

### mantra

mantra meditation, mindfulness, yoga & h2 water

### impact

articles: 298

publications: 222

citations: 11,226

### evidence





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# mantra meditation & mindfulness modulate happiness & DNA

### i. mantra meditation modulates cognition, creativity & mental health



## Effects of a Randomized Controlled Trial of Transcendental Meditation on Components of the Metabolic Syndrome in Subjects With Coronary Heart Disease

JAMA Internal Medicine

https://jamanetwork.com/journals/jamainternalmedicine/article-abstract/410453

randomised controlled trial, single blind citations: 307

"This randomized, controlled trial found that a selected mind-body, stress reduction intervention, the TM program, significantly reduced risk for mortality, MI, and stroke in black men and women with coronary heart disease."

### Stress Reduction in the Secondary Prevention of Cardiovascular Disease: Randomized, Controlled Trial of Transcendental Meditation and Health Education in Blacks

Circulation: Cardiovascular Quality and Outcomes https://www.ahajournals.org/doi/full/10.1161/CIRCOUTCOMES.112.967406

randomised controlled trial, single blind citations: 222

"This is the first randomised controlled trial to demonstrate that a selected mind-body intervention, the transcendental meditation program, decreased blood pressure in association with decreased psychological distress, and increased coping in young adults at risk for hypertension."

A Randomized Controlled Trial on Effects of the Transcendental Meditation Program on Blood Pressure, Psychological Distress, and Coping in Young Adults

American Journal of Hypertension <a href="https://academic.oup.com/ajh/article/22/12/1326/182024">https://academic.oup.com/ajh/article/22/12/1326/182024</a>

randomised controlled trial, single blind citations: 197



"Results indicate that TM can be effective in improving the quality of life and functional capacity of African American congestive heart failure patients."

### Effectiveness of Transcendental Meditation on Functional Capacity and Quality of Life of African Americans with Congestive Heart Failure: A Randomized Control Study

Ethnicity and Disease

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2048830/

randomised controlled trial, single blind citations: 142

"Overall, TM practice is more effective than treatment as usual and most alternative treatments, with greatest effects observed in individuals with high anxiety."

### Effects of the Transcendental Meditation Technique on Trait Anxiety: A Meta-Analysis of Randomized Controlled Trials

The Journal of Alternative and Complimentary Medicine <a href="https://www.liebertpub.com/doi/full/10.1089/acm.2013.0204">https://www.liebertpub.com/doi/full/10.1089/acm.2013.0204</a>

randomised controlled trial, single blind citations: 139

"Results indicate that the Transcendental Meditation technique improves the quality of life of older breast cancer patients."

### A Randomized Controlled Trial of the Effects of Transcendental Meditation on Quality of Life in Older Breast Cancer Patients

Integrative Cancer Therapies <a href="https://journals.sagepub.com/doi/abs/10.1177/1534735409343000">https://journals.sagepub.com/doi/abs/10.1177/1534735409343000</a>

randomised controlled trial, single blind citations: 73

"The results of this randomized controlled study indicate that the TM program was effective at four-month follow-up in reducing psychological distress and burnout in employees working in a therapeutic school for students with behavioral problems."

### Effect of Transcendental Meditation on Employee Stress, Depression, and Burnout: A Randomized Controlled Study

The Permanente Journal <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3951026/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3951026/</a>

randomised controlled trial citations: 100



### The cumulative effects of Transcendental Meditation on cognitive function — a systematic review of randomised controlled trials

Wiener Klinische Wochenschrift https://link.springer.com/article/10.1007/BF03040500

randomised controlled trial citations: 95

#### mantra meditation research via David Lynch Foundation

https://www.davidlynchfoundation.org/research.html

#### **Benefits to Education**

- 1. 21% increase in high school graduation rate, Education 133 (4): 495-500, 2013
- 2. 10% improvement in test scores and GPA, Education 131: 556-565, 2011
- 3. Increased attendance and decreased suspensions for high school students, Health and Quality of Life Outcomes 1:10, 2003
- 4. Reduced ADHD symptoms and symptoms of other learning disorders, Mind & Brain: The Journal of Psychiatry 2 (1): 73-81, 2011
- 5. Increased intelligence and creativity, Intelligence 29: 419-440, 2001
- 6. 40% reduction in psychological distress, including stress, anxiety and depression, American Journal of Hypertension 22(12): 1326-1331, 2009
- 7. Reduction in teacher burnout and perceived stress, Permanante Journal 18 (1): 19-23, 2014

#### **Improved Brain Functioning**

- 1. Human Physiology 25 (1999) 171-180.
- 2. Psychophysiology 31 Abstract (1994) S67.
- 3. Psychophysiology 27 Supplement (1990) 4A.
- 4. Psychophysiology 26 (1989) 529.
- 5. International Journal of Neuroscience 15 (1981) 151-157.
- 6. International Journal of Neuroscience 14: (1981) 147-151.
- 7. International Journal of Neuroscience 13: (1981) 211-217.
- 8. Psychosomatic Medicine 46: (1984) 267-276.

### Increased Blood Flow to the Brain

- 1. Physiology & Behavior, 59(3) (1996): 399-402.
- 2. American Journal of Physiology 235(1)(1978): R89–R92.
- 3. Psychophysiology 13 (1976): 168.
- 4. The Physiologist 21 (1978): 60.

### Increased Flexibility of Brain Functioning

- 1. Biological Psychology, 55 (2000): 41-55.
- 2. Psychophysiology 14 (1977): 293–296.

#### Increased Efficiency of Information Transfer in the Brain

- 1. Motivation, Motor and Sensory Processes of the Brain, Progress in Brain Research 54 (1980): 447–453.
- 2. International Journal of Neuroscience 10 (1980): 165-170.
- 3. Psychophysiology 26 (1989): 529.



#### Mobilization of the Latent Reserves of the Brain

1. Proceedings of the International Symposium: Physiological and Biochemical Basis of Brain Activity, St. Petersburg, Russia, (June 22–24, 1994).

#### **Increased Intelligence in Secondary and College Students**

- 1. Intelligence 29/5 (2001): 419-440.
- 2. Journal of Personality and Individual Differences 12 (1991): 1105-1116.
- 3. Perceptual and Motor Skills 62 (1986): 731-738.
- 4. College Student Journal 15 (1981): 140-146.
- 5. Journal of Clinical Psychology 42 (1986): 161-164.
- 6. Gedrag: Tijdschrift voor Psychologie [Behavior: Journal of Psychology] 3 (1975): 167-182.
- 7. Dissertation Abstracts International 38(7) (1978): 3372B-3373B.
- 8. Higher Education Research and Development 15 (1995): 73-82.

#### **Increased Creativity**

- 1. Journal of Personality and Social Psychology 57 (1989) 950-964.
- 2. The Journal of Creative Behavior 19 (1985) 270-275.
- 3. Dissertation Abstracts International 38(7): 3372B–3373B, 1978.

#### **Improved Memory**

1. Memory and Cognition 10 (1982): 207-215.

#### **Improved Academic Performance**

- 1. Education 107 (1986): 49-54.
- 2. Education 109 (1989): 302-304.
- 3. British Journal of Educational Psychology 55 (1985): 164–166.

### **Benefits in Special Education**

- 1. Journal of Clinical Psychiatry 42 (1981) 35-36.
- 2. Journal of Biomedicine 1 (1980) 73-88.

