Nutritional Strategies for Depression Anxiety and Adhd

R. Ryan Patel DO FAPA
u.osu.edu/emotionalfitness
No presenter has an actual or potential conflict of interest in relation to this educational activity or presentation.
Objectives

• Nutrition to reduce Depression
• Nutrition to reduce Anxiety
• Nutrition to reduce ADHD
• Enough/adequate calories, and exercise considerations with regards to nutrition for depression, anxiety.
• Assessment, implementation strategies & caveats for disordered eating.
Dietary pattern in the general population
Figure I-1. Adherence of the U.S. Population Ages 2 Years and Older to the 2010 Dietary Guidelines, as Measured by Average Total Healthy Eating Index-2010 (HEI-2010) Scores

Data Sources: Analyses of What We Eat in America, National Health and Nutrition Examination Survey (NHANES) data from 1999-2000 through 2009-2010.

Note: HEI-2010 total scores are out of 100 possible points. A score of 100 indicates that recommendations on average were met or exceeded. A higher total score indicates a higher quality diet.

Figure 2-1.
Dietary Intakes Compared to Recommendations.
Percent of the U.S. Population Ages 1 Year & Older
Who Are Below, At, or Above Each Dietary Goal or Limit

- Vegetables
- Fruit
- Total Grains
- Dairy
- Protein Foods
- Oils
- Added Sugars
- Saturated Fat
- Sodium

Percent of Population Below Recommendation or Limit
Percent of Population Above Recommendation or Limit

NOTE: The center line is the goal or limit. For most, those represented by the orange sections of the bars, shifting toward the center line will improve their eating pattern.

DATA SOURCES: What We Eat in America, NHANES 2007-2010, for average intakes by age-sex group. Healthy U.S.-Style Food Patterns, which vary based on age, sex, and activity level, for recommended intakes and limits.

Figure 2-3.
Average Daily Food Group Intakes by Age-Sex Groups, Compared to Ranges of Recommended Intake

Vegetables

Fruits
Figure 2-3. (continued...)

Average Daily Food Group Intakes by Age-Sex Groups, Compared to Ranges of Recommended Intake

Protein Foods

DATA SOURCES: What We Eat in America, NHANES 2007-2010 for average intakes by age-sex group. Healthy U.S.-Style Food Patterns, which vary based on age, sex, and activity level, for recommended intake ranges.
Figure 2-5.

Average Whole & Refined Grain Intakes in Ounce-Equivalents per Day by Age-Sex Groups, Compared to Ranges of Recommended Daily Intake for Whole Grains & Limits for Refined Grains*

*NOTE: Recommended daily intake of whole grains is to be at least half of total grain consumption, and the limit for refined grains is to be no more than half of total grain consumption. The blue vertical bars on this graph represent one half of the total grain recommendations for each age-sex group, and therefore indicate recommendations for the minimum amounts to consume of whole grains or maximum amounts of refined grains. To meet recommendations, whole grain intake should be within or above the blue bars and refined grain intake within or below the bars.

DATA SOURCES: What We Eat in America, NHANES 2007-2010 for average intakes by age-sex group. Healthy U.S.-Style Food Patterns, which vary based on age, sex, and activity level, for recommended intake ranges.
Figure 2-9. Average Intakes of Added Sugars as a Percent of Calories per Day by Age-Sex Group, in Comparison to the Dietary Guidelines Maximum Limit of Less than 10 Percent of Calories

NOTE: The maximum amount of added sugars allowable in a Healthy U.S.-Style Eating Pattern at the 1,200-to-1,800 calorie levels is less than the Dietary Guidelines limit of 10 percent of calories. Patterns at these calorie levels are appropriate for many children and older women who are not physically active.

DATA SOURCE: What We Eat in America, NHANES 2007-2010 for average intakes by age-sex group.
Nutrition and exercise serve as anti-oxidants.
Dietary Protein, exercise

Dietary fruit and veggies increase vitamins and minerals
Childhood Obesity Up Worldwide Almost 10-Fold Over 4 Decades
United States is 15th out of 200 countries studied

*Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents, and adults*
Abarca-Gómez, Leandra et al.

http://dx.doi.org/10.1016/S0140-6736(17)32129-3

People are getting lots of calories, are they getting lots of nourishment?
How does this fit with food insecurity?
Mental Function and Obesity

- Cognitive impairment
- Schizophrenia
- Depression
- Eating disorder (Reward abnormality)

Obesity

Graph showing BDNF levels:
- Saline Leptin: CD, DIO
- Leptin: CD, DIO

Legend:
- * Significant difference
- ** Highly significant difference

Diagram showing:
- Lean: Normal plasma leptin levels
- ARC: Antidepressant
- Hippocampus: BDNF
- Hyperleptinemia:
  - Leptin resistance: ARC
  - Overweight: Obese
  - Depression

Summary:
- Obese individuals may experience mental dysfunction due to alterations in leptin levels and BDNF activity.
- Leptin resistance and hyperleptinemia can contribute to depression and other mental health issues.

