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Tronieri JS, Wadden TA, Pearl RL, Berkowitz RI, Alamuddin N, Chao AM. Mindful Eating, General Mindful Awareness, and Acceptance as Predictors of Weight Loss. *Mindfulness* (N Y). 2020 Dec;11(12):2818-2827.

What We Know, Think We Know, or Are Starting to Know

As diet and nutrition are fundamental aspects of everyday life, the research in this area inevitably casts a wide net, incorporating everything from metabolic physiology to food policy. In this regard, it is unsurprising to see an interest in the effects of behavioural therapies, such as Mindfulness-based Eating Awareness ⁽¹⁾ or Acceptance and Commitment-based interventions ⁽²⁾, emerge in the research.

The relatively poor return on investment from deliberate dieting for weight loss ⁽³⁾, coupled with potential adverse psychological consequences of weight stigma ^(4,5), have generated interest in what are broadly termed “non-diet nutrition” approaches ⁽⁶⁾. In a [recent \[March 2023\] Deepdive](#), we covered the first meta-analysis of the effects of the most popular non-diet approach, Intuitive Eating [IE], on psychological outcomes.

Interventions such as IE, or Health at Every Size [HAES], may be defined by the lack of any deliberate pursuit of a weight loss goal. However, mindfulness-based or acceptance-based interventions have typically been utilised in the context of weight loss dieting ^(7,8). While that might appear incongruent with the concept of non-diet nutrition, what places such interventions under this umbrella is the fact that they promote eating according to external cues, rather than emotional and external stimuli ⁽⁹⁾.

Previous intervention trials have shown that Mindful Eating improves diet quality, and facilitates weight loss through reduced reward-driven eating ^(1,10). Separately, in the Mind Your Health trial an Acceptance-Based intervention led to significantly greater weight loss over 1-year compared to standard behavioural treatment ⁽²⁾, and greater likelihood of weight loss maintenance at 3-years ⁽¹¹⁾.

However, as acceptance is a component part of mindfulness-based training, the potential related and distinct effects of these constructs are important to determine. The present study investigated the influence of general mindfulness, mindful eating, and acceptance, on weight loss.

The Study

The study was a secondary analysis of a weight loss trial that was conducted in two phases:

- **Phase 1:** A 14-week low energy [1,000–1,200kcal/d] meal replacement diet targeting a minimum of 5% bodyweight loss from baseline.
- **Phase 2:** Participants who achieved a $\geq 5\%$ weight loss in Phase 1 were then randomised to receive a drug [lorcaserin, a serotonin receptor agonist that decreases appetite] or placebo and entered a 52-week weight maintenance phase.

Phase 1 involved weekly 90-minute group lifestyle counselling sessions delivered by registered dietitians or psychologists. In Phase 2, sessions were every second week for the first 12-weeks, then monthly thereafter.

The primary outcomes of the present analysis were short-term weight loss [i.e., over 14-weeks in Phase 1] and long-term weight loss [i.e., over 66-weeks from the start of Phase 1 to end of Phase 2].

The analysis investigated whether baseline levels of mindful eating, general mindful awareness, or acceptance, predicted weight loss at the respective short and long-term timepoints.

Results: 178 participants were enrolled in Phase 1, of which 137 participants entered Phase 2. ~87% of participants were female, the average age of participants was ~45yo, and ~70% of the participants were Black/African American [~22% White, ~6% Hispanic, ~2 Asian]. Average bodyweight at baseline was ~114kg, corresponding to a Body Mass Index [BMI] of 40.9kg/m².

Predictors of Short-term Weight Loss [Phase 1, 0-14 Weeks]: Average weight loss over 14-weeks was 10kg [8.5% of initial weight]. In the analysis of each eating predictor alone, only acceptance significantly predicted weight loss.

In analysing all predictors together, acceptance remained significant, indicating that the effect of acceptance was independent of mindful eating and general mindfulness. Participants with low acceptance scores at baseline lost 8.7kg on average, compared to 11.2kg in those with high acceptance scores.

