

# Mindfulness, Eating Behaviours, and Obesity: A Review and Reflection on Current Findings

Michail Mantzios · Janet Clare Wilson

Published online: 10 January 2015  
© Springer Science+Business Media New York 2015

**Abstract** Mindfulness and mindful eating have become popular in recent years. In this review, we first explore what mindfulness is in the context of psychological research, and why it offers promise for eating behaviours and weight loss. Second, we review the main empirical findings for weight loss in mindfulness-based intervention programmes. Third, contradictions in the findings are explored in more depth, and suggestions are made regarding why they may be occurring. Fourth, the benefits of adding self-compassion (and compassion) training to mindfulness practise to assist weight loss is discussed. Finally, the limitations of the research literature (and possible solutions) are explored. Overall, it is concluded that while mindfulness meditations that specifically focus on eating may be extremely helpful in promoting better eating behaviours, and assist in weight regulation, work is still needed to make such interventions appeal to a wider audience.

**Keywords** Mindfulness · Meditation · Compassion · Eating behaviours · Obesity

## Introduction

The rising number of overweight and obese individuals and the related health risks have become a pressing issue for most western societies [1]. Current proposals suggest that

mindfulness may be a way of aiding weight regulation, and preliminary findings are optimistic [2]. Yet, not all of the results have been positive [3]. In this brief review, we will explore these contradictions more fully, suggest why mindfulness has the potential to aid weight management, highlight the usefulness of combining compassion with mindfulness-based interventions in weight loss treatments, and outline limitations which may play a significant role in the effectiveness of mindfulness-based interventions. At the outset, however, it is vital to explain what is meant by mindfulness, to assist in the later discussions on findings relevant to eating, weight loss and obesity.

Kabat-Zinn [4] described mindfulness as an awareness that emerges through purposely paying attention in the present moment, non-judgmentally. Bishop and others [5] similarly described mindfulness as the self-regulation of attention to achieve a non-elaborative awareness of the current experience. Thus, mindfulness is a state, but to develop such a state of awareness requires practice — which usually involves meditation — and consists of consciously and purposely practising to attend non-judgmentally the present moment. The practice of the state of mindful awareness has many benefits, but for the purposes of this review, how mindful awareness can aid weight regulation will be explored. In short, mindful awareness can potentially minimise the automatic and inattentive reactions around food, as well as reduce emotional triggers which lead to emotional eating and unnecessary consumption of food.

Automatic (or inattentive) eating is unavoidable, because eating is an overlearned behaviour (i.e., one eats three times a day, most days), that often becomes secondary to other tasks of everyday life [6]. Bargh [7] identified four characteristics of automatic behaviours: 1) they take place without awareness, 2) they begin without intention, 3) they carry on once started without control, and 4) they function with little effort. Recent research demonstrated that automatic eating is common,

---

This article is part of the Topical Collection on *Psychological Issues*

M. Mantzios (✉)  
School of Social Sciences, Division of Psychology, Birmingham City  
University, City North Campus, Birmingham B42 2SU, UK  
e-mail: michael.mantzios@bcu.ac.uk

J. C. Wilson  
Department of Psychology, University of Portsmouth,  
Portsmouth, UK

whereby people eat because it is mealtime and not because of any awareness of hunger [8]. Further, seeing food or having it within arm's length can automatically increase food intake [9]. However, mindful awareness brings the eater's focus back to what one is eating. Indeed, findings show that mindfulness 'deautomatizes' eating, and improves reactions to cravings [10], and thus, aids better weight regulation. Similar to automaticity, impulsivity is an inclination towards quick, unintentional reactions to stimuli without considering the negative consequences of those actions [11]. Impulsivity is also related to overeating and obesity. An impulsive person has trouble controlling attention, and hence, can be powerless in delaying gratification. Recent preliminary findings suggested a negative relationship between measures of mindfulness and impulsivity, which supports the assumption that using mindfulness techniques may decrease impulsivity [12], and once again aid with lowering food consumption.