Graphical representation illustrates the relationship between leptin levels, BDNF, and mental health outcomes in obese individuals.
http://www.healingisessential.com/child-obesity-wow/
While the scientific report of the 2015 Dietary Guidelines for Americans Advisory Committee concluded that current evidence is still limited to recommend a specific diet for depression, newer research provides further evidence of nutritional support for depression.
Dietary patterns and depression risk: A meta-analysis

In total, 21 studies from ten countries.

• A dietary pattern characterized by a high intakes of fruit, vegetables, whole grain, fish, olive oil, low-fat dairy and antioxidants; Low intakes of animal foods was apparently associated with a decreased risk of depression.

• A dietary pattern characterized by a high consumption of red and/or processed meat, refined grains, sweets, high-fat dairy products, butter, potatoes and high-fat gravy, and low intakes of fruits and vegetables is associated with an increased risk of depression.

Li Y1, Lv MR2, Wei YJ3, Sun L2, Zhang JX4, Zhang HG5, Li B6.
Diet to reduce Hypertension shows lower odds of depression

- DASH diet and depression (BDI) among 580 girls age 12 to 18 years.
- Cross-sectional study
- Adjusted for age, energy intake, mother's job status, passive smoking, start of menstruation, parental death, parental divorce, physical activity level and body mass index.
- A high adherence to a Dash-style diet (for individuals in the upper quartile) was associated with a lower odds of depression compared with subjects with lower adherence (those in the lowest quartile) (OR 0.47; 95% CI 0.26–0.84, P-value = 0.009); these associations remained significant after adjustments.
- DASH diet emphasizes:
  - High intakes of fruits, vegetables, nuts, legume, seed, low fat dairy products, whole grain, and fish.
  - Low consumption of red and processed meat, sweetened beverage, sodium and refined grains.

There are many correlation, cross sectional and self reported studies showing an association between Mediterranean diet and lower incidence of depression.

What about prospective clinical trials showing improved depression with dietary intervention?
To prospectively evaluate the association of the Mediterranean diet and depression risk.

- 15,980 adults initially free of depression at baseline or in the first 2 years of follow-up.
- 10.8 years of follow up.
- Food consumption was measured at baseline through a validated food-frequency questionnaire,
- 666 cases of incident depression.
- Comparing the highest versus the lowest quartiles of adherence, statistically significant for the Mediterranean diet {hazard ratio (HR) 0.75, [95% confidence interval (95% CI) 0.61, 0.94]; p < 0.01).
- A reduced depression risk was associated with higher consumption of both fruits and nuts [HR 0.82 (95% CI 0.69, 0.96); p = 0.02], moderate nuts consumption [HR 0.77 (95% CI 0.64, 0.93); p = 0.01], and avoidance of fast/fried food [HR 0.63 (95% CI 0.41, 0.96); p = 0.03].

The Mediterranean diet was associated with reduced depression risk over time.

Does the MIND diet decrease depression risk? A comparison with Mediterranean diet in the SUN cohort
SMILES Clinical trial

- Australian adults with major depressive disorder with poor diet at baseline
- Randomized to receive 7 hours of either dietary intervention OR social support over 12 weeks
- Whole foods based Mediterranean approach
- 31 completed dietary support, 25 completed social support

Smiles Trial: Depression scores

Diet intervention

Social Support

32% of those on diet intervention went into remission versus 8% in control group

Weekly cost of food in the SMILES trial:
Prior to intervention $138 AU/week
Recommended nutrition $112 AU/week
HELFIMED Trial

• Mediterranean diet and fish oil for adults with self reported depression. (n=152)
• Every 2 weeks received food hampers and MedDiet cooking workshops for 3 months and fish oil supplements for 6 months, or attend social groups every 2 weeks for 3 months.
• Assessments at baseline, 3 and 6 months included mental health, quality of life (QoL) and dietary questionnaires, and blood samples for erythrocyte fatty acid analysis.

Outcomes of the HELFIMED Trial

~50% improvement in depression symptoms on the DASS.

Processed food and depression

- 3486 participants (26.2% women, mean age 55.6 years)
- 2 dietary patterns were identified: ‘whole food’ (heavily loaded by vegetables, fruits and fish) and ‘processed food’ (heavily loaded by sweetened desserts, fried food, processed meat, refined grains and high-fat dairy products).
- Self-reported depression was assessed 5 years later using the Center for Epidemiologic Studies – Depression (CES–D) scale.
- After adjusting for potential confounders, participants in the highest tertile of the whole food pattern had lower odds of CES–D depression (OR = 0.74, 95% CI 0.56–0.99) than those in the lowest tertile.
- In contrast, high consumption of processed food was associated with an increased odds of CES–D depression (OR = 1.58, 95% CI 1.11–2.23).

