

### An Expanded Model for Mindful Eating for Health Promotion and Sustainability: Issues and Challenges for Dietetics Practice

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**INDFULNESS INVOLVES BEING FULLY PRESENT** from moment to moment, with full awareness of one's own emotional state and physical condition, as well as one's surroundings.<sup>1-4</sup> Mindfulness practice has been increasingly incorporated into the treatment of chronic diseases.<sup>4</sup> Promising results have been observed in the management of depression, stress, physical function, quality of life, and chronic pain.<sup>4,5</sup> Mindful eating generally refers to the application of mindfulness techniques to eating, which involves nonjudgmental awareness of internal and external cues influencing the desire to eat, food choice, quantity of consumption, and the manner in which food is consumed.<sup>6</sup> In dietetics, mindful eating strategies have been utilized primarily in the management of obesity and eating disorders.<sup>7,8</sup>

Because mindful eaters are aware of how their food choices and eating behavior directly and indirectly affect themselves, mindful eating can be a useful strategy to positively influence food consumption to maximize health and prevent diseases. However, the awareness of one's eating behavior need not be limited to personal benefit. Aligning healthy dietary choices with efforts to promote both environmental sustainability and food security are values that are consistent with the 2015 United Nations' Sustainable Development goals.<sup>9</sup> The Academy of Nutrition and Dietetics supports nutrition as a cornerstone of health promotion and encourages registered dietitian nutritionists (RDNs) to be involved in promoting sustainable agriculture.<sup>10-12</sup> One potential approach to achieve these goals can involve raising clients' awareness through the use of a value-based framework that ties dietary practices to the joint goals of individual health, environmental sustainability, and food security.

The key principles of mindfulness techniques, which have been successful in eating disorder and obesity treatment,<sup>13-15</sup> can also be harnessed to empower individuals to make dietary choices that benefit both personal health and the natural resources involved in food production. In mindful eating, one would make food choices that maximize benefit while minimizing harm to themselves, others, and the environment. In this article, we briefly review the current literature on mindful eating and propose a broader concept of mindful eating as an approach for health promotion and sustainable development. In order to move the practice of mindful eating forward, we identify research needs for the development of tools and provide evidence to support the broader use of mindful eating for health promotion.

#### BENEFITS OF MINDFULNESS ON EATING BEHAVIOR IN HEALTHY POPULATIONS

A number of studies have suggested that mindfulness or mindful eating is linked to food choice and consumption quantity. In a small cross-sectional study in South Australia, a higher mindfulness score was associated with a higher mindful eating score, which in turn was associated with choosing smaller serving sizes of energy-dense foods.<sup>16</sup> An intervention study on mindful eating for restaurant meals among healthy perimenopausal women resulted in lower total energy and fat intake.<sup>17</sup> A study of college students showed a higher level of mindfulness was associated with a higher preference for fruit and a tendency to choose fruit instead of sweets for a snack.<sup>18</sup> Mindful eating strategies can also reduce emotional eating and response to external eating cues.<sup>7</sup>

Psychological stress has been associated with unhealthy eating behavior. In laboratory-based experiments, stressful experiences have been shown to increase energy intake in normal-weight women, an effect believed to be mediated through a stress-induced lower level of satiety.<sup>19</sup> Others have also found an increase in food consumption under stressful conditions, even though stress was unrelated to hunger or satiety level.<sup>20</sup> Under stressful conditions, food choice can shift toward items higher in sugar and fat, and this phenomenon might be more pronounced in women than men.<sup>21-23</sup> Mindfulness techniques have been shown to be effective in stress reduction.<sup>3,24</sup> In addition, individuals with a higher level of mindfulness reported less emotional eating.<sup>25</sup>

## CURRENT STUDIES OF MINDFUL EATING ON HEALTH OUTCOMES

Mindful eating has so far been used primarily as a technique in medical nutrition therapy, with the majority of the

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scientific literature focused on weight management and eating disorders. While all interventions have incorporated mindfulness practices such as meditating, mindful eating, and understanding eating triggers, there were major differences among treatment protocol.<sup>7</sup> For example, interventions range from a 7-hour silent day of meditation practice to incorporating dietary records.<sup>13,17</sup> Most interventions have been variations of Mindfulness-Based Eating Awareness Training, which incorporates mindfulness and meditation practices to address eating-related processes, such as hunger triggers, food choice, and emotional regulation.<sup>26</sup>

Among studies on weight management, most have been conducted among fairly homogenous populations of predominantly middle-aged, obese women, and the results have varied. While many studies observed significant weight loss when mindfulness techniques were used, only a small number of studies found it resulted in significantly more weight loss than the comparison method.<sup>27</sup> Interestingly, in Timmerman and colleagues,<sup>17</sup> an analysis of only those who completed the entire study found the treatment group had significantly less weight gain than the control group.