Automatic eating can also come in the form of emotional eating. Emotional eating results from the use of food as a coping mechanism in the presence of negative emotions [13]. In other words, eating becomes a tool for avoiding or suppressing negative thoughts and emotions. Avoidance or suppression is a short-term escape from the emotions, but not a long-term solution, as the tendency to avoid negative thoughts and emotions may create a more frequent and intense reoccurrence [14]. Thus, once eating becomes a coping mechanism to avoid or suppress negative emotions, it also becomes more habitual and automatic. Instead of trying to suppress or avoid negative emotions, staying attentive and promoting a non-elaborative attitude through mindfulness may help one to cope with negative emotions without food. Recent findings show that emotional eating is positively associated with weight gain, anxiety and depression [15]; while mindfulness has a strong negative relationship with weight gain, anxiety and a positive relationship to greater emotional stability [16–18]. Therefore, mindfulness could moderate the effect of negative emotions on eating behaviour, or, reduce the impact of the present moment emotional state on eating behaviour, as mindfulness becomes the new coping mechanism.

Few empirical mindfulness interventions have focused on weight loss [19•]. For example, a recent study found that the attribute of mindfulness negatively predicted weight gain in civilians who entered a highly stressful military environment [16]. Another study found that participants lost more weight in a mindfulness meditation group that was dieting, compared to a dieting control group [19•]. Yet, the participants in this study were not obese, exercised regularly, and had a controlled diet; all of which made it difficult to generalise these positive findings.

However, there have been other interventions which fit with the basic premise of mindfulness aiding weight regulation with obese and non-obese samples. For example, the Mindfulness-Based Eating Awareness Training (MB-EAT)

programme is an intervention which targets the automatic reaction to food related cues, such as the smell and sight of food [20–22]. This training, nevertheless, was designed for binge eating and may need to be adapted for more general weight management. This adaptation is underway by the original creators of this programme. Similar findings exist for other mindfulness-based interventions, where researchers successfully helped people decrease their tendency to eat in response to their emotions, as well as decreased automatic eating [10, 22–24]. Although studies have targeted different types of eating which relate to weight gain, and some have investigated weight loss and maintenance, looking at findings collectively suggests that mindfulness-based interventions are overall effective in decreasing overeating and weight. The main limitation of all the research mentioned above is that, despite the positive results in the short term, there is limited evidence of the durability of effects. Thus, research needs to extend participant follow-ups, to establish the long-term efficacy of mindfulness-based interventions for eating.

### Examining Contradictory Findings

Existing research on mindful eating has been conducted with a range of meditations. However, these meditation practices may vary from very general practices of mindfulness to meditations which are specific to eating. For example, at the more general end of the spectrum, some researchers are using the body-scan meditation. Meditators are simply invited to scan parts of their body (e.g., neck, throat, finger tips, etc.) throughout the meditation practice, while attending to their breath [25]. At the other end of the spectrum is the raisin meditation, which is specific to the act of food consumption and mindfulness [21]. The emphasis during this practice is placed on slowing down to acknowledge the taste, colours, and texture of the raisin; hence, to fully experience eating throughout the process. In other words, there is no impulsivity, no distractions, no automaticity, and no emotional interference (through a non-elaborative or non-judgmental attitude) in the fully attentive act of eating calmly a single raisin.

Current evidence suggests that mindfulness interventions become more effective for weight regulation when they clearly direct participants to improve eating behaviours, weight loss or maintenance [3, 25–27, 28•]. Participants need to display some intent to improve their eating behaviours or weight regulation; otherwise it might take some time to come around to the idea of mindful eating. For example, working on the assumption that mindfulness assists in moderating automaticity that occurs in reaction to external stimuli (such as portion size) [29, 30], one recent study found that a mindfulness-based intervention was not helpful and did not deter overeating [25]. However, this study used the 'body-scan meditation', which does not directly relate to automatic eating, and thus, did not assist the participants with overconsumption in the timeframe

set by researchers. One solution here would be to extend the time of practice and observation of participants to encourage acceptance and recognition of the idea of eating mindfully. A more direct solution, however, would be to use the ‘fullness meditation’ [19••], or, the aforementioned ‘raisin meditation’ [31], which are more relevant to attentive and slower eating practices.

One mindfulness-based stress reduction failed to show any impact on emotional eating [3]. However, again, this programme did not focus on eating at all (as the authors themselves point out in their discussion). It is logical to assume that if people are eating in response to their emotions, then being more mindful might help, as the emotions are better handled. However, meditating mindfully takes time and usually means that meditators are restricting this new skill to meditation sessions, and gradually realize that mindfulness can be used beyond meditation to improve other aspects of life. Once again, expecting mindfulness practices in the short term to reduce specific detrimental eating behaviours, which were developed and learned over many years, may be too optimistic.

