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Highlights by  
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## Interventions

Articles testing the applied science and implementation of mindfulness-based interventions

Bartels-Velthuis, A. A., van den Brink, E., Koster, F., Hoenders, H. J. R. (2020). **The Interpersonal Mindfulness Program for Health Care Professionals: A Feasibility Study.** *Mindfulness.* [\[link\]](#)

Bauer, C. C., Rozenkrantz, L., Caballero, C.,...Whitfield-Gabrieli, S. (2020). **Mindfulness training preserves sustained attention and resting state anticorrelation between default-mode network and dorsolateral prefrontal cortex: A RCT.** *Human Brain Mapping.* [\[link\]](#)

Bayır, B., Aylaz, R. (2020). **The effect of mindfulness-based education given to individuals with substance-use disorder according to self-efficacy theory on self-efficacy perception.** *Applied Nursing Research.* [\[link\]](#)

Cascales-Pérez, M. L., Ferrer-Cascales, R., Fernández-Alcántara, M., Cabañero-Martínez, M. J. (2020). **Effects of a mindfulness-based programme on the health- and work-related quality of life of healthcare professionals.** *Scandinavian Journal of Caring Sciences.* [\[link\]](#)

Chin, B., Lindsay, E. K., Greco, C. M.,...Creswell, J. D. (2020). **Mindfulness interventions improve momentary and trait measures of attentional control: Evidence from a RCT.** *Journal of Experimental Psychology.* [\[link\]](#)

Engbretson, A. M., Poehlmann-Tynan, J. A., Zahn-Waxler, C. J.,...Raison, C. L. (2020). **Effects of Cognitively-Based Compassion**

**Training on Parenting Interactions and Children's Empathy.** *Mindfulness.* [\[link\]](#)

Galante, J., Stochl, J., Dufour, G.,...Jones, P. B. (2020). **Effectiveness of providing university students with a mindfulness-based intervention to increase resilience to stress: 1-year follow-up of a pragmatic RCT.** *J Epidemiol Community Health.* [\[link\]](#)

Gallegos, A. M., Heffner, K. L., Cerulli, C.,...Pigeon, W. R. (2020). **Effects of mindfulness training on posttraumatic stress symptoms from a community-based pilot clinical trial among survivors of intimate partner violence.** *Psychological Trauma.* [\[link\]](#)

Garland, E. L., Hudak, J., Hanley, A. W., Nakamura, Y. (2020). **Mindfulness-oriented recovery enhancement reduces opioid dose in primary care by strengthening autonomic regulation during meditation.** *American Psychologist.* [\[link\]](#)

Hunter-Jones, J., Gilliam, S., Davis, C.,...Hansen, N. (2020). **Process and Outcome Evaluation of a MBCT Intervention for Cisgender and Transgender African American Women Living with HIV/AIDS.** *AIDS and Behavior.* [\[link\]](#)

Kor, P. P., Liu, J. Y., Chien, W. T. (2020). **Effects of a modified MBCT for family caregivers of people with dementia: A RCT.** *The Gerontologist.* [\[link\]](#)

Loucks, E. B., Nardi, W. R., Gutman, R.,...Harrison, A. (2020). **Mindfulness-Based College: A Stage 1 RCT for University Student Well-Being.** *Psychosomatic Medicine.* [\[link\]](#)

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Pinhas-Hamiel, O., Hamiel, D. (2020). **Cognitive Behavioral Therapy and MBCT in Children and Adolescents with Type 2 Diabetes.** *Current Diabetes Reports.* [\[link\]](#)

Sansone, E., Grazzi, L., Raggi, A.,...D'Amico, D. (2020). **Mindfulness as an add-on treatment for patients with chronic migraine and medication overuse: A preliminary analysis.** *Neurological Sciences.* [\[link\]](#)

Sant'Anna, E. M., Paiva, S. P. C., Santos, R. P.,...Reis, F. M. (2020). **Mindfulness-based program to support lifestyle modification and weight loss in infertile women: Randomized controlled trial.** *Journal of Psychosomatic Obstetrics Gynaecology.* [\[link\]](#)

Shankland, R., Tessier, D., Strub, L.,...Baeyens, C. (2020). **Improving Mental Health and Well-Being through Informal Mindfulness Practices: An Intervention Study.** *Applied Psychology: Health and Well-Being.* [\[link\]](#)

### Associations

Articles examining the correlates and mechanisms of mindfulness

Brintz, C. E., Roth, I., Faurot, K.,...Gaylord, S. A. (2020). **Feasibility and Acceptability of an Abbreviated, Four-Week Mindfulness Program for Chronic Pain Management.** *Pain Medicine.* [\[link\]](#)

