

# Yoga and eating disorders: is there a place for yoga in the prevention and treatment of eating disorders and disordered eating behaviours?

Dianne Neumark-Sztainer\*

Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, Minneapolis, MN, USA

(Received 4 September 2013; accepted 27 October 2013)

This paper addresses the question: what can the practice of yoga offer the field of eating disorders in terms of prevention and treatment? Regarding prevention, preliminary research suggests that yoga may be effective in decreasing risk factors, and increasing protective factors, for eating disorders. Yoga was also found to be helpful in a small number of treatment studies. However, findings are not consistent across studies, which are limited in number, and due to the preliminary nature of this body of research, most studies have weaknesses in their designs (e.g. observational design, no control groups, or small sample sizes). The basic tenets of yoga, anecdotal reports of its effectiveness, its high accessibility and low cost, and initial research findings suggest that yoga may offer promise for the field of eating disorders. Two options are suggested for prevention: (1) eating disorder prevention can be integrated into ongoing yoga classes and (2) yoga can be integrated into eating disorder prevention programmes. Regarding treatment, it is important to examine the effectiveness of different teaching styles and practices for different eating disorders. Potential harms of yoga should also be explored. Further research, using stronger study designs, such as randomised, controlled trials, is needed.

Keywords: yoga; eating disorders; treatment; prevention; body image

Eating disorders and disordered eating behaviours, such as unhealthy weight control practices and binge eating, are of public health concern given their high prevalence and serious health consequences (Eaton et al., 2012; Hoek & van Hoeken, 2003; Johnson, Cohen, Kasen, & Brook, 2002; Neumark-Sztainer, 2012; Neumark-Sztainer, Story, Hannan, Perry, & Irving, 2002; Neumark-Sztainer, Wall, Story, & Standish, 2012; Patton, Selzer, Coffey, Carlin, & Wolfe, 1999; Paxton & Heinicke, 2008; Stice, Presnell, Shaw, & Rohde, 2005). It is crucial to identify strategies that can help in the prevention and treatment of these problems. Strategies that are particularly desirable are those that are widely accessible to populations at greatest risk for these problems, acceptable to participants, and relatively low in cost.

The practice of yoga, which is based in ancient Eastern teachings, has grown in popularity over the past few decades within Westernised societies, particularly among women. Yoga, which incorporates physical postures (i.e. asanas) with mindfulness and meditation, offers promise to the field of eating disorders as a mind-body therapy that can promote a stronger connection with, and a greater acceptance of, oneself and one's body (Boudette, 2006; Dittmann &

<sup>\*</sup>Email: neuma011@umn.edu

<sup>© 2013</sup> The Author(s). Published by Taylor & Francis.

Freedman, 2009; Douglass, 2009, 2011; Mehling et al., 2011; Neumark-Sztainer, 2012). Yoga is used as an adjunct component to eating disorders treatment within many treatment programmes. A 2006 study on therapies offered within 18 residential eating disorder treatment programmes in the USA found that two-thirds of the programmes (66.7%) offered yoga (Frisch, Herzog, & Franko, 2006). Emerging evidence suggests that yoga has benefits for mental health, although a 2013 review of randomised, controlled trials examining the effects of yoga on neuropsychiatric disorders found that the evidence for a beneficial effect of yoga on eating disorders was inconclusive (Balasubramaniam, Telles, & Doraiswamy, 2012). There were only two studies that met inclusion criteria (i.e. were randomised, controlled trials) and these studies had inconsistent findings (McIver, O'Halloran, & McGartland, 2009; Mitchell, Mazzeo, Rausch, & Cooke, 2007). Given that the basic tenets of yoga seem to offer potential for the prevention and treatment of eating disorders, and yoga is being utilised within treatment programmes, it is worthwhile to explore its potential utility and consider necessary steps for future research.

The aim of this paper is to consider the potential benefits of yoga in the prevention and treatment of eating disorders and related disordered eating behaviours. Specific questions to be addressed include the following: what can the practice of yoga offer the field of eating disorders in terms of prevention? How strong is the evidence that yoga can help in the treatment of eating disorders? And what are the next steps needed to more fully determine the potential value of the practice of yoga for the field of eating disorders?

