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The role of mindfulness based interventions in the treatment of obesity and eating disorders: An integrative review



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KEYWORDS

Obesity;
 Mindfulness;
 Eating disorders;
 Complementary and
 alternative medicine

Summary More than one-third of U.S. adults over the age of 20 years are classified as obese and nearly two-thirds are overweight or obese. The prevalence of obesity among U.S. children and adolescents has almost tripled since 1980, with 17% of all youth and children now considered obese. Nine million children aged 6–19 years are overweight, making obesity the largest health care threat facing today’s children. Historically, the arsenal against obesity has been primarily focused on interventions that increase physical activity and decrease caloric intake. American weight loss strategies that incorporate dietary modifications and exercise have proven effective in achieving weight loss, but most of the weight is regained over time. Mindfulness based interventions, combined with other traditional weight loss strategies, have the potential to offer a long-term, holistic approach to wellness. However, research reports examining the complementary addition of mindfulness based approaches in the treatment obesity and eating disorders are relatively scarce in the empirical literature. This paper describes what is currently known about the role of mindfulness based interventions when used alone, or in combination with, other traditional approaches in the treatment of obesity and eating disorders.

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Introduction

The 2011–2015 strategic plan released by the National Center of Complementary and Alternative Medicine (NCCAM) includes strategies for increasing the number of empirical studies that describe the impact of Complementary and Alternative Medicine (CAM) when used to supplement healthy behaviors or facilitate behavior change. The NCCAM report notes that “mindfulness practices may be associated with greater psychological well-being, less disordered eating, greater weight loss and improved metabolic function”.¹

There is mounting evidence to support the effectiveness of mindfulness based therapies in the psychological treatment of anxiety and depressive disorders.^{2,3} Eating disorders are treatable medical conditions that frequently co-exist with depression and anxiety disorders.⁴ However, to date, little research has been devoted to exploring the effect of mindfulness, when used alone, or in combination with other traditional forms of weight management protocols to address the psychological component of obesity and other eating disorders.⁵

Research question

This paper describes what is currently known about the role of mindfulness based interventions when used alone or in combination with other traditional approaches in the treatment of obesity and eating disorders. An integrative review was conducted to examine the following question:

- *What is the role of mindfulness-based interventions in the treatment of obesity and eating disorders?*

Concepts explored in this review

Eating disorders

Eating disorders are most commonly characterized as dietary disturbances that result in excessive intake or strict avoidance of food.⁴ Anorexia nervosa, bulimia, and binge-eating make up some of the most common types of eating disorders.⁴ Bulimia and anorexia nervosa occur more commonly among women, who make up approximately 85–90% of individuals with these diseases. Census data reveals a mortality rate for individuals with anorexia nervosa to be 12 times the death rate for all causes of death combined in females aged 15–24.⁴

Unhealthy eating patterns often begin in childhood. The Youth Risk Behavioral Surveillance System⁶ data describes a

disturbing eating pattern among thousands of children, as reported within one month prior to being surveyed:

- 17.4% of girls (7570) and 7.2% of boys (7441) did not eat for 24 h in order to lose weight or keep from gaining weight.
- 5.9% of girls (7603) and 4.2% of boys (7479) took pills to lose weight or keep from gaining weight without a physician’s advice.
- 6.0% of girls (7588) and 2.5% of boys (7456) vomited or took laxatives to lose weight or to keep from gaining weight.

