

# An 8-Month Follow Up of the Mindless to Mindful (M2M) Self-Regulation Intervention on Fat Mass Loss

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David Kawahata, PhD<sup>1</sup> and Duke Biber, PhD<sup>2</sup> 

## Abstract

**Purpose:** To assess the maintenance of fat mass loss and increases in exercise self-control and self-compassion at 8-months follow-up to the Mindless to Mindful (M2M) program.

**Design:** This was a single-group follow-up case study.

**Sample:** For the analysis, 79 of the original 195 M2M participants ( $n = 40.51\%$ ) participated.

**Intervention:** The eight-week M2M program provided goal-setting, group exercise, and goal monitoring to promote fat mass loss.

**Measures:** Participants completed measures of body fat, the brief self-control scale, and the self-compassion scale-short form.

**Analysis:** Paired sample t-tests were used to determine differences within and between groups ( $P$ -value  $< .05$ ).

**Results:** There was a significant increase in fat mass from post-test to follow-up ( $t(78) = 3.105$ ,  $P = .001$ ,  $d = .349$ ), but participants did not revert to baseline. There was a significant decrease in self-control ( $t(78) = -3.381$ ,  $P < .001$ ,  $d = -.380$ ) and self-compassion ( $t(78) = -2.670$ ,  $P = .005$ ,  $d = -.300$ ). Further, team participants gained significantly more fat mass ( $M = 3.46$ ,  $SD = 7.41$ ), had diminished self-control ( $M = -2.87$ ,  $SD = 5.83$ ), and decreased self-compassion ( $M = 0.16$ ,  $SD = 0.38$ ) when compared to individual participants.

**Conclusion:** Participants maintained some fat mass loss at eight-month follow-up.

## Keywords

self-regulation, maintenance, exercise intervention, fat mass, mental health, interventions

## Purpose

More than half of adult Americans are not meeting the recommended physical activity guidelines.<sup>1</sup> Regular physical activity protects against a variety of negative health outcomes, and adults who engage in more than 300 min of moderate intensity activity each week reap substantial and long-term health benefits.<sup>2</sup> There are many barriers to exercise adherence.<sup>3,4</sup> The self-regulation of exercise (eg, the process by which individuals control their own thoughts, emotions, and behaviors in pursuit of personal goals) and the associated theory is an appropriate framework to address barriers to help adults achieve the recommended levels of physical activity.<sup>5,6</sup> One program that is based on self-regulation with the goal of helping adults meet the existing physical activity guidelines is the 8-week Mindless to Mindful (M2M) program.<sup>7</sup> The M2M program provided one-on-one coaching goal setting based on biometric screenings, moderate-to-vigorous exercise in a group setting, monitoring of progress and goals using a weekly diary, and follow-up meetings to re-evaluate goals. During M2M, participants met physical activity guidelines for eight weeks, had significant fat mass loss, and experienced increases in self-control

of exercise and self-compassion.<sup>7</sup> This study assessed the maintenance of fat mass loss and increases in exercise self-control and self-compassion at 8-months follow-up to the initial M2M program.

## Methods

### Design and Sample

Prior to participation, all participants completed informed consent that was approved by the University Institutional

<sup>1</sup>School of Natural & Applied Sciences, William Jessup University, Rocklin, CA, USA

<sup>2</sup>Department of Health Sciences, College of Health and Behavioral Studies, James Madison University, Harrisonburg, VA, USA

### Corresponding Author:

Duke Biber, Department of Health Sciences, College of Health and Behavioral Studies, James Madison University, 235 Martin Luther King Jr. Way Harrisonburg, Harrisonburg, VA 22807, USA.

