



## CLINICAL APPLICATIONS

overriding homeostatic hunger, and satiety signals; this connection can be exacerbated by stress. In fact, stress can interfere with self-regulation; contribute to overeating and consumption of foods that are high in calories, fat, or sugar; and interfere with sleep (12). Findings from the American Psychological Association's Stress in America™ survey reported that 39% of U.S. adults said that they either overeat or eat unhealthy foods in response to stress (13). This is capsulized by the fact that stress is linked to dysregulated eating, weight gain, impaired glucose metabolism, abdominal adiposity, and lipid abnormalities (14,15). Given the connections between stress, overeating, and obesity, health and fitness professionals are uniquely positioned to use mindful eating techniques that promote increased responsiveness to homeostatic signals regulating food intake.

---

**“In fact, stress can interfere with self-regulation; contribute to overeating and consumption of foods that are high in calories, fat, or sugar; and interfere with sleep (12). Findings from the American Psychological Association's Stress in America™ survey reported that 39% of U.S. adults said that they either overeat or eat unhealthy foods in response to stress (13).”**

---

### PURPOSE

The purposes of this *Clinical Applications* column are to define mindfulness and mindful eating, to provide examples of research conducted with mindfulness and mindful eating, and to describe strategies for implementing mindfulness and mindful eating into health and fitness practice.

### MINDFULNESS, MEDITATION, AND MINDFUL EATING

Informed by Buddhist traditions, the concept of mindfulness in psychological literature has been described as observing one's immediate experience with curiosity, paying attention on purpose, and being open to the experience (nonjudgment) (16–18). Mindfulness can be conceptualized as a state and trait (known as dispositional mindfulness), with the latter considered to be relatively stable over time (19,20). Although state mindfulness tends to be the focus of mindfulness-based interventions, some data indicate that dispositional mindfulness also may change in the context of interventions (21). Mindfulness-based interventions have shown results across conditions and outcomes, including psychological stress, psychological well-being, chronic pain, depression, and addiction (22,23). Mindfulness practice is theorized to promote adaptive self-regulation, which is thought to be key to maintaining long-term eating habits, particularly in the face of stress (24). A review of general mindfulness practices on weight control,

both yoga and non-yoga mindfulness interventions, concluded that these approaches show promise in reducing overall food consumption, making healthier food choices, and slowing the eating process (16).

---

**“Informed by Buddhist traditions, the concept of mindfulness in psychological literature has been described as observing one's immediate experience with curiosity, paying attention on purpose, and being open to the experience (nonjudgment) (16–18).”**

---

Mindful eating is simply using mindfulness techniques during the act of eating and refers to developing an awareness of physical versus psychological hunger and satiety cues, focusing on how food affects all of the senses, and awareness of the physical and emotional sensations in response to eating (25,26). Mindful eating asks an individual to tune into their body and its internal cues on when to eat, what to eat, and how to eat. Studies on mindful eating have examined physiological outcomes such as weight and glycemic control, eating behaviors such as binge and emotional eating, and food-related outcomes such as food intake and choice (25). There is evidence to suggest that mindful eating techniques can facilitate change in eating behaviors with positive effects on emotional eating, binge eating, and eating in response to external cues (25).

---

**“Mindful eating is simply using mindfulness techniques during the act of eating and refers to developing an awareness of physical versus psychological hunger and satiety cues, focusing on how food affects all of the senses, and awareness of the physical and emotional sensations in response to eating (25,26).”**

---

Research into the mechanisms of mindfulness and mindful eating interventions is ongoing; however, there are several emerging theories. Studies have shown that mindfulness affects the structure and function of the brain. Mindfulness and mindful eating may result in increasing the prefrontal cortex activity and functional connectivity while reducing amygdala activity, the emotional control center of the brain, which in turn would reduce emotional arousal (22,25). It is thought that mindful eating also increases internal hunger and satiety cues and reduces external cues to eat (25), such as seeing or smelling food, eating

