intake of dietary folate

(Bhatia & Singh, 2015; Mikkelsen et al, 2017)

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Folate Supplementation

- RBC folate levels (in addition to serum Hcy levels) may be more clinically useful for assessing folate status
- Studies have shown beneficial effects (↓ depression scores) with supplementation as low as 400 mcg daily, 10-15 mg daily is more effective
- Those with folate metabolism polymorphisms: methylated folate may help to resolve deficiency & improve depressive symptoms
    - MTHFR polymorphism: *MTHFR C677T* variant is a polymorphism impacting body's ability to methylate folic acid → ↑ susceptibility to oxidative stress

(Borges-Vieira & Cardoso, 2023; Mikkelsen et al, 2017; Stengler, 2021)

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Amino Acid Deficiency and Supplementation

- Assessed through direct serum measurements
- ↓ levels d/t
  - Poor diet/low appetite
  - Poor digestion
  - Malabsorption
- Intake of branched-chain amino acids (BCAAs) leucine, isoleucine, & valine is important to mental health maintenance
- Lysine & arginine may be common insufficiencies in anxiety
- Treated with free AA supplementation
  - Digestive support may be necessary to improve a client's utilization of dietary protein
  - 5-Hydroxytryptophan (5-HTP) shown to be a potent supp for many with depression
    - Further research is needed
    - 5-HTP supp is risky with pts taking SSRIs & MAOIs

(Javelle et al, 2020; Lopez, 2022)

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Part 3:

Integrative Approaches for Mental Health

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Poll Question

Which of the following integrative dietary approach for mental health is cost-effective and has no known side effects?

a) Taking daily psychobiotic supplements
b) Following a Mediterranean-style diet
c) Taking a daily psyllium fiber supplement
d) Incorporating inulin-type fructans into daily meal pattern

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The Mediterranean Diet

- Best-studied whole diet intervention for depression
  - Promotes overall dietary balance
  - Cost-effective
  - No known side effects
- Emphasis on:
  - ↑ consumption of fruits, veg, legumes, nuts, whole grains, olive oil
- Mediterranean eating pattern encourages lifestyle changes
  - Mindful eating
  - Enjoyable movement

(Jacka et al, 2017; Opie et al, 2017)

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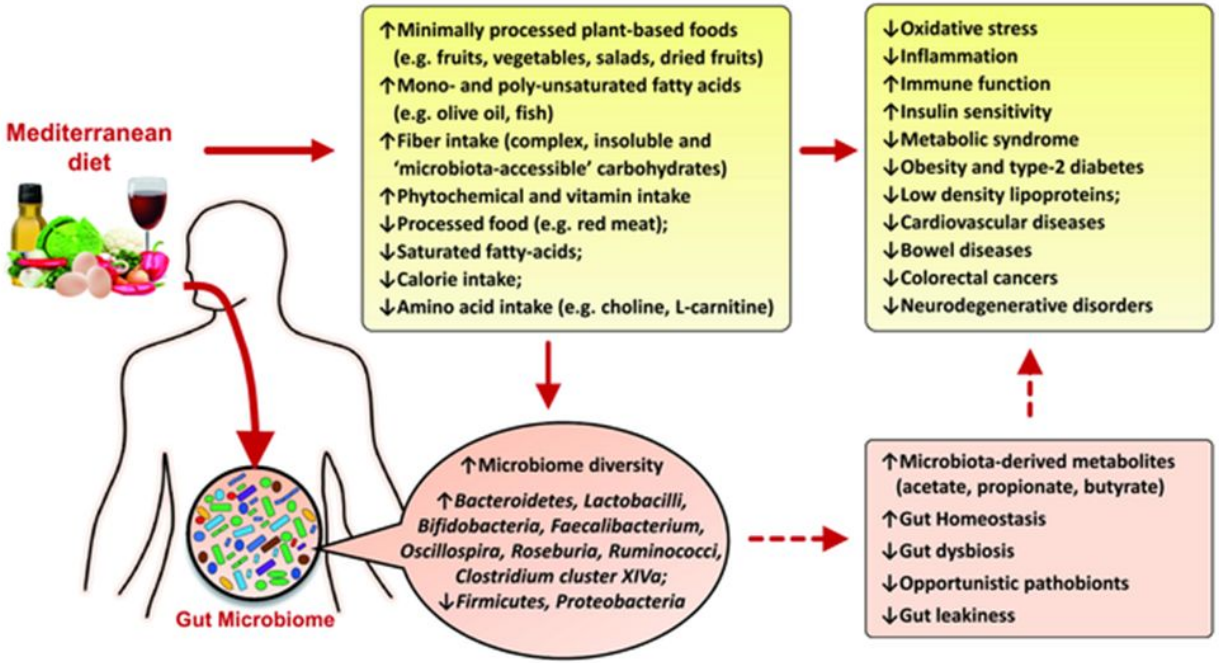
Beneficial Impacts of the Mediterranean Diet



