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Weight loss strategies utilized in a men's weight loss intervention

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Abstract

Men are underrepresented in weight loss programs and little is currently known about the weight loss strategies men prefer. This study describes the weight loss strategies used by men during a men-only weight loss program. At baseline, 3, and 6 months, participants reported how frequently they used 45 weight loss strategies including strategies frequently recommended by the program (i.e., mentioned during every intervention contact; e.g., daily self-weighing), strategies occasionally recommended by the program (i.e., mentioned at least once during the program; e.g., reduce calories from beverages), and strategies not included in the program (e.g., increase daily steps). At baseline participants ($N=107$, 44.2 years, 31.4 kg/m², 76.6% white) reported regularly using 7.3 ± 6.6 ($M \pm SD$) strategies. The intervention group increased the number of strategies used to 19.1 ± 8.3 at 3 months and 17.1 ± 8.4 at 6 months with no changes in the waitlist group. The intervention group reported increased use of most of the strategies frequently recommended by the program (4 of 5), nearly half of the strategies occasionally recommended by the program (10 of 24), and 1 strategy not included in the program (of 16) at 6 months. The intervention effect at 6 months was significantly mediated by the number of strategies used at 3 months. This study adds to what is known about men's use of weight loss strategies prior to and during a formal weight loss program and will help future program developers create programs that are tailored to men.

Keywords

weight loss; men's health; Health Behavior; Diet; Physical Activity/Exercise

Introduction

Men in the United States have a higher prevalence of overweight and obesity (71.3%), compared to women (65.8%) (Ogden, Carroll, Kit, & Flegal, 2014) yet men are underrepresented in studies of weight loss programs (Pagoto et al., 2011; Robertson et al., 2014) and in many commercial weight loss programs (Gudzune et al., 2015). In studies of men's preferences for weight loss programs, men have reported wanting programs that are individualized, encourage physical activity, are gender-targeted, and provide information in a straight-forward manner (Egger & Mowbray, 1993; Morgan, Warren, Lubans, Collins, &

Callister, 2011; Sabinsky, Toft, Raben, & Holm, 2007; Wolfe & Smith, 2002). These preferences stand in contrast to many behavioral weight loss programs that are delivered in group formats and are often comprised mainly of women participants (Wadden & Butryn, 2003). This mismatch may in part explain men's low participation in weight loss programs.

A small number of weight loss programs designed specifically for men have been evaluated (e.g., Hunt et al., 2014; Robertson et al., 2015; Young, Morgan, Plotnikoff, Callister, & Collins, 2012). One such program was the Rethinking Eating and FITness (REFIT) program (Crane, Lutes, Ward, Bowling, & Tate, 2015). The efficacy of the REFIT weight loss program was evaluated in a randomized trial as compared to a waitlist control group. The program emphasized autonomy through making moderate changes from typical intake (approximately 600 calories per day) via self-selected techniques concurrent with increasing moderate-to-vigorous physical activity to 225 minutes per week. The average weight loss achieved by intervention participants was 5% of initial body weight (versus no change in the waitlist comparison group) across six months, a modest but clinically significant weight loss (Jensen et al., 2014). A subsequent analysis demonstrated that the intervention effect was mediated through changes in self-efficacy, autonomous motivation, self-regulation of diet, diet intake, and self-weighing (Crane, Ward, Lutes, Bowling, & Tate, 2016).

Despite knowing that diet and self-monitoring were the key drivers of the weight loss achieved in the REFIT program (Crane et al., 2016), it is unclear which specific weight control behaviors participants used to change their diet and self-monitoring (e.g., recording intake, recording physical activity). Throughout the intervention, participants were presented with options for ways to change their diet, physical activity, and self-monitoring behaviors. Intervention content was designed to enhance the autonomy of the participants and thus all recommendations were presented as choices for changes that could be made to produce weight loss. This intervention approach provides a unique opportunity to evaluate men's preferences for weight loss strategies within the context of a successful weight loss program. In order to continue moving the science of developing the most attractive and tailored weight loss interventions with men forward, it is important to understand which behaviors men chose to enact during a weight loss program and if these changes mediate the relationship between the intervention and weight loss in order to better tailor program recommendations.

