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# The effectiveness of a comprehensive mind body weight loss intervention for overweight and obese adults: A pilot study

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Relaxation Response;  
Meditation

## Summary

**Objectives:** This pilot study evaluated the effectiveness of a comprehensive mind body intervention for weight loss in overweight and obesity and the maintenance of weight loss at 6-month follow-up.

**Design:** Thirty-one overweight and obese employees (Body Mass Index (BMI) 28.6–47.9 kg/m<sup>2</sup>) from a large corporation participated in a 20-week comprehensive mind body intervention targeting weight loss.

**Main outcome measures:** Weight, BMI, waist and hip circumference, rate pressure product (RPP), blood pressure, fasting blood glucose, cholesterol, triglycerides, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and psychological variables were collected at baseline, post-intervention, and 6-month follow-up.

**Results:** Using linear mixed model analyses, the intervention resulted in significant mean weight loss (−4.3 kg, 95% CI −5.8 to −2.8), decreases in BMI (−1.51, 95% CI −2.1 to −1.0), hip circumference measurement (−4.3 cm, 95% CI −6.9 to −1.5), and triglyceride levels (95% CI −33.1 to −4.8). In 6-month follow-up after intervention, statistically significant improvements in weight, BMI and waist measurement were sustained. Participants also showed positive

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changes in self-reported psychological indices: food-related disinhibition, and hunger both decreased significantly ( $p < 0.01$ ); general self-efficacy increased ( $p < 0.05$ ); positive affect increased ( $p < 0.001$ ); physical function and self-esteem increased ( $p < 0.01$ ); and measures of health-promoting behaviors on 4 subscales (health responsibility, physical activity, nutrition, and stress management) also showed statistically significant improvements ( $p < 0.001$ ) at post-intervention and 6-month follow-up.

**Conclusions:** This comprehensive mind body intervention showed modest effects on physical, laboratory, and psychological outcomes, both immediately following treatment and at 6-month follow-up, in overweight and obese individuals.

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## Introduction

The prevalence of obesity continues to be high in the United States.<sup>1</sup> Obesity is a major public health concern associated with many common chronic diseases,<sup>2</sup> higher mortality, and reduced life expectancy.<sup>3,4</sup> While many dietary and lifestyle interventions for obesity result in weight loss and may reduce the risk factors for coronary disease,<sup>5-7</sup> weight regain over time is common.<sup>8</sup>

It has been proposed that stress and negative emotions are critical factors in inducing overeating, a form of maladaptive coping in some participants with obesity.<sup>9,10</sup> Relaxation techniques may function to reduce emotional eating and lead to weight reduction.<sup>11</sup> However, relatively few studies have explored whether mind body interventions, and those that include relaxation training in particular, are useful for maintaining weight loss. Manzoni et al. reported in an exploratory randomized control trial that the addition of relaxation training to a standard in-patient weight loss program involving healthy diet and exercise promotion was effective in reducing both self-reported emotional eating episodes and depressive and anxiety symptoms, and in improving perceived self-efficacy for eating control, at 3 month follow-up post-intervention.<sup>11</sup> While one study, the results of this RCT suggest that mind body techniques, such as relaxation training, may provided added benefit to traditional weight loss programs in their behavior and psychological outcomes.

In this study, we examined the effectiveness of a 20-week comprehensive mind body weight loss intervention that included relaxation training as a primary component in overweight and obese individuals, with a 6-month follow-up.

## Methods

### Participants

The study was approved by the Institutional Review Board of Massachusetts General Hospital in Boston, MA. Employees between the ages of 18 and 65 were recruited from a large corporation in the greater Boston area via emails and presentations by the BHI staff. Employees interested in participating were instructed to contact the study staff in order to complete a phone screening. Eligible participants were (1) able to read and understand English; (2) able to provide informed consent and be willing to complete a 1-year study; and (3) obese ( $BMI \geq 30 \text{ kg/m}^2$ ) or overweight ( $BMI \geq 25 \text{ kg/m}^2$ ) with an

obesity-related comorbidity such as systolic or diastolic hypertension, Type 2 Diabetes, impaired glucose tolerance, hyperinsulinemia, significant hyperlipidemia, hepatic steatosis, or sleep apnea. Eligible participants were determined to be in stable general health by the research physician, with an initial body weight of at least 132.3 lbs (60 kg).

Potential participants were excluded if determined to have serious or unstable current or past medical conditions or the presence of current or past medical problems that would impair performance during the exercise tests. Participants were not permitted to have used anorexiatic medications for the purpose of weight reduction in the 6 months prior to enrolling in the study, to be concurrently enrolled in another weight control intervention or using orexigenic medications (e.g., TCAs, mirtazapine, megestrol acetate), or to receive surgery for weight reduction during the study or its follow-up. Females who were pregnant or currently nursing an infant at the time of enrollment were not eligible to participate in the study. In addition, those with known endocrine or genetic causes for obesity, medical factors affecting vascular function (including cigarette smoking), as well as individuals with a change of more than 3% of body weight in the 2 months prior to enrollment, were excluded.

### The BHI Lighten-Up Intervention

The BHI Lighten-Up Intervention is a 20-week comprehensive outpatient group intervention based on the principles and practices of mind body medicine (see Table 1). A core component of the 20 weekly sessions is elicitation of the relaxation response (RR) using a variety of methods including: hatha yoga, imagery, mindfulness, contemplation, and single-pointed focus.<sup>12</sup>

### Assessments

Employees who met the inclusion criteria consented to participation before completing a 3-h baseline assessment with a physician, nurse, exercise physiologist, dietician, and staff researcher at BHI. During the visit, individuals completed physical measurements, laboratory tests, and a series of psychological questionnaires (see Measures section). Participants also completed this battery of assessments post-intervention (Assessment 2; between 21 and 27 weeks) and at 6-month follow-up (Assessment 3; between 48 and 54 weeks).

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