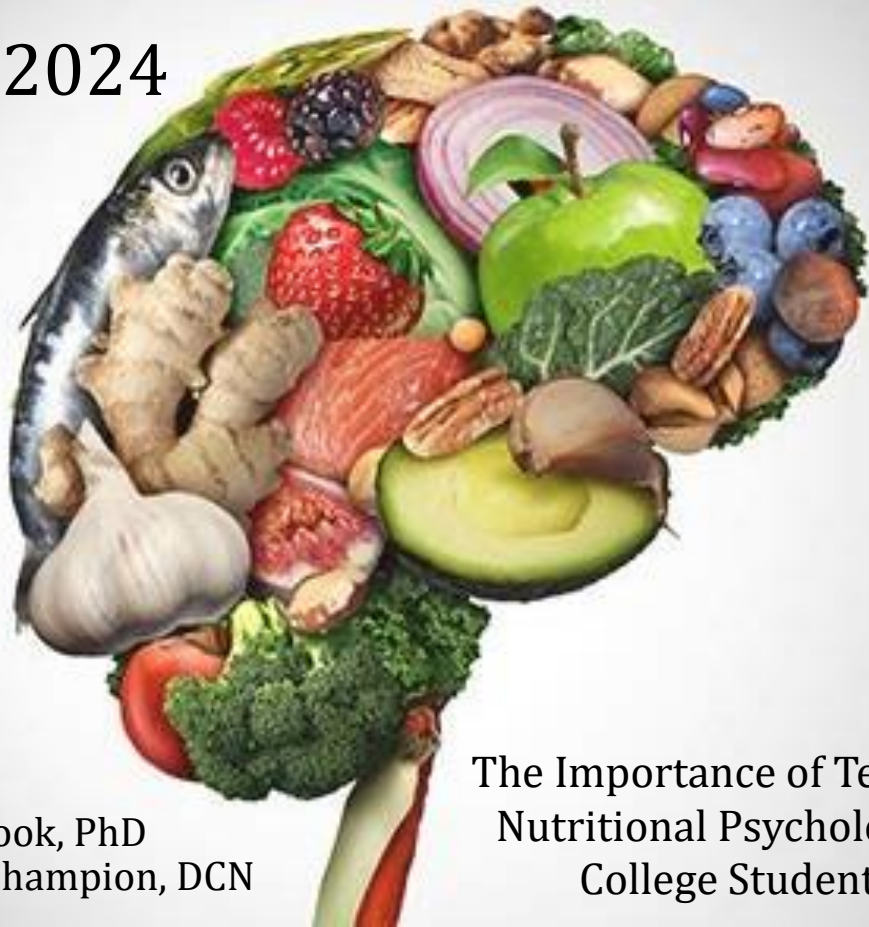


WPA 2024



Andrea Cook, PhD
Jennifer Champion, DCN

The Importance of Teaching
Nutritional Psychology to
College Students

Slide Decks and Textbook Information

Slide Decks and Textbook Information

***Nutritional Psychology: Understanding the
Relationship between Mental Health and Nutrition***

Available February 2025
Taylor & Francis Group
CRC Press Division



<https://drandreacook.com/nutritional-psych-book>

Nutritional Psychology Definition

Nutritional Psychology Definition

- explores a range of issues that impact mental health including
 - nutritional deficiencies
 - eating behaviors (including eating disorders)
 - cultural influences
 - lifestyle impact (movement, stress, sleep)
 - social justice issues



There is now robust research evidence that changes in nutrition can be an important adjunct to mental health treatment

Introduce in College

Introduce Nutritional Psychology in College

- often first time making food decisions and practicing self-care without parental supervision
- pressure from peers to fit in with social eating
- often confused about healthy eating
- stress eating behavior common
 - “Freshman 15”



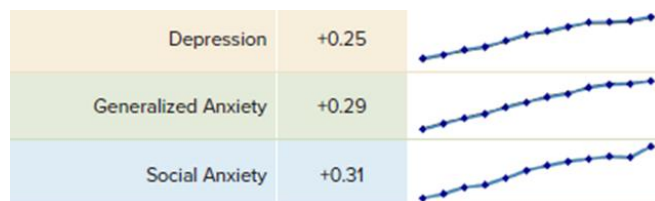
Mental Disorders in College

- Often first significant mental health crisis in college
- Mental disorders - 31% college students report 1 or more disorders across 8 countries in WHO study

Auerbach et al. (2018) WHO world mental health surveys international college student project.

