

Exploring Wellness Strategies in Mental Health

Developed in collaboration with

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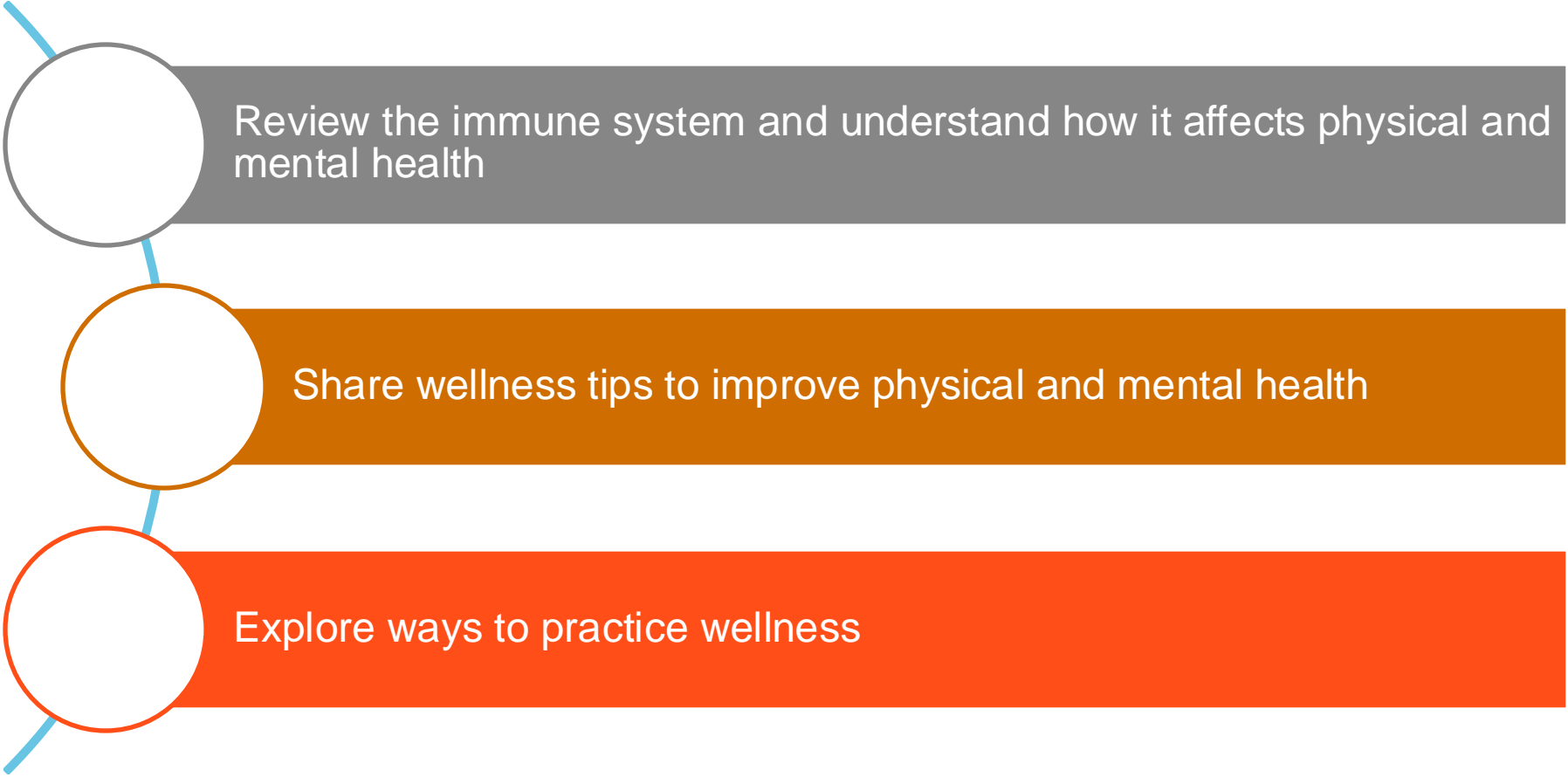
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Learning Objectives



Review the immune system and understand how it affects physical and mental health

Share wellness tips to improve physical and mental health

Explore ways to practice wellness

Inflammation: Effects on Physical and Mental Health



Role of the Immune System Has Changed Over Time

Hunter-gatherer period

- High death rate
- Stressors
 - Predators
 - Infection and Sickness
 - Conflict with other humans
- Immunity
 - Wound healing
 - Fighting infection



Miller and Raison. *Nat Rev Immunol.* 2016;16:22-34.

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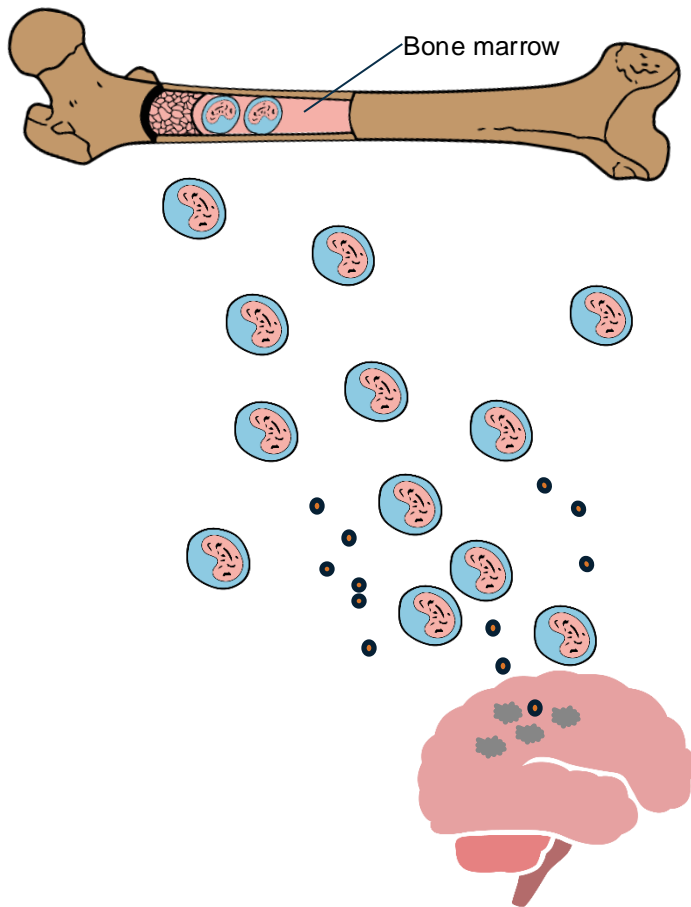


