Nutrition and Physical activity for Stress Management

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Name: Dr. Taline Zourikian - “Canadian Obesity Weekend – May 2022”

Financial Disclosures

(over past 24 months)

	Speaker	Advisory	Research	Consultant
AbbVie				
Allergan				
Janssen				
Lundbeck	√			
Mylan				
Otsuka Pharma	√			
Pendopharm				
Pentax Medical				
Pfizer				
Shire				
Takeda				

CanMEDS Roles Covered: Dr. Zourikian - “Canadian Obesity Weekend 2022”

X	**Medical Expert** (as *Medical Experts*, physicians integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional values in their provision of high-quality and safe patient-centered care. *Medical Expert* is the central physician Role in the CanMEDS Framework and defines the physician’s clinical scope of practice.)
X	**Communicator** (as Communicators, physicians form relationships with patients and their families that facilitate the gathering and sharing of essential information for effective health care.)
	Collaborator (as *Collaborators*, physicians work effectively with other health care professionals to provide safe, high-quality, patient-centred care.)
	Leader (as *Leaders*, physicians engage with others to contribute to a vision of a high-quality health care system and take responsibility for the delivery of excellent patient care through their activities as clinicians, administrators, scholars, or teachers.)
X	**Health Advocate** (as *Health Advocates*, physicians contribute their expertise and influence as they work with communities or patient populations to improve health. They work with those they serve to determine and understand needs, speak on behalf of others when required, and support the mobilization of resources to effect change.)
X	**Scholar** (as *Scholars*, physicians demonstrate a lifelong commitment to excellence in practice through continuous learning and by teaching others, evaluating evidence, and contributing to scholarship.)
	Professional (as *Professionals,* physicians are committed to the health and well-being of individual patients and society through ethical practice, high personal standards of behaviour, accountability to the profession and society, physician-led regulation, and maintenance of personal health.)

How does physical activity impact stress ?

Effects of Exercise and Physical activity on Anxiety -Physiological[1]

HPA axis

- Exercise-induced changes in the HPA axis modulates stress reactivity and anxiety in humans.

Monoamine system

Opioid system

Neurotropic factors

Neurogenesis

Effects of Exercise and Physical activity on Anxiety -Psychological[1]

1. Stress can cause ↑ **anxiety sensitivity**
   - ↑ interoceptive sense
   - Aerobic exercise is like a graded exposure therapy
   - **Short-term aerobic exercise ↓ anxiety sensitivity**

2. ↑ self-efficacy

3. Exercise = a **distraction** from stressors and a “time out” from daily activities.

Current evidence

- Meta-analysis on aerobic exercise
- Meta-analysis on resistance exercise training
- Studies on balance
- A systematic review about yoga in anxiety

Aerobic Exercise for Anxiety – A systematic review and meta-analysis[2]

- 15 studies, total of 675 patients.
- Anxiety disorders or raised anxiety on a validated scale.
- **Aerobic exercise was effective in the treatment of raised anxiety compared to waiting list control groups.**
- **High Intensity exercise > low intensity exercise**.
- 1 study: higher dropout rates with high intensity exercise.
- “[…] exercise programmes need to be carefully tailored to the individual, especially patients with high anxiety sensitivity levels, in order to maximise the benefit from exercise while minimising the risk of the patient dropping out.”

Resistance Exercise Training for Anxiety - Meta-analysis and meta-regression analysis of RCTs[3]

- 16 articles, 922 participants.
- Randomization to RET or a non-active control condition.
- A validated anxiety outcome measured at baseline, mid-, and/or post-intervention.
- **RET significantly reduced anxiety symptoms.**

Balance Training for anxiety

- Vestibular mutant mice.[4]
  - Training significantly improved balance performance of Hdb mice and in parallel, decreased the level of anxiety compared to untrained Hdb mice.

- **Children with balance dysfunction** vs. normally balanced controls, assigned to balance training or waiting-list control.[5]
  - Higher anxiety and lower self-esteem at baseline in the balance dysfunction group.
  - Treatment improved balance performance, reduced anxiety and increased self-esteem.