Evans, S., Bhide, S., Quek, J.,...Sciberras, E. (2020). **Mindful Parenting Behaviors and Emotional Self-Regulation in Children With ADHD and Controls.** *Journal of Pediatric Psychology.* [\[link\]](#)

Gu, S., Li, Y., Liang, F.,...Wang, F. (2020, August 28). **The Mediating Effects of Coping Style on the Effects of Breath Count Mindfulness**

**Training on Depressive Symptoms among International Students in China.** *Neural Plasticity.* [\[link\]](#)

Hudak, J., Hanley, A. W., Marchand, W. R.,...Garland, E. L. (2020). **Endogenous theta stimulation during meditation predicts reduced opioid dosing following treatment with Mindfulness-Oriented Recovery Enhancement.** *Neuropsychopharmacology.* [\[link\]](#)

Isbel, B., Sysak, T., Summers, M. J. (2020). **A Qualitative Examination of the Developmental Trajectory of Learning Mindfulness Across an 8-Week Program.** *Mindfulness.* [\[link\]](#)

Kim, S. Y., Suh, H., Oh, W., Daheim, J. (2020). **Daily change patterns in mindfulness and psychological health: A pilot intervention.** *Journal of Clinical Psychology.* [\[link\]](#)

Knudsen, R. K., Gregersen, T., Ammentorp, J.,...Timmermann, C. (2020). **Healthcare professionals' experiences of using mindfulness training in a cardiology department – a qualitative study.** *Scandinavian Journal of Caring Sciences.* [\[link\]](#)

Lin, Y., Gloe, L. M., Louis, C. C.,...Moser, J. S. (2020). **An electrophysiological investigation on the emotion regulatory mechanisms of brief open monitoring meditation in novice non-meditators.** *Scientific Reports.* [\[link\]](#)

Nardi, W. R., Harrison, A., Saadeh, F. B.,...Loucks, E. B. (2020). **Mindfulness and cardiovascular health: Qualitative findings on mechanisms from the mindfulness-based blood pressure reduction (MB-BP) study.** *PloS One.* [\[link\]](#)

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Nien, J.T., Wu, C.H., Yang, K.T.,...Zhou, C. (2020, August 28). **Mindfulness Training Enhances Endurance Performance and Executive Functions in Athletes: An Event-Related Potential Study.** *Neural Plasticity.* [\[link\]](#)

Pomè, A., Burr, D. C., Capuozzo, A., Binda, P. (2020). **Spontaneous pupillary oscillations increase during mindfulness meditation.** *Current Biology.* [\[link\]](#)

Proeve, M. J. (2020). **The Relationship of Two Types of Shame with Meditation Experience.** *Mindfulness.* [\[link\]](#)

Sessanna, L., Nisbet, P., Alanazi, N.,...Lorenz, R. A. (2020). **The Experience of Participating in an 8-Week MBSR plus Sleep Retraining Course among Women Living with Multiple Sclerosis.** *Clinical Nursing Research.* [\[link\]](#)

Srinivasan, N., Tripathi, S., Singhal, I. (2020). **Meditators Exercise Better Endogenous and Exogenous Control of Visual Awareness.** *Mindfulness.* [\[link\]](#)

Wang, M. Y., Freedman, G., Raj, K.,...Bailey, N. W. (2020). **Mindfulness meditation alters neural activity underpinning working memory during tactile distraction.** *Cognitive, Affective & Behavioral Neuroscience.* [\[link\]](#)

Xiao, C., Chen, Y., Wu, Y.,...Wang, Z. (2020). **MBSR therapy as a preclinical intervention for peri-menopausal depressive moods – An observational study.** *European Journal of Integrative Medicine.* [\[link\]](#)

## Methods

*Articles developing empirical procedures to advance the measurement and methodology*

Bednar, K., Voracek, M., Tran, U. S. (2020). **Common Factors Underlying the Five Facets of Mindfulness and Proposed Mechanisms: A Psychometric Study Among Meditators and Non-meditators.** *Mindfulness.* [\[link\]](#)

Beshai, S., Bueno, C., Yu, M.,...Pitariu, A. (2020). **Examining the effectiveness of an online program to cultivate mindfulness and self-compassion skills (Mind-OP): RCT on Amazon's Mechanical Turk.** *Behaviour Research and Therapy.* [\[link\]](#)

Bibeau, M., Dionne, F., Riera, A., Leblanc, J. (2020). **The Influence of Compassion Meditation on the Psychotherapist's Empathy and Clinical Practice: A Phenomenological Analysis.** *Journal of Humanistic Psychology.* [\[link\]](#)

Bokoch, R., Hass-Cohen, N. (2020). **Effectiveness of a School-Based Mindfulness and Art Therapy Group Program.** *Art Therapy.* [\[link\]](#)