Modern life

- Low death rate
- Stressors
 - Environmental
 - Medical illness
 - Social
- Immunity
 - High inflammation
 - Higher rates of immune system disorders

Miller and Raison. *Nat Rev Immunol.* 2016;16:22-34.

Stress Activates the Immune System



Stress causes the immune system to release cells that fight off infections



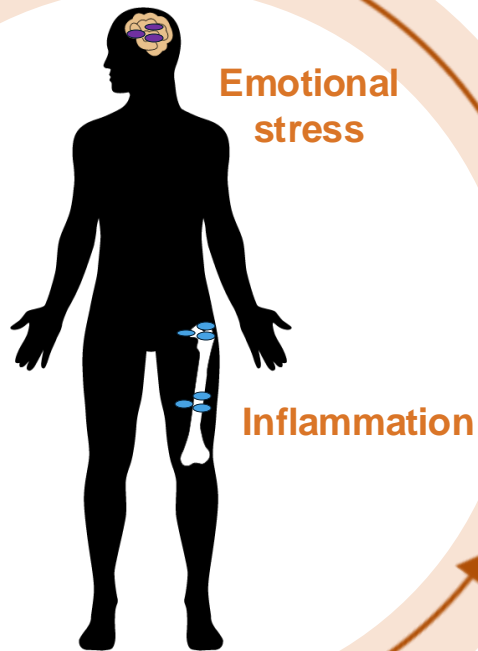
These cells release chemicals that cause inflammation to fight off infection



This may cause inflammation in the brain

Miller AH, et al. *Nat Rev Immunol.* 2016;16(1):22-34.

Stress Can Activate the Immune System



Emotional stress can activate immune responses throughout the body

The greater a person's inflammatory response to stress, the more likely he/she is to develop depression over the next few months

Miller et al. *Nat Rev Immunol.* 2016;16:22-34.

Mild Inflammation May Have Lasting Effects

If mild inflammation lasts for a long period of time, it may increase the risk of mental and **physical** disorders

Posttraumatic stress disorder¹

Bipolar disorder²

Major depressive disorder³

Heart disease⁴

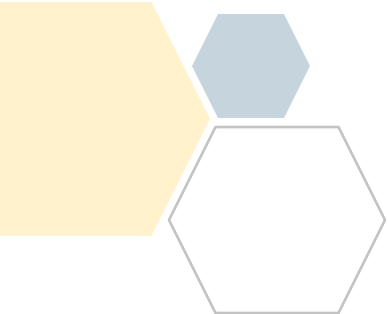
Cancer⁴

Diabetes⁴

1. Eraly et al. *JAMA Psychiatry*. 2014;71:423-431. 2. Najjar et al. *J Neuroinflammation*. 2013;10:43. 3. Lindqvist. *Psychoneuroendocrinology*. 2017;76:197-205. 4. Puzianowska-Kuźnicka et al. *Immun Ageing*. 2016;13:21.