### What can yoga offer the field of eating disorders in terms of prevention?

Given the high prevalence of eating disorders and disordered eating behaviours and the challenges and costs associated with treatment, it is crucial to work towards their prevention. One option for utilising yoga to help prevent eating disorders is to make use of ongoing yoga classes as a setting for eating disorder prevention by incorporating language, messages, and activities aimed at eating disorder prevention and early identification of problems. A second option is to incorporate yoga into eating disorder prevention interventions. Both of these options are considered here.

#### Incorporating eating disorder prevention into ongoing yoga classes

For a number of reasons, it seems appropriate to utilise ongoing yoga classes to reach out to participants with messages aimed at the prevention of risk factors and the promotion of protective factors for eating disorders. First of all, participation in yoga classes is high; it is estimated that approximately 20 million adults in the USA (8.7% of the adult population) practice some yoga (Yoga in America Study, 2012). Thus, there is a captive audience to receive these messages. Furthermore, females are at greater risk for eating disorders and disordered eating behaviours than males and the majority of yoga practitioners are female. Two large-scaled studies conducted within the USA found that approximately 80% of yoga practitioners are females (Neumark-Sztainer, Eisenberg, Wall, & Loth, 2011; Yoga in Amezrica Study, 2012).

Second, yoga classes offer a suitable venue for incorporating messages aimed at promoting self-acceptance, body appreciation, connection to one's body, and responsiveness to one's body's needs. In a study of female yoga practitioners, women commented on how yoga had helped them with their body image, ability to reconnect to their body, and self-acceptance (Dittmann & Freedman, 2009). For example, comments included, 'Yoga has been the only thing that has significantly helped me deal with my [body image] issues'. 'Before I found the practice, my body seemed more like a foreign space that I live in. Now I see my body as a tool, home ...'. 'Yoga gives me a higher level of acceptance for what physically I have to work with'. It is possible that yoga has the potential to additionally help individuals recognise and appropriately

respond to internal signs of hunger and satiety. In one observational cross-sectional study, adult yoga practitioners were more likely to engage in mindful eating behaviours than non-practitioners (Framson et al., 2009). Furthermore, without attention to these issues, yoga classes have the potential to produce undesirable effects; participants may compare themselves with more experienced or flexible students in the class, be critical of their own ability to either assume a pose or stay focused during meditation, with the end result of feeling worse about themselves and their bodies.

Finally, there is some research that suggests individuals attending yoga classes are at equal or greater risk for disordered eating behaviours than the general population; thus yoga classes may provide a suitable venue for reaching this captive audience. In Project EAT-III, a population-based study of 2287 young adults, 5.2% of young men and 17.6% of young women were reported to be practicing yoga or Pilates (asked in the same question) (Neumark-Sztainer et al., 2011). Among yoga/Pilates practitioners, the average time spent in practice was 2.2 hours/week for young men and 2.0 hours/week for young women. Extreme weight control behaviours (i.e. self-induced vomiting, diet pills, laxatives, and diuretics) were reported by 18.6% of the male young adult practitioners as compared to 6.8% of the non-practitioners. Similarly, binge eating was reported by 11.6% of the male practitioners as compared to 4.2% of the non-practitioners. Among the female young adults, the overall prevalence of disordered eating was high among both practitioners (extreme weight control practices: 22.7% and binge eating: 14.0%) and non-practitioners (extreme weight control practices: 20.3% and binge eating: 14.9%) but did not differ across the groups. It is likely that individuals dealing with eating and body image issues may be attracted to yoga/Pilates. This type of selection process may be leading to the higher prevalence of these behaviours. Conclusions from this study must be drawn cautiously, given that yoga and Pilates were assessed simultaneously and questions about type and intensity of practice were not asked. Furthermore, it is important to note that, in general, levels of practice were lower than those reported by participants in other studies examining the impact of yoga, which are presented later in this paper. Nevertheless, findings suggest that within such mind-body classes, there may be significant numbers of individuals engaging in disordered eating behaviours who could benefit from a teaching approach that helps them feel better about and more connected to their bodies, in order to increase the likelihood of taking care of themselves and avoiding these harmful behaviours.

No studies could be found that specifically examined the impact of incorporating eating disorder prevention activities into yoga classes open to the general public. However, there have been some studies examining the impact of yoga participation on risk and protective factors for eating disorders. As discussed below, these studies suggest that high levels of yoga practice may be helpful in promoting body awareness, responsiveness, and appreciation.