CDC.⁶

Obesity

During the past three decades, the United States (U.S.) has experienced a steady rise in the prevalence of obesity.⁷ More than one third of U.S. adults over the age of 20 years are classified as obese (a body mass index (BMI) of 30 or greater) and nearly two-thirds are overweight or obese (BMI greater than 25).⁸ Obesity is the second leading cause of preventable death and is associated with heart disease (the number one cause of death in the U.S.), as well as type II diabetes, stroke, and certain types of cancer.⁷ Approximately 80% of all states in the U.S. (39 out of 50) are experiencing obesity prevalence rates of 25% or greater.⁷ The prevalence of obesity among U.S. children and adolescents has almost tripled since 1980, with 17% of all youth and children now classified as obese.^{7,9} Nine million children aged 6–19 years are now considered overweight, making obesity the largest health care threat facing today’s children.¹⁰ As a result of the obesity epidemic in America, health conditions once associated with adults are now occurring in children. Examples of some of the “adult diseases” emerging in children include: high blood pressure, early symptoms of hardening of the arteries, type II diabetes, nonalcoholic fatty liver disease, polycystic ovary disorder, and disordered breathing during sleep.¹¹ Adolescents who are overweight have a 70% likelihood of becoming overweight adults; that chance increases to 80% if both parents are overweight.¹²

Mindfulness

Concepts pertaining to mindfulness have been broadly described as: “Paying attention on purpose, being in the present moment, and to the non-judgmental ‘unfolding of the experience moment by moment’”.¹³ Daubenmier and colleagues described mindfulness as a non-judgmental present-moment experience to distance the self from

interpreting habitual patterns of thoughts, emotions, and behaviors and thus permitting heightened adaptive responses.¹⁴ Mindfulness is recognized as a CAM modality. CAM is defined as “a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine”.¹⁵ For the purpose of this review, the concept of mindfulness focused on mindfulness-related interventions, such as yoga, meditation, and awareness training.

Mindfulness falls within a range of other emotional models, including Cognitive Emotional Behavioral Therapy (CEBT). Cognitive Emotional Behavioral Therapy has been used successfully to enable individuals with eating disorders to “understand the experience and expression of emotions, so that they can identify and challenge their beliefs and attend and respond to their emotions adaptively”.¹⁶

Methods

Design of literature search

Electronic searches were conducted of journal articles written in the English language. Due to the relatively low number of articles available on the chosen topic, the period of publications searched included a period of 9 years (2003–2012), with preference given to research studies occurring during the last five years. Reference pages of journal articles relative to the topic under study were also reviewed and some were accessed and used. Articles were included if they demonstrated how mind–body CAM modalities were used to treat obesity and eating disorders. The relevant studies identified in this review described mindfulness as a combination or adjunct therapy. The search for published literature on the contributions of mindfulness produced a comprehensive amount of studies on the mind/body connection to more traditional health problems, such as: musculoskeletal pain, anxiety, high cholesterol, and insomnia. However, research trials describing the mind–body connection to obesity and eating disorders were relatively few, most occurring within the past five years.

Analytical strategies

Journal articles were included in this review that: (1) focused a mindfulness based approach for treating obesity or disordered eating, and (2) yielded discernible outcomes significant to advance the continued study of the mind–body approach.

Databases for this search included Ebscohost (Medline, CINAHL, and Academic Search Premiere) and the Cochrane Library. Search terms initially included the term “obesity” combined with an array of topics including: yoga, complementary medicine, complementary therapies, alternative therapies, alternative medicine, holistic health, mindfulness, relaxation, and cognitive therapies. The search resulted in relatively few usable articles for this review.

As the literature review advanced, several additional search terms were added: specifically, certain search terms were added to the term “obesity”. These included “emotional eating”, “emotional overeating”, “eating disorders”, “over eating”, “binge eating”, “overweight”,

“adiposity”, “body mass index”, and “disordered eating”. The Ebscohost search engine (Medline, CINAHL, Academic Search Premiere) was used but results were still limited to only 28 articles; some of which were not usable because the articles did not meet the criteria for this review. A search was conducted using the same Ebscohost data bases, but with the terms “mindfulness”, “eating disorder” and “children”, resulting in only three articles, while “yoga” and “obesity” and “children” yielded eleven articles.

Search terms for “children”, “youth” and “adolescents” were also expanded to include “adults”. While the search resulted in relatively few articles (compared to traditional weight management literature), sufficient articles existed to allow for an analysis of the impact of mindfulness as a strategy for the prevention and treatment of obesity and other eating disorders in both adults and children.