Targeting Inflammation With Wellness



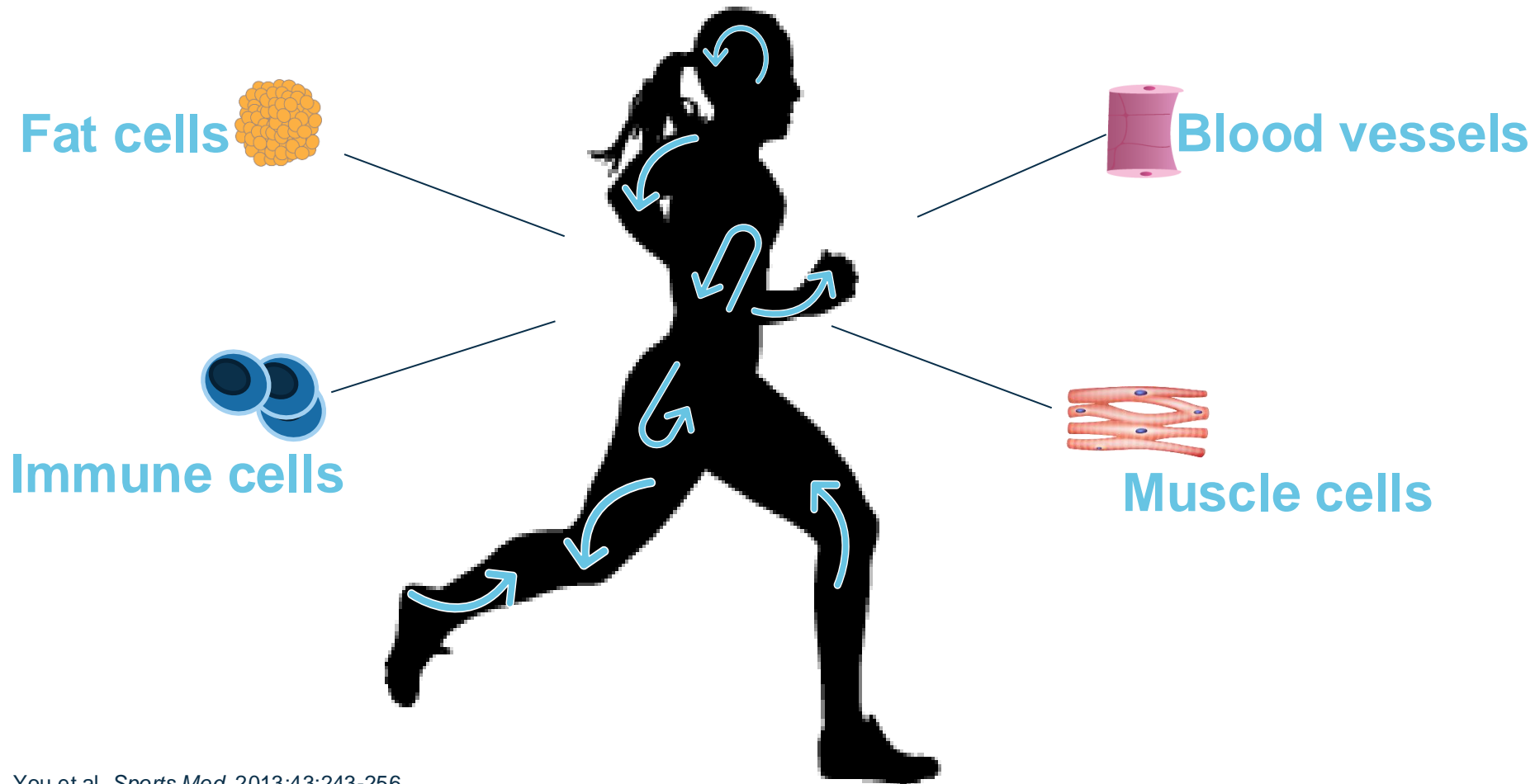
Targets to Improve Wellness



1. Lacey et al. *Psychoneuroendocrinology*. 2014;50:85-94. 2. You et al. *Sports Med*. 2013;43:243-256. 3. Rosenkranz et al. *Brain Behav Immun*. 2013;27:174-184. 4. Depner et al. *Curr Diab Rep*. 2014;14:507. 5. Fardet and Boirie. *Nutr Rev*. 2014;72:741-762.

Exercise Can Reduce Inflammation in Different Ways

Exercise

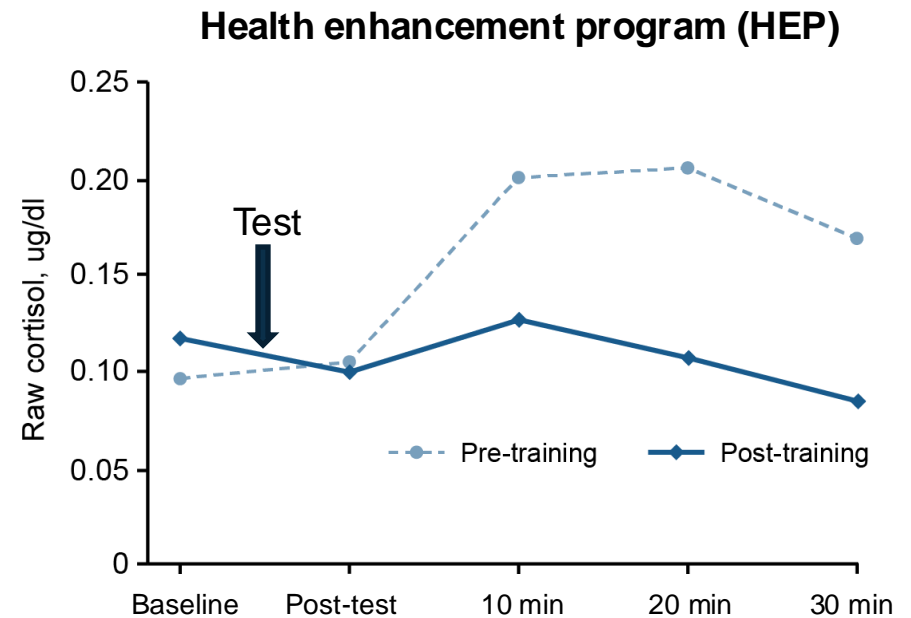
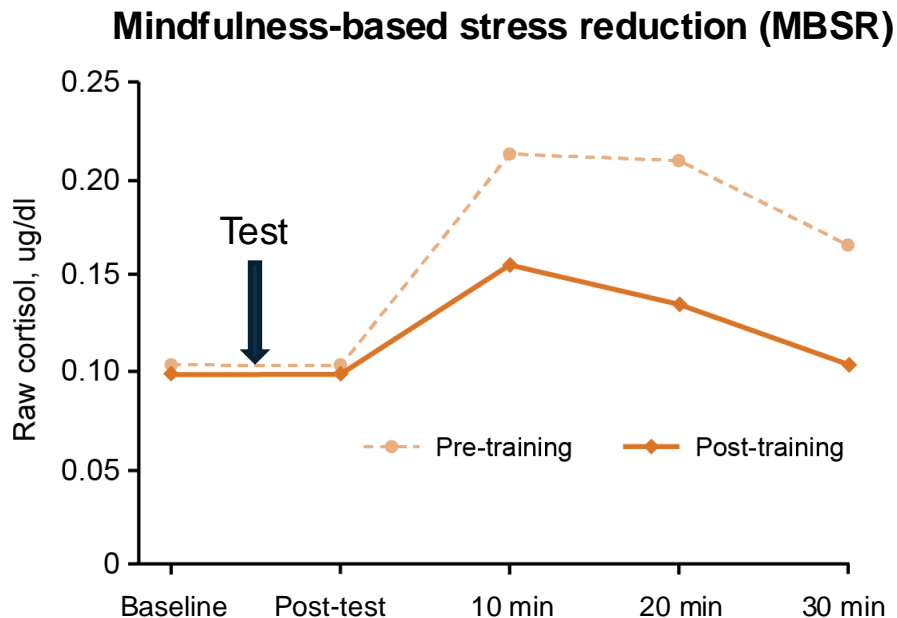


You et al. *Sports Med.* 2013;43:243-256.