### Table 3

Associations between dietary pattern scores at phase 5 and CES–D depression at phase 7 (n = 3486)

<table>
<thead>
<tr>
<th></th>
<th>Intermediate tertile</th>
<th>Highest tertile</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lowest tertile OR</td>
<td>OR (95% CI)</td>
<td>P^a</td>
<td></td>
</tr>
<tr>
<td>Whole food dietary pattern</td>
<td>1</td>
<td>0.62 (0.48-0.79)</td>
<td>0.0002</td>
<td>0.64 (0.49-0.83)</td>
</tr>
<tr>
<td>Model 1^b</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 2^c</td>
<td>1</td>
<td>0.68 (0.52-0.89)</td>
<td>0.004</td>
<td>0.74 (0.56-0.98)</td>
</tr>
<tr>
<td>Model 3^d</td>
<td>1</td>
<td>0.71 (0.54-0.92)</td>
<td>0.01</td>
<td>0.74 (0.56-0.99)</td>
</tr>
<tr>
<td>Processed food dietary pattern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 1</td>
<td>1</td>
<td>1.28 (0.97-1.69)</td>
<td>0.08</td>
<td>1.75 (1.25-2.45)</td>
</tr>
<tr>
<td>Model 2</td>
<td>1</td>
<td>1.22 (0.92-1.62)</td>
<td>0.17</td>
<td>1.58 (1.12-2.23)</td>
</tr>
<tr>
<td>Model 3</td>
<td>1</td>
<td>1.22 (0.92-1.62)</td>
<td>0.17</td>
<td>1.58 (1.11-2.23)</td>
</tr>
</tbody>
</table>

CES–D, Center for Epidemiologic Studies — Depression scale.

^a Value for trend.
^b Model 1: adjusted for gender, age and energy intake.
^c Model 2: model 1 plus adjustment for marital status, employment grade, education, physical activity and smoking habits.
^d Model 3: model 2 plus adjustment for hypertension, diabetes, cardiovascular disease, self-reported stroke, use of antidepressive drugs and cognitive functioning.
Effect size of improving nutrition may be as helpful as therapy for depression

- Randomized therapy trial for early depression in the elderly used a nutritional instruction arm as the control (thinking that food instruction was neutral and wouldn’t help mental health), finding it equal to a type of community-based psychotherapy in preventing worsening of depression.

- Dietary coaching program (highlighted in a case example): 6–8 sessions lasting 30 minutes, over a 6–12 week period and semiannual boosters 3, 9, and 15 months after the treatment phase.
- The mean baseline CES-D score was 21.15 (SD=7.91). N=95 in the dietary coaching arm completed the 2-year study.
- 40%−50% improvement in depressive symptoms, with the mean Beck Depression Inventory (27) score decreasing from 9.92 (SD=5.51) at baseline to 5.93 (SD=4.94) after treatment, and the improvements were sustained over 2 years.

Coaching in Healthy Dietary Practices in At-Risk Older Adults: A Case of Indicated Depression Prevention
Dietary pattern to prevent depression

Key dietary recommendations for the prevention of depression emerged from current published evidence. These comprise:

(1) Follow 'traditional' dietary patterns, such as the Mediterranean, Norwegian, or Japanese diet comprised mainly of whole foods;

(2) Increase consumption of fruits, vegetables, legumes, wholegrain cereals, nuts, and seeds;

(3) Include a high consumption of foods rich in omega-3 polyunsaturated fatty acids; (tuna, salmon, organic/wild meats)

(4) Replace unhealthy foods with whole foods

(5) Limit your intake of processed-foods, 'fast' foods, commercial bakery goods, and sweets.

Systematic review: Dietary recommendations for the prevention of depression
R.S. Opie, C. Itsiopoulos, N. Parletta, A. Sanchez-Villegas, T.N. Akbaraly, A. Ruusunen  
Pages 161-171 | Published online: 02 Mar 2016
Nutrition page for weight loss and low carb Mediterranean diet examples.

https://www.hsph.harvard.edu/nutritionsource/healthy-weight/healthy-dietary-styles/
Sample foodlist for depression


Greens,
Walnuts Omega 3’s
Avocados
Olive oil (MUFA)
B vitamins
Apples, Berries (Antioxidants)
Mushroom, unsweetened yogurt (probiotics)
Fermented foods: kimchi, sauerkraut with live cultures
Tomatoes (folate)
Seeds (omega 3’s)
Lean meats, complex carbs, legumes
Example food list to help with depression accessible on campus:

**Protein:** Lean meats: chicken, turkey, fish, eggs  
Legumes: chickpeas, hummus, beans, lentils, etc.  
Dairy: low fat yogurt with live cultures.

**Good fats:** avocado oil, coconut oil, olive oil.  
Nuts: Nut butters, RAW or Dry Roasted nuts (cashew, almonds, peanuts, walnuts, etc)  
Seeds: RAW or Dry roasted pumpkin seeds, sunflower seeds, etc.

**Good carbs Carbs:**  
Whole Fruit: Apples, Oranges (vit C), bananas, berries, etc.  
Vegetables: carrots, cucumber, spinach/greens, tomatoes, Sweet potatoes/potatoes, etc  
Whole grains: Old fashioned oats, pseudo-grains like wild rice/quinoa, products made with 100% whole grain, etc.

