



STRESS AND ITS IMPACT ON ABILITY TO FUNCTION

27% of all adults said that most days they are so stressed they can't function

46% of all adults said that most days they are so stressed they can't function

46% of those under 45

56% of Black adults under 35

42% ages 35 to 44

46% of white adults under 35

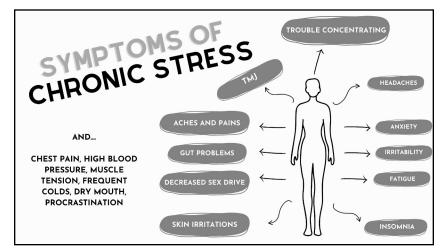
16% ages 45 to 64

44% of Latina/o adults under 35

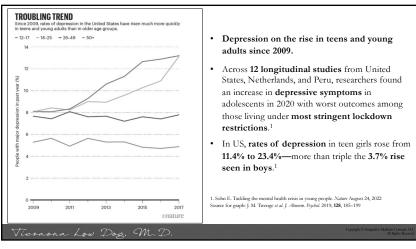
STRESS IN AMERICA™ 202

C 2022 American Psychological Association

**Cappage Composed Making Composed



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Mental Health

- Our emotional, psychological, and social well-being. Affects how
 we think, feel, and act. Helps determine how we handle stress,
 relate to others, and make healthy choices.
- When demands placed on us exceed our resources and coping abilities, our mental health can be impacted. If someone is working long hours, caring for a relative, or experiencing economic hardship, they may experience poor mental health.
- Poor mental health and mental illness are NOT the same. A person
 can experience poor mental health and not be diagnosed with a
 mental illness AND someone with a mental illness can have periods
 of mental, physical, social wellbeing.

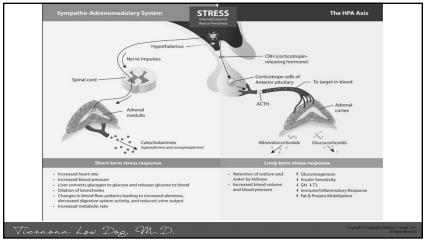
https://www.cdc.gov/mentalhealth/learn/index.htm

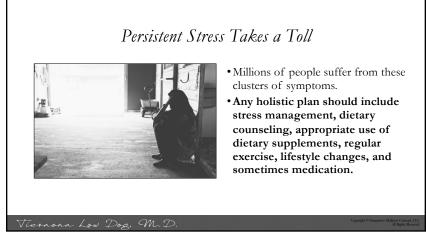
Visions / De M T

STRESS · School/work demands/frustrations · Problems in personal relationships **IMBALANCE** · Financial problems SKILL USF • Concerns about job stability · Too many obligations, not enough time FLEXIBLE SCHEDULE Chronic illness of self or loved one Negative self-talk or feelings CONTROL · Very high expectations · Major life changes (TOO LITTLE) · Experiencing discrimination or abuse **DEMAND** · Have little control over given situation · Inability to accept things as they are (TOO MUCH) · Changes in body or health status

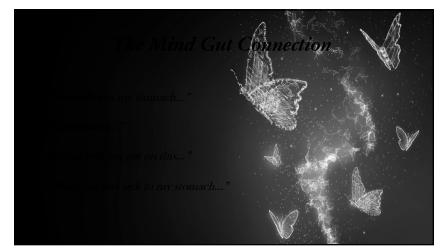
Some Sources of Stress

RISK OF POOR HEALTH









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Human Microbiome Project

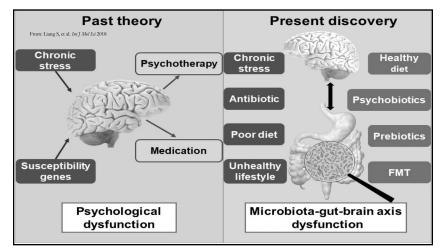
- Massive NIH research initiative cataloging microorganisms living in and on our body starting in 2007.
- Led to rapidly growing appreciation for incredible and diverse impact these organisms have on our health and well-being.
- Gut bacteria produce vitamins, break down food; their presence or absence linked to obesity, inflammatory bowel disease, IBS, anxiety, depression, food allergies, neuroinflammation, GI infections, HTN, diabetes, metabolic syndrome, and more.
- Our resiliency, our ability to recover quickly from stressors, may be a function of which bacteria inhabit or don't inhabit our gut.