(Nagpal R et al, 2019)

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Fiber

- Associated with ↓ risk of depression via modulation of the gut microbiome
- ↑ intake (esp resistant starches & prebiotics) may help to fight inflammation by:
  - improving gut microbiome composition
  - ↑ SCFA production
  - ↓ intestinal permeability & LPS translocation
  - ↓ inflammation, prevent neuroinflammation
- Associated with ↓ risk of depression via modulation of the gut microbiome
- ↑ whole plant foods, foods fortified with fiber, fiber supplements (psyllium, partially hydrolyzed guar gum (PHGG))
  - PHGG enrich *Bifidobacterium* & *Lactobacillus,* ↑ SCFA production in the colon, may improve mood

(Berk et al, 2013; Fatahi et al, 2020; Niv et al, 2016; Swann et al, 2020; Taylor et al, 2020; Więdłocha et al, 2021)

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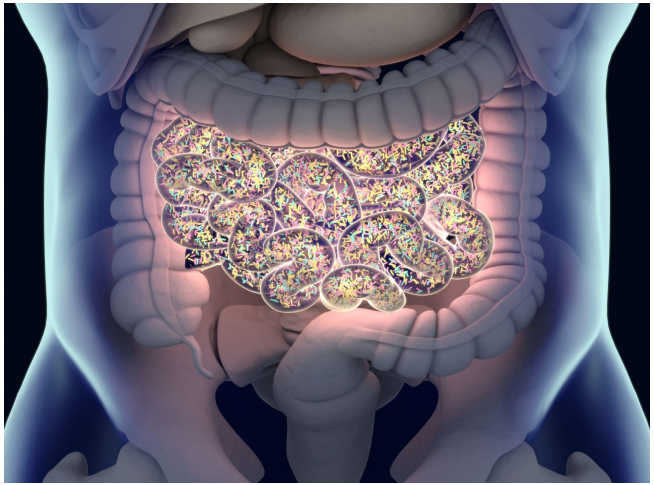
Prebiotics

- Must not be digested & absorbed so that it can be fermented by gut bacteria
- Must be shown to induce proliferation or activity of health-promoting microbes
- Inulin - chicory, onion, wheat, Jerusalem artichoke
  - 3-5 g/day of inulin-type fructans may promote growth of:
    - *Bifidobacterium* & *Lactobacillus* (associated with GABA production)
    - *Faecalibacterium prausnitzii* (produces butyrate, associated with improved QOL)
- Use with caution in those with GI conditions (IBS, SIBO)



(Cunningham et al, 2021; Gibson et al, 2017; Hughes et al, 2022; Valles-Colomer et al, 2019)

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Fermented Foods

- Effective in quickly ↑ microbial diversity & ↓ inflammatory markers
- Fermented dairy intake can ↓ anxiety & stress levels
- Many fermented food products contain fermentable & prebiotic fibers (fermented veggies, fruits, legumes)
- Accessible to those of all income levels
- Culturally-relevant fermented foods can be made at home