Hassed, C., Flighty, A., Chambers, R.,...Kazantzis, N. (2020). **Advancing the Assessment of Mindfulness-Based Meditation Practice: Psychometric Evaluation of the Mindfulness Adherence Questionnaire.** *Cognitive Therapy and Research.* [\[link\]](#)

Mackiewicz Seghete, K. L., Graham, A. M., Lapidus, J. A.,...Dimidjian, S. (2020). **Protocol for a mechanistic study of MBCT during pregnancy.** *Health Psychology.* [\[link\]](#)

Marchand, W. R., Beckstrom, J., Nazarenko, E.,...Parker, A. (2020). **The Veterans Health**

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**Administration Whole Health Model of Care: Early Implementation and Utilization at a Large Healthcare System.** *Military Medicine.* [\[link\]](#)

Pollonini, L., Montero-Hernandez, S., Park, L.,...Ahn, H. (2020). **Functional Near-Infrared Spectroscopy to Assess Central Pain Responses in a Nonpharmacologic Treatment Trial of Osteoarthritis.** *Journal of Neuroimaging.* [\[link\]](#)

Stieger, J. R., Engel, S., Jiang, H.,...He, B. (2020). **Mindfulness Improves Brain-Computer Interface Performance by Increasing Control Over Neural Activity in the Alpha Band.** *Cerebral Cortex.* [\[link\]](#)

### Reviews

Articles reviewing content areas of mindfulness or conducting meta-analyses of published research

Chan, J., Leung, D. K., Walton, H.,...Spector, A. (2020). **Can Mindfulness-Based Interventions Benefit People with Dementia? Drawing on The Evidence from a Systematic Review in Populations with Cognitive Impairments.** *Expert Review of Neurotherapeutics.* [\[link\]](#)

Chang, Y. C., Yeh, T. L., Chang, Y.M., Hu, W. Y. (2020). **Short-term Effects of Randomized Mindfulness-Based Intervention in Female Breast Cancer Survivors: A Systematic Review and Meta-analysis.** *Cancer Nursing.* [\[link\]](#)

Golden, H. L., Vosper, J., Kingston, J., Ellett, L. (2020). **The Impact of Mindfulness-Based Programmes on Self-Compassion in Nonclinical Populations: A Systematic Review and Meta-Analysis.** *Mindfulness.* [\[link\]](#)

Shim, M., Tilley, J. L., Im, S.,...Gonzalez, A. (2020). **A Systematic Review of Mindfulness-Based Interventions for Patients with Mild Cognitive Impairment or Dementia and Caregivers.** *J Geriatric Psychiatry Neuro.* [\[link\]](#)

### Trials

Research studies newly funded by the National Institutes of Health (SEP 2020)

Colorado State University (L. Shomaker, PI). **Mindfulness-based intervention for depression and insulin resistance in adolescents.** NIH/NCCIH project # 1U01AT011008. [\[link\]](#)

Old Dominion University (M. Kelley, PI). **Adaptation of mindfulness training to treat moral injury in veterans.** NIH/NCCIH project # 1R34AT011038. [\[link\]](#)

University of Pittsburg (C. Conklin, PI). **Mindfulness and TDCS to reduce situational urgency incontinence in women.** NIH/NIA project #1R21AG064361. [\[link\]](#)

University of Texas Houston (D. Santa Maria, PI). **Adapting MBSR intervention for emotion regulation and impulsivity in homeless young adults.** NIH/NCCIH project #1R34AT010672. [\[link\]](#)

VA Puget Sound Healthcare System (D. Kearney, PI). **Evaluation of MBSR and CBT for veterans with chronic pain.** VA project #1I01RX003283. [\[link\]](#)

West Chester University of Pennsylvania (M. Gawrysiak, PI). **MBRP to improve extended release naltrexone adherence and drug use outcomes for opioid use disorder.** NIH/NIDA project #1R15DA050102. [\[link\]](#)

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## Highlights

*A summary of select studies from the issue, providing a snapshot of some of the latest research*

Children who have a greater cognitive capacity to sustain attention often perform better in school. Cognitive capacities such as increased attentional control can result from mindfulness training, as shown previously in samples of children. Little is known about the brain activity that links such training to sustained attention in children.

A promising mechanism to test is the functional relationship between areas of the brain that support sustained attention (the Central Executive Network, CEN) and mind wandering (the Default Mode Network, DMN). The activity of these two networks is positively correlated in very young children, and becomes increasingly anticorrelated as children develop the capacity to sustain attention and mature into adulthood.

**Bauer et al. [Human Brain Mapping]** tested the effects of an in-school mindfulness training on sustained attention performance as well as CEN and DMN brain activity in school children.