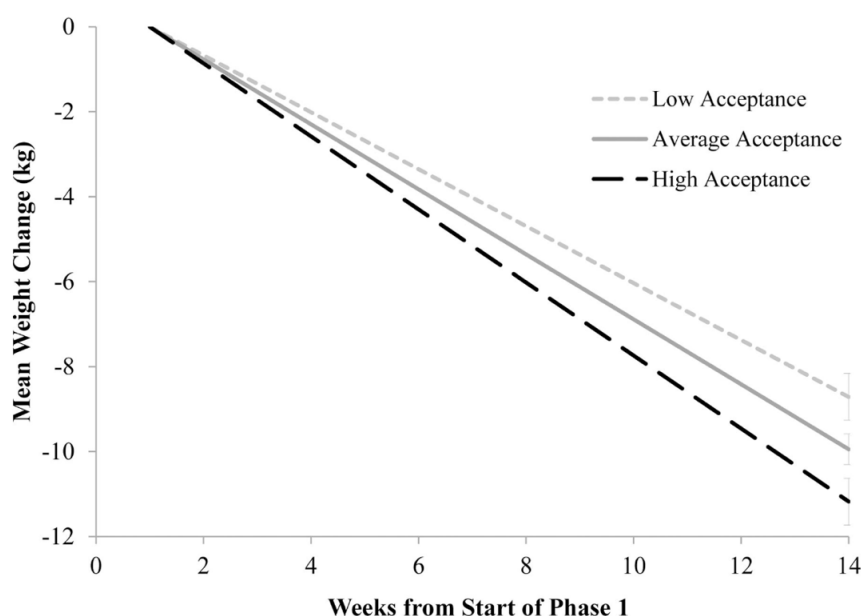


Figure from the paper illustrating the associations between acceptance scores at baseline and weight loss over 14-weeks. Higher acceptance scores predicted a faster rate of weight loss, and greater magnitude of overall achieved weight loss during this study phase.

Predictors of Long-term Weight Loss [Phase 1 & 2, 0-66 Weeks]: Of the 137 participants who entered Phase 2, the average weight loss at the end of the intervention was 9.4kg [7.8% of baseline weight] in the lorcaserin group compared to 7.5kg [6.6% of initial weight] in the placebo group.

In the analysis of each predictor alone, both mindful eating and acceptance were significant predictors of weight loss over 66-weeks. However, in analysing all predictors together, none were significantly independent predictors of weight loss.

In stratifying participants according to baseline acceptance scores, those with low baseline acceptance were associated with a 6.9kg weight loss at 66-weeks compared to 10.1kg in participants with high baseline acceptance scores; these differences were not statistically significant [although the estimated difference in magnitude is clear].

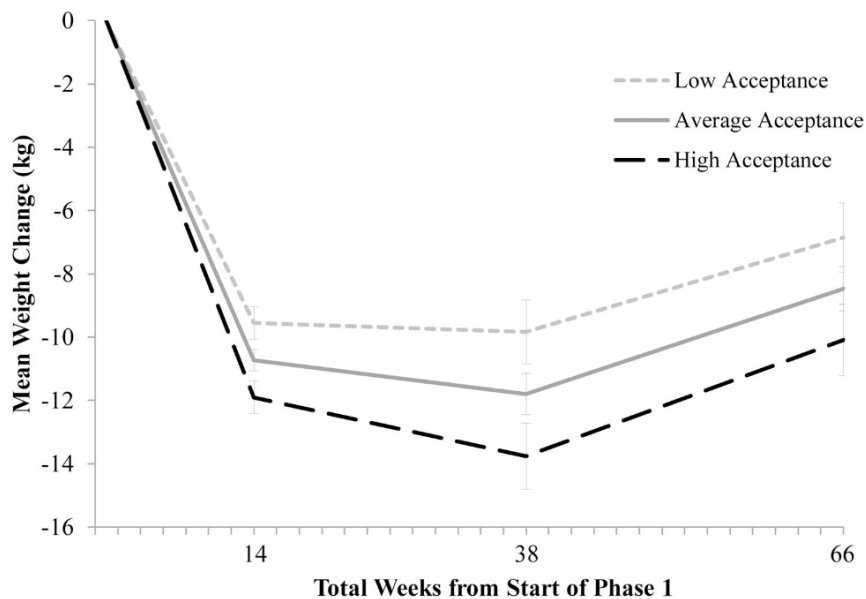


Figure from the paper illustrating the associations between acceptance scores at baseline and weight loss over 66-weeks, i.e., including both Phase 1 and Phase 2 of the primary study.

The Critical Breakdown

Pros: The aims and hypotheses of the study were clearly stated. The study sample consisted predominantly of Black women, an underrepresented demographic in research. Mindful eating, general mindfulness and acceptance were assessed using validated scales that showed good internal consistency, i.e., the extent to which the items [or questions] in a test measure the intended construct. The statistical analysis accounted for missing data to maintain the sample size of the study. The analysis analysed the effects of mindful eating, general mindfulness, and acceptance, both as sole predictors and together in the same model [more on this under **Key Characteristic**, below]. Relevant covariates, including BMI, age, sex, ethnicity, depression scores, and treatment group, were all included in the analysis.

Cons: This study is a secondary analysis of a weight loss intervention trial, and while the aims, hypotheses, outcomes, and analysis, were all clearly presented, it is always important to bear in mind that secondary analyses are correlational findings. In this regard, the actual design and implementation of the parent study is relevant to the limitations of the present analysis. The parent trial involved both a low-calorie meal replacement phase, followed by half of the participants entering the second phase being allocated to an appetite suppressing drug; hardly ideal circumstances to be analysing constructs like mindful eating. Further, the study analysed the presence of these behaviours at baseline, not the implementation of an intervention to develop these behaviours. Finally, while not a limitation of the present analysis *per se*, please note that the drug used has been removed from the market due to concerns of cancer risk.