**TABLE 1: Strategies for Mindful Eating**

• Slowing down the pace of eating
• Eating without distraction (e.g., phone, social media, news, driving, and television)
• Using all senses when eating by noticing colors, smells, flavors, textures, and sounds
• Noticing what it feels like to chew, taste, and swallow food
• Acknowledging response to food without judgment
• Taking note of the effect food has on feelings and body
• Choosing food that is pleasing and nourishing
• Pausing frequently during a meal to determine feelings of fullness

based on boredom, stress or other emotions, and seeing advertisements or other people eat (27).

The results of a systematic review suggest that mindfulness-based interventions improve obesity-related eating behaviors, specifically binge eating, emotional eating, and external eating (28), but rigorous long-term randomized controlled trials are limited

(23). It is unclear whether mindfulness or mindful eating alone would be sufficient enough to bring about substantial weight loss for people with obesity. However, effective strategies for weight loss require a combination of nutrition and physical activity interventions, and mindfulness can be one tool to support an individual who experiences difficulty with emotional eating and overconsumption of food.

### STRATEGIES FOR THE HEALTH AND FITNESS PROFESSIONAL TO INCORPORATE INTO PRACTICE

Mindfulness training is not a new concept in the health and fitness industry, as it is frequently used in mind-body exercise such as yoga. Mindful eating is not a diet plan and does not require specific macronutrient ratios. In fact, there are no restrictions placed on the type or amount of food consumed; therefore, this intervention may be appealing to individuals who have difficulty following a meal plan or any diet with restrictions. Before implementing mindful eating interventions, health and fitness professionals are encouraged to consider structural, environmental, interpersonal, and individual factors, such as access to healthy foods and eating disorders, that may warrant attention before meaningful participation in this practice.

**Figure.** Mindful eating practice.

**Practicing Mindful Eating**  
 To introduce mindful eating to individuals, consider employing the following exercise scripted by Nelson (31) based on Kabat-Zinn’s work on living mindfully (18). Read this script slowly and without distractions.

“I am going to give us a series of directions for our mindful eating practice. While we are practicing, let’s silently pay attention to this experience. At any point when we notice our thoughts are taking us away from this mindful eating exercise, let’s gently bring our awareness and attention back to this mindful eating exercise.

1. Place one raisin in front of you. (Pause)
2. Imagine you have just been dropped off on this planet, and you know nothing about where you are. You have never experienced anything from Earth. With no experience, there are no judgments, fears, or expectations. It is all new to you. Take a few deep breaths and relax. (Pause)
3. Pick up the raisin. What do you see? Look at its surface, color, size, textures. (Pause)
4. What do you feel? Notice its weight, **texture**, feeling any softness, hardness, coarseness, or smoothness. Notice its stickiness. (Pause)
5. What do you smell? Do you have a reaction to the smell? (Pause)
6. What do you hear? Roll the raisin between your fingers and listen to hear what sound it makes. (Pause)
7. Place the raisin between your lips and just hold it there for a few moments. What do you notice happens inside you? (Pause)
8. Let the raisin roll back into your mouth, but do not chew yet, just roll it around. Is there a taste? Do you salivate? What do you want to do? (Pause)
9. What do you taste? Bite down, just once. What do you notice? (Pause)
10. Slowly begin to chew, noticing what each bite brings. (Pause)
11. Chew the raisin until it is completely liquefied before you swallow. (Pause)
12. After swallowing, close your eyes for a few moments to notice the consequence of what you just experienced. (Pause)

After the exercise, discuss the following:

1. Were there aspects of this exercise that were difficult or easy?
2. How would you describe your experience with mindful eating exercise?
3. Is this exercise something that you would like to try to incorporate into your life?