Methods

Participants

Participants for the REFIT study were recruited from the Chapel Hill region of North Carolina in 2013–2014. Participants were recruited through email listservs for local employers (primarily the university and affiliated hospital and a local government), flyers distributed in the community, and word-of-mouth. Men were eligible for the study if they were classified as overweight or moderately obese (25–40 kg/m²), healthy enough to exercise independently (PAR-Q; Thomas, Reading, & Shephard, 1992), able and willing to attend group sessions at the research site, and had not lost more than 10 pounds in the six months prior to recruitment.

Intervention Description

Participants were randomized to receive the REFIT program immediately ($n = 53$) or to a waitlist control group ($n = 54$). As described elsewhere (Crane et al., 2015), the REFIT program was a gender-targeted weight loss program developed to incorporate program features that were reported by men to be appealing (e.g., Egger & Mowbray, 1993; Morgan et al., 2011; Wolfe & Smith, 2002). and targeted constructs from social cognitive theory (Bandura, 1991) and self-determination theory (Ryan & Deci, 2000). The program was delivered via two face-to-face one-hour, group sessions and 13 asynchronous, tailored, online contacts (weekly during weeks 3–12, monthly for months 4–6). Core recommendations in the program were to 1) reduce intake to 500–1000 calories below baseline levels by making a minimum of six 100-calories changes each day, 2) increase physical activity to a minimum of 45 minutes five days per week of moderate to vigorous physical activity, and 3) use a simple checklist-type self-monitoring form to evaluate progress in the program including recording weight, physical activity, and the number of 100-calorie changes made each day (Crane et al., 2015). Participants were not encouraged to use detailed self-monitoring (i.e., recording the amounts of food eaten and the associated calories using a mobile application) throughout the program unless they consistently failed to lose at least one pound per week. Gender targeting of the program included responding to men's preference to avoid focusing on calorie counting via the reduction of calories through the 100 calorie changes and using a simplified tracking format. Intervention materials were targeted through the use of male-oriented pictures, male preferred foods, and male-focused examples. Finally, based on recommendations from a previous men-only weight loss program, the language used during the intervention was streamlined but occasionally incorporated humor into the lessons and feedback (Morgan et al., 2011).

Program content was delivered through asynchronous online contacts (delivered via the online survey software, Qualtrics) where participants would report their self-monitoring data, receive tailored feedback, and select their next lesson provided as a PDF. Lesson order was self-tailored to allow for individualization within the structured program. Lessons were brief and focused on one specific area of diet or eating behavior which participants would focus on changing over the next week. Lesson topics included: 1) reducing fat consumption, 2) reducing calories from beverages, 3) reducing portion sizes, 4) reducing calories from snacks, 5) reducing calories from meats, 6) using meal-replacements, 7) reducing calories from fast-food, 8) reducing added sugar, 9) reducing calories from restaurant eating, 10) decreasing calorie-density, 11) eating during sedentary behavior, 12) developing consistent meal patterns, 13) water as a beverage replacement, 14) eating in social situations, 15) relapse prevention, and 16) maintaining motivation for weight control behaviors. Behavioral topics typically included in behavioral weight control programs were incorporated into the lessons including problem solving, planning ahead, and stimulus control.

The waitlist group was informed that they would receive a modified version of the REFIT program after the completion of the study. During the study, waitlist participants were discouraged from joining organized weight loss program but were not discouraged from attempting weight loss on their own. All study procedures were reviewed and approved by the University of North Carolina at Chapel Hill Institutional Review Board.

Measures

Assessments were conducted at baseline, 3 months post-randomization, and 6 months post-randomization. During each assessment period, participants completed an in-person visit where their weight was objectively measured. They also completed online questionnaires and online diet recalls (not reported here). At baseline, participants reported their demographic information including age, race, marital status, and their highest education level achieved.

During all assessments, participants completed a weight loss strategies questionnaire (Steinberg, Bennett, Askew, & Tate, 2015; Wing et al., 2015). This questionnaire included a list of 45 commonly used weight loss strategies (see Table for individual items; 14 times rarely used by <25% of participants are included in the footnote) and participants reported the frequency they used each strategy over the prior 3 months on a five-point scale (“never or hardly ever,” “some of the time,” “about half the time,” “much of the time,” “always or almost always”). Participants who reported using a strategy “much of the time” or “always or almost always” were categorized as regularly using that strategy. The number of strategies used regularly was summed to create a total number of strategies used. The strategies were categorized as “frequently recommended,” “occasionally recommended,” or “not included” in the REFIT program. Strategies that were classified as “frequently recommended” included strategies that were recommended during every contact (e.g., record weight). Strategies that were classified as “occasionally recommended” by the program include strategies that were the focus of a specific lesson or were offered a strategy occasionally during feedback on progress (e.g., reduce sugar-sweetened beverages). Strategies categorized as “not included” in the program were never included in lesson content or during online contacts (e.g., follow a structured meal plan).

