



Mindfulness and Physical Activity

Abstract: *Mindfulness and mindful activity can have a profound effect on physical and mental health. When considering mindfulness and physical activity, it is important to differentiate between physical activities, which are geared toward mindfulness and have mindful components, for example, yoga, pilates, and tai chi, from other mindfulness interventions that are then geared toward greater awareness and mindfulness, which may then lead to healthful behavior change such as increasing physical activity. Prescribing mindfulness interventions may be another resource to help physicians when interacting with their patients, considering motivating patients to exercise and become more physically active can be challenging. Engaging in mindfulness can elicit change over time. Integrating mindfulness to interventions with exercise is one way to initiate exercise adherence as well as improve self-efficacy. When practicing mindful-based exercise programs, the benefits can also be seen with improved breathing rate and depth, heart rate, and parasympathetic activity. Promoting mindfulness-based training for physical activity has positive effects both psychologically and physiologically.*

Keywords: behavior change, yoga, tai chi, exercise adherence

Mindfulness and mindful activity can have a profound effect on physical and mental health.¹⁻⁷ As mentioned in both review articles in this issue,^{8,9} more research is needed to see the true effects of mindfulness; however, the implications for mindfulness as an acceptable intervention in a lifestyle medicine practice appear to be positive. When considering mindfulness and physical activity, it is important to differentiate between physical activities, which are geared toward mindfulness and have mindful components (e.g. yoga, pilates, and tai chi) from other mindfulness

transtheoretical model (TTM);¹⁰⁻¹² and research indicates that with regard to mindfulness and TTM, those who are more mindful are more likely to follow through on an intention to become more physically active.¹³ In a cross-sectional study, Loucks et al found that those who were more mindful were more successful at maintaining an exercise program.¹⁴ Ulmer and colleagues also found that those who were more mindful and accepting were more likely to maintain their exercise program.¹⁵ Therefore, it seems as though for those patients having difficulty starting and/or maintaining an exercise program, a

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interventions that are geared toward greater awareness and mindfulness, which may then lead to healthful behavior change such as increasing physical activity.

Prescribing mindfulness interventions may be another resource to help physicians when interacting with their patients, considering motivating patients to exercise and become more physically active can be challenging.¹⁰ When prescribing exercise for patients, it is important to assess which stage of change patients are in within the

mindfulness program may help them to achieve their goals.

Physical activity associated with mindfulness may also help with behavior change along with the activity in and of itself helping to increase physical activity. McIver and colleagues found that 12-weekly yoga sessions with instructions for home practice greatly increased self-reported physical activity after intervention and at 3-month follow-up compared with the control group in obese, women, binge eaters.¹⁶ Bryan and colleagues also implemented

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a yoga intervention with a mindfulness component, and their pilot study revealed that those in the intervention group not only increased in physical activity adherence during the intervention and postintervention but also had an increase in exercise self-efficacy and improved attitudes toward exercise habits in previously sedentary adults when compared with control.¹⁷ In a Tai Chi intervention with Parkinson's patients, researchers found that those individuals in the Tai Chi group versus the other groups showed increased perceptions of exercise-related health benefits and a greater probability to exercise adherence.¹⁸ These mindful physical activities not only appear to assist in improving health behavior, mindful physical activities seems to have physical and mental health benefits in and of themselves.

Improved mood following exercises such as yoga support the idea that mindful exercise may have additional benefits compared with non-mindful modes of exercise.¹⁹ Specific exercise programs that combine stimulating and calming techniques or those that promote exercise plus cognitive strategies are more effective in promoting psychological and physiological benefits than are exercise programs lacking a structured cognitive component.²⁰ Mind-body exercises such as Tai Chi Chuan and Qigong are easily accessible activities that focus on the homeostasis of the body's internal environment and the recognition that mental attitude can cause physiological change.^{21,22} The Pilates method, which controls for breathing and body movement, taught to college students, was associated with increases in mindfulness, lower stress levels, and improved mood compared with controls involved in an exercise program that did not engage in mind-body practices.²³ Learning mindfulness-based stress reduction and relaxation, including meditation and Hatha yoga, has been shown to have a significant change in breathing patterns compared with controls in women with heart disease.²⁴ Because the increase in sympathetic

activity induced in standing yoga postures disappears when the subject changes to a supine position, it is important to have periods of no activity following periods of activity while maintaining a relaxed attitude.²⁰ The meditation incorporated into these exercises are capable of influencing the parasympathetic activity of the vagus nerve and altering heart rate variability (HRV) and decreasing oxygen consumption.^{20,25}

Oxygen consumption increases during yoga postures with the standing postures inducing a hypermetabolic state.²⁰ Pranayama breathing during yoga has been shown to cause a significant increase in the carbon dioxide uptake (VCO_2) and heart rate in beats per minute (bpm).²⁶ Observation of participants performing Bikram yoga, Hatha yoga postures done in a heated room, has shown higher than expected heart rates when compared with the corresponding oxygen uptake (VO_2) values.²⁷ The meditation phase of yoga causes a change to a hypometabolic state with a significant drop in VO_2 and a reduction in heart rate by an average of 6 bpm, creating moments of distinct metabolic variation within the same yoga session. These changes during meditation are controlled physiologically by the parasympathetic nervous system.²⁶ At slower breathing rates, maximum R-R intervals are longer and minimum R-R intervals are shorter showing fluctuations in sympathetic nerve traffic.²⁸

Recent studies have shown the potential of mindfulness practices to increase parasympathetic tone by improving HRV.¹⁹ Meditation training with mindfulness-based stress reduction improved cardiac sympathovagal balance measured by HRV. Compared with controlled respiration alone, meditation improved autonomic balance with reduced sympathetic and increased parasympathetic influence.²⁹ Maximum changes in autonomic variables, including HRV, and breath rate were found during the state of effortless meditation suggesting increased vagal modulation.³⁰ Sedentary elderly women who began Tai Chi Chuan training

showed a significant within-group training effect for HRV, suggesting improved autonomic control as well as improved VO_2 compared with those engaged in brisk walking.³¹ The physiological benefits of mindful exercise reflect the parasympathetic response, which may correspond with the healthy lifestyle change.

Engaging in mindfulness can elicit change over time. Integrating mindfulness to interventions with exercise is one way to initiate exercise adherence as well as improve self-efficacy. When practicing mindful-based exercise programs, the benefits can also be seen with improved breathing rate and depth, heart rate, and parasympathetic activity. Promoting mindfulness-based training for physical activity has positive effects both psychologically and physiologically. **AJLM**

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