Another way of making mindfulness more behaviour-relevant could be to remove the need for meditation and focus strictly on eating. We developed a ‘mindful concrete construal’ diary, which was an event-based exercise to be used with every meal, and increased mindfulness when eating [32••]. The intent behind this diary was to create an easier method to develop a mindful eating attitude for participants who wanted to lose weight, but were not willing to take part in meditation interventions. The diary involved questions which would be considered during the meal (without the expectation of necessarily answering them during the meal), and immersed the person into the present moment experience. Also, the diary helped dieters acknowledge the thoughts, feelings and emotions that surfaced from time to time, instead of avoiding them. Using the diary for some time meant that the questions became more automatic, and the person developed a purposeful intention to pay attention to the present meal by considering the set of questions. Observing (and enjoying) the present meal and having set goals that relate to eating less at this meal was both concrete and feasible. This way, participants observed goals that were visible and achievable in the present moment. This diary was as effective as mindfulness meditation in aiding weight loss ( $M=3.90$  kg vs.  $M=4.06$  kg, respectively), demonstrating that by aiding the self-regulation of attention whilst eating, participants could benefit from mindfulness without meditation.

There are benefits and limitations to this method of eliminating the use of formal meditation in this context. On the one hand, focusing on food and eating related behaviours increases one’s ability to manage weight, and is easier to practice. On the other hand, a general practice of mindfulness and merging mindfulness with daily behaviours and experiences may be vital to prevent other detrimental behaviours from

emerging (e.g., mindful eating, but mindless drinking) [33–37]. Therefore, the diary we developed appears to be a tool that promotes mindful eating, but is unlikely to promote mindful living. This is also true for any other intervention that is behaviour specific and claims to derive from the theory of mindfulness.

Mindfulness alone may be too limited as it is a difficult state to fully achieve. On its own mindfulness meditation, apart from the aforementioned attentional training, can also be a practise of compassion, forgiveness, selflessness, love and kindness for oneself and others, which is more life affirming than simply observing the present moment [34, 36]. However, as the previous discussion suggests, it may be quicker and more beneficial if other elements — such as compassion and kindness — were explicitly taught as part of the eating intervention and that is what this review will explore next.

### The Added Value of Compassion

In simple terms, compassion means “to suffer with”. Compassion is defined as sensing the suffering and distress of another, and feeling motivated to alleviate such suffering [38]. Compassion characteristically stimulates a self-soothing process which promotes affect regulation and redirects attention with feelings of gentleness and kindness [38]; something that acts as an added support to people who aim to quit smoking, overcome eating disorders, and regulate weight [19••, 32••, 39, 40]. Indeed, being more compassionate [38], especially with oneself [41], improves mindfulness practice. Higher scores in self-compassion have been associated with greater effectiveness of mindfulness interventions [42, 43]. Further, obesity carries with it a strong social stigma; thus, self-compassion may help an individual cope more proactively, and possibly eat less if one of the predisposing behaviours is emotional eating. A recent study suggested that once mindfulness was taken into account, self-compassion uniquely contributed further to the negative prediction of weight gain [16]; while another recent study demonstrated that combined mindfulness and self-compassion interventions aided weight loss more than mindfulness alone ( $M=3.9$  kg vs.  $M=2.7$  kg, respectively) [19••]. Nevertheless, the research to date is preliminary and there remain many gaps and limitations – for example using military personnel within the research, when these participants are more anxious and stressed than other populations – which need further consideration before drawing clear conclusions.

The ability to show compassion to oneself is useful in many respects [44]. The willingness to be compassionate to others, however, has not been explored in relation to food and weight loss, and may seem absurd when considering how it could help someone lose weight. To explore compassion towards others, it may be worthwhile to glance through parent-child relationships, where compassion derives more naturally. For

parents, the health and well-being of the child is a priority, and there is a natural inclination to be more kind and compassionate to their children than to themselves, which can be an advantage in health behaviour modification for the whole family. On the obesity front, the greatest rise is among the younger generations, and children in particular [45]. Children are learning from their parents' eating habits and become conditioned to the foods that are available in the household. Needless to say, the presence of healthier alternatives (e.g. smaller food packaging, smaller plates) as a way to be compassionate and kind to the physical health of the child may be a better way to facilitate weight regulation for both the child and the parent. Indeed, future research might fruitfully explore how mindfulness and compassion training may best help parents cope better with the feeding demands of their children, and indirectly help themselves with regulating their weight.