#### **Increased Integration of Personality**

Increased Self-Confidence and Self-Actualization

- 1. Journal of Social Behavior and Personality 6 (1991): 189-247.
- 2. Higher Stages of Human Development: Perspectives on Adult Growth (New York: Oxford University Press, 1990), 286–341.
- 3. British Journal of Psychology 73 (1982) 57-68.
- 4. College Student Journal 15 (1981): 140-146.
- 5. Journal of Counseling Psychology 20 (1973): 565-566.
- 6. Journal of Counseling Psychology 19 (1972): 184-187.

#### **Improved Perception**

- 1. Perceptual and Motor Skills 49 (1979): 270.
- 2. Perceptual and Motor Skills 64 (1987): 1003–1012.

#### **Increased Efficiency of Perception and Memory**

1. Memory and Cognition 10 (1982): 207-215.

#### **Orientation Towards Positive Values**

1. Perceptual and Motor Skills 64 (1987): 1003-1012.



#### **Improved Problem-Solving Ability**

- 1. Personality and Individual Differences 12 (1991): 1105-1116.
- 2. Dissertation Abstracts International 38(7): 3372B-3373B, 1978.

#### **Decreased Hostility**

- 1. Criminal Justice and Behavior 5 (1978): 3-20.
- 2. Criminal Justice and Behavior 6 (1979): 13-21.

### Improved Left Hemispheric Functioning—Improved Verbal and Analytical Thinking

- 1. The Journal of Creative Behavior 13 (1979): 169-180.
- 2. The Journal of Creative Behavior 19 (1985): 270-275.
- 3. Perceptual and Motor Skills 62 (1986): 731-738.

#### Improved Right Hemispheric Functioning—Improved Synthetic and Holistic Thinking

- 1. The Journal of Creative Behavior 13 (1979): 169-180.
- 2. Journal of Clinical Psychology 42 (1986): 161-164.
- 3. Biofeedback and Self-Regulation 2 (1977): 407-415.

#### Increased Field Independence—Increased Resistance to Distraction and Social Pressure

- 1. Perceptual and Motor Skills 39 (1974): 1031-1034.
- 2. Perceptual and Motor Skills 65 (1987): 613-614.
- 3. Perceptual and Motor Skills 59 (1984): 999-1000.
- 4. Dissertation Abstracts International 38(7) (1978): 3372B-3373B.

#### **Reduced Anxiety**

- 1. Journal of Clinical Psychology 45 (1989) 957-974.
- 2. Anxiety, Stress and Coping: An International Journal 6 (1993) 245-262.
- 3. Journal of Clinical Psychology 33 (1977) 1076-1078.
- 4. Dissertation Abstracts International 38(7) (1978): 3372B-3373B.
- 5. Hospital & Community Psychiatry 26 (1975): 156-159.

#### **Decreased Depression**

- 1. Journal of Counseling and Development 64 (1986): 212–215.
- 2. Journal of Humanistic Psychology 16(3)(1976): 51-60.
- 3. Gedrag: Tijdschrift voor Psychologie [Behavior: Journal of Psychology] 4 (1976): 206-218.

#### **Improved School-Related Behavior**

Reduction of Anger, Absenteeism, Disciplinary Infractions and Suspensions

- 1. Annals of Behavioral Medicine 23 (2001) S100.
- 2. Health and Quality of Life Outcomes 1 (2003): 10.

#### **Increased Tolerance**

- 1. The Journal of Psychology 99 (1978): 121-127.
- 2. International Journal of the Addictions 26 (1991): 293-325.
- 3. Dissertation Abstracts International 38(7) (1978): 3372B-3373B.



#### **Reduced Substance Abuse**

- 1. Alcoholism Treatment Quarterly 11 (1994) 1-524.
- 2. Bulletin of the Society of Psychologists in Addictive Behaviors 2 (1983) 28-33.
- 3. The International Journal of the Addictions 12 (1977) 729-754.
- 4. Journal of Offender Rehabilitation 36 (2003): 127-160.
- 5. American Journal of Psychiatry 132 (1975): 942-945.
- 6. American Journal of Psychiatry 131 (1974): 60-63.

#### **Accelerated Cognitive Development in Children**

- 1. Perceptual and Motor Skills 65 (1987): 613-614
- 2. Journal of Social Behavior and Personality 17 (2005): 65-91.
- 3. Journal of Social Behavior and Personality 17 (2005): 47–64.

#### **Greater Interest in Academic Activities**

1. Western Psychologist 4 (1974): 104-111.

#### **Improved Health**

Physiological Rest

- 1. American Physiologist 42 (1987) 879-881.
- 2. Science 167 (1970) 1751-1754.
- 3. American Journal of Physiology 221 (1971) 795-799.

#### **Increased Muscle Relaxation**

- 1. Electroencephalography and Clinical Neurophysiology 35 (1973): 143-151.
- 2. Psychopathométrié 4 (1978): 437-438.

#### **Faster Reactions**

- 1. Personality and Individual Differences 12 (1991): 1106–1116.
- 2. Perceptual and Motor Skills 38 (1974): 1263–1268.
- 3. Perceptual and Motor Skills 46 (1978): 726.
- 4. Motivation, Motor and Sensory Processes of the Brain, Progress in Brain Research 54 (1980): 447–453.
- 5. L'Encéphale [The Brain] 10 (1984): 139-144.

#### **Decreased Stress Hormone (Plasma Cortisol)**

- 1. Hormones and Behavior 10(1)(1978): 54-60.
- 2. Journal of Biomedicine 1 (1980): 73-88.
- 3. Clinical and Experimental Pharmacology and Physiology 7 (1980): 75–76.
- 4. Experientia 34 (1978): 618-619.

#### Increased Stability of the Autonomic Nervous System

- 1. Psychosomatic Medicine 35 (1973): 341-349.
- 2. Psychosomatic Medicine 44 (1982): 133-153.

### **Healthier Response to Stress**

- 1. Psychosomatic Medicine 35 (1973): 341-349.
- 2. Journal of Counseling and Development 64 (1986): 212–215.
- 3. Psychosomatic Medicine 49 (1987): 212-213.
- 4. Journal of Psychosomatic Research 33 (1989): 29-33.
- 5. Psychosomatic Medicine 44 (1982): 133-153.
- 6. International Journal of Neuroscience 46 (1989): 77-86.



### **Reduced Blood Pressure in Adolescents**

- 1. Annals of Behavioral Medicine 22 (2000) S133.
- 2. American Journal of Hypertension (2004).

#### **Decreased Blood Pressure in Hypertensive Subjects**

- 1. Hypertension 26 (1995): 820-827.
- 2. Journal of Personality and Social Psychology 57 (1989): 950-964.

#### **Decreased Insomnia**

- 1. The New Zealand Family Physician 9 (1982): 62-65.
- 2. Journal of Counseling and Development 64 (1986): 212-215.
- 3. Japanese Journal of Public Health 37 (1990): 729.

#### **Healthier Family Life**

- 1. Psychological Reports 51 (1982): 887-890.
- 2. Journal of Counseling and Development 64 (1986): 212-215

#### **Lower Health Insurance Utilization Rates**

- 1. Psychosomatic Medicine 49 (1987) 493-507.
- 2. American Journal of Health Promotion 10 (1996) 208-216.

#### **Improved Mind-Body Coordination**

- 1. Journal of Clinical Psychology 42 (1986) 161-164.
- 2. Perceptual and Motor Skills 46 (1978) 726.
- 3. Perceptual and Motor Skills 38 (1974) 1263-1268.



### ii. mindfulness modulates DNA



"Psychosocial interventions providing stress reduction and emotional support resulted in trends toward telomere length maintenance in distressed breast cancer survivors, compared with decreases in usual care"

Mindfulness-based cancer recovery and supportive-expressive therapy maintain telomere length relative to controls in distressed breast cancer survivors Cancer, Wiley Periodicals

https://onlinelibrary.wiley.com/doi/full/10.1002/cncr.29063

randomised controlled trial, double blind citations: 160

"Regular yoga practice remarkably attenuated oxidative stress and improved antioxidant levels of the body."