A small number of studies have investigated mindfulnessbased strategies for treating eating disorders.<sup>28</sup> The duration of intervention was typically 6 to 10 weeks, and almost all studies were conducted among white women with binge eating disorder or bulimia nervosa. Most studies were small and used mindfulness meditation to regulate hunger awareness and eating behavior, coping skills, and judgmental thoughts. Some success in normalizing eating behavior and reducing binge eating was observed.<sup>29,30</sup> In a more recent study, a 12-week Mindfulness-Based Eating Awareness Training protocol was more successful in maintaining remission of binge eating 4 months after intervention than a modified cognitive-behavioral therapy protocol.<sup>15</sup>

Two studies included mindful eating strategies for diabetes management.<sup>31,32</sup> In a small, 3-month intervention, overweight adults with type 2 diabetes were randomized into the Mindfulness-Based Eating Awareness Training or standard Diabetes Self-Management Education protocol.<sup>31</sup> At the end of the trial, diet quality and self-efficacy were comparable with the group using diabetes self-management, but the Mindfulness-Based Eating Awareness Training group scored higher on a mindfulness scale. On the other hand, a combined mindful eating (Mindfulness-Based Eating Awareness Training) and yoga intervention was more successful than standard treatment in reducing blood glucose level in Thai women with gestational diabetes.<sup>32</sup>

### CURRENT MINDFUL EATING PROTOCOLS AND ASSESSMENT

Currently, there is no standard on what constitutes mindful eating behavior. Mindful eating interventions use strategies that center around awareness of eating stimuli and regulating quantity of food intake through awareness of physiological needs.<sup>15-17,33</sup> Less attention is placed on the health characteristics of the food eaten. The most well-established mindful eating protocol is the Mindfulness-Based Eating Awareness Training, which was developed for binge eating disorders.<sup>26</sup> The goals of this protocol are to train participants in awareness of external and internal eating cues, temper the binge-guilt-restraint behavior in binge eating–related disorders,

and reintroduce healthy eating regulation. Meditation is a major component of the program. The training also includes mindful eating exercises, sensory awareness of hunger and satiety, making wise food choices based on health reasons and personal preferences, and acceptance of one's feelings. Other studies not using Mindfulness-Based Eating Awareness Training used similar strategies that centered in meditation, including awareness of sensory input from foods (eg, taste, sight, smell), awareness of eating stimuli, and acceptance of one's feelings.<sup>7,34</sup>

Currently, there is no widely recognized standard assessment protocol on adherence to mindful eating. Mindful eating interventions use a battery of established tools that assess mindfulness; eating behaviors, such as restraint and emotional eating; and related constructs. These include the Five Facet Mindfulness Questionnaire,<sup>35</sup> Kentucky Inventory of Mindfulness Skills,<sup>36</sup> Eating Self-Efficacy Scale,<sup>37</sup> and Three-Factor Eating Questionnaire<sup>38</sup> (Table). Only two measurement tools were designed specifically to measure mindful eating.

The Mindful Eating Questionnaire<sup>45</sup> is a 28-item questionnaire that measures disinhibition, awareness, external cues, emotional response, and distraction, and is based on several existing tools. It was tested with participants, mostly white women, from weight-loss programs, a yoga studio, and members of organizations not involved in eating and nutrition issues, and a higher mindful eating score among individuals with longer duration of yoga practice per week was observed. However, this questionnaire was not evaluated for its validity in each of the domains. Additional validation is also needed for other segments of the population, as well as for its ability to detect changes over time.

The second instrument is a 74-item Mindful Eating Scale developed from the Five-Factor Mindfulness Questionnaire and Philadelphia Mindfulness scale.<sup>46</sup> Its correlation with one mindfulness scale and four other disordered eating trait scales were tested on young white subjects. However, there was no evaluation of its ability to differentiate between levels of mindful eating or of its ability to sufficiently detect changes over time.

#### A BROADER APPLICATION OF MINDFUL EATING

Existing mindful eating interventions share many similarities. Interventions aim to train the individual to recognize hunger and satiety signals to guide the individual to avoid overeating. Interventions emphasize having the mind and body united in the now, which draws the individual to the present moment and task, with the intended result of recognizing internal and external cues to eat and to stop eating.<sup>14,15,34</sup> Mindfulness is also intended to cultivate a nonreactive attitude to one's feelings toward food and eating, which can have the potential to break the cycle of overeating followed by over-restriction. Intuitive eating involves a narrower aspect of mindful eating.<sup>47</sup> In particular, intuitive eating focuses heavily on awareness of hunger and satiety cues, and responding appropriately to them. The majority of the mindful eating interventions reviewed were used to treat overeating with the intention of normalizing consumption quantity at the moment of eating.7,48 Mindful eating practices, however, can also be expanded to encompass broader issues related to food and nutrition.

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