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Mindfulness Training May Decrease Inflammation Caused by Social Stress

Mindfulness training reduced stress hormone release

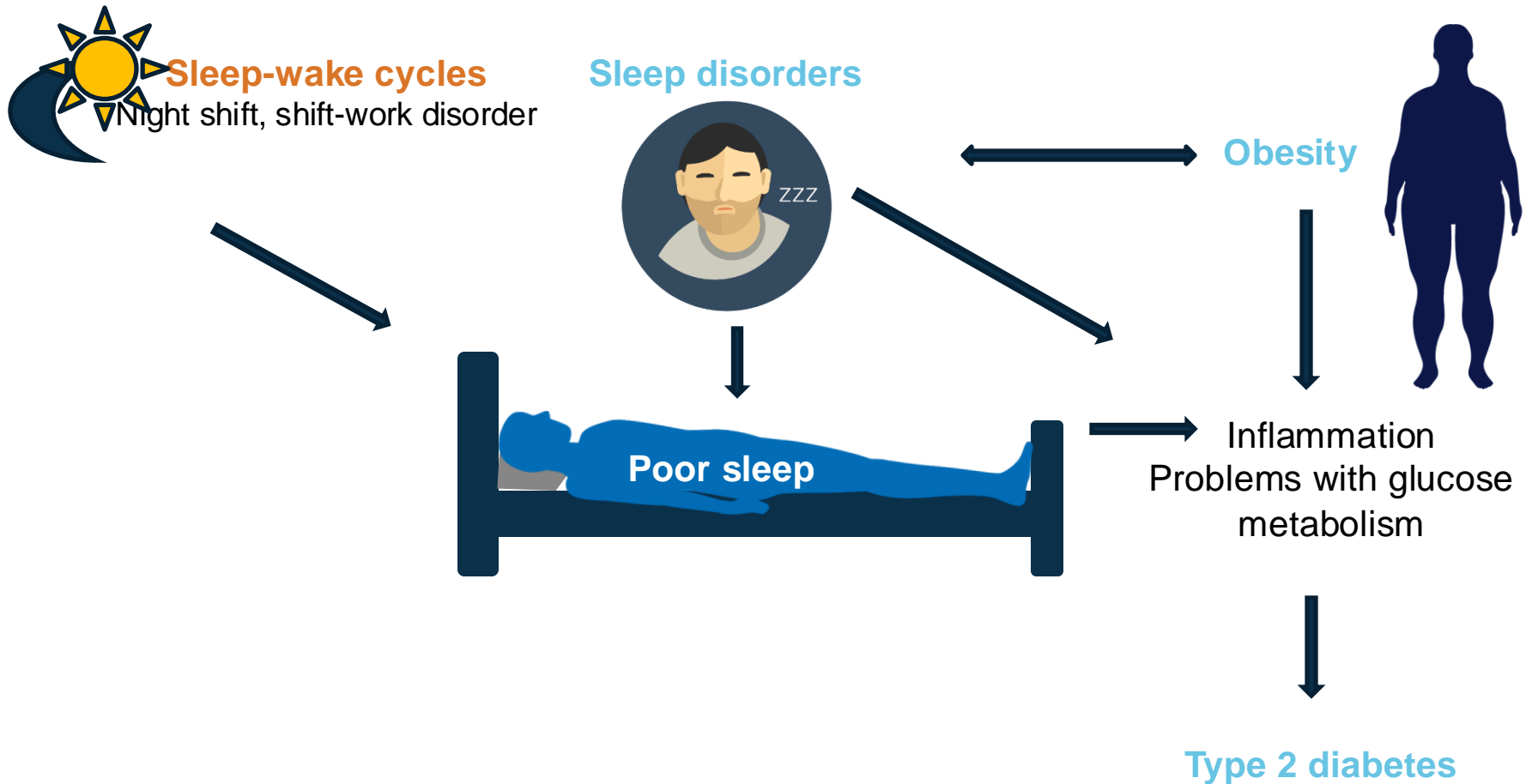


The group that was trained in mindfulness had lower levels of inflammation after a stressful experience compared to the HEP group

HEP, health enhancement program; MBSR, mindfulness-based stress reduction.

Rosenkranz et al. *Brain Behav Immun.* 2013;27:174-184.