Yoga for anxiety

- 2018 systematic review and meta-analysis of RCTs.[6]
- 8 RCTs, 319 particpants
- Evidence for **small short-term effects of yoga on anxiety compared to no treatment.**
- No effects were found for patients with anxiety disorders diagnosed by DSM, only for patients diagnosed by other methods, and **for individuals with elevated levels of anxiety without a formal diagnosis.**

Exercise Recommendations for Stress Management

General exercise program, consisting of aerobic exercise, balance, and strength training

Adherence can be an issue, so it should be tailored to the patient

Start low go slow ! Slow approach, gradual increase in intensity/resistance

Tips to Get Active

> Physical Activity Tips for Adults (18-64 years)

Physical activity plays an important role in your health, well-being and quality of life. Improve your health by being active as part of a healthy lifestyle.

1. Be active at least **2.5 hours a week** to achieve health benefits.
2. Focus on **moderate to vigorous aerobic activity** throughout each week, broken into sessions of 10 minutes or more.
3. Get stronger by adding activities **that target your muscles and bones** at least two days per week.

https://www.canada.ca/en/public-health/services/publications/healthy-living/physical-activity-tips-adults-18-64-years.html

Canadian Network for Mood and Anxiety Treatments (CANMAT) 2016 Clinical Guidelines for the Management of Adults with Major Depressive Disorder: Section 5. Complementary and Alternative Medicine Treatments

Table 2. Summary of Recommendations for Physical and Meditative Treatments.

Intervention	Indication	Recommendation	Evidence	Monotherapy or Adjunctive Therapy
Exercise	Mild to moderate MDD	First line	Level 1	Monotherapy
	Moderate to severe MDD	Second line	Level 1	Adjunctive
Light therapy	Seasonal (winter) MDD	First line	Level 1	Monotherapy
	Mild to moderate nonseasonal MDD	Second line	Level 2	Monotherapy and adjunctive
Yoga	Mild to moderate MDD	Second line	Level 2	Adjunctive
Acupuncture	Mild to moderate MDD	Third line	Level 2	Adjunctive
Sleep deprivation	Moderate to severe MDD	Third line	Level 2	Adjunctive

MDD, major depressive disorder.

Front Pharmacol. 2017; 8: 257.
Published online 2017 May 15. doi: 10.3389/fphar.2017.00257
PMCID: PMC5430071
PMID: 28555108

Is the Comparison between Exercise and Pharmacologic Treatment of Depression in the Clinical Practice Guideline of the American College of Physicians Evidence-Based?

Yael Netz*

How does nutrition impact stress?