Email: [biberdd@jmu.edu](mailto:biberdd@jmu.edu)

**Table 1.** Outcome Variable Descriptives at Baseline, Post-Intervention, and Follow-Up ( $N = 79$ )

	WK0		WK8		WK40	
	M	SD	M	SD	M	SD
Fat Mass	45.52	16.93	37.80	15.35	40.37	14.57
Self-Control	40.73	7.03	43.37	7.20	41.35	7.65
Self-Compassion	3.07	0.63	3.20	0.61	3.07	0.58

Review Board. For the analysis, 79 of the 195 M2M participants completed follow-up measures, and 75.9% ( $n = 60$ ) were female. The average age of participants was 43.99 years ( $SD = 9.01$ ). In the initial M2M trial, participants chose to participate in the program as part of a group (eg, as a team) or as individuals. The methods and results reflect analysis between these two groups at follow-up.

## Measures

The measures below are the same that were completed in the original M2M trial.

**Body Fat.** Lange skinfold calipers and the Jackson-Pollock 4-site equation assessed body fat percentage, fat mass loss, and fat free mass gain, which is a valid and reliable measure when compared to underwater weighing.<sup>8</sup>

**Brief Self-Control Scale.** The 13-item BSCS<sup>9</sup> is a self-reported questionnaire designed to measure general trait self-control. Questions are answered on a 5-point Likert scale from 1 (Not at all) to 5 (Very much).

**Self-Compassion Scale Short-Form.** The 12-item self-compassion scale-short form assesses an individual's self-reported self-kindness, common humanity, and mindfulness to calculate a total self-compassion score.<sup>10</sup> The SCS-SF exhibits near perfect correlation and factor analysis with the long form as a measure of self-compassion.<sup>10</sup> Self-compassion has also been found to enhance self-regulation of health behaviors, including exercise.<sup>11</sup>

## Procedures

Participants were contacted via email to participate in this follow-up assessment. Participants were requested to complete measures of body fat, the BSCS, and the SCS at 8-months follow-up to assess maintenance of effects.

## Analysis

Descriptive statistics assessed outcome variables for all participants at follow-up. Paired sample *t*-tests assessed differences between groups and within groups from post-test to follow-up. Significance was determined using *P*-values  $< .05$ .

## Results

While there was a significant mean increase in FM at follow-up ( $t(78) = 3.105$ ,  $P = .001$ ,  $d = .349$ ), participants did not gain all FM back. There was a significant decrease in self-control ( $t(78) = -3.381$ ,  $P < .001$ ,  $d = -.380$ ) and self-compassion ( $t(78) = -2.670$ ,  $P = .005$ ,  $d = -.300$ ) (Table 1).

From post-M2M to 8-month follow-up, there were significant differences in FM, self-control, and self-compassion between groups (Table 2), in which team participants gained significantly more FM ( $M = 3.46$ ,  $SD = 7.41$ ), had diminished self-control ( $M = -2.87$ ,  $SD = 5.83$ ), and decreased self-compassion ( $M = 0.16$ ,  $SD = 0.38$ ) when compared to individual participants (Table 3).

## Discussion

### Summary

Participants did not revert to pre-M2M program levels, maintaining some fat mass loss and increases in exercise self-control and self-compassion. Previous research has found that fat lost in interventions is not often maintained at 6-month follow-up like it was in M2M.<sup>7</sup> Interventions focusing on self-regulation, dietary changes, and physical activity showed modest long-term retention, particularly when including group or technology-supported coaching and monitoring tools like diaries.<sup>12</sup> Those who engaged in M2M as an individual better

**Table 2.** Differences in Fat Mass, Self-Control, and Self-Compassion Between Groups From Post-Intervention to Follow-Up ( $N = 55$  Team;  $N = 24$  Individual)

Variable	Group	$M \pm SD$	$t(77)$	$P$	Cohen's $d$
$\Delta$ Fat Mass	Team	$3.46 \pm 7.41$	1.678	.049	.411
	Individual	$0.49 \pm 6.84$			
$\Delta$ Self-Control	Team	$-2.87 \pm 5.83$	-2.243	.014	-.549
	Individual	$0.04 \pm 3.03$			
$\Delta$ Self-Compassion	Team	$-0.188 \pm 0.412$	-1.995	.025	-.488
	Individual	$0.014 \pm 0.418$			

\*Post-Intervention (WK8), Follow-Up (WK40).  $p < 0.05$ .