Search terms were further expanded to include those yielding the highest number and most appropriate results for the chosen topic: “obesity, obesity prevention, overweight, eating disorder, weight control, overeating, binge eating, yoga, meditative interventions, dissonance, objectification, relaxation, mindfulness”. The search terms “mindfulness and yoga” (23 articles)” and “mindfulness and eating disorders” (12 articles) yielded the most results adhering to this review’s criteria.

Causes attributed to eating disorders and other unhealthy dietary practices can have deep psychological roots, such as depression, anxiety, body image disturbance, low self-esteem and ineffective coping strategies.¹⁷ The lack of articles resulting from the search demonstrates the need for a more integrated perspective to obesity and eating disorders that incorporates a holistic approach to the human as a unique, complex, spiritual, and cognitive being (Fig. 1).

Results

Results of this literature review produced mindfulness based interventions that most commonly centered on yoga, meditation, cognitive therapy, and eating awareness training. An abundance of the research on mindfulness based practices naturally fell to one of the oldest practices combining the mind–body experience — yoga. Studies have repeatedly confirmed the positive effects of yoga on balance, flexibility, leg and arm strength, heart rate and blood pressure.¹⁸ Decreased symptoms of eating disorders, along with decreased BMI and hip and waist measurements can also be included in the benefits of yoga practice.¹⁸ Other eating related benefits of yoga include overall reduction in food consumption, healthier food choices, and practices that slow the eating process.¹⁸ While the literature supports yoga’s positive effects on general health, the problem of disordered eating requires a treatment commitment, and yoga alone is not enough to cure mental illnesses.¹⁹ There is no question that treatment for eating disorders is essential, and should include a multi-dimensional approach — psychological, dietary, clinical/physician and group support.¹⁹

Individuals with eating disorders have difficulty tolerating negative experiences and distress, and use food, whether in an over-restrictive or over-consumptive manner to regulate emotional experience.¹⁶ Correlations between symptoms of