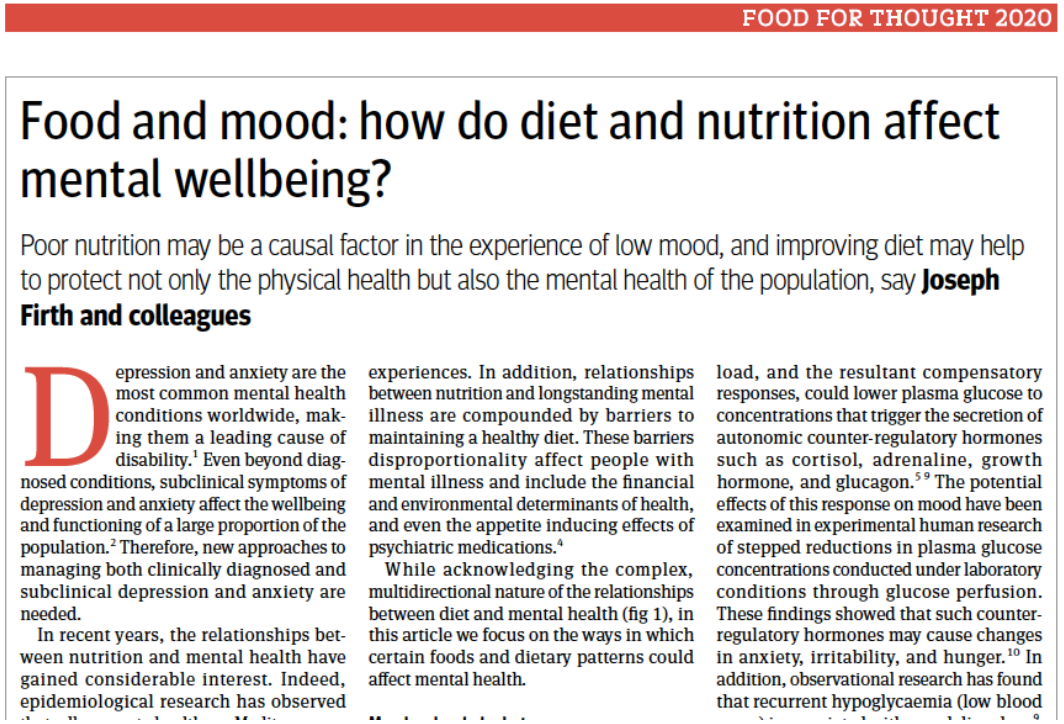
Nutritional psychiatry

- Integrating nutritional approaches into the prevention and treatment of mental disorders and their comorbidities

1-High GI foods and depression symptoms

2-Immune activation

3-Brain, gut microbiome and mood



FOOD FOR THOUGHT 2020

Food and mood: how do diet and nutrition affect mental wellbeing?

Poor nutrition may be a causal factor in the experience of low mood, and improving diet may help to protect not only the physical health but also the mental health of the population, say **Joseph Firth and colleagues**

Depression and anxiety are the most common mental health conditions worldwide, making them a leading cause of disability.[1] Even beyond diagnosed conditions, subclinical symptoms of depression and anxiety affect the wellbeing and functioning of a large proportion of the population.[2] Therefore, new approaches to managing both clinically diagnosed and subclinical depression and anxiety are needed.

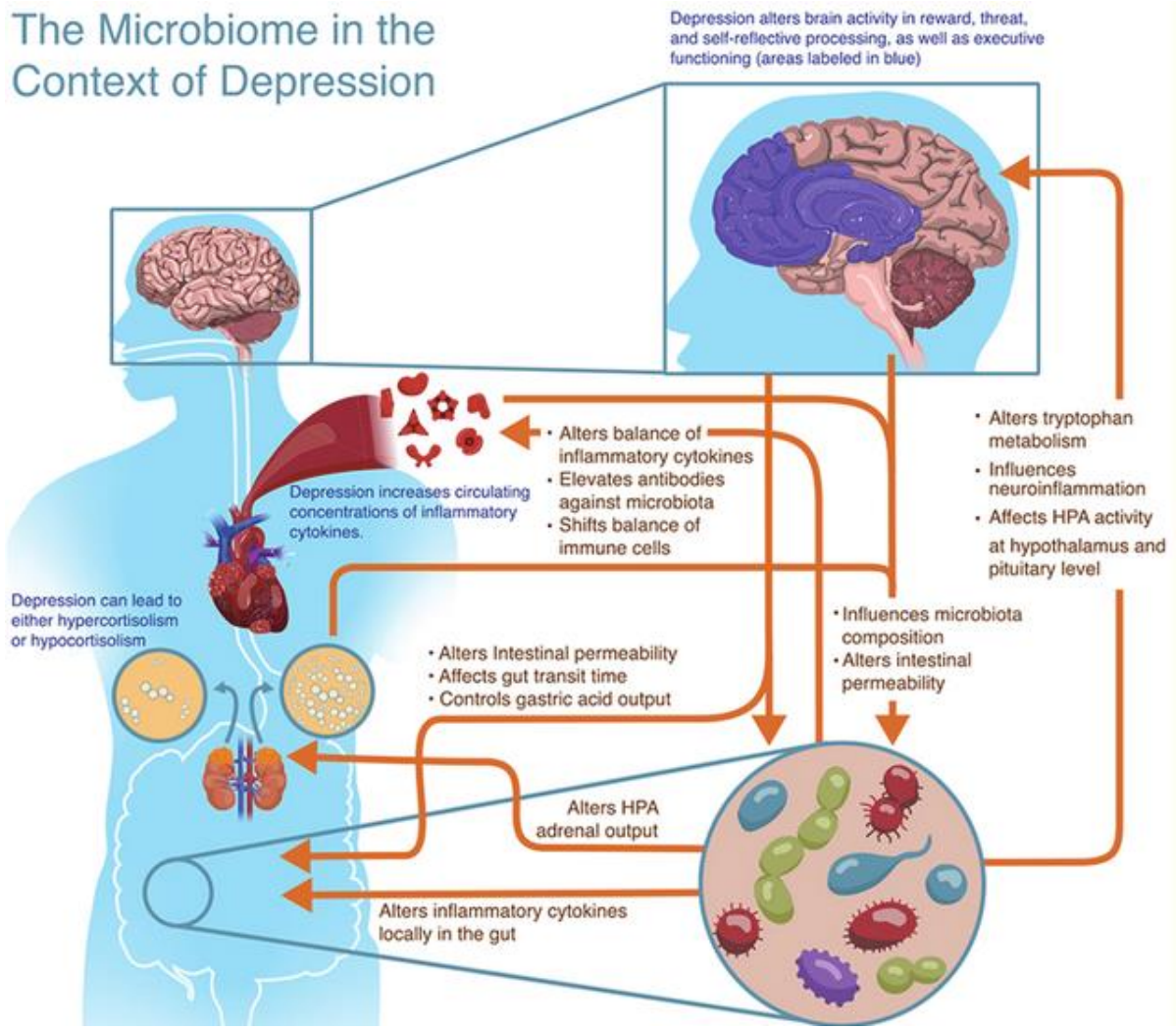
In recent years, the relationships between nutrition and mental health have gained considerable interest. Indeed, epidemiological research has observed