Possible on the go snacks: raw nuts, fruit, low sugar granola, low sugar Nut bars.
Questions/comments about Nutritional strategies for depression
Nutritional strategies to help with anxiety
Fermented foods and anxiety

Cross sectional study of young adults (n=710) completed self-report measures of fermented food consumption, neuroticism, and social anxiety.

Participants responded using a 4-point scale: 1 (never); 2 (1–3 times in the last month); 3 (1–3 times per week); and 4 (at least once per day). Scores were converted to monthly frequencies of 0, 2, 8, and 30.
Probiotics and anxiety

A review of 1,089 abstracts and 183 articles; suggested that probiotics may have a role in anxiety, bipolar disorder, schizophrenia, obesity, and autism (1).

https://u.osu.edu/emotionalfitness/2016/02/05/study-can-adjusting-gut-bacteria-impact-emotions/
Omega 3 and anxiety

- Placebo-controlled, double-blind 12-week RCT comparing $n$-3 supplementation vs placebo in N=68 medical students.

- Omega 3 dosing: (2.5 g/d, 2085 mg eicosapentaenoic acid (EPA) and 348 mg docosahexanoic acid (DHA) or placebo capsules

- Results: 14% decrease in lipopolysaccharide (LPS) stimulated interleukin 6 (IL-6) production and a 20% reduction in anxiety symptoms.

- Planned secondary analyses that used the plasma $n$-6:$n$-3 ratio in place of treatment group showed that decreasing $n$-6:$n$-3 ratios led to lower anxiety and reductions in stimulated IL-6 and tumor necrosis factor alpha (TNF-α) production.

- These data suggest that $n$-3 supplementation can reduce inflammation and anxiety even among healthy young adults.

Caffeine and anxiety

• N= 25, caffeine doubled response to epinephrine and cortisol stress, vs. control

(Caffeine effects on cardiovascular and neuroendocrine responses to acute psychosocial stress and their relationship to level of habitual caffeine consumption. J D Lane; R A Adcock; R B Williams; C M Kuhn. Psychosomatic Medicine 52:320-336 (1990)

• 200mg caffeine at 7am decreases sleep stages 3 and 4 during which some of the most deep, restorative sleep takes place at 9pm.

Hans-Peter Landolt, Esther Werth, Alexander A. Borbély, Derk-Jan Dijk, Caffeine intake (200 mg) in the morning affects human sleep and EEG power spectra at night, Brain Research, Volume 675, Issues 1–2, 1995, Pages 67-74, ISSN 0006-8993, https://doi.org/10.1016/0006-8993(95)00040-W.

• Labels aren’t always accurate. Sunkist orange soda lists 41 mg of caffeine on its label, but in fact was found to have almost six times as much caffeine at 240 mg per bottle.

https://www.npr.org/sections/thesalt/2014/03/13/289750754/wake-up-and-smell-the-caffeine-its-a-powerful-drug

Over 30% variance allowed in food label vs actual food.
Caffeine and anxiety

• Caffeine can lower the amount of B complex vitamins, magnesium the “anti-stress vitamins.”

• Taking extra B vitamins can address imbalances of the brain chemicals GABA, serotonin, dopamine, and epinephrine that contribute to anxiety.

• By giving participants with social anxiety disorder 480 mg of caffeine, 61% of them experienced caffeine-induced panic attacks.
1 cup of coffee increases anxiety even in small amounts for those with underlying anxiety. N=76

Caffeine-containing beverages cause a cell-mediated modification of the GABA-A receptor.

Chronic caffeine or theophylline exposure reduces gamma-aminobutyric acid/benzodiazepine receptor site interactions. D J Roca, G D Schiller and D H Farb. Molecular Pharmacology May 1, 1988, 33 (5) 481-485;
Magnesium and anxiety

Further RCT’s needed. 2 studies showing positive benefits.

Vitamin C and anxiety

RCT of 42 students, oral vitamin C 500mg/d x 14 days: useful for both the prevention and reduction of anxiety (BAI).

7 RCTs of B-Complex and combined mineral/vitamin formulations showing improvements in depression, anxiety and stress.


Flood study, Alberta, 2013
Kaplan et al., 2015, Psychiatry Research

$F(2,52)=3.81, \ p<.05; \ ES=0.76-0.88$

N=56, 23-66y;
Vit d n=17
B complex n=21
Broad Spectrum formula n=18
Anti Anxiety food list

- Asparagus (folate)
- Avocados (Vitamin B6 helps the body make several neurotransmitters, including serotonin)
- Berries (anti oxidants, Vitamin C)
- Fermented foods like: yogurt, keir, soy milk, miso soup, sauerkraut, dark chocolate, juices that contain microalgae, pickles w/ live cultures, tempeh, kimchi.
- Kale, Spinach, greens
- Salmon, tuna
- Omega 3 fortified eggs
- Reduce/avoid caffeine, alcohol, tobacco products, ?thc.
Questions/comments about Nutritional strategies for anxiety
Nutrition for ADHD
Individuals with untreated/poorly treated ADHD more likely to be overweight.