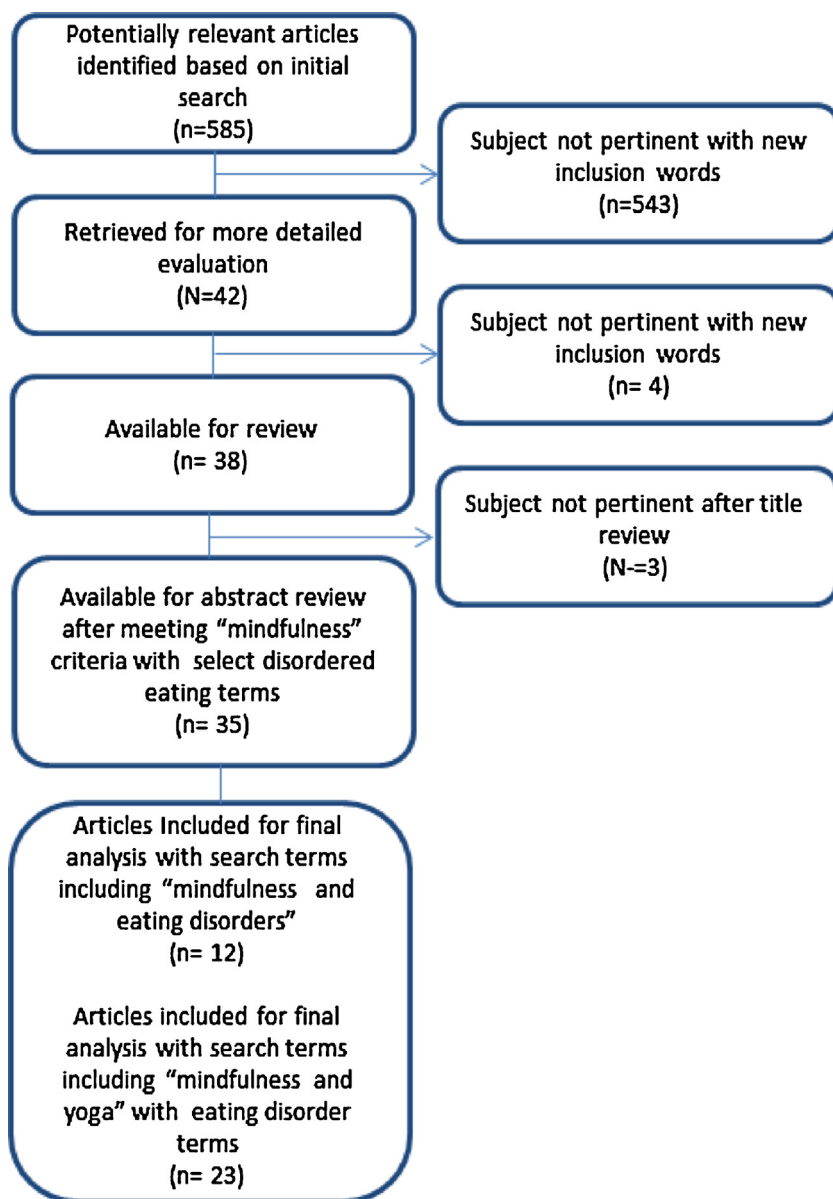


Figure 1 Literature selection process.

eating disorders and emotions have been well described in the empirical literature, often suggesting that emotional distress causes a narrowing of awareness and "behavioral disinhibition" as food is used to "block out... awareness of emotions" that cannot be tolerated by the individual.¹⁶

Research is lacking that fully describes the benefits of yoga to those with eating disorders. However, disordered eating is associated with stress and there is sufficient empirical evidence to conclude that yoga relieves stress.¹⁹ Scime and Cook-Cottone conducted a two-year 'yoga-only' mindfulness study on a group of middle school girls ($N=144$), excluding any dietary or exercise interventions, other than yoga.²⁰ The researchers examined whether yoga's awareness raising component could reduce any of the related risk factors for eating disorders. The fifth-grade yoga practitioners reported greater satisfaction with their physical appearance and fewer eating disordered attitudes compared

with non-practitioners. The participant/comparison group study concluded that the program was successful in reducing body dissatisfaction in participants, although it was not clear that the practice of yoga was the primary contribution in achieving those outcomes.²⁰

In a non-yoga trial, Daubenmier and colleagues examined the effect of mindfulness on the reduction of cortisol and abdominal fat in overweight and obese women ($N=47$).¹⁴ The researchers described mindfulness as a non-judgmental, present-moment experience to distance the self from interpreting habitual patterns of thoughts, emotions, and behaviors, and thus permitting heightened adaptive responses. While yoga was not used in this study, mindfulness techniques were incorporated that were similar to the principles of yoga. Their interventions combined components of mindfulness-based stress reduction, cognitive theory, and eating awareness training. Interventions were

associated with improved mindfulness and responsiveness to bodily sensations, anxiety reduction, and emotionally stimulated eating. Abdominal fat-triggering cortisol was lower in the treatment group compared to the control, but was statistically insignificant. Notably, the intervention was not an effort to produce weight loss. Abdominal fat remained statistically constant and fat distribution was unchanged among the participants. However, participants with the greatest improvements in mindfulness had the largest reductions in abdominal fat. It is also noteworthy that mindfulness significantly improved weight maintenance within the treatment group while the control group gained weight during the study period.¹⁴ This is consistent with another recent study that supports mindful eating as an adjunct to improve long-term results in persons with eating disorders.²¹

Kristal and colleagues conducted a significantly large observational study ($N = 15,550$) that focused on the potential effect of yoga to curb middle-aged weight gain.²² The study objective was to determine if yoga practice alone was associated with less weight gain and/or the achievement of weight maintenance in both men and women after age 45. The researchers hypothesized that weight control could be the byproduct of yoga, when used consistently. An "enhanced awareness" of overeating, and respect for one's own body were concluded to be the primary drivers of a positive body experience, thus leading to weight maintenance, or even weight loss over a sustained length of time for middle-aged men and women (p. 33). Four or more years of yoga practice was associated with lower weight gain among normal weight participants (3.1 pounds), with even lower weight gain among overweight participants (18.5 pounds) compared to weight gain patterns typical in adults over the age of 45.²²