(Kato-Kataoka et al, 2015; Sousa et al, 2022; Tamang et al, 2020; Wastyk et al, 2021)

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Psychobiotics

- Term coined by Timothy Dinan & John Cryan, gut-brain axis researchers out of University College Cork in Ireland
- *"A live organism that, when ingested in adequate amounts, produces a health benefit in patients suffering from psychiatric illness"*
- The use of some probiotics to:
  - Improve a dysbiotic gut
  - ↓ inflammation
  - ↓ intestinal permeability
  - Modify brain-derived neurotrophic factor (BDNF) levels
  - Modulate HPA axis activity
  - Produce or influence production of neurotransmitters (GABA, serotonin, dopamine)
  - Alter gene expression of neurotransmitter receptors in the CNS

(Dinan et al, 2013; Foster & McVey Neufeld, 2013; Strandwitz, 2018)

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Psychobiotics for Depression & Anxiety

Probiotic	Research Outcomes
B. longum R0175 and *L. helvicus R0052* ($3x10^9$ CFU x 30 days)	May regulate stress hormones via the HPA axis, ↓ hyper-activity to pain and stress, ↓ depression scores & reduced kynurenine production in patients with MDD
B. longum, B. bifidum, B. lactis, and *L. acidophilus* ($18*10^9$ CFU daily x 8 wks)	↓ anxiety scores for patients with GAD also taking sertraline

(Ait–Belgnaoui et al, 2018; Eskandarzadeh et al, 2021; Kazemi et al, 2019; Messaoudi et al, 2011; Romjin et al, 2017; USprobioticguide.com)

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Omega-3 Fatty Acids

- Delivers an antidepressant effect by targeting neuroinflammation
- Individuals with ↑ levels of inflammatory markers appear to respond the best to omega-3 (specifically EPA) supplementation
- Can be assessed using the omega-3 index: measures omega-3 content of RBCs
- Consumption of omega-3 FAs is helpful for balanced omega-6: omega-3 ratio
- Supplements should contain at least 1-2 grams EPA

(DiNicolantonio & O'Keefe, 2018; Guu et al, 2019)

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Brain-Derived Neurotrophic Factor (BDNF)

- Necessary for:
  - brain plasticity & growth
  - prevention of neuronal damage from glutamate excitotoxicity
- Helps to resynchronize circadian rhythm
- Modulates neurotransmitter levels
  - glutamate, GABA, acetylcholine, dopamine, glycine
- ↓ levels linked to worsening mood sx
- Pts with MDD have dramatically ↓ levels compared to healthy controls

(Caviedes et al, 2017; Won & Kim, 2017)

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BDNF-Boosting Diets

Mediterranean diet, traditional Japanese diet, Nordic diet, Indo-Mediterranean diet

Common traits that boost BDNF production & stimulate neurogenesis:

- ↑ F/V
- ↑ in omega-3 fatty acids
- ↑ polyphenols
- ↑ l-theanine
- ↑ vitamin E
- ↑ vitamin A
- ↓ in non-nutrient-dense fats & added sugars

(Marx et al, 2017; Noah &Truswell, 2001; Opie et al, 2017; Singh et al, 2022)

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Promoting Detoxification through Diet

- Inducers of cytochrome P450 enzymes (phase I detoxification):
  - crucifers, green tea, curcumin, quercetin, chicory root, astaxanthin
- Inducers of phase II detoxification enzymes:
  - crucifers, alliums, green & rooibos tea, ferulic acid, ellagic acid
  - NRF2: transcription factor that promotes production of phase II detox enzymes & antioxidants
    - NRF2 inducers: fish oil, lycopene, curcumin, crucifers, garlic, green tea catechins, resveratrol, isoflavones, ginger

(Aronica et al, 2022; Hodges & Minich, 2015; Ventriglio et al, 2020)

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Reducing Toxic Exposure and Buildup