#### The Difficulties with Applying Mindfulness Meditation to the General Public

Despite the benefits of mindfulness-based interventions, there are also difficulties. Based on our experience conducting research with obese and non-obese clients, we would like to discuss three of the main difficulties. First, mindfulness meditation does not have a glowing reputation in the minds of the general public. Mindfulness is often seen as a Buddhist practise (which is where the name and practice originate from) and many of our participants were practising Christians who felt meditating was in some way a betrayal of their religion. As one participant's family member put it, "You should be ashamed for practising something that is outside our Christian faith". Further, although meditation is now widely used in research and therapy, to some members of the public it is "hippy dippy nonsense". Thus, seeking volunteers for research on mindfulness frequently appeals to people who are primarily interested in holistic well-being. For example, when trying to apply an intervention to a group, for example, within the Greek Military (as we did, [16]), there was much resistance. Comments included "Don't waste any more time on this boring and mind-numbing practice", or "Meditation is girly, like yoga" (there were also many unrepeatable comments littered with sarcasm and contempt for all parties involved coming from those who refused to take part in the military research). Thus, many people (including family and friends of our participants) see mindfulness meditation as an obscure and abstract Buddhist practice that is not relevant to their daily lives. If they do not see its relevance, then they are highly unlikely to maintain any regular practice. We would suggest that to get around this difficulty, some psychoeducation at the outset is needed. It is important to either point out that meditation is an integral part of Judeo-Christian practise and that praying can be a form of meditation, or alternatively, to replace the term mindfulness meditation with other

descriptions such as "brain training" that helps one to develop a calmer, more relaxed form of open attention. This may 'sell' it better and allow more people to try it without prior stereotypes influencing their decision to learn the techniques or to make them part of their daily lives. Further, as a result of perceptions about mindfulness, more randomised control studies are needed, as there bias in recruiting those willing to participate in mindfulness meditation experiments, and it may be their enthusiasm for such practices that creates a strong placebo effect. Indeed, future research may want to compare calling it mindfulness meditation versus brain training to see if one version attracts more volunteers, and 'better' results than the other.

Second, although mindfulness meditation is simple, it is not easy. Indeed, many of our participants struggled with the techniques. In particular, they reported they were never clear if they were 'doing it right' and they wanted some means to measure improvement. Whilst that may go against some Buddhist principles that form the basis of the original practise of mindfulness, it is very much an integral part of Western thinking about health. Thus, future research might explore techniques such as biofeedback to investigate how the measurable improvement observed by participants may change the commitment to, and acceptance of mindfulness interventions. Maintenance of the practise is essential for long-term use and having something to measure (even 'an app for that') may help. On the other hand, the reality is that there are those participants who enjoy mindfulness practices, who make mindfulness a part of their everyday life with ease, and continue to practice without any need to monitor their progress in mindfulness, or, other health outcomes. Identifying such individual differences may be the next fundamental part to determine the usefulness of mindfulness-based interventions in obesity treatments.

Third and finally, the cost and accessibility of mindfulness meditation is a problem. Many people may try to learn and practice meditation with a CD or a book, but it is better and easier to practise in a group with an instructor [28•]. However, to do that in a non-Buddhist context, more therapists need to be trained in the practise, and perhaps to regularly practise themselves. Alternatively, future research might explore involving live meditation sessions through online platforms to allow people to join together to practice, possibly with chat rooms to ask questions and share problems that meditators are facing, or, develop non-meditation techniques as suggested above that allow larger numbers to participate at a low cost.

#### Conclusions

In conclusion, mindful eating research is still in its infancy. Preliminary results show that mindfulness-based interventions

reduce weight [19••, 22, 23, 32••], emotional eating [22, 23, 46] and automatic eating [22, 46, 47]. Further, despite the problems, behaviour specific mindfulness interventions appear to be effective in weight management [32••]. However, like any weight management technique it must be continued long-term if effective weight management is to be maintained. To date, there is no empirical evidence demonstrating effective long-term use. Further, despite the surge in mindfulness research in general, little research has focused on long-term maintenance. For now, it is safe to conclude that mindfulness-based interventions that focus on eating may be extremely helpful in promoting better eating behaviours and weight regulation in the short-term, and that there is future benefit in conducting mindfulness-based interventions within the obesity treatment context.