Wanden-Berghe et al. conducted a systematic review of the literature to determine the effect of mindfulness based therapies on eating disorders.²³ Their review included eight research articles and described variable trial qualities with small sample sizes. The researchers concluded there was support in the literature for the effectiveness of mind-based interventions as a treatment for eating disorders, as demonstrated by: (1) reductions in eating concern, (2) increased eating awareness, and (3) improvements in emotional regulation.²³

Dittman and Freedman divided yoga participants into subgroups based on the presence or absence of a spiritual element for engaging in yoga practice.²⁴ The researchers theorized spiritual readiness would influence body awareness, body responsiveness, and body satisfaction. While the spirituality aspect proved to be insignificant, study participants in both groups reported improved body awareness, body responsiveness, intuitive eating, and body satisfaction. Participants attributed these improvements in body satisfaction and body image to the combined physical and spiritual aspects of yoga practice.²⁴

Dissonance theory holds that people possess "competing beliefs" that require adjustments in cognition to make them "congruent" (i.e. thin-ideal internalization versus self-acceptance).¹⁷ The effect of dissonance in reducing the risk factors for eating disorders was compared to yoga.¹⁷ In this study, a yoga group attended six 45-min yoga-only sessions that did not involve dissonance training. Alternatively, the dissonance group made no attempt to emphasize exercise

during its six 45-min sessions. Instead, the dissonance group explored the origin and perpetuation of the thin ideal and its negative consequences, along with self-objectification and historical feminist perspectives on thinness and oppression. As expected, the dissonance group improved self-awareness and experienced a significant reduction in anxiety. However, the yoga group experienced no significant changes in disordered eating symptoms, body awareness, or drive for thinness. The authors suggest the limited exposure to yoga was the prime reason for the lack of significant changes. More importantly, the mindfulness based treatment, even without the physiological aspect of yoga practices, seemingly has a positive impact on treating obesity and eating disorders.¹⁷

Article characteristics

Table 1 provides a summary of the most relevant characteristics for each journal article included in this review. Summarized information was grouped by: (1) author, title and year, (2) study purpose, (3) population characteristics, (4) research methods and instruments, and (5) results or comments. Summarized articles from this integrative review included randomized controlled studies, integrative/literature reviews, state of the science reports, qualitative studies, and interview/questionnaire designs.

There were few research articles describing mindfulness as a stand-alone approach to obesity prevention or treatment. Almost all of the studies included in this review specifically targeted women and children. Following an exhaustive search, few studies were found that included men as recipients of mindfulness based interventions alone or in conjunction with any other weight loss strategy.

Discussion

Mindfulness is relevant to cognition and learning and is an essential component of holistic obesity treatment.^{25,26} Mindfulness encourages individuals to "understand the experience and expression of emotions, so they can identify and challenge their beliefs and attend and respond to their emotions adaptively".¹⁶ Recent studies indicate that mindfulness approaches can improve or extend long term health outcomes in persons with eating disorders and is also associated with a reduction in overall food consumption, healthier food choices, and practices that slow the eating process among obese populations.^{14,18,21} The incorporation of mindfulness as an adjunct to obesity treatment seems appropriate, since individuals with eating disorders are better able to respond to maladapted coping behaviors if they have an enhanced understanding of their experience and possess the skills necessary to challenge unhealthy beliefs.¹⁶

Implications for public health nursing

Many public health interventions exist to increase the level of knowledge surrounding the complex issue of disordered eating. With an overweight adult majority, and a childhood/adolescent obesity rate that has almost tripled in the past 30 years, it seems timely for public health to