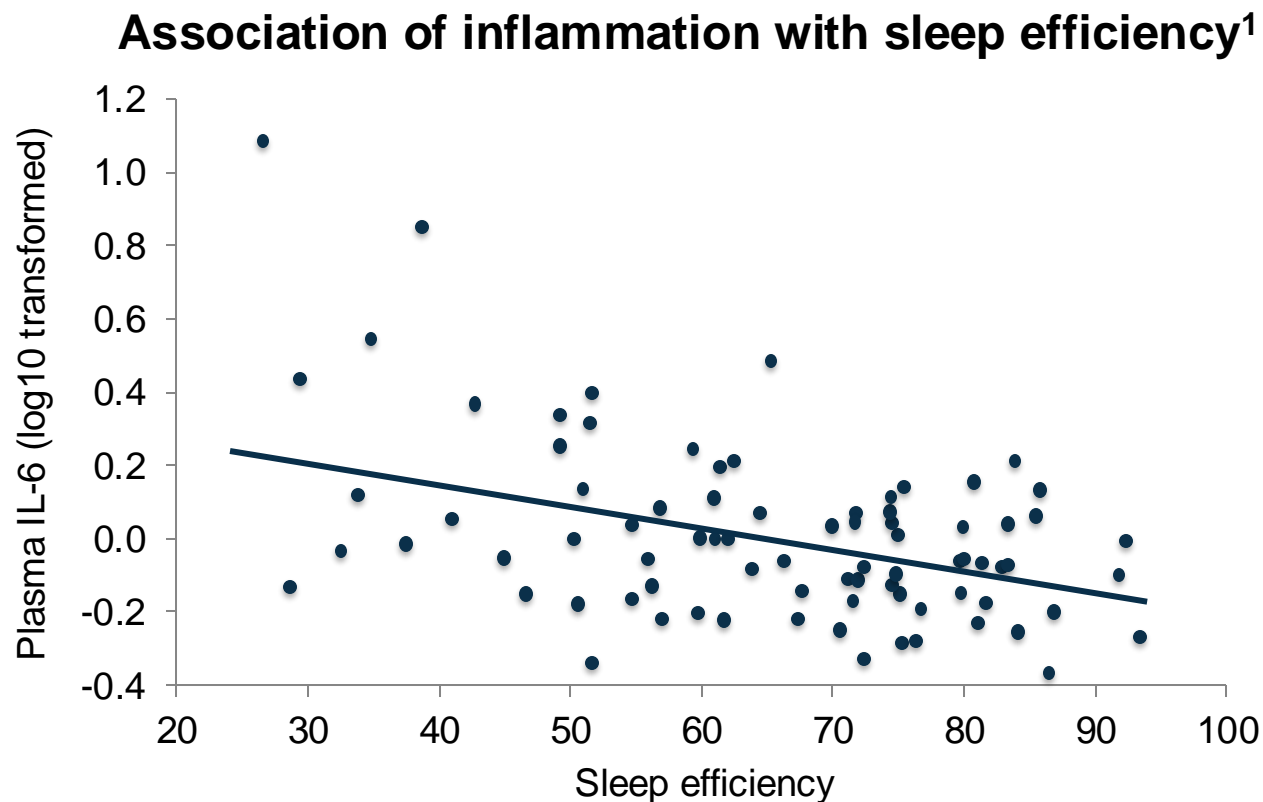
Sleep Is Connected to Inflammation and other conditions



Depner et al. *Curr Diab Rep.* 2014;14:507.

Sleep Problems Are Associated With Increases in Inflammation

Sleep



In a meta-analysis of 72 studies (N >50,000), worse sleep problems were associated with more inflammation²

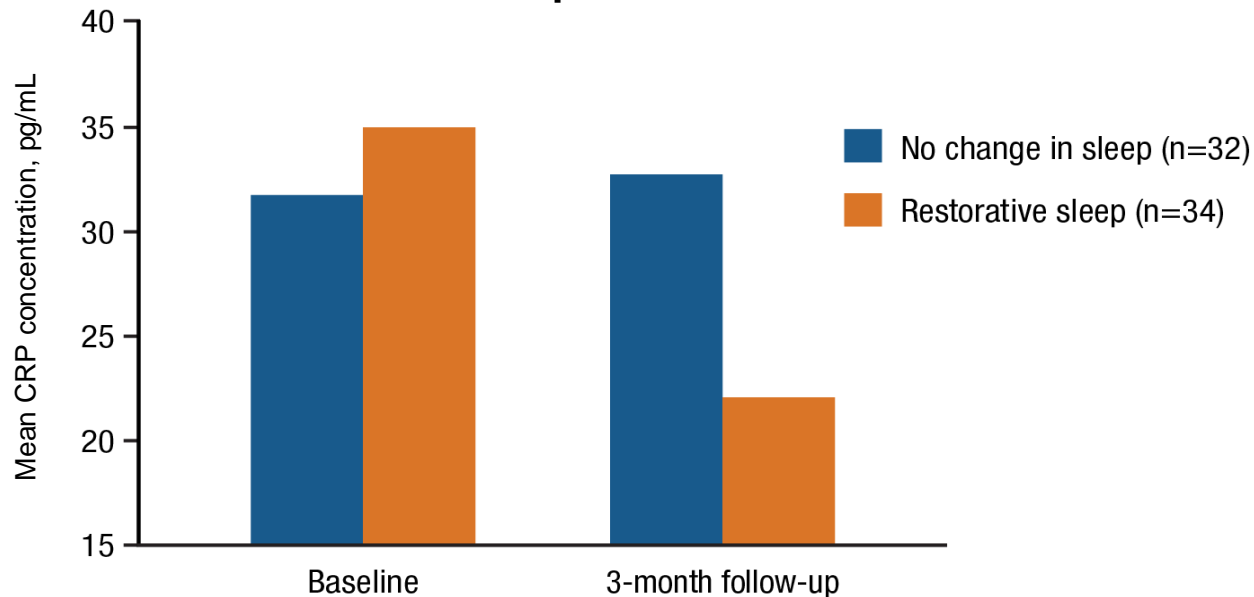
IL-6, interleukin 6.