### Compliance with Ethics Guidelines

**Conflict of Interest** Michail Mantzios and Janet Clare Wilson declare that they have no conflict of interest.

**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by any of the authors.

### References

Papers of particular interest, published recently, have been highlighted as:

- Of importance
- Of major importance

1. Organization WH. Obesity and overweight. Fact sheet no. 311. 2014. [www.who.int/mediacentre/factsheets/fs311/en/](http://www.who.int/mediacentre/factsheets/fs311/en/).
2. O'Reilly G, Cook L, Spruijt-Metz D, et al. Mindfulness-based interventions for obesity-related eating behaviours: a literature review. *Obes Rev*. 2014;15(6):453–61.
3. Kearney DJ, Milton ML, Malte CA, et al. Participation in mindfulness-based stress reduction is not associated with reductions in emotional eating or uncontrolled eating. *Nutr Res*. 2012;32(6):413–20.
4. Kabat-Zinn J. Mindfulness-based interventions in context: past, present, and future. *Clin Psychol Sci Pract*. 2003;10(2):144–56.
5. Bishop SR, Lau M, Shapiro S, et al. Mindfulness: a proposed operational definition. *Clin Psychol Sci Pract*. 2004;11(3):230–41.
6. Cohen D, Farley TA. Eating as an automatic behavior. *Prev Chronic Dis*. 2008;5(1):A23.
7. Bargh JA, Chartrand TL. The unbearable automaticity of being. *Am Psychol*. 1999;54(7):462–79.
8. Tuomisto T, Tuomisto MT, Hetherington M, et al. Reasons for initiation and cessation of eating in obese men and women and the affective consequences of eating in everyday situations. *Appetite*. 1998;30(2):211–22.
9. Wansink B, Painter JE, Lee YK. The office candy dish: proximity's influence on estimated and actual consumption. *Int J Obes*. 2006;30(5):871–5.

10. Alberts HJ, Mulkens S, Smeets M, et al. Coping with food cravings. Investigating the potential of a mindfulness-based intervention. *Appetite*. 2010;55(1):160–3.
11. Stanford MS, Mathias CW, Dougherty DM, et al. Fifty years of the Barratt Impulsiveness Scale: an update and review. *Personal Individ Differ*. 2009;47(5):385–95.
12. Peters JR, Erisman SM, Upton BT, et al. A preliminary investigation of the relationships between dispositional mindfulness and impulsivity. *Mindfulness*. 2011;2(4):228–35.
13. Geliebter A, Aversa A. Emotional eating in overweight, normal weight, and underweight individuals. *Eat Behav*. 2003;3(4):341–7.
14. Wegner DM, Schneider DJ, Carter SR, et al. Paradoxical effects of thought suppression. *J Pers Soc Psychol*. 1987;53(1):5.
15. Kontinen H, Männistö S, Sarlio-Lähteenkorva S, et al. Emotional eating, depressive symptoms and self-reported food consumption. A population-based study. *Appetite*. 2010;54(3):473–9.
16. Mantzios M, Wilson JC, Linnell M, et al. The role of negative cognition, intolerance of uncertainty, mindfulness, and self-compassion in weight regulation among male army recruits. *Mindfulness*. 2014:1–8.
17. Hofmann SG, Sawyer AT, Witt AA, et al. The effect of mindfulness-based therapy on anxiety and depression: a meta-analytic review. *J Consult Clin Psychol*. 2010;78(2):169.
18. 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.
19. Mantzios M, Wilson JC. Exploring mindfulness and mindfulness with self-compassion-centered interventions to assist weight loss: theoretical considerations and preliminary results of a randomized pilot study. *Mindfulness*. 2014:1–12. *This study provides the lengthiest longitudinal account of mindfulness-based interventions, and also offers an additional account of the role of compassion in weight loss and maintenance.*
20. Van Strien T, Herman CP, Verheijden MW. Eating style, overeating, and overweight in a representative Dutch sample. Does external eating play a role? *Appetite*. 2009;52(2):380–7.
21. Kristeller J, Wolever RQ, Sheets V. Mindfulness-based eating awareness training (MB-EAT) for binge eating: a randomized clinical trial. *Mindfulness*. 2013:1–16.
22. Daubenmier J, Kristeller J, Hecht FM, et al. Mindfulness intervention for stress eating to reduce cortisol and abdominal fat among overweight and obese women: an exploratory randomized controlled study. *J Obes*. 2011:1–13.
23. Niemeier HM, Leahey T, Palm Reed K, et al. An acceptance-based behavioral intervention for weight loss: a pilot study. *Behav Ther*. 2012;43(2):427–35.
24. Jacobs J, Cardaciotto L, Block-Lerner J, et al. A pilot study of a single-session training to promote mindful eating. *Adv Mind-Body Med*. 2012;27(2):18–23.
25. Marchiori D, Papies EK. A brief mindfulness intervention reduces unhealthy eating when hungry, but not the portion size effect. *Appetite*. 2014;75:40–5.
26. Timmerman GM, Brown A. The effect of a “mindful restaurant eating” intervention on weight management in women. *J Nutr Educ Behav*. 2012;44(1):22–8.
27. Miller CK, Kristeller JL, Headings A, et al. Comparative effectiveness of a mindful eating intervention to a diabetes self-management intervention among adults with type 2 diabetes: a pilot study. *J Acad Nutr Diet*. 2012;112(11):1835–42.
28. Mantzios M, Giannou K. Group vs. single mindfulness meditation: exploring avoidance, impulsivity, and weight management in two separate mindfulness meditation settings. *Appl Psychol Health Well Being*. 2014. *The problems of different mindfulness meditations and the relationship to weight loss are critically explored.*