Impett, Daubenmier, and Hirschman (2006) conducted an intervention study that examined the potential for yoga to buffer against self-objectification and promote embodiment and overall psychological well-being. The study employed a within-person repeated measures design in which 19 adults (17 women and 2 men) participated in a two-month intensive yoga programme. Participants were experienced yogis and reported practicing yoga for an average of five years and six months prior to the programme. Over the course of the programme, participants practiced yoga for an average of 4.4 hours per week. The results were mixed in terms of the programme's effectiveness. From baseline to post-intervention, there was a decrease in self-objectification among participants, but changes in variables, such as embodiment and psychological well-being (i.e. positive affect, negative affect, satisfaction with life, and self-acceptance), were not found. Participants completed weekly surveys at six time points throughout the intervention; during weeks in which participants increased the frequency of their yoga practice, findings indicated increases in measures of positive affect, satisfaction with life, and body awareness and

decreases in negative affect. Given the high level of yoga experience of participants, the generalisability of the findings to less experienced practitioners is not clear and needs to be further explored. On the one hand, those starting at lower levels of yoga practice may have more room for the improvement and show greater changes. On the other hand, it may be that a high level of yoga practice is needed for meaningful change and that participating in just one yoga class a week is unlikely to lead to change. This study, and its findings, points to a need for studies that include control conditions and that examine the impact of different levels of yoga practice on outcomes.

In another study, Daubenmier (2005) compared three convenience samples (total n = 139) of women doing yoga, aerobics, and neither activity (Daubenmier, 2005). As in the previous study, yoga practitioners were experienced and engaged in yoga for 5.0 hours a week for an average of six years and two months. Furthermore, yoga practitioners were drawn from Iyengar and Ashtanga classes, in which the instructors emphasised body awareness and responsiveness. Yoga practitioners exhibited greater body awareness, responsiveness, and satisfaction and less self-objectification than both of the other groups and lower disordered eating attitudes than the aerobics group. These results are promising for the field of eating disorders given the importance of some of the variables assessed. For example, the measure of body responsiveness included items of relevance to eating disorders such as 'I am confident that my body will let me know what is good for me' and 'I "listen" to my body to advise me about what to do'. While findings are likely to be a result of a dedicated yoga practice, they may also be due to self-selection differences between women choosing to participate in yoga as compared to other activities.

Promising findings from these two studies point to a need for randomised, controlled trials that would allow for the determination of whether involvement in a regular yoga practice leads to a decrease in risk factors and an increase in protective factors for eating disorders. Furthermore, in order to determine if eating disorder prevention can be incorporated into ongoing yoga classes attended by the general public, it is important to add and evaluate the impact of specific activities aimed at enhancing protective factors and decreasing risk factors for eating disorders. For example, the impact of training yoga teachers on eating disorder prevention and early identification could be examined by randomising teachers into two conditions (receive vs. do not receive training on eating disorders) and then evaluating the impact of the training programme on the teachers' knowledge, attitudes, and behaviours related to risk and protective factors for eating disorders in themselves and their students, activities and language that they use in the classes that they teach, and relevant outcomes in their students.

## Incorporating yoga into eating disorder prevention interventions

It is also worthwhile to consider the value of incorporating yoga into interventions specifically designed to prevent eating disorders and to assess acceptance by participants, feasibility of implementation, and effectiveness in preventing risk factors or promoting protective factors for eating disorders and disordered eating patterns. Published research in this area is very limited and, as discussed below, findings from two identified studies are not clear-cut.

Mitchell et al. (2007) compared the impact of a yoga intervention with a dissonance-based intervention and a control condition in a randomised, controlled study. Participants included 93 female undergraduate psychology students recruited with fliers advertising a study for women dissatisfied with their bodies. The yoga and dissonance intervention each met once a week for 45 minutes over a six-week period. Although participants in the dissonance group showed decreases in disordered eating symptoms, drive for thinness, and alexithymia, no significant changes were seen among participants in the yoga condition. The authors concluded that the yoga intervention may not have been long or intense enough to have an impact. Furthermore, as compared to the

cognitive dissonance group, the yoga intervention addressed outcomes such as body dissatisfaction much more indirectly. Findings raise the question as to whether yoga interventions that more specifically address risk and protective factors for eating disorders may be more effective than more global approaches.