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Gut Microbiome and Hypothalamic Pituitary Adrenal (HPA) Axis

Hypothalamus	Limble	System	STRESS							
Hypothalamus	Leaky gut	Cottises	Pituitary							
Adrenals	Cortises	ThP-0, IMP-9, and	System	Street	Cortises	ThP-0, IMP-9, and	System	Street	ThP-0, IMP-9, and	System

Enteric Nervous System: The Second Brain

THE MIND-GUT CONNECTION • 100 million nerve cells from esophagus to rectum:

dopamine, serotonin, norepinephrine, GABA,

happiness—90% is made in GI tract, not the brain.

• Gut microbiota cause changes in how brains

react to events/stressors; dysbiosis may trigger

acetylcholine, melatonin; critical for mood, sleep, anxiety, concentration, reward, and motivation.

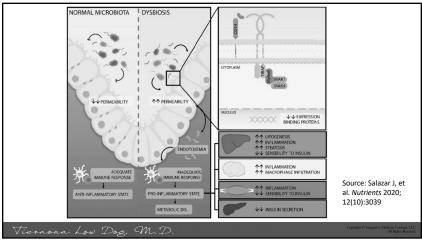
• Gut bacteria produce neurotransmitters:

• Serotonin is associated with depression and

anxiety and depressive symptoms.

controls digestion and propulsion through GI tract.

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Periodontium

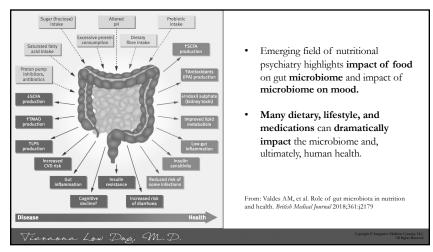
Barrier

Viable

Purcocurate

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17





19 20

Two Bugs Noticeably Absent

- Gut microbial diversity has been shown to be lower in those with depression.
- Flemish Gut Flora Project (1054 healthy adults): 173 diagnosed with depression or poor quality-of-life intake; research team compared their microbiomes with those other participants.
- Two kinds of microbes, Coprococcus and Dialister, missing from microbiomes of depressed subjects, but not those with a high quality of life. Findings true, even after age, sex, or antidepressant use, all of which influence the microbiome, were accounted for.
- 1064 Dutch people: researchers found same two species missing among those who were depressed but not in those with high quality of life.
- Intriguing...

Valles-Colomer M, et al. The neuroactive potential of the human gut microbiota in quality of life and depression. Nature Microbiology 2019; 4: 623–632

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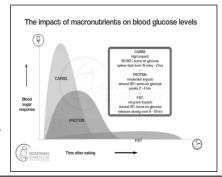
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Refined Carbohydrates

- If you overdo processed/refined carbs, blood sugar goes up, insulin is released, store extra glucose as fat, driving inflammation.
- Blood sugar goes up and then plummets, disrupting sleep/wake cycle and leaving one tired.
- Eating lots of carbs makes one crave lots of carbs (dopamine rush).
- High carb/sugar diets cause dysbiosis, degrading intestinal barrier, driving systemic inflammation.

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Fiber, Sugar, Processed Foods and Depression

- Consumption of sweetened beverages and refined foods associated with increased risk of depression in longitudinal studies.
- Women's Health Initiative (n = 87,618): higher consumption of dairy products, fiber, fruits, and vegetables associated withs significantly LOWER odds of depression; refined carbs associated with increased odds of depression in menopausal and postmenopausal women.



· Brain is always "on."

· Requires constant supply of

makes all the difference.

20% of daily energy.