29. Wansink B, Van Ittersum K, Painter JE. Ice cream illusions: bowls, spoons, and self-served portion sizes. *Am J Prev Med*. 2006;31(3):240–3.
30. Rolls BJ, Roe LS, Kral TV, et al. Increasing the portion size of a packaged snack increases energy intake in men and women. *Appetite*. 2004;42(1):63–9.
31. Hong PY, Lishner DA, Han KH. Mindfulness and eating: an experiment examining the effect of mindful raisin eating on the enjoyment of sampled food. *Mindfulness*. 2012;1–8.
32. Mantzios M, Wilson J. Making concrete construals mindful: a novel approach for developing mindfulness and self-compassion to assist weight loss. *Psychol Health*. 2014;29(4):422–41. *This study is the first attempt to develop mindfulness without meditation, and provides preliminary data on the effectiveness of mindful (i.e., attentive and non-judgmental) eating on weight loss.*
33. Kabat-Zinn J. *Wherever you go, there you are: mindfulness meditation in everyday life*. New York: Hyperion; 1994.
34. Kabat-Zinn J. *Coming to our senses: healing ourselves and the world through mindfulness*. New York: Hyperion; 2006.
35. Grossman P, Niemann L, Schmidt S, et al. Mindfulness-based stress reduction and health benefits: a meta-analysis. *J Psychosom Res*. 2004;57(1):35–43.
36. Grossman P, Van Dam NT. Mindfulness, by any other name...: trials and tribulations of sati in western psychology and science. *Contemp Buddhism*. 2011;12(01):219–39.
37. Shapiro SL, Carlson LE, Astin JA, et al. Mechanisms of mindfulness. *J Clin Psychol*. 2006;62(3):373–86.
38. Gilbert P. *Compassion: conceptualisations, research and use in psychotherapy*. London: Routledge; 2005.
39. Kelly AC, Zuroff DC, Foa CL, et al. Who benefits from training in self-compassionate self-regulation? A study of smoking reduction. *J Soc Clin Psychol*. 2010;29(7):727–55.
40. Ferreira C, Pinto-Gouveia J, Duarte C. Self-compassion in the face of shame and body image dissatisfaction: implications for eating disorders. *Eat Behav*. 2013;14(2):207–10.
41. Neff K. Self-compassion: an alternative conceptualization of a healthy attitude toward oneself. *Self Identity*. 2003;2(2):85–101.
42. Hollis-Walker L, Colosimo K. Mindfulness, self-compassion, and happiness in non-meditators: a theoretical and empirical examination. *Personal Individ Differ*. 2011;50(2):222–7.
43. Birnie K, Speca M, Carlson LE. Exploring self-compassion and empathy in the context of mindfulness-based stress reduction (MBSR). *Stress Health*. 2010;26(5):359–71.
44. Neff KD. Self-compassion, self-esteem, and well-being. *Soc Personal Psychol Compass*. 2011;5(1):1–12.
45. Oken E. Maternal and child obesity: the causal link. *Obstet Gynecol Clin N Am*. 2009;36(2):361–77.
46. Woolhouse H, Knowles A, Crafti N. Adding mindfulness to CBT programs for binge eating: a mixed-methods evaluation. *Eat Disord*. 2012;20(4):321–39.
47. Alberts HJ, Thewissen R, Raes L. Dealing with problematic eating behaviour. The effects of a mindfulness-based intervention on eating behaviour, food cravings, dichotomous thinking and body image concern. *Appetite*. 2012;58:847–51.