Table 1

Author, title, year	Purpose of study/report	Population characteristics	Research Method and Instrument/Evidence	Results/Comments
Chambers, R., Gullone, E., Allen, N. (2009). Mindful emotion regulation: An integrative review	Review of literature that attempts to integrate mindfulness and emotion regulation, then conceptualize them	Multiple studies of various neurological diagnoses	Literature review	Author cautions against including mindfulness too readily in existing cognitive models as it distorts mindfulness' potential as a psychological intervention
Corstophine, E. (2006). Cognitive-emotional-behavioral therapy for the eating disorders: Working with beliefs about emotions	Clinical practice report on cognitive emotional behavioral therapy (CEBT), its effects on emotional distress	One case study	Clinical practice report on cognitive emotional behavioral therapy	As an alternative CEBT has potential to reduce frequency and severity of impulsive behaviors, i.e. eating disorders
Daniels, S. (2006). The consequences of childhood obesity	State of the science on childhood obesity	Infants, children, and adolescents	Tracking of current medical literature and studies related to childhood obesity	Review and discussion of obesity consequences in children from body systems to psychosocial effects to health care costs
Daubenmier, J., Kristeller, J., Hecht, F., Maniger, N., Kuwata, M., Jhaveri, K., Lustig, R., Kemeny, M., Karan, L., Epel, E. (2011). Mindfulness intervention for stress eating to reduce cortisol and abdominal fat among overweight and obese women: an exploratory randomized controlled study	Study effects of mindfulness and resulting stress reduction as an intervention on abdominal fat, cortisol levels, in obese/overweight women	47 overweight and obese women who wanted to control effects of stress. San Francisco area, recruited via media and flyers	Mindfulness assessed with Kentucky Inventory of Mindfulness Skills (KIMS); chronic stress in work life assessed with Wheaton Chronic Stress Inventory; eating behaviors with Dutch Eating Behavior Questionnaire	Increase of mindfulness and responsiveness to bodily sensations, reduced anxiety; emotional eating response decrease. Treatment did not reduce abdominal fat. Mindfulness and awareness may improve ability to cope and reduce reliance on comfort foods
Douglass, L. (2009). Yoga as an intervention in the treatment of eating disorders: does it help?	Explores yoga as an experimental adjunct to traditional weight loss treatment modalities	Various	Review of yoga-effectiveness research, yoga practices, yoga teacher methods	Supported by other interventions, yoga is an effective adjunct in increasing self-awareness, reflection and the ability to self-soothe
Dittmann, K.A., Freedman, M.R. (2009). Body awareness, eating attitudes, and spiritual beliefs of women practicing yoga	Explore how postural yoga and perceived spirituality relate to factors that influence body dissatisfaction and disordered eating. Aimed to determine levels of body awareness, intuitive eating, others	157 women over 18 years. Most were white, college educated, middle class, mean age 47 attending class or practicing yoga at least once/week	Mixed. Qualitative, descriptive correlational. Survey instruments and interviews	Women in this study attributed improvements in body image, body satisfaction, and eating attitudes, in part, to yoga practice and associated spirituality

Table 1 (Continued)