"Yoga practice also significantly increased immune-related cytokines, such as interleukin-12"

"Moreover, yoga beneficially affected stress hormone releases as well as partially improved immune function"

Regular Yoga Practice Improves Antioxidant Status, Immune Function, and Stress Hormone Releases in Young Healthy People: A Randomized, Double Blind, Controlled Pilot Study The Journal of Alternative and Complimentary Medicine <a href="https://www.liebertpub.com/doi/abs/10.1089/acm.2014.0044">https://www.liebertpub.com/doi/abs/10.1089/acm.2014.0044</a>

randomised controlled trial, double blind citations: 57



"it is shown that two different definitions of meditation are able to change the expression of genes in distinct ways and that the mental silence definition of meditation may exert its biological effects by altering the expression of genes related to the immune system/inflammation, cancer and cell structure and function"

### Epigenetic Changes Associated With Two Different Conceptualisations of Meditation- A Randomised Trial

Sydney Medical School The University of Sydney <a href="https://ses.librarv.usvd.edu.au/handle/2123/16649">https://ses.librarv.usvd.edu.au/handle/2123/16649</a>

randomised controlled trial citations:

"This work provides an initial indication that mindfulness based stress reduction may be a novel treatment approach for reducing loneliness and related pro-inflammatory gene expression in older adults"

# Mindfulness-Based Stress Reduction training reduces loneliness and pro-inflammatory gene expression in older adults: a small randomized controlled trial

Brain Behavioural Immunology <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3635809/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3635809/</a>

randomised controlled trial, single blind citations: 458

"DNA epigenetic status of the subjects was affected by the MBT-T mind-body therapeutic protocol treatment."

#### Pilot Study on Epigenetic Response to A Mind-Body Treatment

Translational Medicine https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6067070/

randomised controlled trial citations: 9

"The results of 18 studies that used gene expression analysis in research on meditation and related MBIs have overall found downregulation of NF-kB-targeted genes, which can be understood as the reversal of the molecular signature of the effects of chronic stress"

## What Is the Molecular Signature of Mind-Body Interventions? A Systematic Review of Gene Expression Changes Induced by Meditation and Related Practices

Frontiers in Immunology

https://www.frontiersin.org/articles/10.3389/fimmu.2017.00670/full

randomised controlled trial citations: 121



"A brief daily yogic meditation intervention may reverse the pattern of increased NF-κB-related transcription of pro-inflammatory cytokines and decreased IRF1-related transcription of innate antiviral response genes previously observed in healthy individuals confronting a significant life stressor"

# Yogic meditation reverses NF-kB and IRF-related transcriptome dynamics in leukocytes of family dementia caregivers in a randomized controlled trial

Psychoneuroendocrinology

https://www.sciencedirect.com/science/article/pii/S0306453012002260?via%3Dihub

randomised controlled trial citations: 219

"A 12-week restorative lyengar yoga intervention reduced inflammation-related gene expression in breast cancer survivors with persistent fatigue. These findings suggest that a targeted yoga program may have beneficial effects on inflammatory activity in this patient population, with potential relevance for behavioral and physical health."

"the yoga group showed reduced activity of the pro-inflammatory transcription factor nuclear factor kappa B (NF-кВ)"

### Yoga reduces inflammatory signaling in fatigued breast cancer survivors: A randomized controlled trial

Psychoneuroendocrinology <a href="https://www.sciencedirect.com/science/article/pii/S0306453014000444?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S0306453014000444?via%3Dihub</a>

randomised controlled trial citations: 181

"A 4-week mindfulness based stress reduction resulted in significant improvement in sperm DNA integrity and regulation of oxidative stress may affect the sperm epigenome"

### Impact of mindfulness based stress reduction on sperm DNA damage

Journal of the Anatomical Society of India <a href="https://www.sciencedirect.com/science/article/pii/S0003277818300583">https://www.sciencedirect.com/science/article/pii/S0003277818300583</a>

randomised controlled trial citations: 6



"Qigong practice may regulate immunity, metabolic rate, and cell death, possibly at the transcriptional level. Our pilot study provides the first evidence that Qigong practice may exert transcriptional regulation at a genomic level"

## Genomic profiling of neutrophil transcripts in Asian Qigong practitioners: a pilot study in gene regulation by mind-body interaction

Journal of Alternative and Complimentary Medicine <a href="https://www.ncbi.nlm.nih.gov/pubmed/15750361/">https://www.ncbi.nlm.nih.gov/pubmed/15750361/</a>

citations: 66

"Meditation helps regulate the stress response, thereby suppressing chronic inflammation states and maintaining a healthy gut-barrier function. Conclusions The current research team recommends the integration of meditation into conventional health care and wellness models"

The Effects of Stress and Meditation on the Immune System, Human Microbiota, & Epigenetics Adv Mind Body Med

https://www.ncbi.nlm.nih.gov/pubmed/29306937/

citations: 32

The impact of psychological distress during pregnancy on the developing fetus: biological mechanisms and the potential benefits of mindfulness interventions

Journal of Perinatal Medicine

https://www.degruyter.com/view/j/jpme.2017.45.issue-9/jpm-2016-0189/jpm-2016-0189.xml

citations: 29

The bioinformatics of psychosocial genomics in alternative and complementary medicine

Forsch Komplementarmed Klass Naturheilkd <a href="https://www.ncbi.nlm.nih.gov/pubmed/12853721/">https://www.ncbi.nlm.nih.gov/pubmed/12853721/</a>

citations: 12

"there are rapid (within 2 hours of start of practice) and significant gene expression changes in PBMCs peripheral blood mononuclear cells of practitioners during a comprehensive yoga program. These data suggest that previously reported effects of yoga practices have an integral physiological component at the molecular level which is initiated immediately during practice and may form the basis for the long term stable effects"

Rapid gene expression changes in peripheral blood lymphocytes upon practice of a comprehensive yoga program

PLoS One

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3629142/



"This study provides the first compelling evidence that the RR relaxation response elicits specific gene expression changes in short-term and long-term practitioners. Our results suggest consistent and constitutive changes in gene expression resulting from RR may relate to long term physiological effects."

#### Genomic counter-stress changes induced by the relaxation response

PLoS One

https://www.ncbi.nlm.nih.gov/pubmed/18596974/

citations: 355

"Three recent studies started to provide some of this information through gene expression profiling in circulating immune cells, which support the hypothesis that yogic/meditative practices have a measurable effect at the molecular level"

### Regulation of gene expression by yoga, meditation & related practices: a review of recent studies

Asian Journal of Psychiatry <a href="https://www.ncbi.nlm.nih.gov/pubmed/23380323/">https://www.ncbi.nlm.nih.gov/pubmed/23380323/</a>

citations: 76

Rapid changes in histone deacetylases and inflammatory gene expression in expert meditators

Psychoneuroendocrinology

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4039194/

citations: 256

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#### Genome-wide expression changes in a higher state of consciousness

Conscious Cognition

https://www.ncbi.nlm.nih.gov/pubmed/22742996

citations: 17

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### Social regulation of gene expression in human leukocytes

Genome Biology

https://www.ncbi.nlm.nih.gov/pubmed/17854483/

citations: 711

Psychosocial genomics: gene expression, neurogenesis, and human experience in mind-body medicine

Advanced Mind Body Medicine <a href="https://www.ncbi.nlm.nih.gov/pubmed/12629875/">https://www.ncbi.nlm.nih.gov/pubmed/12629875/</a>



### Epigenetic changes in response to tai chi practice: a pilot investigation of DNA methylation marks

Evidence Based Complimentary Alternative Medicine https://www.ncbi.nlm.nih.gov/pubmed/22719790

citations: 36

Mind-controlled transgene expression by a wireless-powered optogenetic designer cell implant Natural Communication

https://www.ncbi.nlm.nih.gov/pubmed/25386727



# iii. mindfulness modulates OXTR Oxytocin Receptor Gene, empowering connectedness



"the effect of oxytocin on spirituality was moderated by oxytocin-related genotypes."