Typical eating behaviors among individuals with ADHD:
- Frequent eating, skipping meals, impulsive
- Due to limited patience, convenience/immediate foods, processed foods, added sugars
- Sugar sweetened beverages
- Excessive caffeine
- Fewer fruits and vegetables
- This pattern increases risk of fluctuating energy, hunger, and increased distraction

• Shift towards food choices, meal schedule/plan that help stabilize energy/blood sugars → benefits focus.
• Impact of protein intake on dopamine levels → attention.
Stimulant medications may decrease appetite
  • Mindful about usual food intake
  • Meal planning and scheduling
  • Weight monitoring
Vitamin D may help with ADHD symptoms:
• Deficiency common: can check level and supplement if needed
• Dietary sources include
  Fatty fish like tuna, salmon
  Vitamin D fortified foods like: low fat dairy, milk alternatives
  Egg yolks, beef liver
• May need prescription or OTC supplementation depending on blood level, nutritional limitations.
Reduction in ADHD symptoms using micronutrients

Rucklidge et al., 2014, Br J Psychiatry

ES=0.61, P<.01

Micronutrients (n=42)

Placebo (n=38)

ES=0.59, p<.05

Self-report

Observer report
Micronutrients with children with ADHD: RCT evidence
Rucklidge et al., accepted pending minor revisions

- 93 participants with ADHD (med free)
- Mean age: 9.67 years (1.52); 76% male
- Diagnosis:
  - K-SADS and >65 on one of the DSM based scales of CPRS-R and >60 on one of the DSM based scales of CTRS-R
- 28% ADHD Inattentive type; 67% ADHD combined
- Co-occurring current diagnoses:
  - 5% mood disorder; 42% an anxiety disorder; 55% Oppositional Defiant Disorder; 9% Conduct Disorder; 44% LD; 83% any co-occurring disorder
    - Mean CGAS at baseline = 48.5 (6.4)
- 10 weeks RCT: 47 micronutrients, 46 placebo
Responders to nutrients/placebo targeting children with ADHD

- "Much" to "very much" improved: global functioning
- 30% ↓ ADHD Inattentive
- 30% ↓ ADHD Hyperactive/Impulsive
- In remission on mood*

*based on children entering trial with severe mood dysregulation (n=62)
<table>
<thead>
<tr>
<th>Study</th>
<th>Doses</th>
<th>Study Length</th>
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<tbody>
<tr>
<td>Belanger et al. 2009</td>
<td>500mg-1gm EPA; 1-400mg EPA</td>
<td>16 weeks</td>
</tr>
<tr>
<td>Bos et al. 2015</td>
<td>650mg EPA, 650mg DHA</td>
<td>16 weeks</td>
</tr>
<tr>
<td>Stevens et al., 2003</td>
<td>480mg dha, 80mg epa</td>
<td>17 weeks</td>
</tr>
<tr>
<td>Richardson &amp; Montgomery 2005</td>
<td>558mg epa, 174mg dha</td>
<td>26 weeks</td>
</tr>
<tr>
<td>Sinn &amp; Bryan 2007; Sinn et al. 2008</td>
<td>558mg epa, 174mg dha</td>
<td>30 weeks</td>
</tr>
<tr>
<td>Johnson et al. 2009</td>
<td>558mg epa, 174mg dha</td>
<td>26 weeks</td>
</tr>
</tbody>
</table>
How might Omega 3’s improve ADHD symptoms

- EPA regulates serotonin release
- DHA regulates serotonin receptor function
- Different and complementary actions
- Effect size smaller than Rx medication, but might mean lowering dose of Rx
- Practice experience
Exercise for ADHD symptoms:
- Increases tryptophan transport across blood-brain barrier
- Increases serotonin production
- Other benefits
- Nutrition will need to account for exercise level.
A.N.D. 2012 statement:

- Nutritive and non nutritive sweeteners does not impact behavior of kids with adhd
- AACAP does not address dietary treatments for adhd
Artificial Food Colorings and Food Preservatives

- Conflicting studies
- May be worth trying
Summary Nutrition for ADHD

• Vitamin D
• Micronutrients
• Omega3s
• Complex vs simple carbs
• Protein
• ?fiber
• Exercise
  • +/- elimination diet to remove artificial ingredients and food coloring.
Macros: Protein fat carb and calories for mental health
10 SIGNS YOU’RE NOT EATING ENOUGH

1) You feel STRESSED all the time.
2) Low energy.
3) Trouble falling or staying asleep.
4) Food cravings.
5) Hard time waking up.
6) Cold hands and feet.
7) Poor appetite.
8) Your food journal resembles that of a toddler.
9) Low body temperature (below 97.8 upon waking).
10) Labels on your food say "fat free", "sugar free", or "low calorie."

Butternutrition.com
Possible clues of nutritional imbalances include food cravings and or:

Constipation, fluctuating energy level, hairloss, libido loss, cravings, elevated caffeine intake, chills, weight change, excessive urination, foggy headed, morning fatigue despite adequate sleep, muscle aches cramps, impaired concentration/studying.