What you eat directly

ultimately, your mood.

affects the structure and function of brain and,

fuel-and what's in that fuel

Weighs ~3 pounds but uses

ungwisch JE, et al. High Glycemic Index Diet as a Risk Factor for Depression: Ana om the Winner's Health Initiative. Am I Clin Nate 2015 Anne-107/21-454.63

Glycemic Load & Mood

- 82 healthy weight or healthy overweight or obese, adults enrolled in 28 day randomized, crossover-controlled feeding study.
- Compared to low GL diet, a high GL diet resulted
- 38% higher score for depressive symptoms (P = 0.002)
- 55% higher score for total mood disorder (P = 0.05)
- 26% higher score for *fatigue/inertia* (P = 0.04)

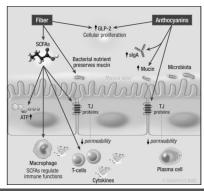


Breymeyer KL, et al. Appetite 2016; Dec 1;107:253-259

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Eat More Fiber and Colorful Plants



- Gut bacteria digest (ferment) fibers for fuel, increasing number/balance gut microbiota
- Diets high in fiber and anthocyanins (purple, black, blue, red pigments in plants) strengthen intestinal barrier, preventing toxins from passing through intestinal wall into bloodstream, reducing inflammation.

Men: 38 g/d fiber Women: 25-28 g/d fiber

27 28

European Union: My New Gut Project

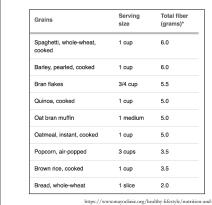
- Initiative focused on promoting health by targeting the gut microbiome.
- Dietary recommendation intended to improve major depressive symptoms by targeting the gut microbiome: increase consumption of fiber and fish.
- Average annual seafood intake for Americans is 14.6 pounds, and USDA estimates that 80% – 90% of the population fails to meet the recommendation of two servings of seafood per week.

Dinan TG, et al. Feeding melancholic microbes: MyNewGut recommendations on diet and mood. Clin Nutr 2019;38:1995–2001 Bliss RM. Consumers Missing Out on Seafood Benefits.

Serving Total fiber Fruits size (grams)* Raspberries 1 cup 1 medium 5.5 Apple, with skin 4.5 1 medium Banana 3.0 1 medium Orange 1 medium 3.0 Strawberries 3.0 1 cup

Vegetables	Serving size	Total fiber (grams)*
Green peas, boiled	1 cup	9.0
Broccoli, boiled	1 cup chopped	5.0
Turnip greens, boiled	1 cup	5.0
Brussels sprouts, boiled	1 cup	4.0
Potato, with skin, baked	1 medium	4.0
Sweet corn, boiled	1 cup	3.5
Cauliflower, raw	1 cup chopped	2.0
Carrot, raw	1 medium	1.5

https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/high-fiber-foods/art-20050948



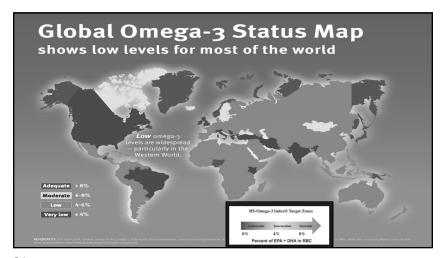
Legumes, nuts and seeds	Serving size	Total fiber (grams)*
Split peas, boiled	1 cup	16.0
Lentils, boiled	1 cup	15.5
Black beans, boiled	1 cup	15.0
Baked beans, canned	1 cup	10.0
Chia seeds	1 ounce	10.0
Almonds	1 ounce (23 nuts)	3.5
Pistachios	1 ounce (49 nuts)	3.0
Sunflower kernels	1 ounce	3.0

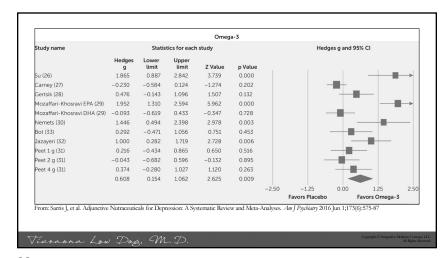
https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/high-fiber-foods/art-20050948