experiences. In addition, relationships between nutrition and longstanding mental illness are compounded by barriers to maintaining a healthy diet. These barriers disproportionality affect people with mental illness and include the financial and environmental determinants of health, and even the appetite inducing effects of psychiatric medications.[4]

While acknowledging the complex, multidirectional nature of the relationships between diet and mental health (fig 1), in this article we focus on the ways in which certain foods and dietary patterns could affect mental health.

load, and the resultant compensatory responses, could lower plasma glucose to concentrations that trigger the secretion of autonomic counter-regulatory hormones such as cortisol, adrenaline, growth hormone, and glucagon.[5 9] The potential effects of this response on mood have been examined in experimental human research of stepped reductions in plasma glucose concentrations conducted under laboratory conditions through glucose perfusion. These findings showed that such counter-regulatory hormones may cause changes in anxiety, irritability, and hunger.[10] In addition, observational research has found that recurrent hypoglycaemia (low blood

Firth J, Gangwisch JE, Borisini A, Wootton RE, Mayer EA. Food and mood: how do diet and nutrition affect mental wellbeing? BMJ. 2020 Jun 29;369:m2382. doi: 10.1136/bmj.m2382. Erratum in: BMJ. 2020 Nov 9;371:m4269. PMID: 32601102; PMCID: PMC7322666.



Flux MC, Lowry CA. Finding intestinal fortitude: Integrating the microbiome into a holistic view of depression mechanisms, treatment, and resilience. Neurobiol Dis. 2020 Feb;135:104578. doi: 10.1016/j.nbd.2019.104578. Epub 2019 Aug 24. PMID: 31454550; PMCID: PMC6995775.

Current evidence

- Smiles Study
- Helfimed Trial
- A brief diet intervention can reduce symptoms of depression in young adults – A randomised controlled trial

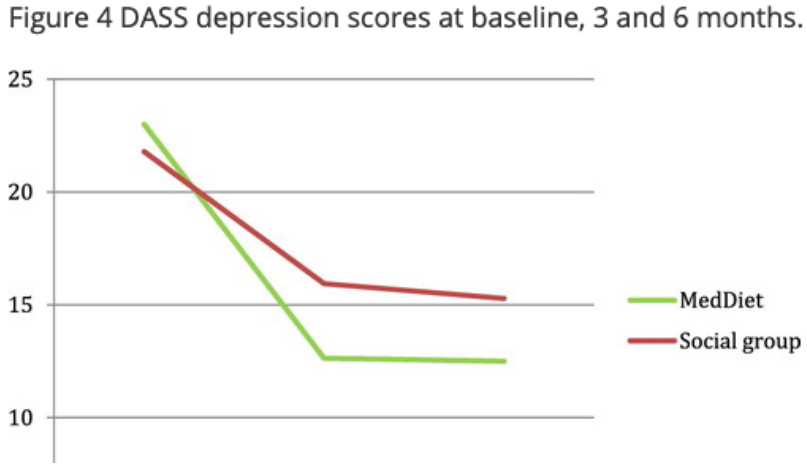
Smiles Study (Jacka et al, 2017)[11]