## CLINICAL APPLICATIONS

**TABLE 2: Additional Resources on Mindfulness and Mindful Eating**

Books
<ul style="list-style-type: none"> <li>• Bays JC. <i>Mindful Eating: A Guide to Rediscovering a Healthy and Joyful Relationship with Food</i>. Revised edition. Boulder (CO): Shambhala; 2017.</li> </ul>
<ul style="list-style-type: none"> <li>• Fletcher M. <i>The Core Concepts of Mindful Eating: The Professional Edition</i>. Epping (NH): Megrette.com; 2017.</li> </ul>
<ul style="list-style-type: none"> <li>• Kabat-Zinn J. <i>Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness</i>. New York (NY): Dell Pub., a division of Bantam Doubleday Dell Pub. Group; 1991.</li> </ul>
<ul style="list-style-type: none"> <li>• Mulligan BA. <i>The Dharma of Modern Mindfulness: Discovering the Buddhist Teachings at the Heart of Mindfulness-Based Stress Reduction</i>. Oakland (CA): New Harbinger Publications, Inc.; 2018.</li> </ul>
<ul style="list-style-type: none"> <li>• Rossey L. <i>The Mindfulness-Based Eating Solution</i>. Oakland (CA): New Harbinger Publications, Inc.; 2016.</li> </ul>
Web sites with trainings and additional resources
<ul style="list-style-type: none"> <li>• MB-EAT; <a href="http://www.mb-eat.com">www.mb-eat.com</a></li> </ul>
<ul style="list-style-type: none"> <li>• Am I Hungry?; <a href="http://www.amihungry.com">www.amihungry.com</a></li> </ul>
<ul style="list-style-type: none"> <li>• Mindful Eating/Conscious Living; <a href="http://www.me-cl.com">www.me-cl.com</a></li> </ul>
<ul style="list-style-type: none"> <li>• Eat for Life; <a href="http://www.lynnrossy.com">www.lynnrossy.com</a></li> </ul>
<ul style="list-style-type: none"> <li>• Core Concepts Mindful Eating; <a href="http://www.megrette.com">www.megrette.com</a></li> </ul>
Apps
<ul style="list-style-type: none"> <li>• Eat Right Now; available in App Store and Google Play</li> </ul>
<ul style="list-style-type: none"> <li>• Insight Timer; available in App Store, Google Play, Android</li> </ul>

The health and fitness professional can begin to teach individuals mindful eating techniques through guided practices. Mindful eating involves learning to assess internal hunger and satiety signals, helping the individual determine what, when, and how much to eat (see Table 1). An example of a guided mindful eating practice is detailed in the Figure. Research indicates that the disposition of the mindfulness instructor is important. Participants in a diet, exercise, and mindfulness intervention who viewed their instructor as helpful during the intervention had better health outcomes compared with groups led by an instructor rated as less helpful (29). These findings underscore that it is important that health and fitness professionals seek and adhere to proper training and guidance if choosing to implement mindfulness into their practice. In addition to remaining educated through peer-reviewed, scientific literature regarding mindful eating, health and fitness professionals may consider attending mindfulness trainings and engaging in their own practice of mindful eating; several mindful eating trainings and other resources are listed in Table 2. As thoroughly discussed in a previous *Clinical Applications* column, it is imperative that health and fitness professionals stay within their scope of practice when providing nutrition guidance and that the prescription of individualized diet plans be made by certified specialists in sports dietetics or registered dietitians (30). However, teaching basic nutrition information, general healthy eating principles, and

behavioral techniques such as mindful eating is within the health and fitness professional's purview.

## CONCLUSION

Overeating due to stress and other mindless eating practices can, over time, lead to weight gain along with other associated negative health outcomes. Combining healthy eating patterns with physical activity is fundamental in body weight regulation. Mindful eating is a strategy that promotes a nonjudgmental attitude toward food and allows clients to make intentional decisions about what, when, and how to eat, without following strict dietary regimens. Health and fitness professionals are uniquely positioned to introduce mindful eating practices as a strategy to underscore an overall healthy lifestyle.