Key Characteristic

The key characteristic of the present study is the analysis of each predictor of general mindfulness, mindful eating, and acceptance, both separately and together in the same model. In this approach, analysing the individual predictors determined whether there was any effect of that factor in isolation. However, by including all three together in the same model, this analysis determined whether there was any effect of each predictor that was independent of the others.

This is important because these factors tend to overlap, i.e., acceptance is a component of mindfulness-based interventions ^(1,2). In the long-term analysis, mindful eating was modestly associated with weight loss, even after including general mindful awareness, however, once acceptance was added to the model mindful eating was no longer independently associated with weight loss.

Importantly, however, while acceptance was also associated with long-term weight loss in isolation, in the full model it was no longer significant; in effect, this analysis indicates that mindful eating and acceptance cancelled each other out. Given that both constructs overlap to an extent, this mutual cancelling out suggests a lack of strong distinction between eating-related mindfulness and general acceptance. We'll expand on this point in the next section...

Interesting Finding

Two points arise from the previous section that are interesting findings from this study. The first is that in the analysis of either short-term or long-term predictors of weight loss, general mindful awareness did not show up as a significant predictor in any of the respective analyses. The second is the lack of independent distinction between mindful eating and acceptance in the long-term weight loss analysis, despite both having a significant association in isolation.

In relation to the first, studies that have utilised a mindfulness-based intervention and demonstrated some benefits for weight loss and eating behaviours have deployed the Mindfulness-Based Eating Awareness Training [MB-EAT] ^(1,10), i.e., it is *specific* to eating-related mindfulness. And the benefits may reflect this specificity, with reduced reward-driven eating mediating the relationship between MB-EAT and weight loss ⁽¹⁰⁾. This has also been demonstrated in a previous intervention, in which mindful eating had a greater influence on portion size moderation than general mindfulness alone ⁽¹²⁾.

In relation to the second interesting finding, a similar consideration may arise. General acceptance therapy emphasises cognitive flexibility ⁽¹³⁾, however, acceptance-based interventions have also previously suggested that benefits are more specifically related to food-related factors [i.e., cravings] ^(2,11). This position has been supported from a recent 1yr weight loss trial using an acceptance-based intervention, in which the associations with weight loss were domain-specific to eating-related acceptance, rather than general acceptance ⁽¹⁴⁾.

Thus, the fact that mindful eating and acceptance cancelled the respective isolated associations of each other out suggests some degree of overlap between these constructs that likely reflects eating-related behaviours more specifically, that would require more granular assessment in future research.

Relevance

Let's start with reiterating one of the major limitations of the present study, which is that these constructs were not assessed as actual interventions. Only one session in the entire intervention contained details on mindful eating. Thus, this study was analysing the habitual levels of these constructs in participants at baseline, not determining whether training in either mindful eating or acceptance led to differences in weight loss. Such is the limitation of a secondary analysis where the primary study was designed for very different purposes.

And this is also important given the suggestions of some of the findings. For example, the difference over the entire study between low and high acceptance scores was 3kg greater weight loss in those with high acceptance scores; this is not insubstantial. However, it does not appear to be representative. A meta-analysis of acceptance-based interventions published recently showed paltry effects on weight loss [~0.33kg less compared to control groups] ⁽¹³⁾.

However, this study did show significant benefits to lowering weight stigma ⁽¹³⁾. There is a similar theme for mindfulness-based interventions, which overall exhibit little effect on weight, but decreases binge eating and impulsive eating ⁽⁸⁾.

This may be where the real utility of such treatments lies, as acceptance-based interventions may specifically be effective in individuals with high levels of disinhibited eating ⁽¹⁵⁾. Similarly, the effect of mindful eating appears to be more evident in individuals with reward-driven eating ⁽¹⁰⁾. Cumulatively, the evidence indicates that the potential effectiveness of cognitive and behavioural interventions reflects the degree to which they relate to eating-related behaviours.

Application to Practice

It is important to note that interventions such as MB-EAT or Acceptance and Commitment are domain-specific treatments that would require relevant domain-specific training to implement in practice. The actual magnitude of benefit from a weight loss standpoint appears to be modest, whether using mindfulness-based or acceptance-based approaches.

However, considering these interventions through the prism of weight loss is likely doing their real value a disservice, given the improvements in psychological aspects of eating behaviour and sense of internalised weight stigma that may result. In this respect, there may be particular utility for these interventions in individuals with more binge eating, emotional eating, and disinhibited eating behaviours.

For nutrition professionals interested in applying such interventions in practice, however, would require upskilling in training to deliver them properly and effectively.

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