1 50 M

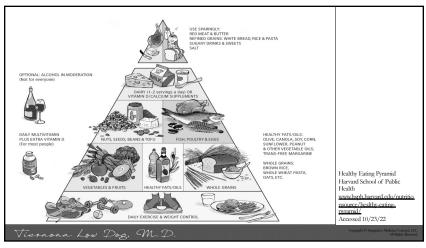
5 FOODS LINKED TO **BETTER BRAINPOWER GREEN VEGGIES** TEA + COFFEE 4. Coffee and tea might offer more collards, and broccoli are rich in brain-healthy nutrients like vitamin K, lutein, folate, and beta carotene. Research than just a short-term concentration boost in a recent study, participants with higher caffeine consumption scored suggests these plant-based foods may help slow cognitive decline. better on tests of mental function. **FATTY FISH** 2. Fatty fish are abundant sources of omega-3 fatty acids, healthy unsaturated fats that have been linked WALNUTS Nuts are excellent sources of protein and healthy fats, and walnuts in particular might also improve memory, to lower blood levels of beta-amyloid the protein that forms damaging clumps in the brains of people with according to a study. Alzheimer's disease. www.health.harvard.edu **3.** Flavonoids, the natural plant pigments that give berries their brilliant hues, also help improve memory, research shows. BERRIES

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31 32



I C Na B2

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Take an Age/Gender Appropriate Multi

- 90 million Americans are vitamin D deficient (using Endocrine Society guidelines < 20ng/mL)
- 30 million are deficient in vitamin B6 (mostly women)
- 18 million people have B12 deficiency (mostly > 50 yrs.)
- ~21 million Americans have serious vitamin C deficiency, 66 million are at risk for deficiency
- 13% Latinas, and 16% African American, and 8% white women (ages 12–49) are iron deficient
- Women 25–39 overall have borderline iodine insufficiency



CDC: 2nd National Report on the Biochemical Indicators of Diet and Nutrition in the U.S. population

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Micronutrient Status of Americans

- NHANES: biochemical status of vitamins A, B6, B12, C, D, E, folate, and anemia aggregated
 to determine overall risk of multiple concurrent deficiencies in U.S. children and adults (n =
 15,030) aged >9 years.
- 31% of population at risk of at least one vitamin deficiency or anemia.
- Deficiency risk most common in women (37% overall): 19–50 years (41%) and pregnant or breastfeeding women (47%).
- Those who did NOT take dietary supplements had highest risk of any deficiency (40%) compared to users of full-spectrum MVI supplements (14%).
- Individuals consuming an adequate diet based on ERA had a lower risk of any deficiency (16%) compared to those with inadequate diet (57%).

Bird JK, et al. Nutrients 2017 Jun 24;9(7):655.

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Twelve Antidepressant Nutrients

- Food is a modifiable determinant of systemic inflammation, which has been described as a major cause and consequence of depression.
- Folate, iron, EPA and DHA, magnesium, potassium, selenium; vitamins A, B1 (thiamine), B6, B12, and C; and zinc is crucial for brain and mood health.
- Highest-scoring animal foods: oysters, mussels, seafoods, and organ meats.
- Highest-scoring plant foods: leafy greens, peppers, cruciferous vegetables.

Kiecolt-Glaser JK, et al. Inflammation: depression fans the flames and feasts on the heat. Am J Psychiatry. 2015;172:1075-1091.

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flourouracil)

From: Kerns JC, et al. Thiamin deficiency in people with obesity. Adv Nutr. 2015 Mar 13;6(2):147-53.

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Thiamine, Obesity and Mood

GOOD SOURCES

Whole Grains

wheat - oats - barley

0·19 mg

Brown Rice 1 cup



- Water soluble, reserves depleted within 4 weeks.
 Pork, beef, organ meats, eggs, fish, wheat germ, whole grains, legumes, and nuts.
- Thiamine deficiency: 15.5–29% of obese patients seeking bariatric surgery.
- Studies show thiamine improves depression alone or as adjunct to SSRI.
- Signs/symptoms deficiency: irritability, depression, fatigue, sleep disturbance, muscle cramps, muscle aches. More severe: hypotension, cardiomegaly, blindness, confusion, heart failure, peripheral neuropathy.

Borges-Vicira JG, et al. Nutr Neurosci. 2023 Mar;26(3):187-207. Kerns JC, et al. Adv Nutr. 2015 Mar 13;6(2):147-53.