Other symptoms…
Importance of protein for mental health

• Dopamine is made from the amino acid tyrosine

• Serotonin is made from the tryptophan

Both are made from protein

http://diet.hajimeru.biz/category/health/nutritionj/
Importance of dietary fats for mental health

- Pufas: Omega 3’s
- MUFA’s Olive/Avo/Macademia
- Saturated fats: coconut oil, butter
- Pro inflammatory oils: seed oils.

Dietary fat important in hormonal and other biological functions.
Carbohydrates for mental health

Carbohydrates triggers the release of insulin in the body; regulates blood sugars AND

- Triggers the entry of tryptophan to brain.
- Tryptophan in the brain affects serotonin and dopamine levels.
- Simple sugars, simple carbs lead to a quick spike and crash and negatively alter mood.

How much is enough food can depend on
• Age (impacts metabolic rate)
• Activity (daily activity, sports, workouts, etc.)
• Undergrad vs grad student
Estimating enough calories:

- Food log
- [https://tdeecalculator.net](https://tdeecalculator.net)
- Calorie trackers: snapshot vs ongoing.
Glycemic Index and Glycemic Load

Low GI foods keep you full longer, and give you sustained energy. Preventing energy crash, food cravings and overeating.

The complete list of the glycemic index and glycemic load for more than 1,000 foods can be found in the article "International tables of glycemic index and glycemic load values: 2008" by Fiona S. Atkinson, Kaye Foster-Powell, and Jennie C. Brand-Miller in the December 2008 issue of Diabetes Care, Vol. 31, number 12, pages 2281-2283.
### Table 1-1.

Healthy U.S.-Style Eating Pattern at the 2,000-Calorie Level, With Daily or Weekly Amounts From Food Groups, Subgroups, & Components

<table>
<thead>
<tr>
<th>Food Group*</th>
<th>Amount* in the 2,000-Calorie-Level Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td></td>
</tr>
<tr>
<td>Dark Green</td>
<td>2½ c eq/day</td>
</tr>
<tr>
<td>Red &amp; Orange</td>
<td>1½ c eq/wk</td>
</tr>
<tr>
<td>Legumes (Beans &amp; Peas)</td>
<td>5½ c eq/wk</td>
</tr>
<tr>
<td>Starchy</td>
<td>1½ c eq/wk</td>
</tr>
<tr>
<td>Other</td>
<td>4 c eq/wk</td>
</tr>
<tr>
<td>Fruits</td>
<td>2 c eq/day</td>
</tr>
<tr>
<td>Grains</td>
<td>6 oz-eq/day</td>
</tr>
<tr>
<td>Whole Grains</td>
<td>&gt; 3 c eq/day</td>
</tr>
<tr>
<td>Refined Grains</td>
<td>≤ 3 oz-eq/day</td>
</tr>
<tr>
<td>Dairy</td>
<td>3 c eq/day</td>
</tr>
<tr>
<td>Protein Foods</td>
<td></td>
</tr>
<tr>
<td>Seafood</td>
<td>5½ oz-eq/day</td>
</tr>
<tr>
<td>Meats, Poultry, Eggs</td>
<td>8 oz-eq/wk</td>
</tr>
<tr>
<td>Nuts, Seeds, Soy Products</td>
<td>26 oz-eq/wk</td>
</tr>
<tr>
<td>Oils</td>
<td>5 oz-eq/wk</td>
</tr>
<tr>
<td>Limit on Calories for Other Uses (% of Calories)*</td>
<td>270 kcal/day (14%)</td>
</tr>
</tbody>
</table>

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* Definitions for each food group and subgroup are provided throughout the chapter and are compiled in Appendix 3.

* Food group amounts shown in eq-cq or ounce-equivalent (eq). oils are shown in grams (g). Quantity equivalents for each food group are defined in Appendix 3. Amounts will vary for those who need less than 2,000 or more than 2,000 calories per day. See Appendix 3 for all 12 calorie levels of the pattern.

Assume food choices to meet food group recommendations are in nutrient-dense forms. Calories

---

## Table 1-2.
### Composition of the Healthy Mediterranean-Style & Healthy Vegetarian Eating Patterns at the 2,000-Calorie Level,\(^{[\text{a}]}\) With Daily or Weekly Amounts From Food Groups, Subgroups, & Components