Scime and Cook-Cottone (2008) evaluated a primary prevention programme that integrated yoga into an intervention that addressed various risk factors for eating disorders such as media pressures and body image concerns. The study design included a control group; however, participants were not randomised into conditions. Participants included 144 fifth grade girls and the intervention was run at school as an after-school programme. The programme showed a positive impact on body dissatisfaction, bulimia, and social self-concept. Of note, the authors of this programme have an ongoing body of research in this area and findings from this study and a related study have led to programme refinement and a published 14-week curriculum entitled 'Girls Growing in Wellness and Balance: Yoga and Life Skills to Empower' provides a detailed explanation of each of the sessions (Cook-Cottone, Kane, Keddie, & Haugli, 2013). Sessions address topics such as mindful and intuitive eating, feelings, negative thoughts, self-image, and media awareness. At the end of each session in which these topics are addressed, approximately 45 minutes are devoted to yoga practice with references to the content taught in the programme. For example, in the session dedicated to enhancing self-image, the relaxation portion of the yoga practice includes a guided imagery related to finding personal strength. Findings from this study suggest the potential value of incorporating yoga into eating disorder prevention programmes. However, in order to truly assess the effectiveness of yoga, it would be important to teach a similar programme with and without the addition of yoga.

## Can yoga help in the treatment of eating disorders?

Yoga is often used as a complement to eating disorder treatment. For example, The Emily Programme, a large facility in the Minneapolis/St Paul area, offers approximately 30 yoga classes a week for clients at different levels of treatment (Diers, personal communication, 15 May 2013). At the Monte Nido Residential treatment programme, yoga is a regular component of treatment (Wyer, 2001). Thus, an important question to consider is whether the inclusion of yoga enhances programme effectiveness. Two randomised, controlled trials, conducted in very different populations for different types of eating disorders, were found in the published scientific literature (Carei, Fyfe-Johnson, Breuner, & Brown, 2010; McIver et al., 2009). As described below, these trials, in conjunction with valuable but somewhat smaller and less rigorous studies (Cook-Cottone, Beck, & Kane, 2008; Dale et al., 2009) and some of the studies already described in this paper, provide preliminary evidence for the utility of yoga in eating disorders treatment.

Carei et al. (2010) conducted a randomised, controlled pilot study to assess the impact of individualised yoga treatment on adolescents receiving outpatient care for anorexia nervosa, bulimia nervosa, or eating disorders not otherwise specified. Participants included 50 girls and 5 boys, 11–21 years of age. Participants in the control group received 'standardised' care (i.e. meeting with a physician and a dietician every other week), while those in the intervention group additionally received individualised yoga instruction (1:1) twice a week for eight weeks. A standardised yoga treatment protocol was employed. This study is of particular interest in that it is the only study located that taught yoga on an individualised basis, which is the manner in which it was originally taught in the Viniyoga tradition (Desikachar, 1999; Kraftsow, 1999). Results showed improvements in various measures in both study arms, but the group receiving yoga had significantly lower global scores on the Eating Disorder Examination at follow-up (four weeks following completion of the intervention) as compared to the standard treatment group. A food

preoccupation assessment, given to the yoga participants before and after each of the 16 yoga sessions, showed pre-post differences, such that participants indicated less food preoccupation after their yoga practice.

McIver et al. (2009) conducted a randomised, controlled trial to assess the impact of yoga on binge eating behaviours among a community-based sample of adult women in Australia. The final analysis included 25 women in the intervention group and 25 women in the wait-list control group. Participants were recruited via newspaper and radio announcements; inclusion criteria included a body mass index greater than 25 and a score higher than 20 on the Binge Eating Scale (Gormally, Black, Daston, & Rardin, 1982). The yoga intervention included 12 60-minute weekly group sessions that included movement and stillness, breath awareness, and meditation. Additionally, participants were strongly encouraged to engage in a 30-minute daily home practice and were provided with a CD and an illustrated manual. Mindful eating was also an important component of the programme; participants were invited to become aware of their eating habits and to try to eat in the absence of other distractions (e.g. television). Feedback forms suggested that the majority of participants practiced five days a week. Results were very encouraging; statistically significant and meaningful improvements were seen in binge eating behaviours in the intervention group as compared to the control group. Specifically, from baseline to post-test, binge eating scores decreased from 29.9 to 14.5 among women receiving the yoga intervention as compared to a decrease from 28.6 to 27.2 in the control condition; differences remained statistically significant at three-month follow-up. Additional benefits included an increase in physical activity and a small, but statistically significant, decrease in body mass index among those in the yoga intervention. The authors also conducted a qualitative analysis based upon personal journals from 20 of the participants receiving yoga, which provided rich data on the experience of the participants as a result of the practice (McIver, McGartland, & O'Halloran, 2009). Emerging themes showed a greater connection over time both with one's body (i.e. went from feeling estranged to empowered) and one's food consumption (i.e. went from being full and feeling empty to feeling satiation). Findings from this study provide preliminary evidence that combining a yoga practice with work on mindful eating may have benefits for the treatment of binge eating disorder. Findings suggest that research with larger populations and a longer follow-up period is warranted.