"participants were also genotyped for polymorphisms in two genes critical for oxytocin signaling, the oxytocin receptor gene (OXTR rs53576) and CD38 (rs6449182 and rs3796863)."

"These results provide the first experimental evidence that spirituality, endorsed by millions worldwide, appears to be supported by oxytocin."

Effects of oxytocin administration on spirituality and emotional responses to meditation Social Cognitive and Affective Neuroscience <a href="https://academic.oup.com/scan/article/11/10/1579/2413952">https://academic.oup.com/scan/article/11/10/1579/2413952</a>

citations: 44

Common variant in OXTR predicts growth in positive emotions from loving-kindness training <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5359600/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5359600/</a>

citations: 27

Neurogenetic Mechanisms of Self-Compassionate Mindfulness: the Role of Oxytocin-Receptor Genes

Springer: Mindfulness

https://link.springer.com/article/10.1007/s12671-019-01141-7

citations: 3

"Psychological resources of optimism, mastery, and self-esteem have been found to be significant predictors of effective stress management, neurophysiological responses to stress, and physical and psychological health-related outcomes in previous research. The present results suggest that OXTR is one gene that is linked to these resources"

Oxytocin receptor gene (OXTR) is related to psychological resources

**PNAS** 

https://www.pnas.org/content/108/37/15118



# iv. mindfulness modulates interleukin 6 (IL-6), reducing inflammation, anxiety and depression



### Depression following open-heart surgery: A path model involving interleukin-6, spiritual struggle, and hope under preoperative distress

Journal of Clinical Psychiatry <a href="https://onlinelibrary.wilev.com/doi/abs/10.1002/jclp.20716">https://onlinelibrary.wilev.com/doi/abs/10.1002/jclp.20716</a>

citations: 40

"Among breast cancer survivors with insomnia, 3 months of Tai Chi reduced cellular inflammatory responses, and reduced expression of genes encoding proinflammatory mediators. Given the link between inflammation and cancer, these findings provide an evidence-based molecular framework to understand the potential salutary effects of Tai Chi on cancer survivorship"

"Levels of toll-like receptor-4-activated monocyte production of IL-6 showed an overall reduction in Tai Chi"

### Tai chi, cellular inflammation, and transcriptome dynamics in breast cancer survivors with insomnia: a randomized controlled trial

National Cancer Institute Monographs <a href="https://www.ncbi.nlm.nih.gov/m/pubmed/25749595/">https://www.ncbi.nlm.nih.gov/m/pubmed/25749595/</a>

randomised controlled trial citations: 93

Openness and conscientiousness predict 34-SSweek patterns of Interleukin-6 in older persons Brain, Behaviour and Immunity

https://www.sciencedirect.com/science/article/pii/S0889159111000080

citations: 57

Trait mindfulness is associated with blood pressure and interleukin-6: exploring interactions among subscales of the Five Facet Mindfulness Questionnaire to better understand relationships between mindfulness and health

Journal of Behavioural Medicine <a href="https://link.springer.com/article/10.1007/s10865-014-9575-4">https://link.springer.com/article/10.1007/s10865-014-9575-4</a>



A Pilot Study Evaluating the Effect of Mindfulness-Based Stress Reduction on Psychological Status, Physical Status, Salivary Cortisol, and Interleukin-6 Among Advanced-Stage Cancer Patients and Their Caregivers

Journal of Holistic Nursing <a href="https://journals.sagepub.com/doi/abs/10.1177/0898010111435949">https://journals.sagepub.com/doi/abs/10.1177/0898010111435949</a>

citations: 150

"The findings suggest possible effects of mindfulness meditation on specific markers of inflammation, cell-mediated immunity, and biological aging"

Mindfulness meditation and the immune system: a systematic review of randomized controlled trials

https://nyaspubs.onlinelibrary.wiley.com/doi/pdf/10.1111/nyas.12998

randomised controlled trial citations: 310

"The results of this 3-month pre-post study indicate that participation in this yoga and meditation retreat was associated with alterations in psychological functioning, neurotrophic pathways, HPA axis activity, and inflammatory pathway signaling suggesting enhanced stress resilience and well-being"

"As a group, participants showed significant improvements in depression, anxiety, somatic complaints, increases in mindfulness scores, and a small but significant decrease in BMI"

Yoga, Meditation and Mind-Body Health: Increased BDNF, Cortisol Awakening Response, and Altered Inflammatory Marker Expression after a 3-Month Yoga and Meditation Retreat Frontiers in Human Neuroscience https://www.frontiersin.org/articles/10.3389/fnhum.2017.00315/full



"A brief, mindfulness-based intervention demonstrated preliminary short-term efficacy in reducing stress, behavioral symptoms, and proinflammatory signaling in younger breast cancer survivors"

"women in the mindfulness group who practiced more frequently did evidence lower levels of IL-6 at the post-treatment assessment"

"our trial indicates that the benefits of mindfulness may extend to genomic markers of inflammation, including reductions in proinflammatory gene expression and activity of the proinflammatory transcription factor NF-кВ"

### Mindfulness meditation for younger breast cancer survivors: A randomized controlled trial

https://onlinelibrary.wilev.com/doi/full/10.1002/cncr.29194

randomised controlled trial citations: 194

### Alterations in Resting-State Functional Connectivity Link Mindfulness Meditation With **Reduced Interleukin-6: A Randomized Controlled Trial**

Biological Psychiatry

https://www.sciencedirect.com/science/article/pii/S0006322316000792

randomised controlled trial citations: 218

### Effect of compassion meditation on neuroendocrine, innate immune and behavioral responses to psychosocial stress

Psychoneuroendochrinology

https://www.sciencedirect.com/science/article/pii/S0306453008002199

citations: 825

### Innate immune, neuroendocrine and behavioral responses to psychosocial stress do not predict subsequent compassion meditation practice time

Psychoneuroendochrinology

https://www.sciencedirect.com/science/article/pii/S0306453009001991

citations: 119

#### Mindfulness Meditation for Alcohol Relapse Prevention: A Feasibility Pilot Study

Journal of Addictive Medicine

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4106278/



"Neuroendocrine studies suggest that compassion meditation reduces subjective distress and immune response to stress"

**Loving-kindness and compassion meditation: Potential for psychological interventions** Clinical Psychology Review

citations: 880

# Effects of Buddhism Walking Meditation on Depression, Functional Fitness, and Endothelium-Dependent Vasodilation in Depressed Elderly

The Journal of Alternate and Complimentary Medicine <a href="https://www.liebertpub.com/doi/full/10.1089/acm.2013.0205">https://www.liebertpub.com/doi/full/10.1089/acm.2013.0205</a>

citations: 71

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Self-compassion as a predictor of interleukin-6 response to acute psychosocial stress

Brain, Behaviour and Immunity

https://www.sciencedirect.com/science/article/pii/S0889159113005370

citations: 175

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Comparison of cognitive behavioral and mindfulness meditation interventions on adaptation to rheumatoid arthritis for patients with and without history of recurrent depression