Author, title, year	Purpose of study/report	Population characteristics	Research Method and Instrument/Evidence	Results/Comments
Field, T. (2010). Yoga clinical research review	Review the effects of yoga on anxiety and depression, pain syndromes, cardiovascular, autoimmune and immune conditions, and pregnancy	Various	Literature review	Yoga's effects are far-reaching. Food consumption reduction, better food choices, lower weight gains long-term, decreased symptoms of eating disorder, decreased BMI and waist measurements
Hepworth, N.S. (2011). A mindful eating group as an adjunct to individual treatment for eating disorders: A pilot study	Investigate potential benefits of a mindful eating group as an adjunct to long term treatment for eating disorders	33 females being treated for eating disorders (e.g. bulimia, anorexia nervosa) convenience sample: current patients attending an eating disorder clinic	Eating attitudes test – had sound reliability and validity	Using mindfulness in a group format can be useful as a component of an ongoing individual treatment for people with varying eating disorder presentations.
Kristal, A. R., Littman, A.J., Benitez, D., White, E. (2005). Yoga practice is associated with attenuated weight gain in healthy middle aged men and women	To examine whether yoga practice is associated with lower mean 10 year weight gain after age 45	15,550 adults aged 53–57 recruited to a vitamin and lifestyle study questionnaire	Questionnaires	Regular yoga practice (1/week × 4 or more years) resulted in weight reduction of 3.1 lbs. among normal weight individuals. Overweight weight gain reduced by 18.5 lbs.
Kristeller, J., Wolever, R., (2011). Mindfulness-based Eating Awareness Training for Treating Binge Eating Disorder: the Conceptual Foundation	Conceptual examination of Mindfulness Based Eating Awareness Training (MB-EAT) and overview its effect treating binge eating disorder and associated symptoms	Various: participants in multiple studies typically were obese, predominantly women with diagnosed eating binge eating disorder	MB-EAT program structure gradually introduced with mindfulness meditation, mindful eating, self-awareness and self-acceptance	Studies review in this conceptual analysis showed MB-EAT helps to control compulsive eating patterns associated with binge eating. Program brings awareness in food choice, decisions to start eating and stop eating; re-engages innate satiety signals
McIver, S., O'Halloran, P.O., McGartland, M. (2009). Yoga as a treatment for binge eating disorder: A preliminary study	To examine the efficacy a yoga program aimed at reducing binge eating severity	90 women aged 25–63, half were participants, half was a control group, 25 from both groups were analyzed. Community-based, women with binge eating disorder, BMI 25+. Excluded yoga practitioners, pregnant/lactating, in weight loss program. Community sample from suburban area	Binge Eating Scale (BES), International Physical Activity Questionnaire (IPAQ), measures for BMI	Significant decrease in binge eating scores, BMI, increase in physical activity—sustained in 3 month follow-up (self-reported)

Mitchell, K.S., Maseo, S.E, Rausch, S.M, Cooke, K.L. (2007). Innovative interventions for disordered eating: Evaluating dissonance-based and yoga interventions	Evaluate and compare interactive dissonance intervention versus yoga/meditation intervention	Female, undergrad college students N = 93, broke down as Dissonance group 30, Yoga group 33, control group 30. Recruited from urban university.	Experimental Binge Eating Scale, Eating disorder inventory, ideal body stereotype scale, body shape questionnaire (many others)	Dissonance group manifested significant decreases in disordered eating symptomatology, drive for thinness, body dissatisfaction. No significant change in yoga group from control, but yoga group did not directly address internalization of thin-ideal and body dissatisfaction
Roemer, L. & Orsillo, S. (2007). An open trial of an acceptance-based behavior therapy for generalized anxiety disorder	Open trial of a newly developed acceptance-based behavior therapy for generalized anxiety disorder (GAD)	16 GAD patients at Boston clinic: 16 treatment sessions	Penn State Worry Questionnaire, Depression Anxiety Stress Scales, Beck Depression Inventory, Quality of Life Inventory	Participants demonstrated significant improvements in GAD, worry, anxiety, and depressive symptoms following the intervention as well as through the 3-month follow-up assessment and these changes were of large magnitude
Scime, M., Cook-Cottone C. (2008). Primary Prevention of Eating disorders: A constructivist integration of mind and body strategies	Investigate impact of a primary prevention program aimed at 5th-grade females and eating disorders	75 participants, 69 control group. Called Girls Group prevention program in a western NY middle school	Questionnaires assessing demographics, drive for thinness, bulimia, body dissatisfaction and future intentions of eating disorder behavior	Mixed support for the program, efficacious in reducing body dissatisfaction. Girls thought less about bulimia and uncontrollable eating
Segal, Z. V., Teasdale, J. D., Williams, J., & Gemar, M. C. (2002). The mindfulness-based cognitive therapy adherence scale: inter-rater reliability, adherence to protocol and treatment distinctiveness	To determine the validity of the MBCT scale and measure adherence to CBT – Cognitive Based Therapy	8 week group study	MBCT – Mindfulness based Cognitive Therapy Instrument	Findings indicate that the MBCT-AS may be a useful tool for ensuring the proper delivery of MBCT in future research, and may be helpful in determining the elements of MBCT that are unique to that treatment.
Wanden-Berghe, R., Sanz-Velaro, J., Wanden-Berge, C. (2011). The application of mindfulness to eating disorders treatment: A systematic review	Review the existing literature on effectiveness of mindfulness techniques in treatment of eating disorders	8 studies reviewed, 36 patients, mostly women ranging 15–54 in age	Literature review	Authors claim evidence is limited but mindfulness efficacy is prevalent and worthy of more study