## What are the next steps needed?

The first question addressed in this paper is: what can the practice of yoga offer the field of eating disorders in terms of prevention? Further research is clearly needed to determine the potential for yoga to contribute to eating disorder prevention. Preliminary findings suggest that a regular and fairly intensive yoga practice is associated with factors that may protect individuals from eating disorders and disordered eating behaviours, such as greater body awareness and responsiveness (Daubenmier, 2005) and an overall sense of well-being (Impett et al., 2006). Furthermore, a programme specifically designed to prevent risk factors for eating disorders, which incorporated yoga alongside other interactive activities, showed some positive effects (Scime & Cook-Cottone, 2008). However, in a randomised, controlled trial, a brief yoga intervention did not infer benefits and was found to be less effective than a more focused dissonance-based approach (Mitchell et al., 2007). These preliminary findings showing that yoga may have some benefits for risk factors for eating disorders, in conjunction with the underlying philosophy of yoga that supports greater self-awareness, a non-judgemental stance towards oneself, and the integration of mind and body, suggest that it is certainly worthwhile to move forward with more rigorously designed studies. Some questions that arise as worthy of study include: how much yoga is needed to reduce risk factors and enhance protective factors for eating disorders? What types

of yoga might infer the greatest benefits and the lowest risk of harm? Should yoga be combined with other approaches that address risk factors in order to be most effective and if so, how should this be done?

Given the popularity of yoga and that many participants in group classes may be at risk for body image concerns and disordered eating behaviours, it is worthwhile to explore how to utilise ongoing yoga classes as settings for prevention. Some possible ideas for utilising yoga classes to decrease risk factors and enhance protective factors for eating disorders include the following: using language that helps students appreciate their bodies; a focus on noticing what one's body is saying and not pushing beyond that point; avoidance of any language that might promote comparison among students; and avoidance of language promoting a certain body type (e.g. sixpacks). Care should also be taken in discussing eating patterns such as cleansings, detoxification, and, of course, dieting. Yoga teacher training programmes can offer sessions to help future, or current, yoga teachers incorporate appropriate language. Additionally, teachers should be trained to recognise signs that may indicate increased risk for eating disorders. Teachers should also be taught what to do if concerned about students (e.g. students doing excessive numbers of intensive classes), while recognising that in most cases, students with body image concerns and those engaging in disordered eating behaviours will not be recognisable. Finally, studios can take steps to help individuals with body image issues feel more comfortable such as employing teachers of different shapes and sizes, having mirror-free studios, offering classes suitable for people of different sizes and abilities, and, if merchandise is sold, making sure to have a variety of sizes. Evaluation is important to determine the acceptability of these activities to yoga students and teachers and their effectiveness in modifying relevant attitudes and behaviours. Challenges in implementing such research are likely to be encountered given that there may be objections to utilising modern Western research methods to examine long-standing practices based on Eastern traditions. Thus, it seems particularly important to tread carefully, with great respect for traditional practices that may differ to those viewed as 'evidenced-based'.

It is also worthwhile to build on the work done by Scime and Cook-Cottone (2008) by integrating yoga into eating disorder prevention interventions that utilise other strategies aimed at enhancing media literacy, mindful eating, and self-esteem and decreasing body dissatisfaction and disordered eating behaviours. As previously noted, this research team has published a detailed curriculum (Cook-Cottone et al., 2013) that provides a model for how to integrate different intervention components and use yoga to reinforce messages from the other components. It seems as though their approach, which was implemented with elementary school children, could be modified to meet the needs of older populations and different settings. In order to truly assess the added value of the yoga on targeted outcomes, a three-arm study is recommended in which participants are randomised into 'standard' intervention, intervention plus yoga, and a control condition.