Pork Products

ham · pork

3 ounces, 0.81 mg

Lean Pork,

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milligrams; a 3-ounce serving of meat or fish is about the size of a deck of cards

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Legumes

beans · peas · lentils

Lentils (cooked),

1/2 cup · 0-17 mg

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Vitamin B6

(Pyroxidal-5-Phosphate)

- Involved in production of serotonin, dopamine, melatonin, hemoglobin, protein metabolism, energy production, and more.
- 30 million Americans deficient in B6, mostly women.
- Oral contraceptives/hormones lower B6 levels.
- Vancouver BC: 12.4% prevalence of B6 deficiency and suboptimal status in women 19–32 years of age.
- Deficiency: depression; impaired cognition, attention, memory, and sleep.
- Need ~4–6 mg/d to maintain normal serum levels.



Larsson SC, et al. JAMA 2010; 303(11):107783 Morris MS, et al. Am J Clin Nutr 2018; 87(5):1446-54 Ulvik A, et al. Am J Clin Nutr 2014; 100(1):250-5 Ho Cl., et al. Nutrients 2016; Sep 1;8(9).

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Vitamin B12 Deficiency



Bird JK, et al. Nutrients 2017; doi: 10.3390/rm9070655 Jung SB, et al. Intern Med J 2015; 45(4):409-16. Out M, et al. J Diabetes Complications 2018; 32(2):171-178; Niafar M, et al. Intern Emerg Med 2015; 10(1):93-1026

• Institute of Medicine recommends adults > 50 yrs. get B12 from **fortified foods/supplements**

 Deficiency: tingling/numbness in hands and feet, fatigue, shortness of breath, loss of appetite, taste, smell; joint pain, depression, cognitive impairment, and dementia.

 2015 meta-analysis: 80% increased risk B12 deficiency after 10 months of regular PPI use.

 Meta analysis 29 studies: 245% increased risk B12 deficiency metformin use. Low B12 shown to increase progression of diabetic neuropathy.

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B-Vitamins for the Brain

- Adequate levels of ALL B vitamins are essential for optimal physiological and neurological function.
- Evidence from human research clearly shows a significant proportion of populations of developed countries suffer from deficiencies/insufficiencies in one or more B vitamins.
- In the absence of an optimal diet, administration of the entire B-vitamin group, rather than a small sub-set, at doses in excess of current governmental recommendations would be a rational approach for preserving brain health.

Kennedy D. B Vitamins and the Brain: Mechanisms, Dose and Efficacy-A Review. Nutrients 2016 Jan 27;8(2):68.



Copyright Classes

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PPI & Magnesium

- ~50% Americans do not meet RDA of magnesium from their diet.
- Stomach acid necessary for ionization and absorption of magnesium & calcium
- FDA (2011): long-term PPI use (>one year) can cause dangerously low levels.
- 2015 meta-analysis (n=109,798): 63% increased risk of hypomagnesemia in those taking PPIs, compared to non-users.¹
- 2018 review of patients hospitalized for extreme hypomagnesemia found 70% were taking PPIs.²



2. Cheminet G, et al. Intern Emerg Med 2018

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Magnesium Supplementation

- Magnesium supplementation: 300–600 mg daily of magnesium glycinate, citrate, and malate.
- Caution in those with diminished renal function. Diarrhea is side effect with larger doses.
- Note: Anyone with migraines should do trial of magnesium prophylaxis. Most patients with hypertension, diabetes, inflammation should consider magnesium supplementation.



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Where Can You Get Tested?

- · Talk to your healthcare practitioner about potential concerns around micronutrient deficiencies.
- · Most lab tests are readily available through LabCorp or Quest.
- If you order your own tests, www.requestatest.com, Vibrant America, EveryWell, and SpectraCell are commonly used.



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- Exercise causes release of neurotrophic molecules that promote neurogenesis and brain growth, improve memory, and stave off age-related cognitive decline.
- Aerobic exercise increases microbiota diversity
- Increases insulin sensitivity moving glucose into muscle. Increases efficacy of immune system, especially with age.
- Our bodies evolved to require daily physical activity. Exercise does not make our body work more—it makes it work better.

Circadian Rhythms

- · The microbiota modulates circadian rhythm and circadian disruptions can affect the intestinal microbiota. **Microbes** and humans share circadian clock.
- More than 90 million Americans struggle with getting regular, restful
- Major depressive disorder is often associated with a dysregulation of the circadian clock.
- . In a wake-centric culture, what would it look like if we shifted the way we think about sleep?



or causality. Current Sleep Med Reports 2018; 4(1):50-57

Li, Y, et al. The role of microbiome in insomnia, circadian disturbance and depression. Front Psychiatr 2018; doi: 10.3389/fpsyt.2018.00669

 Sleep—both quantity and quality—crucial for brain health. Correlation between poor sleep and stroke, cognitive aging, Alzheimer's dementia, Parkinson's disease, and others.

