



Review

Can mindfulness influence weight management related eating behaviors? If so, how?



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HIGHLIGHTS

- The term 'mindfulness' has been used to refer to a range of different practices.
- Present moment awareness of the sensory properties of food can reduce later intake.
- Decentering strategies may help individuals resist desired foods.
- Whether the above techniques can aid weight management has yet to be established.
- There is currently little evidence that acceptance strategies can directly influence food intake.

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ABSTRACT

Mindfulness is increasingly being used for weight management. However, the strength of the evidence for such an approach is unclear; although mindfulness-based weight management programs have had some success, it is difficult to conclude that the mindfulness components were responsible. Research in this area is further complicated by the fact that the term 'mindfulness' is used to refer to a range of different practices. Additionally, we have little understanding of the mechanisms by which mindfulness might exert its effects. This review addresses these issues by examining research that has looked at the independent effects of mindfulness and mindfulness-related strategies on weight loss and weight management related eating behaviors. As well as looking at evidence for effects, the review also considers whether effects may vary with different types of strategy, and the kinds of mechanisms that may be responsible for any change. It is concluded that there is some evidence to support the effects of (a) present moment awareness, when applied to the sensory properties of food, and (b) decentering. However, research in these areas has yet to be examined in a controlled manner in relation to weight management.

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Levels of overweight and obesity have increased dramatically over the last three decades; globally, 1 in 3 adults are now overweight or obese and more than 3 million deaths are attributed to the condition every year (Ng et al., 2014). As well as being associated with increased mortality (Whitlock et al., 2009), being overweight or obese is linked to a wide range of chronic health conditions such as type 2 diabetes, hypertension, coronary heart disease, stroke, cancer, metabolic syndrome and osteoarthritis (Kopelman, 2007). As such, it impacts, not only upon quality of life, but also upon the wider economy. For example, overweight and obesity are estimated to have a global cost of \$2.0 trillion a year; equivalent to the cost of armed war, violence, and terrorism (Dobbs et al., 2014). For these reasons, tackling obesity has become a priority for many governments.

An important part of government strategy is the development of weight management interventions. Such interventions may be aimed at helping individuals lose weight, maintain weight losses, or prevent weight gain. These may be achieved by targeting either energy expenditure or energy intake. However, a wide range of different eating behaviors can influence energy intake including reduced portion sizes, reduced frequency of overeating, and a switch from higher to lower calorie foods. Thus weight management may be achieved via multiple pathways.

One approach to weight management that is becoming increasingly popular is the use of mindfulness-based interventions. These are currently being employed by a number of healthcare organizations, as well as being promoted as a strategy for weight management and eating regulation amongst the general public. However, the strength of the evidence for such an approach is unclear. For example, Olson and Emery (2015) conducted a systematic review of 19 mindfulness-based interventions for weight loss. Whilst 13 of these showed significant reductions in weight, it was not certain that these changes were brought about by increases in mindfulness; the authors concluded that there was a need for further research to isolate mindfulness as an active component of treatment, for example by measuring changes in mindfulness.

However, assessing change in mindfulness is not as straightforward as it sounds. In particular, questionnaires designed to assess mindfulness tend to show poor convergent validity and their items may be interpreted in different ways by those with and without experience of mindfulness. They may also be subject to significant desirability bias especially where one group has received training in mindfulness practice and thus subsequently becomes aware of what they are 'meant' to be answering (Grossman, 2011).

An alternative means of identifying a relationship between mindfulness and a particular outcome is simply to restrict the experimental manipulation to mindfulness techniques only. This means that any change in the outcome variable can be more confidently attributed to the mindfulness component. However, because weight loss is difficult to achieve, and because experts recommend that interventions contain multiple elements (National Institute for Health and Clinical Excellence, 2006), in practice such an approach is rare in research examining the effects of mindfulness on weight loss. Nevertheless, there are studies that have examined the independent effects of mindfulness, or mindfulness-related strategies, on what can be regarded as surrogate measures of weight loss, for example calorie intake or food choice. Such outcomes are also relevant for weight maintenance. Whilst there is no guarantee that changes in such outcomes will necessarily translate into weight loss or weight maintenance, they enable us to more confidently conclude that

the change was, indeed, due to the mindfulness-related strategy or strategies employed.

These types of more carefully controlled experimental studies also have two other important advantages over those that examine multi-component mindfulness-based interventions. First, they provide more opportunity to explore whether certain types of mindfulness strategy are more or less effective than others. This is important as mindfulness intervention generally comprises a range of different practices and strategies and it is not always clear whether all components are responsible for the benefits or whether some may be redundant. Indeed, a number of researchers have highlighted the need for dismantling studies (Cavanagh, Vartanian, Herman, & Polivy, 2014; Shapiro, Carlson, Astin, & Freedman, 2006). These issues are particularly important given that overburdening participants with strategies and rules may dilute effects and reduce adherence (Mata, Todd, & Lippke, 2010; Verhoeven, Adriannse, de Ridder, de Vet, & Fennis, 2013).

And second, studies assessing the independent effects of mindfulness typically allow for a more detailed examination of mechanisms. We still know very little about the ways in which different mindfulness strategies bring about their effects (Holzel et al., 2011; Sedlmeier et al., 2012); understanding how mindfulness strategies work will increase the confidence with which we can effectively modify these techniques and apply them in new settings and to different populations. This is essential for the development of effective evidence-based interventions that have a sound theoretical basis (Michie & Abraham, 2004).

In light of the above, the current review examines studies that look at the independent effects of mindfulness-related strategies on weight management and weight management related behavioral outcomes. The review explores (a) evidence for effects, (b) differences in effects across different types of mindfulness-related strategies, and (c) the ways in which such strategies may exert their effects. This should help identify future directions for more experimental work in this area as well as inform the development of evidence-based mindfulness weight management interventions. The review begins with a brief examination of the concept and practice of mindfulness.

1. Mindfulness: definitions and variations in practice

As noted above, the term 'mindfulness' can be used to refer to a range of different practices. Different authors have also conceptualized mindfulness in slightly different ways. The current review draws on definitions of mindfulness put forward by Kabat-Zinn (2003), Bishop et al. (2004), and Shapiro et al. (2006) in order to distinguish between three main types of practice.

Kabat-Zinn (2003), defines mindfulness as 'awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment'. This definition arguably encompasses two key ideas; that of paying attention to present moment experience, and also of taking a non-judgmental attitude towards this experience.

Paying attention to present moment experience requires attention regulation, and this is highlighted in most definitions of mindfulness (e.g. Bishop et al., 2004; Shapiro et al., 2006). Indeed, most mindfulness practice includes exercises in which the individual attempts to maintain their attention on a particular aspect of their present experience. For example, they may attend to their breath, shifting attention back to the breath whenever it wanders. This practice involves several different attentional processes; monitoring the focus of attention, disengaging

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