1. Friedman et al. *Proc Natl Acad Sci U S A*. 2005;102:18757-18762. 2. Irwin et al. *Biol Psychiatry*. 2016;80:40-52.

Sleep Problems Affect Inflammation and Quality of Life



In a study of United States military personnel (N=66), participants with sleep improvements had lower levels of inflammation compared to those whose sleep did not improve



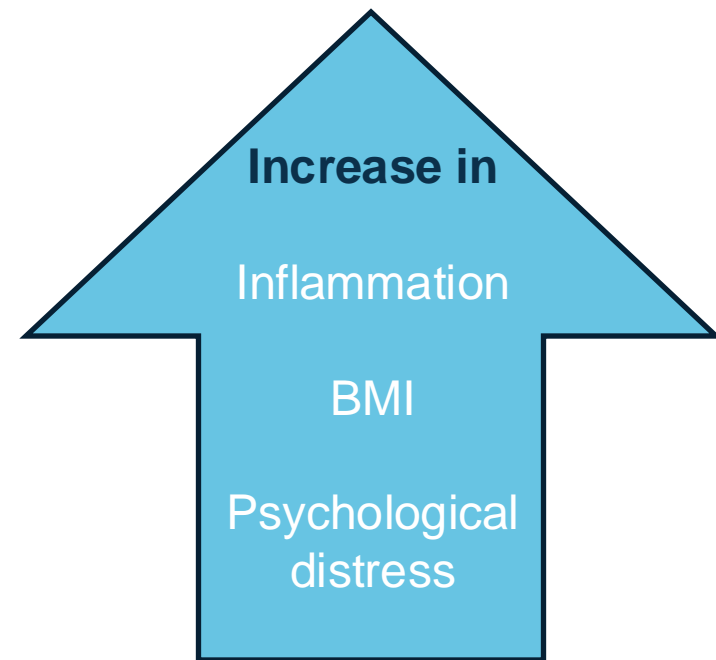
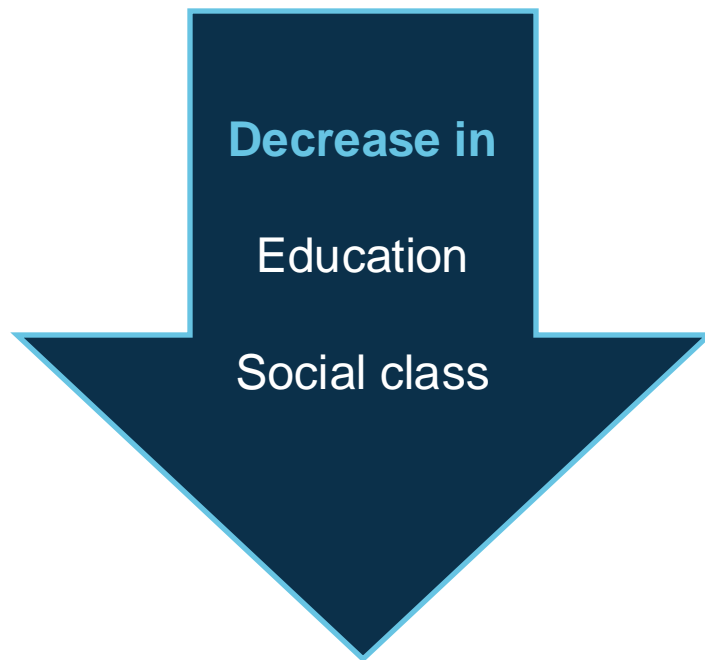
- Participants with improved sleep also reported:
 - Reductions in fatigue and depressive symptoms
 - Increases in emotional well-being, social functioning, and physical functioning

CRP, C-reactive protein.
Heinzelmann et al. *Sleep Med.* 2014;15:65-1570.

Childhood Social Isolation May Lead to High Inflammation in Adulthood

Socialization

Negative consequences of early social isolation may be seen in adulthood[†]

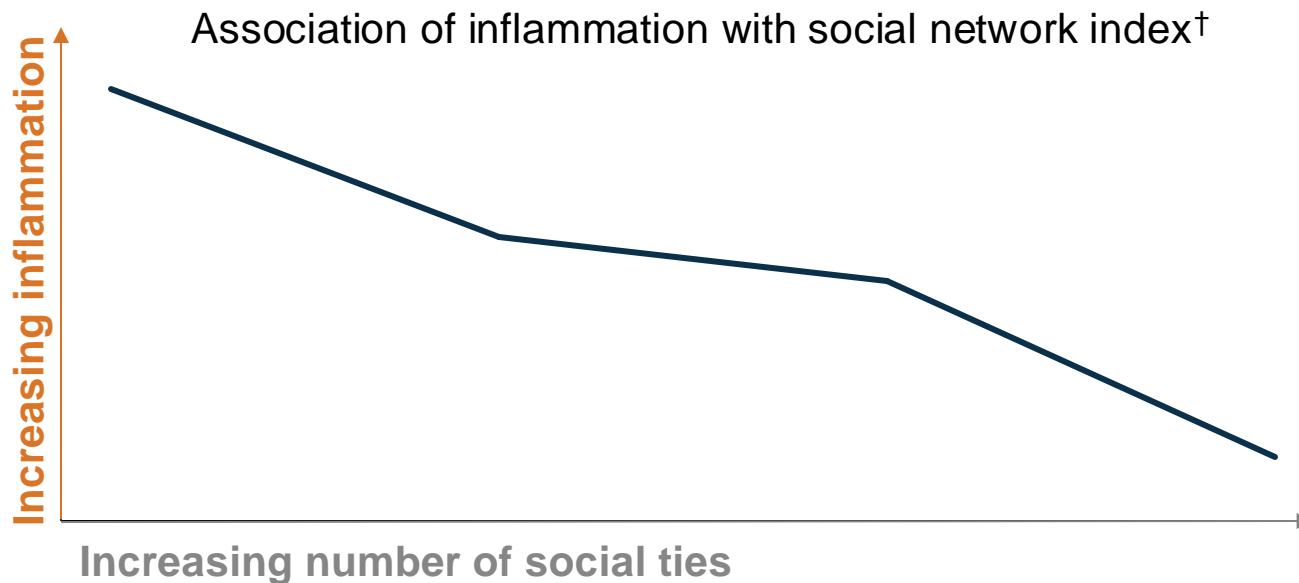


BMI, body mass index.

Lacey et al. *Psychoneuroendocrinology*. 2014;50:85-94.