## References

1. Hruby A, Hu FB. The epidemiology of obesity: a big picture. *Pharmacoeconomics*. 2015;33(7):673–89.
2. National Institutes of Health. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults—the evidence report. *Obes Res*. 1998;6(Suppl 2):51S–209S.
3. Ward ZJ, Bleich SN, Cradock AL, et al. Projected U.S. state-level prevalence of adult obesity and severe obesity. *N Engl J Med*. 2019;381(25):2440–50.
4. Wang Y, Beydoun MA, Min J, Xue H, Kaminsky LA, Cheskin LJ. Has the prevalence of overweight, obesity and central obesity levelled off in the United States? Trends, patterns, disparities, and future projections for the obesity epidemic. *Int J Epidemiol*. 2020;49(3):810–23.
5. Klein S, Burke LE, Bray GA, et al. Clinical implications of obesity with specific focus on cardiovascular disease: a statement for professionals from the American Heart Association Council on Nutrition, Physical Activity, and Metabolism: endorsed by the American College of Cardiology Foundation. *Circulation*. 2004;110(18):2952–67.
6. Curioni CC, Lourenço PM. Long-term weight loss after diet and exercise: a systematic review. *Int J Obes (Lond)*. 2005;29(10):1168–74.
7. Franz MJ, VanWormer JJ, Crain AL, et al. Weight-loss outcomes: a systematic review and meta-analysis of weight-loss clinical trials with a minimum 1-year follow-up. *J Am Diet Assoc*. 2007;107(10):1755–67.
8. Seagle HM, Strain GW, Makris A, Reeves RS. Position of the American Dietetic Association: weight management. *J Am Diet Assoc*. 2009;109(2):330–46.
9. National Institutes of Health. Developing Interventions for Health-Enhancing Physical Activity (R21/R33—Clinical Trial Optional)—PAR-18-307 Research Project Grant. United States Department of Health and Human Services (USDHHS). [cited 2020 Nov 3]. Available from: <https://grants.nih.gov/grants/guide/pa-files/PAR-18-307.html>. Published 2017.
10. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Educ Q*. 1988;15(4):351–77.
11. King KM, Gonzalez GB. Increasing physical activity using an ecological model. *ACSMs Health Fit J*. 2018;22(4):29–32.
12. Tomiyama AJ. Stress and obesity. *Annu Rev Psychol*. 2019;70:703–18.
13. American Psychological Association. *Stress in America*. 2020. [cited 2020 Oct 28]. Available from: <https://www.apa.org/news/press/releases/stress/2020/report>.
14. Wardle J, Chida Y, Gibson EL, Whitaker KL, Steptoe A. Stress and adiposity: a meta-analysis of longitudinal studies. *Obesity (Silver Spring)*. 2011;19(4):771–8.
15. Li L, Li X, Zhou W, Messina JL. Acute psychological stress results in the rapid development of insulin resistance. *J Endocrinol*. 2013;217(2):175–84.
16. Godsey J. The role of mindfulness based interventions in the treatment of obesity and eating disorders: an integrative review. *Complement Ther Med*. 2013;21(4):430–9.
17. Bishop SR, Lau M, Shapiro S, et al. Mindfulness: a proposed operational definition. *Clin Psychol Sci Pract*. 2004;11(3):230–41.
18. Kabat-Zinn J. Stress reduction. In: *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness*. New York (NY): Dell Publishing, a division of Bantam Doubleday Dell Pub. Group; 1991.