Analysis

Data analysis was conducted using SAS 9.4. The original trial was powered to detect a weight loss difference between groups at 3 and 6 months of 2.0 kg (SD 3.0 kg) with 80% power and allowing for up to 15% attrition (needed $N = 104$). At the 6-month assessment, 97 (90.7%) of participants provided objectively measured weight and 96 (89.7%) completed the weight strategies questionnaire at the 6-month assessment.

Changes within group over time were tested using McNemar tests and paired t-test. In the McNemar tests for change in individual strategy use over time, a Bonferroni correction was used to correct for multiple comparisons. Although this correction is conservative, it is warranted due to the exploratory nature of our analysis (no *a priori* hypotheses developed). For these tests, significance was set at $p = 0.001$. Comparisons between treatment groups were tested using chi square and t-tests. Mediation was tested using the PROCESS macro for SAS (Hayes, 2013). This macro uses path analysis to estimate direct and indirect effects and develops bias-correct bootstrap confidence intervals for indirect effects. Except where noted above, significance was set at $p < 0.05$.

Results

At baseline, participants ($N = 107$) were an average of 44.2 years (± 11.4 ; mean $\pm$ SD), predominately classified as obese (BMI 31.4 ± 3.9 kg/m²), non-Hispanic white (76.6%), married (79.4%), had at least a bachelor's degree (83.2%), and employed full time (88.8%). The most commonly endorsed weight control strategies were: reducing fast-food (43.9%), reducing sugar-sweetened beverages such as soda and sweet tea (43.9%), and taking the stairs instead of the elevator (43.0%). Fourteen strategies were rarely used by participants ($< 25\%$ at any time); these included 3 strategies occasionally recommended by the program (i.e., reduce time watching television, use frozen portion-controlled meals, and use liquid meal replacements) and eleven strategies not included in the program (i.e., use a commercial weight loss program, follow a specific diet plan, use structured meal plans, leave last few bites on plate, use meal replacement bars, skip meals, follow an internet weight loss program, use home exercise equipment, exercise at a gym, use a pedometer, and workout with a personal trainer). There were no differences between groups on these strategies at any time point (data not shown).

As shown in the Table, at the 3-month assessment, the intervention group reported increased use of all but one of the strategies frequently recommended by the program (4 of 5 strategies; McNemar χ^2 's = 15.11; p 's < 0.001): including daily self-weighing, decreasing caloric intake by 500–1000 calories, recording/graphing their weight daily, and recording/graphing their activity. Participants did not endorse an increase in the regular use of exercise for periods of 30 minutes or more each day. Intervention participants also increased the use of 16 of the 24 strategies occasionally recommended during the program (McNemar χ^2 's = 12.25; p 's < 0.001 ; see Table). There was little change in use of strategies not explicitly mentioned in the program (2 of 16 strategies; McNemar χ^2 's = 13.50; p 's < 0.001) where participants reported making small changes to their physical activity (e.g., taking the elevator) and increasing their daily steps as weight loss strategies. In the intervention group, there were no significant changes in strategy use between the 3 and 6 month assessments (McNemar χ^2 's = 6.23; p 's > 0.001). However, 8 strategies that were reported more often at 3 months than at baseline were no longer different from baseline at 6 months (McNemar χ^2 's = 4.45; p 's > 0.001). As described above, use of 4 of the 5 frequently recommended strategies remained high throughout the 6-month program. For the waitlist group, there were no significant changes in the use of specific weight loss strategies between baseline and 3 or 6 months (all p 's > 0.001).