**Table 3.** Outcome Variable Descriptives at Baseline, Post-Intervention, and Follow-Up by Group (N = 55 Team; N = 24 Individual)

		WK0	WK8	WK40
		M ± SD	M ± SD	M ± SD
Fat Mass	Team	45.23 ± 16.07	37.56 ± 14.80*	41.02 ± 14.71 <sup>†</sup>
	Individual	46.17 ± 19.11	38.37 ± 16.86*	38.87 ± 14.44
Self-Control	Team	40.27 ± 7.08	43.73 ± 7.19*	40.85 ± 8.22 <sup>†</sup>
	Individual	41.79 ± 6.93	42.54 ± 7.31*	42.50 ± 6.16
Self-Compassion	Team	3.144 ± 0.661	3.303 ± 0.642*	3.115 ± 0.637 <sup>†</sup>
	Individual	2.917 ± 0.539	2.951 ± 0.465*	2.965 ± 0.407

\*Indicates significant within-group differences from baseline to post-test to 8-month follow-up.

<sup>†</sup>Indicates significant between group differences from post-test to 8-month follow-up.

maintained changes than those who participated as a team. Self-determination and intrinsic motivation can drive long-term success in weight management, allowing individuals to maintain progress without external support, whereas those in team-based interventions often rely more on external motivation, which may diminish once the structured support ends.<sup>13</sup> There was a decrease in self-control and self-compassion at follow-up, but the values did not revert to baseline. This is supported by previous research in which self-compassion and self-control often increase during exercise interventions, but is not fully sustained at follow-up.<sup>14,15</sup>

### Limitations

The follow-up evaluation of M2M had a few limitations. Questionnaires were used at follow-up, which rely on individuals' memory and honesty, often resulting in inaccurate or biased data, such as overestimated physical activity levels compared to objective measures.<sup>16</sup> Future implementation of M2M may consider the use of direct measures of physical activity throughout the program and at follow-up to more accurately assess engagement. In addition, there was an imbalance in sample size for the team and individual groups, which can bias the estimate of effects for the two groups or increase sensitivity to violations of assumptions. Future research should aim to recruit comparable group sample sizes. Lastly, this study did not include a control group to compare results to at follow-up. Without a control group, it is difficult to determine whether the initial and follow-up weight loss and psychological effects were from the M2M program.

### Significance

Participants in the M2M program maintained fat mass loss from the initial eight-week program at eight-month follow-up. While there was some reversion, it is encouraging to see that not all the fat mass was regained. There is potential that the M2M program instilled self-regulatory capacity across all participants, indicating the need for follow-up

measures of self-regulation and basic psychological needs. This study highlights the importance of gradually extinguishing exercise interventions to ensure participants are prepared to self-regulate exercise behavior to maintain fat mass loss.

### So What

SO WHAT (Implications for Health Promotion Practitioners and Researchers)

#### What Is Already Known About the Topic?

Most adult Americans are not meeting the recommended physical activity guidelines.<sup>1</sup> There are many barriers to adherence,<sup>3,4</sup> and the self-regulation theory is an appropriate framework to address barriers to help adults achieve the recommended levels of physical activity.<sup>5,6</sup>

#### What Does This Article Add?

Participants in the M2M program maintained some fat mass loss and improvements in self-control and self-compassion at eight-month follow-up.

#### What Are the Implications for Health Promotion Practice and Research?

This study showed that a structured intervention focusing on self-regulation, dietary changes, and physical activity (eg, the M2M program) showed modest long-term retention of fat mass loss through feasible techniques including group-supported coaching and self-monitoring.

### ORCID iD

Duke Biber  <https://orcid.org/0000-0001-9712-1033>

### Informed Consent

All participants completed informed consent prior to participation.

## Ethical Considerations

This study was approved by William Jessup University Institutional Review Board.

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## Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Data Availability Statement

All data is available upon request.

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