• Slow-wave sleep, or deep sleep, decreases with age. Less deep sleep associated with increase in beta-amyloid, protein found to accumulate in people with Alzheimer's.

 Lack of sleep also linked to type-2 diabetes, heart disease, obesity, and depression.



Koffel E, et al. J Gen Intern Med 2018 Jun; 33(6): 955-962.

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Basic Sleep Hygiene

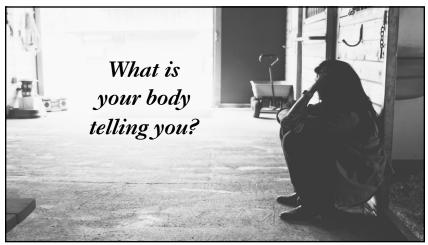


- 1. Make your bedroom dark, quiet, and cool. Invest in good mattress and pillows.
- 2. Turn off TV, computers, tablets, and smartphones 1 hour before bedtime.
- 3. Avoid caffeine after 12:00 PM (e.g., coffee, tea, soda, chocolate).
- 4. Limit alcohol intake and don't drink within 2-3 hours of bedtime.
- 5. Try not to exercise within 2 hours of bedtime.
- 6. Consider a hot bath 1-2 hours before bedtime.
- 7. Try not to eat right before bed. A glass of warm milk, bowl of cereal okay.
- 8. Keep same sleep schedule 7 days a week.
- 9. Get sleep evaluation if sleep disruption and/or daytime fatigue continues.
- 10. CBT for insomnia, or CBT-I, best treatment for chronic insomnia and should be first line of treatment

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Oral Lavender Essential Oil (Lavendula angustifolia)

Meta-analysis randomized, double-blind, placebo-controlled trials show Silexan, essential oil from lavender licensed in 14 countries worldwide, has pronounced anxiolytic effect and beneficial effects on sleep. Adverse events similar to placebo.





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Feeling numb is another way of saying disconnected. While we often describe this as being detached from family, friends, work, Nature, or Creator—what lies underneath for most of us is a profound separation from our own deep inner self.

Staying busy is one way we avoid dealing with unpleasant feelings and emotions. It is when we step out of the busyness of our lives and into solitude that we come face-to-face with things that are hard to look at.



It is impossible to avoid the shadowy places where our fear and sadness live.

But these hidden emotions come at a hefty price to our mental and physical health.

We feel anxious, tired, or "stuck;" we mindlessly eat and gain weight; we struggle to sleep or concentrate; we deal with digestive problems, headaches, and muscle tension.

How many have taken anti-depressants, benzodiazepines, sleeping pills, or other drugs to alleviate symptoms but, in the end, did not find relief?

That's because the symptoms are only part of our story. Our bodies are constantly trying to get our attention. 54



When we ignore our emotions, they keep popping up in all kinds of places, saying, "Hey, deal with me. I'm hurting."

What would it look like to care for your body lovingly?

To deliberately give it nourishing food, healthy movement, adequate rest, lots of joy, and play?

To care for your body as if it were your beloved?

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"But until a person can say deeply and honestly, "I am what I am today because of the choices I made yesterday," that person cannot say, "I choose otherwise."

Stephen Covey

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Our anxiety does not come from thinking about the future, but from wanting to control it.

Kahlil Gibran

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Meaning & Purpose

• What truly gives a person a sense of *meaning and purpose* in life?

 How does one feel the oneness, find the *holy and sacred* in the mundane?

• "If I only had one day left to live, I'd want to ______."

Listen.
Are you
breathing
just a little
and calling
it a life?

Mary Oliver

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60



Praying by Mary Oliver

It doesn't have to be the blue iris, it could be weeds in a vacant lot or a few small stones;

Just pay attention,

then patch a few words together and don't try to make them elaborate,
this isn't a contest but the doorway into thanks, and a silence in which another voice may speak.

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THE ONE YOU FEED