Low Social Network Ties Are Linked With Higher Inflammation

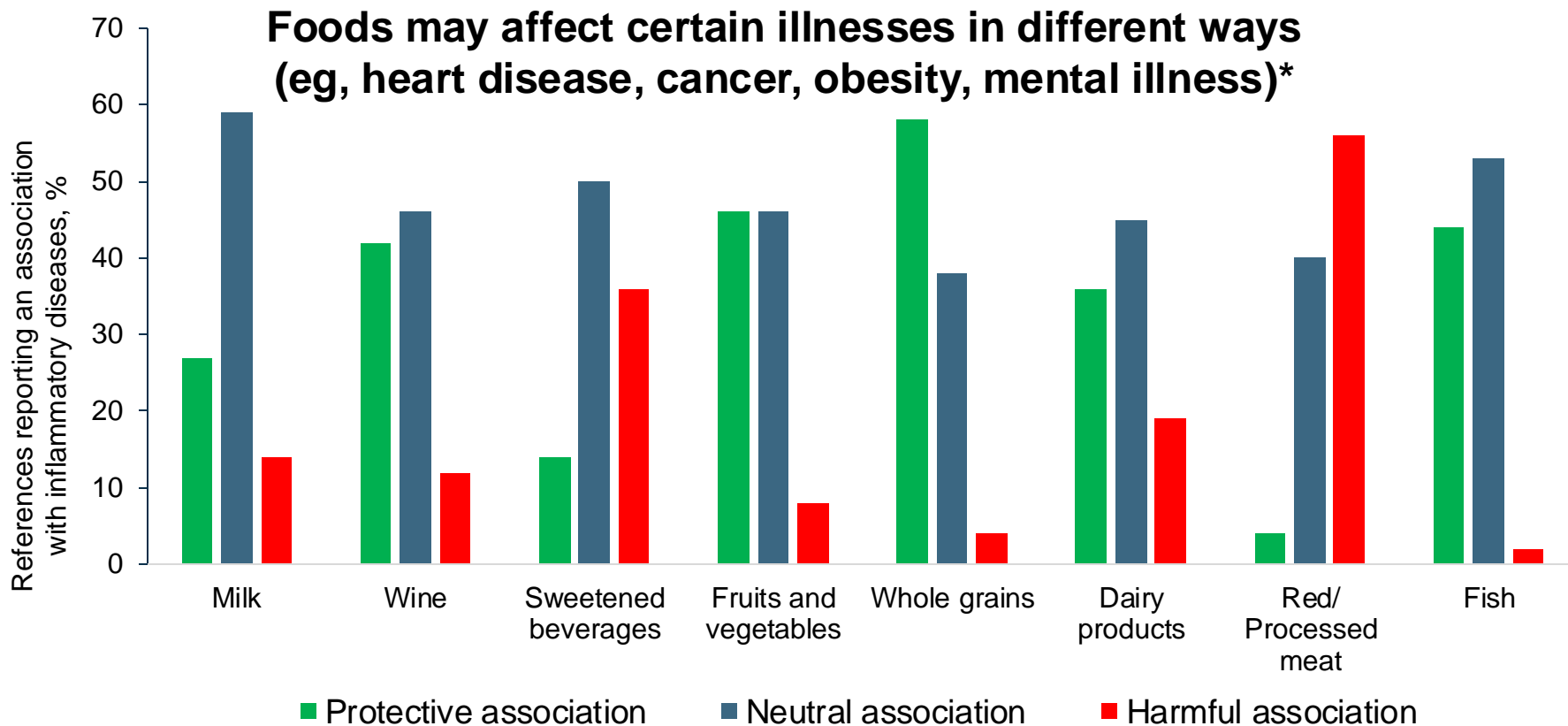
In a national survey of 1,075 American adults with a history of cancer,* those with lower social ties had higher levels of inflammation



*National Health and Nutrition Examination Survey III (1988-1994). †Social network index score based on marital status, frequency of social interactions, religious attendance, and membership in social organizations.

Yang et al. *Biodemography Soc Biol.* 2014;60:21-37.

Diet May Be Linked To Certain Illnesses



*Based on an assessment of pooled/meta-analyses and systematic reviews (N=304) published between 1950 and 2013.

Fardet and Boirie. *Nutr Rev.* 2014;72:741-762.

Certain Diets May Focus on Foods With Anti-inflammatory Effects

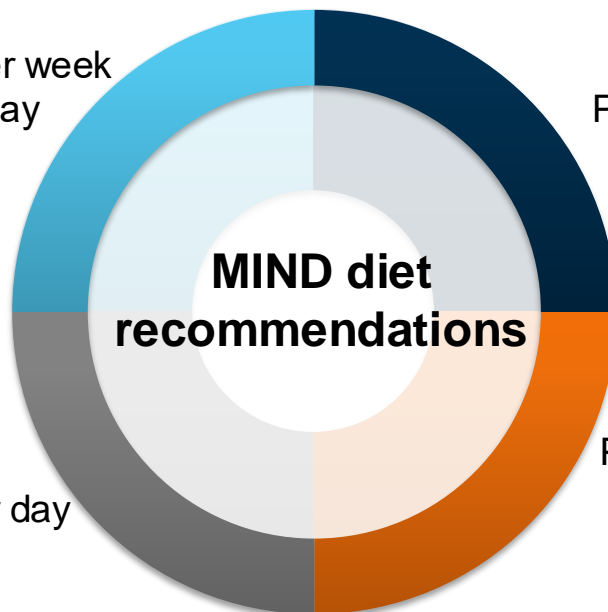
For example, Mediterranean-based diets promote fresh foods, discourage sweets and processed foods, and may positively affect physical and mental health*

Fruits and Vegetables

Green leafy vegetables, ≥ 6 servings per week
Other vegetables, ≥ 1 serving per day
Berries, ≥ 2 servings per week
Beans, > 3 meals per week