APA Psychiatry

https://psycnet.apa.org/record/2008-06469-005



# v. mindfulness modulates telomere length, increasing biological longevity



"telomerase activity may be in part regulated by levels of both psychological and metabolic stress"

## Changes in stress, eating, and metabolic factors are related to changes in telomerase activity in a randomized mindfulness intervention pilot study

Psychoneuroendocrinology

https://www.ncbi.nlm.nih.gov/pubmed/22169588?dopt=Abstract

randomised controlled trial citations: 194

"integrating meditation practice into daily routine may have a protecting effect in terms of epigenetic aging in the long run"

#### **Epigenetic clock analysis in long-term meditators**

Psychoneuroendocrinology <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5863232/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5863232/</a>

randomised controlled trial citations: 31

"Relative telomere length was longer in Loving-Kindness (metta) meditators vs. controls, suggesting that this practice may alter a biomarker associated with longevity"

**Loving-Kindness Meditation practice associated with longer telomeres in women** Brain, Behaviour and Immunity

https://www.sciencedirect.com/science/article/pii/S0889159113001736



"Adopting yoga/meditation-based lifestyle modification causes reversal of markers of aging, mainly oxidative stress, telomerase activity, and oxidative DNA damage."

"This may not only delay aging and prolong a youthful healthy life but also delay or prevent onset of several lifestyle-related diseases, of which oxidative stress and inflammation are the chief cause."

"This report suggests this simple lifestyle intervention may be therapeutic for oxidative DNA damage and oxidative stress."

### Telomerase Activity and Cellular Aging Might Be Positively Modified by a Yoga-Based Lifestyle Intervention

The Journal of Alternative and Complimentary Medicine <a href="https://www.liebertpub.com/doi/10.1089/acm.2014.0298">https://www.liebertpub.com/doi/10.1089/acm.2014.0298</a>

citations: 45

"the absence of experiential avoidance of negative emotions and thoughts is integral to the connection between meditation and telomeres"

Zen meditation, Length of Telomeres, and the Role of Experiential Avoidance and Compassion Mindfulness

https://link.springer.com/article/10.1007/s12671-016-0500-5

citations: 52

"Purpose in Life is influenced by meditative practice and directly affects both perceived control and negative emotionality, affecting telomerase activity directly as well as indirectly"

"This is the first study to link meditation and positive psychological change with telomerase activity"

Intensive meditation training, immune cell telomerase activity, and psychological mediators

Psychoneuroendocrinology

https://www.ncbi.nlm.nih.gov/pubmed/21035949



# vi. mindful water: molecular hydrogen modulates inflammation, cognition and gene expression



"we have demonstrated that intravenous infusion of H2 is effective in treating RA. This method could be useful not only for controlling RA but also for preventing age-related inflammatory diseases"

# Therapeutic efficacy of infused molecular hydrogen in saline on rheumatoid arthritis: A randomized, double-blind, placebo-controlled pilot study

International Immunopharmacology <a href="https://www.sciencedirect.com/science/article/pii/S1567576914002124">https://www.sciencedirect.com/science/article/pii/S1567576914002124</a>

randomised controlled trial, double blind citations: 47

"drinking hydrogen (H2) water for 48 weeks significantly improved the total Unified Parkinson's Disease Rating Scale (UPDRS) score of Parkinson's disease (PD) patients treated with levodopa"

### Pilot study of H2 therapy in Parkinson's disease: A randomized double-blind placebo-controlled trial

Movement Disorders <a href="https://onlinelibrary.wiley.com/doi/abs/10.1002/mds.25375">https://onlinelibrary.wiley.com/doi/abs/10.1002/mds.25375</a>

randomised controlled trial, double blind citations: 108

Therapeutic efficacy of infused molecular hydrogen in saline on rheumatoid arthritis: a randomized, double-blind, placebo-controlled pilot study

International Immunopharmacol <a href="https://www.ncbi.nlm.nih.gov/m/pubmed/24929023/">https://www.ncbi.nlm.nih.gov/m/pubmed/24929023/</a>

randomised controlled trial, double blind citations: 47



"Hydrogen-enriched water improves mitochondrial dysfunction in MM and inflammatory processes in PM/DM polymyositis/dermatomyositis"

# Open-label trial and randomized, double-blind, placebo-controlled, crossover trial of hydrogen-enriched water for mitochondrial and inflammatory myopathies

Medical Gas Res

https://www.ncbi.nlm.nih.gov/m/pubmed/22146674/

randomised controlled trial, double blind citations: 70

"The present findings highlight the potential role of H2 in the regression of hypercholesterolemia and atherosclerosis."

# Hydrogen Activates ATP-Binding Cassette Transporter A1-Dependent Efflux Ex Vivo and Improves High-Density Lipoprotein Function in Patients With Hypercholesterolemia: A Double-Blinded, Randomized, and Placebo-Controlled Trial

The Journal of Clinical Endocrinology and Metabolism <a href="https://www.ncbi.nlm.nih.gov/m/pubmed/25978109/">https://www.ncbi.nlm.nih.gov/m/pubmed/25978109/</a>

randomised controlled trial, double blind citations: 30

"H2-water may have a potential for suppressing dementia in an oxidative stress model"

# Effects of Molecular Hydrogen Assessed by an Animal Model and a Randomized Clinical Study on Mild Cognitive Impairment

Alzheimers Research and Therapy

https://www.ncbi.nlm.nih.gov/m/pubmed/29110615/?i=1&from=Effects%20of%20Molecular%20Hydrogen%20Assessed%20by%20an%20Animal%20Model%20and%20a%20Randomized%20Clinical%20Studv%20on%20Mild%20Cognitive%20Impairment

randomised controlled trial citations: 38

"H2 treatment was safe and effective in patients with acute cerebral infarction. These results suggested a potential for widespread and general application of H2 gas."

### Hydrogen Gas Inhalation Treatment in Acute Cerebral Infarction: A Randomized Controlled Clinical Study on Safety and Neuroprotection

Journal of Stroke and Cerebrovascular Diseases <a href="https://www.ncbi.nlm.nih.gov/m/pubmed/28669654/">https://www.ncbi.nlm.nih.gov/m/pubmed/28669654/</a>

randomised controlled trial citations: 59



"it is hypothesized that administration of hydrogen molecule may have potential as a novel therapy for bipolar disorder, schizophrenia, and other concurrent disorders characterized by oxidative, inflammatory and apoptotic dysregulation."

### Molecular hydrogen: an overview of its neurobiological effects and therapeutic potential for bipolar disorder and schizophrenia

Medical Gas Research

https://medicalgasresearch.biomedcentral.com/articles/10.1186/2045-9912-3-11

citations: 21

"These results suggested the effectiveness of ERW electrolyzed reduced water for prevention of various brain diseases caused by oxidative stress."