19. Jordan CH, Wang W, Donatoni L, Meier BP. Mindful eating: trait and state mindfulness predict healthier eating behavior. *Pers. Individ. Differ.* 2014;68:107–11.
20. Brown KW, Ryan RM. The benefits of being present: mindfulness and its role in psychological well-being. *J Pers Soc Psychol.* 2003;84(4):822–48.
21. Quaglia JT, Braun SE, Freeman SP, McDaniel MA, Brown KW. Meta-analytic evidence for effects of mindfulness training on dimensions of self-reported dispositional mindfulness. *Psychol Assess.* 2016;28(7):803–18.
22. Creswell JD. Mindfulness interventions. *Annu Rev Psychol.* 2017;68:491–516.
23. Goyal M, Singh S, Sibinga EMS, et al. Meditation programs for psychological stress and well-being: a systematic review and meta-analysis. *JAMA Intern Med.* 2014;174(3):357–68.
24. Brown KW, Ryan RM, Creswell JD. Mindfulness: theoretical foundations and evidence for its salutary effects. *Psychol Inq.* 2007;18(4):211–37.
25. Warren JM, Smith N, Ashwell M. A structured literature review on the role of mindfulness, mindful eating and intuitive eating in changing eating behaviours: effectiveness and associated potential mechanisms. *Nutr Res Rev.* 2017;30(2): 272–83.
26. Pannowitz D. Clinical applications of mindful eating. *J Aust Tradit-Med So.* 2015; 21(3):168–71.
27. Schüz B, Schüz N, Ferguson SG. It's the power of food: individual differences in food cue responsiveness and snacking in everyday life. *Int J Behav Nutr Phys Act.* 2015;12:149.
28. O'Reilly GA, Cook L, Spruijt-Metz D, Black DS. Mindfulness-based interventions for obesity-related eating behaviours: a literature review. *Obes Rev.* 2014;15(6):453–61.
29. Daubenmier J, Moran PJ, Kristeller J, et al. Effects of a mindfulness-based weight loss intervention in adults with obesity: a randomized clinical trial. *Obesity (Silver Spring).* 2016;24(4):794–804.
30. King KM, Pierce G, Folsom L, Cessna W, Jagers JR, Wintergerst KA. Championing whole-food and plant-based diets: the role of the health and fitness professional. *ACSMs Health Fit J.* 2020;24(4):50–4.
31. Nelson JB. Mindful eating: the art of presence while you eat. *Diabetes Spectr.* 2017;30(3):171–4.

**Disclosure:** *The authors declare no conflict of interest and do not have any financial disclosures.*



**Kristi M. King, Ph.D., CHES,** is an associate professor in the Exercise Physiology program in the Department of Health and Sport Sciences at the University of Louisville and has a joint appointment in Pediatric Endocrinology with the Wendy Novak Diabetes Center. Dr. King is the principal investigator on multi-year research studies that focus on

*the improvement of health, specifically through physical activity and nutrition interventions and policies. Dr. King earned her Ph.D. from Southern Illinois University Carbondale, completed her postdoctorate training in Physical Activity and Public Health Research at the University of South Carolina's Arnold School of Public Health and Centers for Disease Control and Prevention, and is a Commonwealth Institute of Kentucky Scholar and a Certified Health Education Specialist.*



**Gina B. Gonzalez, Ph.D., CSCS,** is professor of Kinesiology in the Department of Kinesiology, Health and Imaging Sciences at Morehead State University. She earned her Ph.D. in Exercise Science at the University of Mississippi and her M.A. and B.S. degrees at the University of Central Florida. Her primary research interests are personal and community-based physical activity interventions and dietary supplement behaviors and motivations, presenting nationally and internationally on these topics. Dr. Gonzalez is also a National Strength and Conditioning Association Certified Strength and Conditioning Specialist.



**Amanda M. Mitchell, Ph.D., L.P.,** is an assistant professor and licensed psychologist in the Counseling Psychology program in the Department of Counseling and Human Development at the University of Louisville. Dr. Mitchell directs the Social Inequities in Health laboratory, a research program that examines the relationship between socioeconomic position and health from an interdisciplinary lens. She earned her Ph.D. in counseling psychology from the University of Louisville and completed postdoctoral training in psychoneuroimmunology at The Ohio State University Institute for Behavioral Medicine Research.