The researchers randomly assigned 99 sixth-graders (70% female; 53% Caucasian; average age = 12 years) to in-school mindfulness or computer coding training. Mindfulness classes incorporated 5-15 minutes of mindfulness practice per class, involving attention to breathing, body sensations, sounds, thoughts and emotions. The classes also included didactic mindfulness instruction, group discussion, and instructor feedback.

The coding intervention taught children to use a novel programming language and was designed to train creative thinking, systematic reasoning, and collaborative group work. Both interventions took place 4 times per week in 45-minute sessions across 8 weeks.

All children completed a 15-minute sustained attention task before and after intervention that required them to press a button whenever a digit appeared on a computer screen, except when the digit was the number three. A subsample of 40 children had parental permission for brain imaging, and completed fMRI brain scans measuring CEN and DMN activity while at rest before and after the intervention.



After the intervention, the mindfulness group showed significantly better performance on the computer-based sustained attention task than did the coding group (Cohen's  $f^2 = 0.47$ ; large effect size). Performance in the coding group significantly declined over time, while the mindfulness group's performance did not.

Prior to intervention, sustained attention performance correlated significantly with anticorrelations between CEN and DMN ( $r = -.45$ ) for the combined sample. After intervention, the mindfulness group showed a large and significant increase in CEN-DMN anticorrelation ( $f^2 = 0.56$ ) compared to the coding group. Greater post-intervention improvements in sustained attention significantly correlated with larger CEN-DMN anticorrelations ( $r = -.51$ ). There was a significant decrease in CEN-DMN anticorrelation in the coding group.

The study shows that in-school mindfulness training helps preserve sustained attention in children, and highlights greater segregation between the CEN and DMN activity as a likely brain mechanism. This is the first study to show a causal link between changes in attentional performance and brain functional connectivity in children. The study is limited by the smaller subset of the sample that completed brain scans.

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The over-prescription of opioids for chronic pain is a significant risk factor for drug abuse and addiction. About one-fifth of chronic pain patients double their opioid dosage over the course of two years, and so primary care psychological interventions are needed to reduce the risk of eventual misuse and dependence.

In a previous clinical trial, a mindfulness training program for opioid users reduced pain and opioid dosage in chronic pain patients. Garland et al. [*American Psychologist*] conducted a secondary analysis of that clinical trial, now examining whether physiological changes in heart rate variability (HRV) predict opioid dose reduction. HRV is the variation of time between each heartbeat and serves as a biomarker for increased autonomic nervous system self-regulation. Greater HRV is associated with relaxation and greater emotional and behavioral self-control.

The researchers randomly assigned 95 primary care patients who were prescribed opioids for the management of chronic musculoskeletal pain (66% female; 90% Caucasian; average age = 57 years) to Mindfulness-Oriented Recovery Enhancement (MORE) or a support group. Both MORE and support groups were delivered once weekly for 2 hours across 8 weeks. MORE included didactics and practice in mindfulness, cognitive reappraisal, and savoring naturally occurring rewards that included 15 minutes a day of home practice in these skills. Emphasis was placed on making the skills relevant to substance abuse, pain, stress reduction and self-regulation. The support group included nondirective counseling, social support, home journaling, and discussions of chronic pain, stigma, and stress.

Daily opioid dosage before and after intervention was assessed using retrospective self-report and prescription data from the medical record. After intervention, HRV was measured via electrocardiogram during a 5-minute baseline recording and a 10-minute mindfulness meditation. The meditation

instruction was a simple verbal prompt to attend to thoughts, feelings and sensations in the present without judgment and reactivity, and was the same for MORE participants and controls.

The results showed the MORE group reduced daily opioid dosage significantly more than the support group (Cohen's  $d = 1.07$ ). The MORE group decreased their average daily opioid dosage from 66 mgms to 45 mgms, while the support group increased their daily average dosage from 69 mgms to 156 mgms.



The MORE group showed a significantly greater increase in HRV during meditation relative to the rest period ( $d = .42$ ) than controls. Decreased opioid dosage was partially mediated by the increase in HRV during meditation, suggesting that participants with the largest increases in HRV while meditating showed the largest decreases in opioid daily dose. Daily home practice in the MORE group correlated with reduced opioid dose ( $r = -.40$ ) and increased HRV ( $r = .42$ ).

The study shows that a training that includes a significant mindfulness component adapted to reduce the risk of opioid misuse can reduce daily opioid dosage in chronic pain patients. HRV findings suggest that autonomic nervous system activity occurring while meditating might confer greater self-regulation over pain and opioid use. Interpretation of study findings are limited by primary reliance on retrospective self-reports of daily opioid dose. It is also unclear whether increased HRV while meditating is indicative of more state-like autonomic changes that endure over time, or simply reflects that people with prior meditative practice relax more during meditation than people without prior practice.