Oils and Cheese

Olive oil as the primary oil used
Fast fried foods, < 1 time per week
Butter or margarine, < 1 tablespoon per day
Cheese, < 1 serving per week



Protein

Fish (not fried), ≥ 1 meal per week
Poultry (not fried), ≥ 2 meals per week
Red meats, < 4 meals per week
Nuts, ≥ 5 servings per week

Carbohydrates

Whole grains, ≥ 3 servings per day
Pastries/sweets, < 5 servings per week
Wine, 1 glass per day

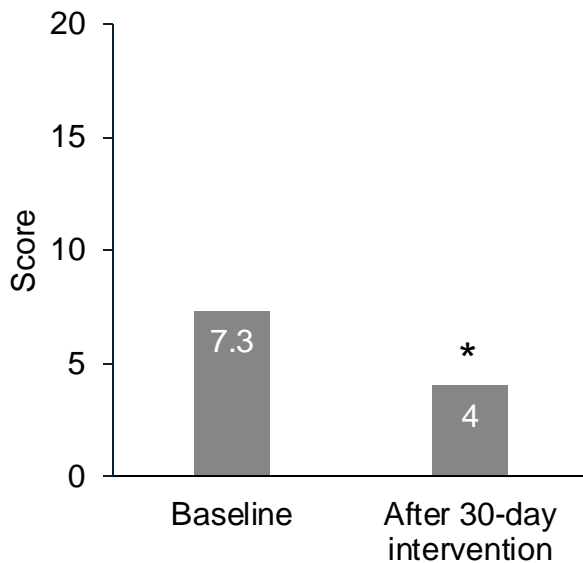
MIND, Mediterranean-DASH diet intervention for neurodegenerative delay; DASH, dietary approach to systolic hypertension
Morris et al. *Alzheimers Dement.* 2015;1:1015-1022.



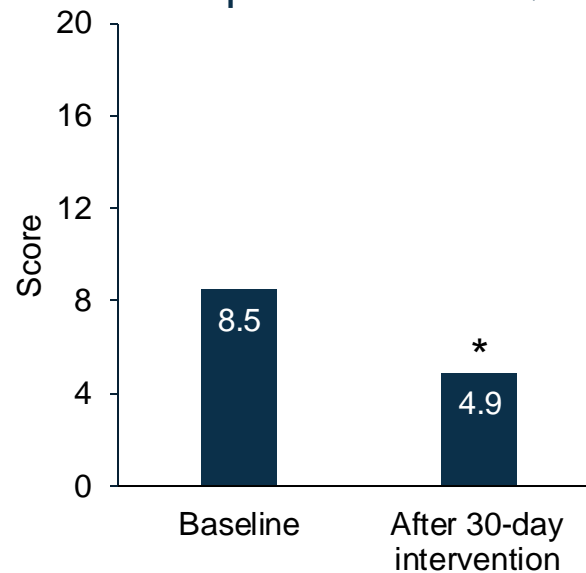
Effects on Overall Wellness

Adults (N=36) who followed the WILD-5 wellness plan for 30 days demonstrated significant improvement in anxiety, depression, and overall well-being

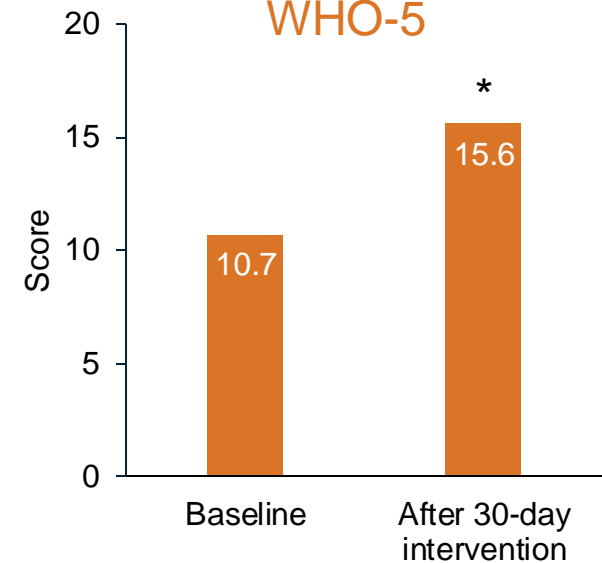
Anxiety: GAD-7



Depression: PHQ-9



Overall Well-being: WHO-5



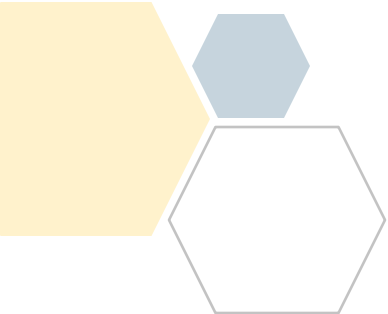
* $P < 0.01$ vs baseline score.

WILD-5, Wellness Interventions to meet Life's Demands; GAD-7, Generalized Anxiety Disorder 7-item; PHQ-9, Patient Health Questionnaire-9; WHO-5, World Health Organization Wellbeing Index.

Jain et al. Poster presented at: 28th Annual US Psychiatric Congress Annual Meeting; September 10-13, 2015; San Diego, CA.



Suggestions for Practicing Wellness



Simple Suggestions for Practicing Wellness*



*Information based on Dr. Jain's own experience in psychiatric settings.

Jain et al. Poster presented at: 28th Annual US Psychiatric Congress Annual Meeting; September 10-13, 2015; San Diego, CA.

Summary



Inflammation may have lasting effects on physical and mental health

Exercise, mindfulness, sleep, nutrition, and social connectedness may decrease inflammation

Exercise, mindfulness, improving sleep, nutrition, and socialization, may positively affect both physical and mental health