### Suppression of Oxidative Stress-Induced Apoptosis of Neuronal Cells by Electrolyzed-Reduced Water

Animal Cell Technology Meets Genomics <a href="https://link.springer.com/chapter/10.1007/1-4020-3103-3\_50">https://link.springer.com/chapter/10.1007/1-4020-3103-3\_50</a>

citations: 3

### Hydrogen-rich saline attenuates anxiety-like behaviors in morphine-withdrawn mice

Neuropharmacology

https://www.ncbi.nlm.nih.gov/m/pubmed/28359771/

citations: 15

## Hydrogen-rich water for improvements of mood, anxiety, and autonomic nerve function in daily life

Medical Gas Research

https://www.ncbi.nlm.nih.gov/m/pubmed/29497485/

citations: 24

Molecular Hydrogen Prevents Social Deficits and Depression-Like Behaviors Induced by Low-Intensity Blast in Mice

Journal of Neuropathology and Experimental Neurology <a href="https://www.ncbi.nlm.nih.gov/m/pubmed/30053086/">https://www.ncbi.nlm.nih.gov/m/pubmed/30053086/</a>



### Hydrogen-rich water improves cognitive impairment gender-dependently in APP/PSI mice without affecting $A\beta$ clearance

Free Radical Research

https://www.ncbi.nlm.nih.gov/m/pubmed/29683360/

citations: 10

Hydrogen-rich saline attenuates isoflurane-induced caspase-3 activation and cognitive impairment via inhibition of isoflurane-induced oxidative stress, mitochondrial dysfunction, and reduction in ATP levels

Journal of Translational Research <a href="https://www.ncbi.nlm.nih.gov/m/pubmed/28386342/">https://www.ncbi.nlm.nih.gov/m/pubmed/28386342/</a>

citations: 17

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Hydrogen-rich saline reverses oxidative stress, cognitive impairment, and mortality in rats submitted to sepsis by cecal ligation and puncture

Journal of Surgical Research <a href="https://www.ncbi.nlm.nih.gov/m/pubmed/22482765/">https://www.ncbi.nlm.nih.gov/m/pubmed/22482765/</a>

citations: 52

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### Hydrogen-rich saline protects against oxidative damage and cognitive deficits after mild traumatic brain injury

Brain Research Bulletin

https://www.ncbi.nlm.nih.gov/m/pubmed/22742936/

citations: 59

Drinking Hydrogen Water Ameliorated Cognitive Impairment in Senescence-Accelerated Mice

Journal of Clinical Biochemistry and Nutrition

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2872234/#\_\_ffn\_sectitle

citations: 58

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Molecular hydrogen stimulates the gene expression of transcriptional coactivator PGC-1 $\alpha$  to enhance fatty acid metabolism

Nature

https://www.nature.com/articles/npjamd20168



"Our data provided important insights into one of the mechanisms by which H2 regulates signal transduction and gene expression; however, H2 might contribute to other types of signaling pathways as well because H2 regulates many genes belonging to various signaling pathways."

# Molecular hydrogen regulates gene expression by modifying the free radical chain reaction-dependent generation of oxidized phospholipid mediators

Nature

https://www.nature.com/articles/srep18971

citations: 72

"our study suggests that H2 can induce beneficial effects through mtUPR activation via epigenetic histone modification and by modification of gene expression"

Molecular hydrogen modulates gene expression via histone modification and induces the mitochondrial unfolded protein response

Biochemical and Biophysical Research Communications <a href="https://www.ncbi.nlm.nih.gov/m/pubmed/28890349/">https://www.ncbi.nlm.nih.gov/m/pubmed/28890349/</a>



### mindfulness modulates mental health - therapeutic evidence

### vii. mindfulness modulates neuroplasticity and mental health



### Sahaja yoga in the management of moderate to severe asthma: a randomised controlled trial Thorax

https://thorax.bmi.com/content/57/2/110.short

randomised controlled trial, double blind citations:

Mindfulness Meditation Modulates Pain Through Endogenous Opioids

Medicine

https://www.sciencedirect.com/science/article/pii/S0002934316303023

randomised controlled trial, double blind citations:

Effects of a neuropsychology program based on mindfulness on Alzheimer's disease: randomized double-blind clinical study

Europe PMC

https://europepmc.org/abstract/med/24880524

randomised controlled trial, double blind citations:

Promoting mindfulness in psychotherapists in training influences the treatment results of their patients: a randomized, double-blind, controlled study

PubMed

https://www.ncbi.nlm.nih.gov/m/pubmed/17917468/

randomised controlled trial, double blind citations:



#### Mindfulness Training for Coping with Hot Flashes: Results of a Randomized Trial

Menopause

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3123409/

randomised controlled trial, double blind citations:

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### A randomised controlled trial of the effects of mindfulness practice on medical student stress levels

Medical Education: Mindfulness Training

https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2923.2010.03877.x

randomised controlled trial, single blind citations:

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# Randomized Controlled Trial of Yogic Meditation Techniques for Patients With Obsessive-Compulsive Disorder

Social Phobia

https://www.cambridge.org/core/journals/cns-spectrums/article/randomized-controlled-trial-of-yogic -meditation-techniques-for-patients-with-obsessivecompulsive-disorder/58279C562281FB7FEF7DB 0951E734FF3

randomised controlled trial, single blind citations:

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## Integrating Mindfulness into Positive Psychology: a Randomised Controlled Trial of an Online Positive Mindfulness Program

Mindfulness

https://www.researchgate.net/publication/305618985\_Integrating\_Mindfulness\_into\_Positive\_Psychology\_a\_Randomised\_Controlled\_Trial\_of\_an\_Online\_Positive\_Mindfulness\_Program

randomised controlled trial citations:

### Mindfulness meditation and the immune system: a systematic review of randomized controlled trials

Annals of the New York Academy of Sciences <a href="https://nyaspubs.onlinelibrary.wiley.com/doi/pdf/10.1111/nyas.12998">https://nyaspubs.onlinelibrary.wiley.com/doi/pdf/10.1111/nyas.12998</a>

randomised controlled trial citations:



#### Randomised Controlled Trial of Yoga and Bio-feedback in management of hypertension

The Lancet

https://www.sciencedirect.com/science/article/pii/S0140673675900021

randomised controlled trial citations:

#### A randomised controlled trial of a brief online mindfulness-based intervention

Behaviour Research and Therapy <a href="https://www.sciencedirect.com/science/article/abs/pii/S0005796713001149">https://www.sciencedirect.com/science/article/abs/pii/S0005796713001149</a>

randomised controlled trial citations:

### Argentine tango dance compared to mindfulness meditation and a waiting-list control: A randomised trial for treating depression

Complementary Therapies in Medicine <a href="https://www.sciencedirect.com/science/article/pii/S0965229912000891">https://www.sciencedirect.com/science/article/pii/S0965229912000891</a>

randomised controlled trial citations:

### Meditation Awareness Training (MAT) for Work-related Wellbeing and Job Performance: A Randomised Controlled Trial

International Journal of Mental Health and Addiction <a href="https://link.springer.com/article/10.1007/s11469-014-9513-2">https://link.springer.com/article/10.1007/s11469-014-9513-2</a>

randomised controlled trial citations:

## Treating fibromyalgia with mindfulness-based stress reduction: Results from a 3-armed randomized controlled trial

Pain

https://www.sciencedirect.com/science/article/pii/S0304395910006779

randomised controlled trial citations:

#### Mindfulness-based stress reduction for healthy individuals: A meta-analysis

Journal of Psychosomatic Research

https://www.sciencedirect.com/science/article/pii/S002239991500080X



### Mindfulness-based therapy: A comprehensive meta-analysis Clinical Psychology Review https://www.sciencedirect.com/science/article/pii/S0272735813000731 citations: The unique brain anatomy of meditation practitioners: alterations in cortical gyrification Frontiers in Human Neuroscience https://www.frontiersin.org/articles/10.3389/fnhum.2012.00034/full citations: Bridging the Hemispheres in Meditation: thicker callosal regions and enhanced fractional anisotropy (FA) in long-term practitioners Neuroimage https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3345952/ citations: The Role of Mindfulness and Loving-Kindness Meditation in Cultivating Self-Compassion and **Other-Focused Concern in Health Care Professionals** Mindfulness https://link.springer.com/article/10.1007/s12671-012-0158-6 citations: Loving-kindness meditation to enhance recovery from negative symptoms of schizophrenia Journal of Clinical Psychology https://onlinelibrary.wiley.com/doi/abs/10.1002/jclp.20591 citations: Changing Your Brain and Generosity through Compassion Meditation Training Centre for Healthy Minds https://centerhealthyminds.org/science/studies/changing-your-brain-and-generosity-through-comp assion-meditation-training citations: **Buddha's Brain: Neuroplasticity and Meditation** IEEE signal processing magazine

the epigenetics of happiness - phase i-iii clinical study Internet of Happiness [IoH] | double blind, randomised controlled research | return to index