The second question addressed in this paper is: how strong is the evidence that yoga can help in the *treatment* of eating disorders? Research on the use of yoga within eating disorder treatment programmes is also in its early stages, with preliminary findings suggesting that yoga may help in the treatment of eating disorders. The two randomised, controlled trials that have been conducted and are described in this paper used different approaches (individualised vs. group and clinic-based vs. community-based) and worked with different age groups (adolescents vs. adults) with different types of eating disorders (primarily anorexia nervosa vs. binge eating disorder) (Carei et al., 2010; McIver et al., 2009). The positive results achieved from these studies, and other smaller studies that did not utilise randomised, controlled study designs (Cook-Cottone et al., 2008; Dale et al., 2009), suggest the potential for yoga, taught in different ways, to aid in the treatment of a variety of eating disorders. Furthermore, it is noteworthy that individuals practicing yoga perceive numerous mental and physical health benefits associated with the practice (Ross, Friedmann, Bevans, & Thomas, 2013).

Given the challenges and costs associated with eating disorders treatment and these preliminary promising findings, it is certainly worthwhile to move forward in exploring the value of yoga as a complement to eating disorder treatment, with more rigorous study designs. Both the acceptance of yoga by participants and its effectiveness should be explored. Best practices in terms of how yoga should be practiced and taught should be explored. An interesting question is whether yoga should be taught in manner that focuses on eating disorders or whether a more global approach should be utilised. For example, should the teacher takes concepts commonly taught in yoga, such as noticing what is going on in one's body, and discuss them in relation to noticing signs of hunger and satiety outside of class? It is also important to explore the mechanisms by which yoga may be contributing to recover from eating disorders, for example, is yoga leading to decreases in anxiety, improvements in body image and self-esteem, and/or increased recognition and responsiveness to hunger and satiety cues?

There is clearly a need for further research to address the question as to whether and how yoga can best help in the prevention and treatment of eating disorders, disordered eating, and body dissatisfaction. A list of suggested recommendations for further research is given in Table 1. More rigorous research is strongly needed. The state of research in this area is very preliminary and as

Table 1. Recommendations for future research exploring the potential for yoga in the prevention and treatment of eating disorders, disordered eating behaviours, and body dissatisfaction.

- (1) Utilise randomised, controlled study designs to assess the impact of yoga on the prevention and treatment of eating disorders disordered eating behaviours and body dissatisfaction
- (2) Assess the impact of participation in yoga classes in which efforts have been made to incorporate eating disorder prevention language, activities, and settings
- (3) Examine the impact of incorporating eating disorder training into yoga teacher training programmes: assess the impact on the teachers being trained, their classes, and their students
- (4) Examine the impact of different types of yoga, the importance of movement in conjunction with meditation, frequency of practice, and intensity of practice on both participation rates and outcomes of interest
- (5) Compare yoga classes specifically designed to address risk and protective factors for eating disorders with more globally focused yoga classes
- (6) Examine the effectiveness of yoga in conjunction with mindful eating work on measures of disordered eating, particularly binge eating, and on recognition and responsiveness to internal signs of hunger and satiety
- (7) Assess the impact of yoga in conjunction with other modalities of prevention and treatment. For example, assess whether the addition of yoga to prevention activities utilising cognitive dissonance approaches enhances participation and effectiveness. When possible, utilise three arms in intervention studies: 'standard' approach, 'standard approach and yoga', and control conditions
- (8) Determine the effectiveness of a yoga practice, and best teaching practices, for different types of eating disorders and different levels of recovery
- (9) Explore the benefits of group vs. individualised approaches of teaching yoga
- (10) Conduct cost-effectiveness and cost-benefit analyses on the impact of yoga on eating disorder-related outcomes
- (11) Assess the mechanisms by which yoga has an impact on outcomes of interest. For example, examine whether the following factors are associated with yoga practice and mediate the relationship between yoga and eating disorder outcomes; perceived stress; cortisol levels; anxiety; coping mechanisms; depression; impulsivity; compulsive physical activity; recognition of hunger and satiety; eating patterns; dietary intake; food preoccupation; dieting; weight and shape concerns; body image; self-esteem; self-compassion; interoceptive awareness; sense of embodiment; and body mass index
- (12) Determine for whom yoga is most acceptable and beneficial and on the flip side for whom yoga is not acceptable and may infer harm
- (13) Assess the risks associated with yoga, particularly among people at risk for eating disorders. For example, explore whether there are certain types of yoga that should be avoided

such tends to have study design weaknesses. It is noteworthy that many of the studies on yoga and its effectiveness with regard to eating disorders have been conducted as student research projects. The dedication of time and resources to the study of yoga and eating disorders is strongly recommended in order to assess effectiveness, best practices, and mechanisms by which yoga may be working.