explore the impact of mindfulness based interventions when integrated with traditional obesity treatments. Mindfulness Based Eating Awareness Training (MB-EAT) may hold promise in public health since its focus is on self-regulation and the body's growing capacity to observe its internal state. MB-EAT participants are encouraged to develop self-awareness that is free from judgment, identify internal strengths, and learn effective coping skills.²⁵ MB-EAT practitioners are encouraged to consider traditional weight loss methods and nutritional counseling, while also incorporating mindfulness meditation approaches to control binge eating and enhance overall awareness of food intake patterns.²² Awareness training that incorporates mindfulness also improves physical awareness through movement and stillness, breath awareness, and concentrative awareness.²⁷

Mindfulness based approaches to obesity and eating disorders were absent from the federal "obesity guidelines" and "best practices" that were examined during this review. In 2009, the National Governor's Association Center for Best Practices published a report outlining successful strategies to prevent childhood obesity.²⁸ This report included a strategy to "develop and implement innovative solutions to public challenges"; however, mindfulness based strategies or research initiatives related to mindfulness were unmentioned in the 50-page report.

The National Institutes of Health (NIH) provide "Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report".²⁹ The Obesity Guidelines were developed by the National Heart, Lung, and Blood Institute in cooperation with the National Institute of Diabetes and Digestive and Kidney Diseases. Even though the Guidelines are 14 years old, they are referenced on the NIH website as "a new approach for the assessment of overweight and obesity" and include recommendations that are "based on the most extensive review of the scientific literature to date".²⁹ The Centers for Disease Control and Prevention (CDC) website provides direct links to the original Obesity Guidelines document: <http://www.cdc.gov/obesity/resources/recommendations.html>.⁷ The 1998 Obesity Guidelines include traditional dietary therapy and "altered activity patterns", as treatment options in obesity. The Guidelines also include the evidence based treatment recommendations of pharmacotherapy and even surgery.⁷ Mindfulness is absent from the recommendations, but thought-based approach to obesity treatment, called "cognitive restructuring" is offered. This approach encourages "rational thought" and modification of "inaccurate beliefs" relating to an individual's weight loss and body image.⁷ Conversely, mindfulness based therapies do not assign value judgments or interpret one's beliefs as accurate or inaccurate; rather, mindfulness guides participants to experience a heightened awareness of self, that is in the present moment, and is absent of judgment.¹⁴

Mindfulness based therapies provide a promising option in the treatment of obesity and other eating disorders. With two-thirds of the nation overweight, updated, federally sponsored empirical studies are needed to describe fully the role of mindfulness in obesity when used as an adjunct to traditional therapies. Resulting data could reframe what is currently considered "best practice" for treatment during a nationwide obesity epidemic.

Limitations and future research

The lack of consistent terminology associated with the concepts of mindfulness, obesity and eating disorders made it challenging to standardize a literature search strategy or to analyze comparatively the outcome data. Additionally, mindfulness based interventions were most frequently associated with yoga. Other applications of mindfulness outside of yoga make it difficult to generalize finding to other populations. Lastly, some yoga practices can be physically demanding which may produce other psychological effects distinctive from the mindfulness component. With yoga interventions, the mind-body exercise ratios can be unclear.

Future studies exploring the effect of a sustained exercise program with the additional component of mindfulness could offer much to what is known about the effect of mindfulness in combination with traditional treatments for obesity and eating disorders.

Conflict of interest statement

None declared.

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