- 12-week, parallel-group, single blind, RCT, 67 participants
- 7 sessions of “befriending protocol” (positive conversations)

or

- 7 sessions of nutritional counseling and mindful eating, integrating a Mediterranean-style diet
- **Remission, defined as a MADRS score <10, was achieved for 32.3% (*n* = 10) and 8.0% (*n* = 2) of the intervention and control groups, respectively.**
- **NNT of 4**

HELFIMED (Parletta et al, 2017)[12]



- RCT, 152 participants
- MedDiet vs. Social group
- The MedDiet group → significantly greater improvements in depression and overall mental health-related QoL compared to the social group.

Dietary recommendations for stress

- Mediterranean Diet
- Omega-3
- Probiotics/prebiotics (fermented foods, fiber)

Mediterranean Diet

- Whole foods-based diet
- Plentiful in vegetables and fruits
- Monounsaturated fats – olive oil, olives, avocado, avocado oil
- Nuts and seeds
- Whole grains
- Legumes
- Tubers

Mediterranean Diet

- Dairy – cheese, yogurt
- Herbs and spices – garlic, basil, mint, rosemary
- Moderate alcohol – 1 glass of red wine a day
- Lean meats
- Fish and seafood (at least twice a week)
- Red meat and sweets are eaten only occasionally

Canadian Network for Mood and Anxiety Treatments (CANMAT) 2016 Clinical Guidelines for the Management of Adults with Major Depressive Disorder: Section 5. Complementary and Alternative Medicine Treatments

Table 3. Summary of Recommendations for Natural Health Products.

Intervention	Indication	Recommendation	Evidence	Monotherapy or Adjunctive Therapy
St. John's wort	Mild to moderate MDD	First line	Level 1	Monotherapy
	Moderate to severe MDD	Second line	Level 2	Adjunctive
Omega-3	Mild to moderate MDD	Second line	Level 1	Monotherapy or adjunctive
	Moderate to severe MDD	Second line	Level 2	Adjunctive
SAM-e	Mild to moderate MDD	Second line	Level 1	Adjunctive
	Moderate to severe MDD	Second line	Level 2	Adjunctive
Acetyl-L-carnitine	Mild to moderate MDD	Third line	Level 2	Monotherapy
Crocus sativus (saffron)	Mild to moderate MDD	Third line	Level 2	Monotherapy or adjunctive
DHEA	Mild to moderate MDD	Third line	Level 2	Monotherapy
Folate	Mild to moderate MDD	Third line	Level 2	Adjunctive
Lavandula (lavender)	Mild to moderate MDD	Third line	Level 3	Adjunctive
Inositol	Mild to moderate MDD	Not recommended	Level 2	
Tryptophan	Mild to moderate MDD	Not recommended	Level 2	
Rhodiola rosea (roseroot)	Mild to moderate MDD	Not recommended	Insufficient evidence	

DHEA, dehydroepiandrosterone; MDD, major depressive disorder; SAM-e, S-adenosyl-L-methionine.

Omega-3

Chart A: Foods with Anti-Inflammatory Ratio

Food	Omega-6: Omega-3 Ratio
Fruit	3:1 or better
White Potato	3:1
Sweet Potato	4:1
Green Vegetables	1:1
Grass-fed meat	3:1 to 5:1
Wild game	3:1 or better
Fresh fish	1:1 or better
Farmed-Raised Salmon	1:1 or worse
Flaxseeds	1:4
Hemp Seeds	2.5:1
Chia Seeds	1:3

Chart B: Foods with Pro-Inflammatory Ratio

Food	Omega-6:Omega-3 Ratio
Nuts	5:1 or worse
Grain-fed meat	5:1 or worse
Grain-fed chicken (white meat)	15:1
Grain-fed chicken (dark meat)	17:1
Grains (wheat, rye, oats, barley)	20:1
Potato Chips	60:1 or worse
Seeds and seed oils (corn, sunflower, safflower, peanut)	70:1 or worse

Probiotics

- “Live microorganisms which confer a health benefit on the host when ingested in adequate amounts”
- Systematic review of DBRCTS of prebiotic and probiotic supplementation for psychiatric disorder: *significant antidepressant effects, but no benefits for psychosis, stress and anxiety.*[14]
- Short colonization time
- **Probiotics and other commercial interventions are unlikely to counteract an unhealthy diet.**
- Probiotics should be at 1 to 25 billion CFU daily vs. store-bought yogurt about 100 million CFU per gram, 12 B CFU per serving (probiotic is over 35 $/month vs yogurt 4-8$).