Anxiety in College

- Anxiety continues as top concern for majority of students (Center for Collegiate Mental Health 2022 Annual Report)
 - 190,000 students in 180 U.S. college and university counseling centers
 - Social Anxiety prevalence increased 17% from 2010 to 2022



- Irregular eating habits significant contributor to anxiety symptoms (Li et al., 2022)

Prevalence and associated factors of depression and anxiety symptoms among college students (Li et al., 2022)

Eating Disorders in College

- Eating Disorders
 - Healthy Minds Study of US college students (N=267,599)
 - Prevalence increased from 15% to 28% of students 2013 to 2021

Trends in eating disorder risk among U.S. college students, 2013–2021
(Daly & Costigan, 2022)

Teaching Nutritional Psychology

- Topics include
 - Psychology and Nutrition Basics
 - e.g., diagnosing mental illness, macronutrients
 - Microbiome and Hormones
 - e.g., digestion and gut health, hunger and satiety hormones
 - Nutritional Deficiencies and Behavior
 - e.g., impact deficiencies on mood and thinking, food choices, self care
 - Weight Loss and Disordered Eating
 - e.g., obesity, trauma, eating disorders
 - Food Policy and New Eating Behaviors
 - e.g., food deserts, food addiction, intuitive eating



Jennifer Champion, DCN, MS, CNS, CN, LDN, BCH
EVIDENCE TO SUPPORT NUTRITIONAL PSYCHOLOGY

THE MIND-BODY CONNECTION

- Mental health and physical health are intricately connected.
- Just as physical ailments can affect mental well-being, nutrition plays a crucial role in mental health.
- The brain requires essential nutrients to function optimally, influencing mood, cognition, and behavior.



NUTRITIONAL DEFICIENCIES & MENTAL HEALTH

- Research shows a correlation between certain nutrient deficiencies and mental health disorders.
 - OMEGA-3 FATTY ACIDS
 - B-VITAMINS, INCLUDING B12, FOLATE, B6, BIOTIN
 - ZINC
 - MAGNESIUM
 - IRON
 - CHOLINE
 - VITAMIN K
 - VITAMIN D
 - PROTEIN
 - CHOLESTEROL

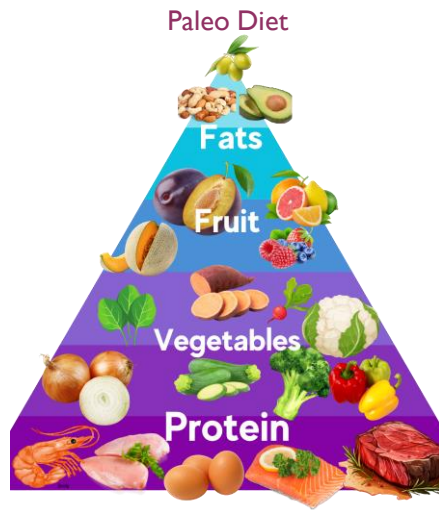
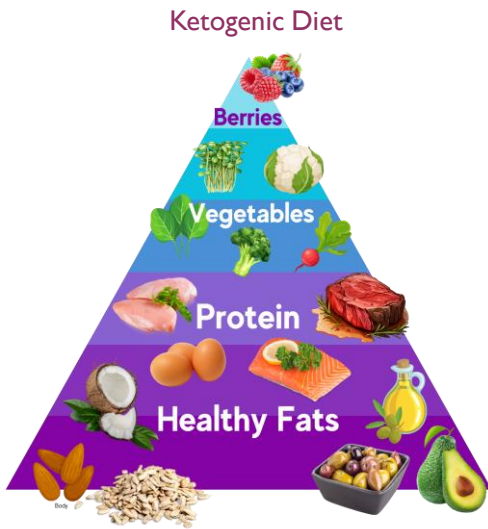


OMEGA-3 FATTY ACID DEFICIENCY INCREASES RISK OF SCHIZOPHRENIA

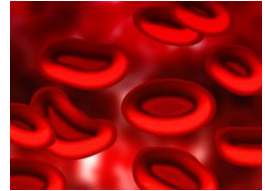
Omega 3's and Schizophrenia (Lange, K. W. (2020). Omega-3 fatty acids and mental health. *Global Health Journal*, 4(1), 18-30.)