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2944261/



### Occipital gamma activation during Vipassana meditation

Cognitive Processing <a href="https://www.ncbi.nlm.nih.gov/pubmed/20013298/">https://www.ncbi.nlm.nih.gov/pubmed/20013298/</a>



#### viii. mindfulness modulates connectedness



#### **Human Heart Rhythms Synchronize While Co-sleeping**

Frontiers in Physiology

https://www.frontiersin.org/articles/10.3389/fphys.2019.00190/full

randomized controlled trial citations:

### The Electricity of Touch: Detection and Measurement of Cardiac Energy Exchange Between People

Brain; Values: Is a Biological Science of Values Possible <a href="https://www.heartmath.org/research/research-library/energetics/electricity-of-touch/">https://www.heartmath.org/research/research-library/energetics/electricity-of-touch/</a>

citations:

### Some Southern African Views on Interconnectedness with Special Reference to Indigenous Knowledge

African Journal of Indigenous Knowledge Systems

https://www.heartmath.org/research/research-library/coherence/southern-african-views-interconnec tedness-special-reference-indigenous-knowledge/

citations:

The Global Coherence Initiative: A Global Psychological Paradigm for Health Promotion

Journal of Psychology in Africa

 $\underline{https://www.heartmath.org/research/research-library/coherence/global-coherence-initiative-global-psychological-paradigm-health-promotion/}$ 

citations:

Achieving Collective Coherence: Group Effects on Heart Rate Variability Coherence and Heart Rhythm Synchronization

Alternative Therapies in Health; Medicine

https://www.heartmath.org/research/research-library/energetics/achieving-collective-coherence-group-effects-on-heart-rate-variability-coherence-hrvc/



New Frontiers in Heart Rate Variability and Social Coherence Research: Techniques, Technologies, and Implications for Improving Group Dynamics and Outcomes

Frontiers in Public Health

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5643505/
citations:
The Global Coherence Initiative: Creating a Coherent Planetary Standing Wave
Global Advances in Health and Medicine
$\underline{\text{https://www.heartmath.org/research/research-library/basic/gci-creating-a-coherent-planetary-standing} \\$
ng-wave/
citations:
Does collective meditation foster trust and trustworthiness in an investment game? International Review of Economics <a href="https://link.springer.com/article/10.1007/s12232-016-0259-y">https://link.springer.com/article/10.1007/s12232-016-0259-y</a>
citations:



# ix. mindfulness and biofeedback modulate heart rate variability and the vagus nerve



### Coherence Training in Children with Attention-Deficit Hyperactivity Disorder: Cognitive Functions and Behavioral Changes

Alternative Therapies in Health and Medicine

https://www.heartmath.org/research/research-library/educational/coherence-training-in-children-with-adhd-cognitive-functions-and-behavioral-changes/

randomised controlled trial, double blind citations:

Yoga and heart rate variability: A comprehensive review of the literature

International Journal of Yoga <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4959333/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4959333/</a>

randomised controlled trial citations:

### Effect of an office worksite-based yoga program on heart rate variability: outcomes of a randomized controlled trial

BMC Complimentary Alternative Medicine <a href="https://www.ncbi.nlm.nih.gov/pubmed/23574691">https://www.ncbi.nlm.nih.gov/pubmed/23574691</a>

randomised controlled trial citations:

Post traumatic stress symptoms and heart rate variability in Bihar flood survivors following yoga: a randomized controlled study

BMC Psychiatry

https://www.ncbi.nlm.nih.gov/pubmed/20193089

randomised controlled trial citations:



Effective and viable mind-body stress reduction in the workplace: a randomized controlled trial Journal of Occupational Health Psychology <a href="https://www.ncbi.nlm.nih.gov/pubmed/22352291">https://www.ncbi.nlm.nih.gov/pubmed/22352291</a>

randomised controlled trial citations:

### Resting heart rate variability after yogic training and swimming: A prospective randomized comparative trial

International Journal of Yoga <a href="https://www.ncbi.nlm.nih.gov/pubmed/26170587">https://www.ncbi.nlm.nih.gov/pubmed/26170587</a>

randomised controlled trial citations:

Yoga respiratory training improves respiratory function and cardiac sympathovagal balance in elderly subjects: a randomised controlled trial

BMJ Open

https://www.ncbi.nlm.nih.gov/pubmed/22021757

randomised controlled trial citations:

### Yoga for Heart Rate Variability: A Systematic Review and Meta-analysis of Randomized Clinical Trials

Applied Psychophysiology Biofeedback <a href="https://www.ncbi.nlm.nih.gov/pubmed/26059998">https://www.ncbi.nlm.nih.gov/pubmed/26059998</a>

randomised controlled trial citations:

# Effects of Heart Rate Variability Coherence Biofeedback Training and Emotional Management Techniques to Decrease Music Performance Anxiety

Biofeedback

https://www.heartmath.org/research/research-library/educational/effects-of-hrv-coherence-biofeedback-training-and-emotional-management-techniques-to-decrease-music-performance-anxiety/

randomised controlled trial citations:



### Facilitating Emotional Self-Regulation in Preschool Children: Efficacy of the Early HeartSmarts Program in Promoting Social, Emotional and Cognitive Development

HeartMath Research Center, Institute of HeartMath

https://www.heartmath.org/research/research-library/educational/facilitating-emotional-self-regulation-in-preschool-children/

on-in-preschool-children/
randomised controlled trial

randomised controlled tria citations:

Resilience Training Program Reduces Physiological and Psychological Stress in Police Officers Global Advances in Health and Medicine

https://www.heartmath.org/research/research-library/organizational/resilience-training-program-reduces-physiological-and-psychological-stress-in-police-officers/

randomised controlled trial citations:

### Heart Rate Variability: New Perspectives on Physiological Mechanisms, Assessment of Self-regulatory Capacity, and Health risk

Global Advances in Health and Medicine <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4311559/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4311559/</a>

citations:

#### Dynamic correlations between heart and brain rhythm during Autogenic meditation

Fontiers in Human Neuroscience

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3728977/

citations:

#### The Grateful Heart: The Psychophysiology of Appreciation

New York: Oxford University Press

https://www.heartmath.org/research/research-library/basic/grateful-heart-the-psychophysiology-of-appreciation/

citations:

#### Applying Resilience Promotion Training Among Special Forces Police Officers

Sage and Open Access

https://www.heartmath.org/research/research-library/organizational/applying-resilience-promotion-training-among-special-forces-police-officers/



# Stress Management Based on Trait-Anxiety Levels and Sleep Quality in Middle-Aged Employees Confronted with Psychosocial Chronic Stress

Psychology

https://www.heartmath.org/research/research-library/organizational/stress-management-based-on-trait-anxiety-levels-and-sleep-quality/



## Heart rate variability (HRV) in adolescent females with anxiety disorders and major depressive disorder

Acta Paediatrica

https://onlinelibrary.wiley.com/doi/full/10.1111/j.1651-2227.2009.01657.x

citations:

### The Effect of Heart Rate Variability Biofeedback on Performance Psychology of Basketball Players

Applied Psychophysiology and Biofeedback https://link.springer.com/article/10.1007/s10484-012-9185-2

citations:

# Heart Rate Variability, Flow, Mood and Mental Stress During Yoga Practices in Yoga Practitioners, Non-yoga Practitioners and People with Metabolic Syndrome

Applied Psychophysiology and Biofeedback <a href="https://link.springer.com/article/10.1007/s10484-016-9340-2">https://link.springer.com/article/10.1007/s10484-016-9340-2</a>

citations:

#### **Psychophysiological Correlates of Flow-Experience**

Advances in Flow Research

https://link.springer.com/chapter/10.1007/978-1-4614-2359-1\_8

citations:

# Impact of Depression and Antidepressant Treatment on Heart Rate Variability: A Review and Meta-Analysis

Biological Psychiatry

https://www.sciencedirect.com/science/article/pii/S0006322309014498

citations:

# The relationship between mental and physical health: Insights from the study of heart rate variability

International Journal of Psychophysiology <a href="https://www.sciencedirect.com/science/article/abs/pii/S016787601300189X">https://www.sciencedirect.com/science/article/abs/pii/S016787601300189X</a>



### Effects of short-term psychological stress on the time and frequency domains of heart-rate variability

Perception and Motor Skills https://www.ncbi.nlm.nih.gov/pubmed/11065312 citations: Depression, Heart Rate Variability, and Acute Myocardial Infarction Circulation https://www.ahajournals.org/doi/full/10.1161/hc4201.097834 citations: Autonomic balance revisited: panic anxiety and heart rate variability Journal of Psychosomatic Research https://www.ncbi.nlm.nih.gov/pubmed/9483470 citations: The effect of mental stress on heart rate variability and blood pressure during computer work European Journal of Applied Physiology https://www.ncbi.nlm.nih.gov/pubmed/14991326 citations: Relationship between major depression and heart rate variability. Clinical consequences and implications for antidepressive treatment Psychiatry Research https://www.ncbi.nlm.nih.gov/pubmed/12467953 citations: Desynchronization of autonomic response and central autonomic network connectivity in posttraumatic stress disorder Human Brain Mapping https://onlinelibrary.wiley.com/doi/abs/10.1002/hbm.23340 citations:



# x. social media data predicts mental illness + Al chatbots modulate mental health



Delivering Cognitive Behavior Therapy to Young Adults With Symptoms of Depression and Anxiety Using a Fully Automated Conversational Agent (Woebot): A Randomized Controlled Trial

JMIR Mental Health

https://www.ncbi.nlm.nih.gov/pubmed/28588005

randomised controlled trial citations:

The Feasibility, Acceptability, and Efficacy of Delivering Internet-Based Self-Help and Guided Self-Help Interventions for Generalized Anxiety Disorder to Indian University Students: Design of a Randomized Controlled Trial

JMIR Research Protocols <a href="https://www.ncbi.nlm.nih.gov/pubmed/26679295">https://www.ncbi.nlm.nih.gov/pubmed/26679295</a>

randomised controlled trial citations:

Using Psychological Artificial Intelligence (Tess) to Relieve Symptoms of Depression and Anxiety: Randomized Controlled Trial

JMIR Mental Health

https://www.ncbi.nlm.nih.gov/pubmed/30545815

randomised controlled trial citations:

**EMOTEX: Detecting Emotions in Twitter Messages** 

ASE BIGDATA/SOCIALCOM/CYBERSECURITY Conference, Stanford University <a href="http://web.cs.wpi.edu/~emmanuel/publications/PDFs/C30.pdf">http://web.cs.wpi.edu/~emmanuel/publications/PDFs/C30.pdf</a>

citations:

Detecting Early Risk of Depression from Social Media User-generated Content

University of Quebec in Montreal (UQAM) <a href="http://ceur-ws.org/Vol-1866/paper\_127.pdf">http://ceur-ws.org/Vol-1866/paper\_127.pdf</a>



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PLOS ONE

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Supported Internet-Delivered Cognitive Behavioral Therapy Programs for Depression, Anxiety, and Stress in University Students: Open, Non-Randomised Trial of Acceptability, Effectiveness, and Satisfaction

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#### mindfulness modulates mental health in at risk communities

#### xi. mindfulness and mantra modulate mental health for refugees



### Significant Reductions in Posttraumatic Stress Symptoms in Congolese Refugees Within 10 days of Transcendental Meditation Practice

Journal of Traumatic Stress

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A randomized controlled trial of cognitive-behavior therapy for Cambodian refugees with treatment-resistant PTSD and panic attacks: A cross-over design

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Cognitive and Behavioural Practice

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# xii. mantra meditation modulates mental health for war veterans, abused women and HIV sufferers



#### transcendental meditation research via David Lynch Foundation

https://www.davidlynchfoundation.org/research.html

#### **Benefits to Veterans**

- \* 40-55% reduction in symptoms of PTSD and depression, Military Medicine 176 (6): 626-630, 2011
- \* 42% decrease in insomnia, Journal of Counseling and Development 64: 212-215, 1985
- \* 25% reduction in plasma cortisol levels, Hormones and Behavior 10: 54–60, 1978
- \* Decreased high blood pressure-on par with first-line antihypertensives, American Journal of Hypertension 21: 310-316, 2008
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- \* Reduced flashbacks and bad memories, Military Medicine 176 (6): 626-630, 2011
- \* Greater resistance to stress, Psychosomatic Medicine 35: 341–349, 1973
- \* Twice the effectiveness of conventional approaches for reducing alcoholism and substance abuse, Alcoholism Treatment Quarterly 11: 13-87, 1994
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- \* Twice as effective as other relaxation techniques for decreasing trait anxiety, Journal of Clinical Psychology 45(6): 957–974, 1989
- \* Improved quality of life, Military Medicine 176 (6): 626-630, 20151

#### Improved Quality of Life in People Living with HIV/AIDS

- 1. Aids Care 25 (2013) 1291-7.
- 2. SF AIDS Foundation/Maharishi University of Management. Submitted for publication.



#### xiii. mindfulness modulates mental health for at risk youth including homeless, incarcerated & indigenous



#### A Stress Reduction and Self-Care Group for Homeless and Addicted Women: Meditation, **Relaxation and Cognitive Methods**

Social Work with Groups

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#### Learning to BREATHE: A Pilot Study of a Mindfulness-Based Intervention to Support **Marginalized Youth**

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#### Studies of resilience among youth experiencing homelessness: A systematic review

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Translating and Implementing a Mindfulness-Based Youth Suicide Prevention Intervention in Native American Community  Journal of Child and Family Studies <a href="https://link.springer.com/article/10.1007/s10826-013-9809-z">https://link.springer.com/article/10.1007/s10826-013-9809-z</a>
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#### The role of meditational practices and mindfulness in improving mental health

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xv. smart phones, social media & blockchain empower homeless including refugees, Indigenous Australians & armed servicemen & women with PTSD



#### 95 per cent of homeless surveyed own a mobile but access not guaranteed

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AT-Ease is the Australian Government's health and wellbeing portal for veterans and their families. AT-Ease provides tailored mental health and wellbeing resources for the serving and ex-serving community

Department of Veteran Affairs <a href="https://at-ease.dva.gov.au">https://at-ease.dva.gov.au</a>



# xvi. mental health risks, policy interventions and statistics for homeless including refugees



"116,427 people were counted in the Census as being homeless on Census night (up from 102,439 in 2011)"

"20% (or 23,437) are Aboriginal and Torres Strait Islander Australians (down from 26% in 2011)"

"30% are born overseas."

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Homelessness Australia

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#### Mental health services in Australia: in brief 2018

Australian Institute of Health and Welfare

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