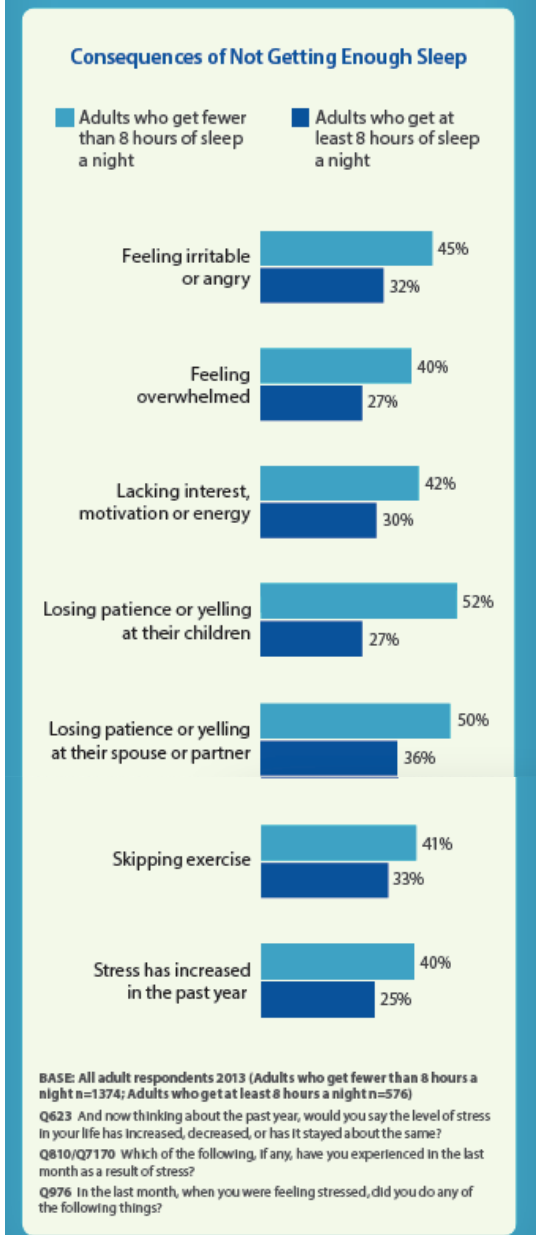
Dietary recommendations for stress

- Mediterranean Diet
  - Diversity of fruits and vegetables
  - Fish 3x/week
  - No processed food
  - No added sugar
- Omega-3
- Probiotics/prebiotics (fermented foods, fiber)

Questions

A word on sleep

ADULTS WHO SLEEP FEWER THAN EIGHT HOURS A NIGHT ARE MORE LIKELY TO REPORT SYMPTOMS OF STRESS.



References

1. Anderson E, Shivakumar G. Effects of exercise and physical activity on anxiety. *Front Psychiatry*. 2013;4:27. Published 2013 Apr 23. doi:10.3389/fpsyt.2013.00027
2. Aylett, E., Small, N. & Bower, P. Exercise in the treatment of clinical anxiety in general practice – a systematic review and meta-analysis. *BMC Health Serv Res* **18,** 559 (2018). https://doi.org/10.1186/s12913-018-3313-5
3. Gordon BR, McDowell CP, Lyons M, Herring MP. The Effects of Resistance Exercise Training on Anxiety: A Meta-Analysis and Meta-Regression Analysis of Randomized Controlled Trials. Sports Med. 2017 Dec;47(12):2521-2532. doi: 10.1007/s40279-017-0769-0. PMID: 28819746.
4. Shefer S, Gordon C, Avraham KB, Mintz M. Balance deficit enhances anxiety and balance training decreases anxiety in vestibular mutant mice. Behav Brain Res. 2015 Jan 1;276:76-83. doi: 10.1016/j.bbr.2014.06.046. Epub 2014 Jun 29. PMID: 24983660.
5. Bart O, Bar-Haim Y, Weizman E, Levin M, Sadeh A, Mintz M. Balance treatment ameliorates anxiety and increases self-esteem in children with comorbid anxiety and balance disorder. Res Dev Disabil. 2009 May-Jun;30(3):486-95. doi: 10.1016/j.ridd.2008.07.008. Epub 2008 Sep 4. PMID: 18775641.