Hei, A. (2020). Mental health benefits of fish consumption. *Clin. Schizophr. Relat. Psychoses*, 15(5).

DIETARY INTERVENTION SUPPORTING MENTAL HEALTH



IRON



- Iron deficiency has long been demonstrated to impair or delay children's cognitive function.
- Iron deficiency anemia worsens psychiatric disorders, and with the push to remove meat from the diet, we are seeing an increase in iron-deficiency anemia.
- Gut bacteria and Iron

Greig, A. J., Patterson, A. J., Collins, C. E., & Chalmers, K. A. (2013). Iron deficiency, cognition, mental health and fatigue in women of childbearing age: a systematic review. *Journal of nutritional science*, 2, e14.

Lee, H. S., Chao, H. H., Huang, W. T., Chen, S. C. C., & Yang, H. Y. (2020). Psychiatric disorders risk in patients with iron deficiency anemia and association with iron supplementation medications: a nationwide database analysis. *BMC psychiatry*, 20, 1-9.

CHOLINE



- Involved in the synthesis of the neurotransmitter acetylcholine, which plays a significant role in mood regulation.
- Helps with cellular membrane structure by converting to phosphatidylcholine

CHOLINE

- Methyl Donor
- Methylation is a chemical reaction in the body where a methyl group gets added to a protein and is generally responsible for any change occurring in gene regulation and expression. It typically acts as a suppressor for many of the gene regulatory elements such as insulators, promoters, enhancers, and repressors.
- Signs of methylation insufficiency: insomnia, depression, addictions, OCD and OCD-like behaviors, delusions, seasonal allergies, constipation, and low pain threshold

Lee, H. S., Chao, H. H., Huang, W. T., Chen, S. C. C., & Yang, H. Y. (2020). Psychiatric disorders risk in patients with iron deficiency anemia and association with iron supplementation medications: a nationwide database analysis. *BMC psychiatry*, 20, 1-9.



B VITAMINS

- B vitamins play significant roles in mental health
- Deficiencies of folate, B6, B12 and biotin all connected to increased risk of anxiety, depression, and psychosis.

MahdaviFar, B., Hosseinzadeh, M., Salehi-Abargouei, A., Mirzaei, M., & Vafa, M. (2021). Dietary intake of B vitamins and their association with depression, anxiety, and stress symptoms: A cross-sectional, population-based survey. *Journal of affective disorders*, 288, 92-98.

FOLATE

- In 1996, researchers determined the role of folate in mental health and found that those with lower levels of serum folate were more likely to experience depression and other mental health struggles
- Reduced folate (along with B12 and B6) leads to increased homocysteine levels. Increased homocysteine levels are seen in those with depression

Coppen, A., & Bolander-Gouaille, C. (2005). Treatment of depression: time to consider folic acid and vitamin B12. *Journal of psychopharmacology*, 19(1), 59-65.
Taylor, M. J., Carney, S. M., Geddes, J., Goodwin, G., & Cochrane Common Mental Disorders Group. (1996). Folate for depressive disorders. *Cochrane database of systematic reviews*, 2010(1).



VITAMIN K



- Known as the coagulation vitamin, and also supports bone, cardiovascular and mental health.
- Reduces incidence and severity of depression

Bolzetta, F., Veronese, N., Stubbs, B., Noale, M., Vaona, A., Demurtas, J., ... & Solmi, M. (2019). The relationship between dietary vitamin K and depressive symptoms in late adulthood: a cross-sectional analysis from a large cohort study. *Nutrients*, 11(4), 787.

VITAMIN D

- Significant roles in hormone balancing, bone health, cardiovascular health, and mental health
- Depression, anxiety, Bipolar Disorder I and II, and other mental health disorders often present with low vitamin D status

Humble, M. B. (2010). Vitamin D, light and mental health. *Journal of Photochemistry and Photobiology B: Biology*, 101(2), 142-149.

Lerner, P. P., Sharony, L., & Miodownik, C. (2018). Association between mental disorders, cognitive disturbances and vitamin D serum level: Current state. *Clinical nutrition ESPEN*, 23, 89-102.