In closing, it should be noted that it is not the author's opinion that yoga is the 'be-all-and-end-all' to the prevention and treatment of eating disorders. It is, however, the author's opinion that yoga provides another tool in the toolbox that may be suitable for some individuals. Given the popularity of yoga, its seemingly high level of acceptability among individuals at risk for disordered eating and eating disorders, and its potential for both benefits (if done correctly) and harm (if not), an exploration of its value in the prevention and treatment of eating disorders, disordered eating behaviours, and body dissatisfaction seems timely.

#### References

- Balasubramaniam, M., Telles, S., & Doraiswamy, P. M. (2012). Yoga on our minds: A systematic review of yoga for neuropsychiatric disorders. *Frontiers in Psychiatry*, 3(12), 1–16.
- Boudette, R. (2006). Question & answer: Yoga in the treatment of disordered eating and body image disturbance: How can the practice of yoga be helpful in recovery from an eating disorder? *Eating Disorders*, 14 (2), 167–170. doi:W34112H852241678 [pii] 10.1080/10640260500536334
- Carei, T. R., Fyfe-Johnson, A. L., Breuner, C. C., & Brown, M. A. (2010). Randomized controlled clinical trial of yoga in the treatment of eating disorders. *Journal of Adolescent Health*, 46(4), 346–351. doi:10. 1016/i.jadohealth.2009.08.007
- Cook-Cottone, C., Beck, M., & Kane, L. (2008). Manualized-group treatment of eating disorders: Attunement in mind, body, and relationship (AMBR). *Journal for Specialists in Group Work*, 33(1), 61–83.
- Cook-Cottone, C., Kane, L., Keddie, E., & Hauqli, S. (2013). Girls growing in wellness and balance: Yoga and life skills to empower. Stoddard, WI: Schoolhouse Educational Services, LLC.
- Dale, L. P., Mattison, A. M., Greening, K., Galen, G., Neace, W. P., & Matacin, M. L. (2009). Yoga work-shop impacts psychological functioning and mood of women with self-reported history of eating disorders. Eating Disorders: The Journal of Treatment and Prevention, 17(5), 422–434.
- Daubenmier, J. J. (2005). The relationship of yoga, body awareness, and body responsiveness to self-objectification and disordered eating. *Psychology of Women Quarterly*, 29, 207–219.
- Desikachar, T. K. V. (1999). *The heart of yoga: Developing a personal practice*. Rochester, VT: Inner Traditions International.
- Dittmann, K. A., & Freedman, M. R. (2009). Body awareness, eating attitudes, and spiritual beliefs of women practicing yoga. *Eating Disorders*, 17(4), 273–292. doi:10.1080/10640260902991111
- Douglass, L. (2009). Yoga as an intervention in the treatment of eating disorders: Does it help? *Eating Disorders*, 17(2), 126–139. doi:10.1080/10640260802714555
- Douglass, L. (2011). Thinking through the body: The conceptualization of yoga as therapy for individuals with eating disorders. *Eating Disorders*, 19(1), 83–96. doi:10.1080/10640266.2011.533607
- Eaton, D. K., Kann, L., Kinchen, S., Shanklin, S. L., Flint, K. H., Hawkins, J., ... Wechsler, H. (2012). Youth risk behavior surveillance United States, 2011. MMWR CDC Surveillance Summaries, 61(4), 1–162.
- Framson, C. F., Kristal, A. R., Schenk, J., Littman, A. J., Zeliadt, S., & Benitez, D. (2009). Development and validation of the Mindful Eating Questionnaire. *Journal of the American Dietetic Association*, 109(8), 1439–1444.
- Frisch, M. J., Herzog, D. B., & Franko, D. L. (2006). Residential treatment for eating disorders. *International Journal of Eating Disorders*, 39(5), 434–442.
- Gormally, J., Black, S., Daston, S., & Rardin, D. (1982). The assessment of binge eating severity among obese persons. *Addictive Behaviors*, 7(1), 47–55.
- Hoek, H., & van Hoeken, D. (2003). Review of the prevalence and incidence of eating disorders. *International Journal of Eating Disorders*, 34, 383–396.
- Impett, E. A., Daubenmier, J. J., & Hirschman, A. L. (2006). Minding the body: Yoga, embodiment, and well-being. *Sexuality Research and Social Policy*, 3(4), 39–48.