References

6. Cramer H, Lauche R, Anheyer D, Pilkington K, de Manincor M, Dobos G, Ward L. Yoga for anxiety: A systematic review and meta-analysis of randomized controlled trials. Depress Anxiety. 2018 Sep;35(9):830-843. doi: 10.1002/da.22762. Epub 2018 Apr 26. PMID: 29697885.

7. Firth J, Gangwisch JE, Borisini A, Wootton RE, Mayer EA. Food and mood: how do diet and nutrition affect mental wellbeing? BMJ. 2020 Jun 29;369:m2382. doi: 10.1136/bmj.m2382. Erratum in: BMJ. 2020 Nov 9;371:m4269. PMID: 32601102; PMCID: PMC7322666.

9. Flux MC, Lowry CA. Finding intestinal fortitude: Integrating the microbiome into a holistic view of depression mechanisms, treatment, and resilience. Neurobiol Dis. 2020 Feb;135:104578. doi: 10.1016/j.nbd.2019.104578. Epub 2019 Aug 24. PMID: 31454550; PMCID: PMC6995775.

10. McDonald D, Hyde E, Debelius JW, Morton JT, Gonzalez A, Ackermann G, Aksenov AA, and al. American Gut Consortium, Knight R. American Gut: an Open Platform for Citizen Science Microbiome Research. mSystems. 2018 May 15;3(3):e00031-18. doi: 10.1128/mSystems.00031-18. PMID: 29795809; PMCID: PMC5954204.

References

11. Jacka FN, O'Neil A, Opie R, Itsiopoulos C, Cotton S, Mohebbi M, Castle D, Dash S, Mihalopoulos C, Chatterton ML, Brazionis L, Dean OM, Hodge AM, Berk M. A randomised controlled trial of dietary improvement for adults with major depression (the 'SMILES' trial). BMC Med. 2017 Jan 30;15(1):23. doi: 10.1186/s12916-017-0791-y. Erratum in: BMC Med. 2018 Dec 28;16(1):236. PMID: 28137247; PMCID: PMC5282719

12. Parletta N, Zarnowiecki D, Cho J, Wilson A, Bogomolova S, Villani A, Itsiopoulos C, Niyonsenga T, Blunden S, Meyer B, Segal L, Baune BT, O'Dea K. A Mediterranean-style dietary intervention supplemented with fish oil improves diet quality and mental health in people with depression: A randomized controlled trial (HELFIMED). Nutr Neurosci. 2019 Jul;22(7):474-487. doi: 10.1080/1028415X.2017.1411320. Epub 2017 Dec 7. PMID: 29215971.

13. Francis HM, Stevenson RJ, Chambers JR, Gupta D, Newey B, Lim CK. A brief diet intervention can reduce symptoms of depression in young adults - A randomised controlled trial. PLoS One. 2019 Oct 9;14(10):e0222768. doi: 10.1371/journal.pone.0222768. PMID: 31596866; PMCID: PMC6784975.

14. Wallace CJK, Milev R. The effects of probiotics on depressive symptoms in humans: a systematic review. Ann Gen Psychiatry. 2017 Feb 20;16:14. doi: 10.1186/s12991-017-0138-2. Erratum in: Ann Gen Psychiatry. 2017 Mar 7;16:18. PMID: 28239408; PMCID: PMC5319175.

15. Wastyk HC, Fragiadakis GK, Perelman D, Dahan D, Merrill BD, Yu FB, Topf M, Gonzalez CG, Van Treuren W, Han S, Robinson JL, Elias JE, Sonnenburg ED, Gardner CD, Sonnenburg JL. Gut-microbiota-targeted diets modulate human immune status. Cell. 2021 Aug 5;184(16):4137-4153.e14. doi: 10.1016/j.cell.2021.06.019. Epub 2021 Jul 12. PMID: 34256014.