VITAMIN D DEFICIENCY FACTORS

- Low intake of Salmon (especially the bones) and mushrooms
- Indoor living
- Fluorescent lighting
- Sunscreen
- Sunglasses
- Gut malabsorption

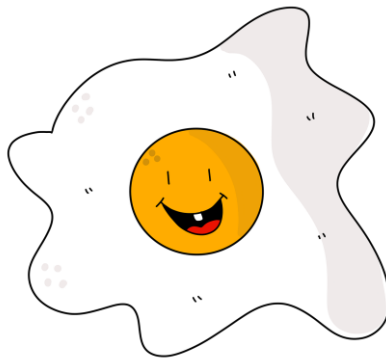


ZINC

- Immune system, reproductive health, depression prevention
- Client or patients with reduced zinc levels often exhibit greater incidence of depression

Swardfager, W., Herrmann, N., Mazereeuw, G., Goldberger, K., Harimoto, T., & Lanctôt, K. L. (2013). Zinc in depression: a meta-analysis. *Biological psychiatry*, 74(12), 872-878.

CHOLESTEROL



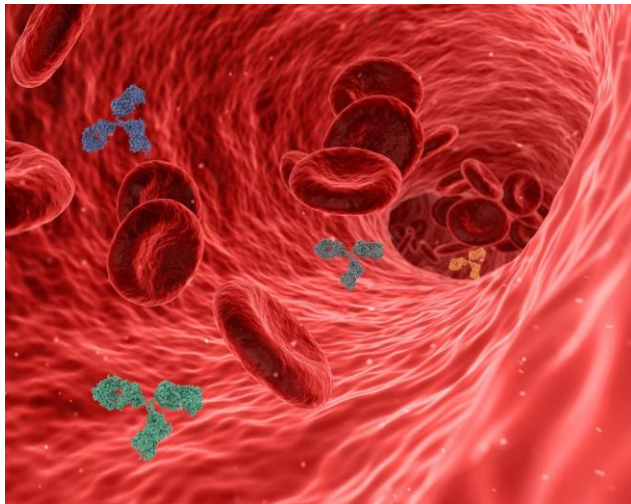
Cholesterol is a sterol compound found in most body tissues and is an important constituent of cell membranes and precursors of other compounds, including hormones, and is necessary for neuronal physiology.

“Cholesterol depletion in neurons impairs synaptic vesicle exocytosis, neuronal activity and neurotransmission, leads to dendritic spine and synapse degeneration.”

Zhang, J., & Liu, Q. (2015). Cholesterol metabolism and homeostasis in the brain. *Protein & cell*, 6(4), 254-264.



WHY HAVE WE LEARNED TO FEAR CHOLESTEROL?





STATIN USAGE & MOOD

CHAM, S., KOSLIK, H. J., & GOLOMB, B. A. (2016). MOOD, PERSONALITY, AND BEHAVIOR CHANGES DURING TREATMENT WITH STATINS: A CASE SERIES. *DRUG SAFETY-CASE REPORTS*, 3, 1-13.



INFLAMMATION IS HIGH IN THOSE WITH MENTAL HEALTH DIAGNOSES

WORK ON INFLAMMATION AND CHOLESTEROL WILL BALANCE AND MENTAL HEALTH IMPROVES!

Rosenblat, J. D., Cha, D. S., Mansur, R. B., & McIntyre, R. S. (2014). Inflamed moods: a review of the interactions between inflammation and mood disorders. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 53, 23-34.

LOW CHOLESTEROL LEVELS ARE PROBLEMATIC

- Low cholesterol impairs cognition and mental health.
- Low cholesterol is a risk factor for attentional impulsivity in patients with mood symptoms, increased incidence of death by suicide, and impaired cognition.

Benton, D. (1995). Do low cholesterol levels slow mental processing?. *Psychosomatic Medicine*, 57(1), 50-53.

Sahebzamani, F. M., D'Aoust, R. F., Friedrich, D., Aiyer, A. N., Reis, S. E., & Kip, K. E. (2013). Relationship among low cholesterol levels, depressive symptoms, aggression, hostility, and cynicism. *Journal of clinical lipidology*, 7(3), 208-216.