- Johnson, J. G., Cohen, P., Kasen, S., & Brook, J. S. (2002). Eating disorders during adolescence and the risk for physical and mental disorders during early adulthood. Archives of General Psychiatry, 59(6), 545–552.
- Kraftsow, G. (1999). Yoga for wellness: Healing with the timeless teachings of viniyoga. New York, NY: Penguin Group.
- McIver, S., McGartland, M., & O'Halloran, P. (2009). 'Overeating is not about the food': Women describe their experience of a yoga treatment program for binge eating. *Qualitative Health Research*, 19(9), 1234–1245. doi:10.1177/1049732309343954
- McIver, S., O'Halloran, P., & McGartland, M. (2009). Yoga as a treatment for binge eating disorder: A preliminary study. *Complementary Therapies in Medicine*, 17(4), 196–202.
- Mehling, W. E., Wrubel, J., Daubenmier, J. J., Price, C. J., Kerr, C. E., Silow, T., ... Stewart, A. L. (2011). Body awareness: A phenomenological inquiry into the common ground of mind-body therapies. *Philosophy, Ethics, and Humanities in Medicine*, 6, 6. doi:10.1186/1747-5341-6-6
- Mitchell, K. S., Mazzeo, S. E., Rausch, S. M., & Cooke, K. L. (2007). Innovative interventions for disordered eating: Evaluating dissonance-based and yoga interventions. *International Journal of Eating Disorders*, 40(2), 120–128. doi:10.1002/eat.20282
- Neumark-Sztainer, D. (2012). Integrating messages from the eating disorders field into obesity prevention. *Adolescent Medicine: State of the Art Reviews*, 23(3), 520–543.
- Neumark-Sztainer, D., Eisenberg, M. E., Wall, M., & Loth, K. A. (2011). Yoga and Pilates: Associations with body image and disordered-eating behaviors in a population-based sample of young adults. *International Journal of Eating Disorders*, 44(3), 276–280. doi:10.1002/eat.20858
- Neumark-Sztainer, D., Story, M., Hannan, P. J., Perry, C. L., & Irving, L. M. (2002). Weight-related concerns and behaviors among overweight and non-overweight adolescents: Implications for preventing weight-related disorders. *Archives of Pediatrics and Adolescent Medicine*, 156(2), 171–178.
- Neumark-Sztainer, D., Wall, M., Story, M., & Standish, A. R. (2012). Dieting and unhealthy weight control behaviors during adolescence: Do they predict changes in weight ten years later? *Journal of Adolescent Health*, 50, 80–86.
- Patton, G. C., Selzer, R., Coffey, C., Carlin, J. B., & Wolfe, R. (1999). Onset of adolescent eating disorders: Population based cohort study over 3 years. *BMJ*, 318(7186), 765–768.
- Paxton, S. J., & Heinicke, B. E. (2008). Body image. In S. Wonderlich & J. E. Mitchell (Eds.), *Annual review of eating disorders, part 2* (pp. 69–83). Oxford: Radcliffe.
- Ross, A., Friedmann, E., Bevans, M., & Thomas, S. (2013). National survey of yoga practitioners: Mental and physical health benefits. *Complementary Therapies in Medicine*, 21(4), 313–323.
- Scime, M., & Cook-Cottone, C. (2008). Primary prevention of eating disorders: A constructivist integration of mind and body strategies. *International Journal of Eating Disorders*, 41(2), 134–142. doi:10.1002/eat.20480
- Stice, E., Presnell, K., Shaw, H., & Rohde, P. (2005). Psychological and behavioral risk factors for obesity onset in adolescent girls: A prospective study. *Journal of Consulting and Clinical Psychology*, 73(2), 195–202. doi:10.1037/0022-006X.73.2.195
- Wyer, K. (2001). Mirror image: Yoga classes at the Monte Nido clinic are changing how women with eating disorders see themselves. *Yoga Journal*, *158*, 70–73.
- Yoga in America Study. (2012). Retrieved November 18, 2013, from http://www.yogajournal.com/press/ yoga in america