- ↓ intake of ultra-processed foods (UPFs)
- Limit/avoid alcohol
- Test home water systems for chemicals & heavy metals
- ↓ use of plastics
- Use the Environmental Working Group's (EWG) list of approved personal care products
- Switch from conventional produce to organic, at least for the "Dirty Dozen"
- Daily exercise, saunas, steam baths to promote sweating
- ↑ water consumption

Note: avoid using fear-based language & individualize recommendations

(Kuan et al, 2022)

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Trauma-Informed Care

Implement by identifying the signs of trauma & change standard practices that could be triggering or re-traumatizing to vulnerable individuals

1. Screen for trauma history
    a. Obtain permission to ask about mental health diagnoses, substance use, sleep issues, safety concerns, etc.
2. Create a safe space

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(Burden et al, 2022; SAMHSA, 2014)

Principles of a Trauma-Informed Approach

1. Safety
    a. keep space quiet, clean, calm
2. Trustworthiness & transparency
    a. discuss policies/procedures
    b. obtain informed consent
3. Peer support & mutual self-help
    a. facilitate group classes or create a list of local support groups
4. Collaboration & mutuality
    a. therapeutic interactions
5. Empowerment, voice, & choice
    a. partnership
6. Cultural, historical, & gender issues
    a. support inclusivity & celebrate diversity

(Burden et al, 2022; SAMHSA, 2014)

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Case Study 1

Background:

- C.N. - 71 yo female 1 year s/p multiple myeloma tx
- On sertraline for depression x10 yrs
- Unpredictable BM and frequent diarrhea since starting Revlimid (immune-modulating med for MM)
- Meds: sertraline, welchol
- Wanting to get off sertraline, better manage depressive sxs, and improve GI function
- Eating a very restrictive bland, low-fat, low-insoluble fiber diet, not enjoying her food, dislikes cooking
- MSQ: 105 (out of 284)

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Case Study 1

Treatment Approaches:

- Supplements: PHGG (fiber), probiotic (L. rhamnosus), vitamin D
- Diet: low-FODMAP diet to find symptom triggers (actually increased her dietary variety) -> structured reintroductions. Focusing on antioxidant-rich, low-FODMAP fruits and veggies. Mindfulness & deep breathing whenever incorporating a new food.
- Mental Health: work with a therapist, harness support system, journal symptom triggers (both GI and emotional triggers as she d/c'd sertraline)
- Movement: mindful walking at the Denver Botanical Gardens
- Nutritional Balance: add more protein to meals and snacks, gradually add fat back in (salmon, walnuts, flaxseed, olives, garlic-infused evoo, whole eggs)
- Sleep: making a schedule, exposure to morning sunshine

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Case Study 1

Outcomes:

- Able to d/c sertraline with PCP support and feeling great. MM is still hard but she feels much more balanced/able to handle it.
- Understanding the impact of blood sugar changes on her mood/energy/cognition was huge for her (and how to prevent them).
- Actually gained back a little bit of weight with the low-FODMAP diet, and bowel function has improved to the point she was able to go on a weeklong retreat with a friend. Reintroductions are a process for her, but she's enjoying her food again–no more bland food!

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Questions?

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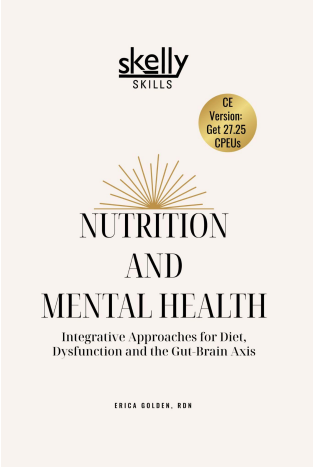
For Your Continued Learning

Thank you for attending!

- Learn more with *Nutrition and Mental Health: Integrative Approaches for Diet, Dysfunction and the Gut-Brain Axis (27.25 CPEUs),* at SkellySkills.com

- Live attendees: You'll get a link to the feedback survey in one hour/CE Cert tomorrow

- Learn more about Erica Golden, RDN, LD, IFNCP and her practice at nourishedmindnutrition.com and on Instagram @nourishedmindnutrition



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