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Healthy Mediterranean-Style Eating Pattern</th>
<th>Healthy Vegetarian Eating Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td>2% c-eq/day</td>
<td>2% c-eq/day</td>
</tr>
<tr>
<td>Dark Green</td>
<td>1% c-eq/week</td>
<td>1% c-eq/week</td>
</tr>
<tr>
<td>Red &amp; Orange</td>
<td>5% c-eq/week</td>
<td>5% c-eq/week</td>
</tr>
<tr>
<td>Legumes (Beans &amp; Peas)</td>
<td>1% c-eq/week</td>
<td>3% c-eq/week</td>
</tr>
<tr>
<td>Starchy</td>
<td>5 c-eq/week</td>
<td>5 c-eq/week</td>
</tr>
<tr>
<td>Other</td>
<td>4 c-eq/week</td>
<td>4 c-eq/week</td>
</tr>
<tr>
<td>Fruits</td>
<td>2% c-eq/day</td>
<td>2 c-eq/day</td>
</tr>
<tr>
<td>Grains</td>
<td>6 oz-eq/day</td>
<td>6 oz-eq/day</td>
</tr>
<tr>
<td>Whole Grains</td>
<td>≥3 oz-eq/day</td>
<td>≥3 oz-eq/day</td>
</tr>
<tr>
<td>Refined Grains</td>
<td>&lt;3 oz-eq/day</td>
<td>&lt;3 oz-eq/day</td>
</tr>
<tr>
<td>Dairy</td>
<td>2 c-eq/day</td>
<td>3 c-eq/day</td>
</tr>
<tr>
<td>Protein Foods</td>
<td>6% oz-eq/day</td>
<td>3% oz-eq/day</td>
</tr>
<tr>
<td>Seafood</td>
<td>15 oz-eq/week</td>
<td>—</td>
</tr>
<tr>
<td>Meats, Poultry, Eggs</td>
<td>26 oz-eq/week</td>
<td>3 oz-eq/week (eggs)</td>
</tr>
<tr>
<td>Nuts, Seeds, Soy Products</td>
<td>5 oz-eq/week</td>
<td>15 oz-eq/week (eggs)</td>
</tr>
<tr>
<td>Oils</td>
<td>27 g/day</td>
<td>27 g/day</td>
</tr>
<tr>
<td><strong>Limit on Calories for Other Uses (% of Calories)</strong></td>
<td><strong>260 kcal/day (13%)</strong></td>
<td><strong>250 kcal/day (15%)</strong></td>
</tr>
</tbody>
</table>

\(^{[\text{a}]}\) Food group amounts shown in c-eq (or ounce equivalent) units. Amounts are shown in grams (g) or ounces (oz) for each food group. 1 c-eq equals 0.5 oz for adults and 0.3 oz for children. Some conversions for food groups are modified in Appendix 4, Appendix 5, and Appendix 6 for all 2,500- to 2,000-kcal levels of the patterns. Definitions for each food group and subgroup are provided throughout the chapter and are repeated in Appendix 7.

**Mediterranean patterns include 3 oz-eq per week of legumes as a vegetable subgroup, and an additional 3 oz-eq per week of legumes as a protein food.** The table assumes a 10-oz-equivalent serving of legumes in the vegetable group.

For the FDA and USDA, provide additional guidance for selecting and portioning foods for women who are pregnant or breastfeeding and young children. For more information, see the FDA or USDA websites [www.fda.gov](http://www.fda.gov) [www.usda.gov](http://www.usda.gov). Assumptions about food choices in these food groups recommendations are in nutrients dense forms. Calories from added sugars, added fats, added sodium, starches, alcohol, and/or fat more than the recommended amount of nutrients from foods are met for under this category.

**NOTE:** The diet eating pattern should not exceed Dietary Guidelines limits for intake of calories from added sugars and saturated fat and should be within the Acceptable Macronutrient Distribution Range.-------

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Key Recommendations:

Consume a healthy eating pattern that accounts for all foods and beverages within an appropriate calorie level.

A healthy eating pattern includes:

- A variety of vegetables from all of the subgroups—dark green, red and orange, legumes (beans and peas), starchy, and other
- Fruits, especially whole fruits
- Grains, at least half of which are whole grains
- Fat-free or low-fat dairy, including milk, yogurt, cheese, and/or fortified soy beverages
- A variety of protein foods, including seafood, lean meats and poultry, eggs, legumes (beans and peas), and nuts, seeds, and soy products
- Oils

A healthy eating pattern limits:

- Saturated fats and trans fats, added sugars, and sodium

Key Recommendations that are quantitative are provided for several components of the diet that should be limited. These components are of particular public health concern in the United States, and the specified limits can help individuals achieve healthy eating patterns within calorie limits:

- Consume less than 10 percent of calories per day from added sugars[1]
- Consume less than 10 percent of calories per day from saturated fats[2]
- Consume less than 2,300 milligrams (mg) per day of sodium[3]
- If alcohol is consumed, it should be consumed in moderation—up to one drink per day for women and up to two drinks per day for men—and only by adults of legal drinking age[4]

In tandem with the recommendations above, Americans of all ages—children, adolescents, adults, and older adults—should meet the Physical Activity Guidelines for Americans to help promote health and reduce the risk of chronic disease. Americans should aim to achieve and maintain a healthy body weight. The relationship between diet and physical activity contributes to calorie balance and managing body weight. As such, the Dietary Guidelines includes a Key Recommendation to:

- Meet the Physical Activity Guidelines for Americans.[5]

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[1] Definitions for each food group and subgroups are provided throughout Chapter 1. Key Elements of Healthy Eating Patterns and are compiled in Appendix B. USDA Food Patterns: Healthy U.S.-Style Eating Pattern.