Troisi, A. (2011). Low cholesterol is a risk factor for attentional impulsivity in patients with mood symptoms. *Psychiatry research*, 188(1), 83-87.



FIREFIGHTER CASE STUDY

Male, 52 YO, Hx of unexplained anger and aggression combined with PTSD and trauma



WE NEED EACH OTHER!

WHEN THERAPISTS AND NUTRITIONISTS COME TOGETHER, WE MAKE A BIGGER IMPACT FOR OUR CLIENTS!





Andrea Cook, PhD

**THE EXPERIENCE OF TEACHING NUTRITIONAL
PSYCHOLOGY TO COLLEGE STUDENTS**

ACE Study

Adverse Childhood Experiences (ACE) Study

- Correlation childhood abuse and neglect and later-life health and well-being
- CDC-Kaiser Permanente 1995 to 1997
- >17,000 Kaiser patients from Southern Cal
 - physical exams
 - confidential surveys
- Results demonstrated higher number of ACEs correlated with greater risk of chronic disease later in life

Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study (Felitti, et al., 1998)

ACEs Brain Development

- ACEs impact on Brain Development
 - Appraise situations as more dangerous and hopeless
 - Increased stress neurotransmitters
 - Decreased stress response regulation
 - Increased anxiety
 - Increased brain inflammation

Childhood adversity impact on gut microbiota and inflammatory response to stress during pregnancy (Hantsoo, et al., 2019)

ACEs Gut Development

- ACEs impact on Gut Development
 - Hypersensitive and hyper-responsive gut
 - Changes in gut motility and digestive juices disturbs the gut microbiome, thins mucus lining colon wall
 - Decrease protective bacteria e.g., lactobacilli
 - Increase pathogenic bacteria (e.g., E. coli) contributing to gut infections
 - Increased gut inflammation

Childhood adversity impact on gut microbiota and inflammatory response to stress during pregnancy (Hantsoo, et al., 2019)

ACE Study

- ACEs and Obesity
 - Meta-analysis 10 studies, >118,000 participants
 - 46% increase in the odds of adult obesity following exposure to multiple ACEs
 - Most commonly cited mechanisms linking ACEs to obesity
 - social disruption
 - health behaviors
 - chronic stress response

Adverse Childhood Experiences and Adult Obesity (Wiss & Brewerton, 2020)

ACEs Nutrition Interventions

- Nutrition Interventions
 - Lowers inflammation in both brain and gut
 - Improving health of gut microbiome
 - increased fruits and vegetables
 - pre- and probiotics
 - omega 3 fatty acids
 - identify food sensitivities

The Inflamed Mind: A Radical New Approach to Depression (Bullmore, 2018)

Sleep Deprivation

- Sleep Deprivation
 - 60% Americans have sleep difficulties nearly every night
 - 40% older adults suffer poor quality and quantity
 - Contributes to cognitive decline
 - 10% Americans suffer chronic insomnia
 - 10% children have Obstructive Sleep Disordered Breathing (oSDB)
 - Habitual snoring in children is associated with inattention, aggression, and hyperactivity
 - Strong association between ACEs and sleep disorders (e.g., sleep apnea, nightmares, insomnia)

Sleep Smarter (Shawn Stevenson, 2016)

Sleep and Hormones

- Impact of Poor Sleep
 - Linked to chronic diseases, including type 2 diabetes, cardiovascular disease, obesity, and depression
 - Reduced leptin, elevated grehlin, increased BMI
 - Compared 8 to 5 hours sleep = 15.5% decrease in leptin
 - Compare 8 to 5 hours sleep = 14.9% increase in grehlin
 - Habitual sleep duration below 7.7 hours associated with increased BMI for children and adults

Short Sleep Duration is Associated with Reduced Leptin, Elevated Ghrelin, and Increased Body Mass Index (Taheri 2004)

Sleep and Food Choices

- Sleep deprivation changes food decision making
 - Less executive function (pre-frontal cortex)
 - More impulsive/emotional (amygdala)
 - Increased hunger (hormone level changes)
 - Increases likelihood of unhealthy food choices
 - Dietary habits impact sleep

Sleep deprivation in development of obesity, effects on appetite regulation, energy metabolism, and dietary choices (Akhlghi & Kohanmoo, 2023)