[2] The recommendation to limit intake of calories from added sugars to less than 10 percent per day is a target based on food pattern modeling and national data on intakes of calories from added sugars that demonstrate the public health need to limit caloric intake from added sugars to meet food group and nutrient needs within calorie limits. This limit on calories from added sugars is not to create an Upper Level (UL) set by the Institute of Medicine (IOM). For most calorie levels, there are not enough calories available after meeting food group needs to consume 10 percent of calories from added sugars and 10 percent of calories from saturated fats and still stay within calorie limits.

[3] The recommendation to limit intake of calories from saturated fats to less than 10 percent per day is a target based on evidence that replacing saturated fats with unsaturated fats is associated with decreases in cardiovascular disease. This limit eliminates from saturated fats in not set by the IOM. For most calorie levels, there are not enough calories available after meeting food group needs to consume 10 percent of calories from added sugars and 10 percent of calories from saturated fats and still stay within calorie limits.

[4] The recommendation to limit intake of sodium to less than 2,300 mg per day is the US for individuals ages 14 years and older set by the IOM. The recommendations for children younger than 14 years of age is the IOM age- and sex-appropriate limits (see Appendix A, Nutrition Goals for Age- and Sex Groups Based on Dietary Reference Intakes and Dietary Guidelines Recommendations).

[5] It is not recommended that individuals begin drinking or drink more for any reason. The amount of alcohol and calories in beverages varies and should be accounted for under the limits of healthy eating patterns. Alcohol should be consumed only by adults of legal drinking age. There are many circumstances in which individuals should not drink, such as during pregnancy. See Appendix A: Alcohol for additional information.

opportunity to move toward a healthy eating pattern. Small shifts in food choices—over the course of a week, a day, or even a meal—can make a big difference. Here are some ideas for realistic, small shifts that can help people adopt healthy eating patterns.

- High Calorie Snacks → Nutrient-Dense Snacks
- Fruit Products with Added Sugars → Fruit
- Refined Grains → Whole Grains
- Snacks with Added Sugars → Unsalted Snacks
- Solid Fats → Oils
- Beverages with Added Sugars → No-Sugar-Added Beverages
Implementation of the Dietary Guidelines Through MyPlate

MyPlate, MyWins.
Find your healthy eating style and maintain it for a lifetime. This means:

- Make half your plate fruits & vegetables.
- Focus on whole fruits.
- Vary your veggies.
- Make half your grains whole grains.
- Vary your protein routine.
- Move to low-fat or fat-free milk or yogurt.
- Limit:
  - Drink and eat less sodium, saturated fat, and added sugars.

Everything you eat and drink over time matters.
The right mix can help you be healthier in the future.

Start with small changes to make healthier choices you can enjoy.
Visit ChooseMyPlate.gov for more tips, tools, and information.
### Males

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<tr>
<td>76 &amp; Up</td>
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https://health.gov/paguidelines/
### Table III: Daily protein requirements for physical activity

<table>
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<tr>
<th>Physical activity level</th>
<th>g/kg BW/day</th>
<th>Comments</th>
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<tbody>
<tr>
<td>General fitness</td>
<td>0.8-1.0</td>
<td>Focus on protein quality. Amino-acid content. Whole foods. Safe, convenient supplements where needed.</td>
</tr>
<tr>
<td>Older individuals</td>
<td>1.0-1.2</td>
<td></td>
</tr>
<tr>
<td>Moderate amount of intense training</td>
<td>1.0-1.5</td>
<td></td>
</tr>
<tr>
<td>High volume of intense training</td>
<td>1.5-2.0</td>
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</tr>
</tbody>
</table>
Exercise has mental health and nutritional demands must account for activity level.
Sedentary behavior and depression

13 cross-sectional studies with 110 152 participants
11 longitudinal studies with 83 014 participants were included in this meta-analysis.
RR of depression for the highest versus non-occasional/occasional sedentary behaviour was 1.25 (95% CI 1.16 to 1.35, I²=50.7%) for all included studies.
The pooled RRs of depression for sedentary behavior were 1.31 (95% CI 1.16 to 1.48) in cross-sectional studies and 1.14 (95% CI 1.06 to 1.21) in longitudinal studies.

In subgroup analysis by different types of sedentary behavior, the pooled RRs of depression were 1.13 (95% CI 1.06 to 1.21) for long-time TV viewing (≥6 vs <2 h/day) and 1.22 (95% CI 1.10 to 1.34) for prolonged computer or internet use (>4 vs <2 h/day).

This is the first meta-analysis investigating the association between sedentary behavior and depression.
This meta-analysis indicates that sedentary behavior might be positively associated with the risk of depression.
Bi-directional relationship.
Assessment
During initial evaluation:
24 hour food recall
Assess activity level (including exercise, job)
Handouts with sample food list
Implementation strategies:
• Individual work: establish goals, what is realistic for the student, what are they willing to do.
• Workshops
• Partnering with students/RA
• Dining services
• Disordered eating
Questions/comments