Sleep

- Caffeine
 - Impacts nervous and endocrine (hormone) systems
 - Increases production of adrenaline and cortisol causes surge and then crash (fatigue, brain fog, irritability)
 - Adenosine (neurotransmitter) cue to sleep is disrupted
 - Disrupts sleep
 - 6 hours before bed = lost 1 hour of sleep and disrupted REM and deep sleep cycles (Drake et al., 2013)
 - Can create vicious cycle of daytime sleepiness driving increased caffeine use
 - Half-life 5-8 hours = half still active in system

Sleep Smarter (Shawn Stevenson, 2016)

Sleep

- Gut Health and Sleep
 - 30 types of neurotransmitters in gut
 - serotonin 80-95% produced in gut
 - gut has 400 times more melatonin than brain
 - Serotonin precursors e.g., tryptophan, zinc, B vitamins
 - Gut microbiota help produce, absorb and transport neurotransmitters
 - Gut bacteria have a circadian timing system
 - Healthy bacteria supported by rhythm
 - Opportunistic bacteria when rhythm disrupted

Sleep Smarter (Shawn Stevenson, 2016)

Food Social Issues

- U.S. industrial food system is an invisible form of oppression
- Created an environment that makes good food choices very difficult
 - “blame the victim” vs. “change the system”
 - promotes obesity as character flaw, weakness
- Promotes medical treatment to address symptoms rather than lifestyle nutrition changes
 - gastric bypass surgery for obesity
 - insulin, dialysis, and amputation for diabetes

Food Deserts, Swamps, and Apartheid

- Food Deserts
 - Only food available is highly processed
 - Sold at convenience stores and fast-food outlets
 - Closest grocery store more than a mile away
 - 23 million Americans live in food deserts
- Food Swamps
 - 4+ convenience stores within $\frac{1}{4}$ mile of home
 - Low-income and racial/ethnic minority populations more likely to live in food swamps
- Food deserts vs. food swamps
 - Desert = little access to affordable, nutritious food
 - Swamp = fast food, convenience stores, and liquor stores greatly outnumber groceries stores

CDC and International Journal of Environmental Research and Public Health

Food Deserts, Swamps, and Apartheid

- Food Apartheid
 - looks at the whole food system, along with race, geography, faith, and economics
 - social and political form of discrimination embedded in the food system
 - e.g., black communities 2x fast-food restaurants compared to white communities
- Policy Changes
 - US municipalities adopting zoning laws to improve food environment and reduce disparities
 - supply and demand model not effective

CDC and International Journal of Environmental Research and Public Health

Eating on a Budget

- Eating on a Budget
 - Create a food budget and weekly shopping lists
 - Don't shop when you are hungry
 - Cheaper to eat more whole vegetables and fruits, requires preparation
 - Start small – knife, cooking spoon, cutting board, pan
 - Choose simple recipes
 - Experiment with different ingredients
 - Small portions of meat, 2-3 no-meat dinners/week
 - Buy in bulk: rice, beans, quinoa, nuts, sardines
 - Freeze small cooked portions for quick meals later

Good and Cheap: Eat Well on \$4/Day by Leanne Brown (2015)

Food Shopping Strategies

Food Shopping Strategies

- Start building a pantry – olive oil, soy sauce, herbs, spices
- Diverse veggies = more flavor; base of most meals
 - <https://www.misfitsmarket.com/> organic delivered 40% off
- Get creative with wilted vegetables e.g., sautéed or soup
- Fruits & veggies in season are fresher and cheaper
- Frozen fruits & veggies – healthy, wait for sales
- Always buy eggs and yogurt – fast and versatile
- Vary protein sources – beans, nuts, meat, eggs, fish
- Cook larger batches and freeze leftovers in small portions

Good and Cheap: Eat Well on \$4/Day by Leanne Brown (2015)

Meditation and Deep Breathing

- Meditation and Deep Breathing
 - Start every class with research about benefits for physical and mental health
 - Clearly lay out fight, flight, freeze or fawn
 - Include an ongoing discussion about impact of stress
 - Practice meditation every class – 5-minute videos
- Intuitive Eating
 - Recognize body cues of hunger and satiety
 - Don't vilify certain foods or food groups
 - Learn to eat with mindfulness
 - Goal is to learn about your body

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