At baseline participants reported regularly using 7.3 ± 6.6 of the 45 strategies. The intervention group increased the number of strategies used to 19.1 ± 8.3 (M $\pm$ SD) at 3 months which was significantly greater than the waitlist control group at 7.1 ± 6.1 strategies used ($t = -8.18$; $p < 0.01$). At 6 months, regular use of weight loss strategies decreased slightly (paired $t = 2.61$, $p = 0.01$) in the intervention group but remained higher than the waitlist group (17.1 ± 8.4 strategies vs. waitlist: 8.7 ± 8.1 , $t = -4.97$, $p < 0.001$). The number of strategies used regularly at 3 months was tested as a mediator of weight loss achieved at 6 months. Participants in the intervention group lost more weight at 6 months compared to waitlist group participants (5.6 ± 6.5 vs. 0.6 ± 3.3 kg; $t = -4.69$; $p < 0.01$) and this

intervention effect was significantly mediated by the number of strategies used regularly at 3 months (indirect effect: -3.41 ; 95% confidence interval: -6.49 ; -1.21 ; see Figure).

Discussion

This study adds to what is known about men's use of weight loss strategies prior to and during an organized weight loss program. The intervention participants reported significant and persistent increases in many of the weight loss strategies assessed and demonstrated a preference for diet reduction strategies focused on empty calories. Further, the intervention effect produced by the REFIT weight loss program was mediated by the number of strategies reported by participants during the program. The knowledge gained from this analysis can help guide future weight loss intervention development by identifying the specific strategies men use within an organized weight loss program.

Prior to entering the weight loss program, participants reported that they were already using an average of seven strategies to control their weight. These focused primarily on reducing well-known sources of excess and empty calories (e.g., fast food and sugar-sweetened beverages) as well as lifestyle activity (e.g., taking stairs instead of the elevator). Despite the potential utility of these strategies for controlling weight, these strategies alone were not sufficient to produce weight loss as demonstrated by the waitlist group's stability of both their weights and strategy use during the weight loss program.

Unique to this study was the ability to investigate the specific weight loss behaviors men changed during the weight loss program. Participants in the intervention group demonstrated sizeable and sustained change in most (4 of 5) of the frequently recommended strategies. These strategies, including daily self-weighing, graphing/charting of their weight, graphing/recording their physical activity and decreasing their caloric intake by 500–1000 calories. All strategies focused on self-monitoring and self-regulation, key components of successful weight loss attempt (e.g., Burke, Wang, & Sevvick, 2011; Gokee-LaRose, Gorin, & Wing, 2009; Wing, Tate, Gorin, Raynor, & Fava, 2006). Conversely, the only strategy that was frequently recommended by the REFIT program where no significant between group differences were found for exercising for periods of 30 minutes or more. This finding stands in contrast to the intervention participants report of increasing their physical activity via a validated self-reported recall of activity over the prior week between baseline and the follow-up time points (Crane et al., 2015). The cause of this discrepancy in results is unclear but may be due to how the question was asked (e.g., participants were focusing on longer or shorter bouts of exercise than 30 minutes) or perhaps they did not view increasing their structured physical activity as weight loss strategy per se (e.g., they exercised more or longer because they wanted to increase fitness). Future research will need to explore how men perceive the connections between physical activity and weight loss.

In addition to four frequently recommended strategies, intervention participants added more strategies that were occasionally recommended in the program. Within this category of strategies, participants chose to change behaviors associated with consuming empty calories, such as calories from high-calorie snacks, beverages, and desserts. These techniques have been associated with weight loss (e.g., Rolls, Roe, & Meengs, 2006; Tate et al., 2012) and

thus should continue to be encouraged and supported in future weight loss programs. Further, these strategies were presented in the REFIT program as ways to reduce calories without producing excessive hunger. Because hunger is a deterrent for dieting reported by some men (Egger & Mowbray, 1993; Sabinsky et al., 2007), continuing to support use of these strategies for this purpose is warranted. Participants in REFIT also initially reported an increase in self-monitoring of diet that decreased at the 6-month assessment. A similar tapering of diet self-monitoring has been noted in other weight loss programs (e.g., Burke, Conroy, et al., 2011).

Very few participants reported using strategies that limited the number of food choices available to participants such as using meal replacement products or following a meal plan. This finding is particularly notable given that both meal plans and meal replacement products have been associated with weight loss success (Heymsfield, Van Mierlo, Van der Knaap, Heo, & Frier, 2003; Wing et al., 1996). Future programs may need to give more attention to marketing, explaining the benefits of these strategies, or using greater repetition to increase uptake, if these strategies are a focus of the program. Promotion of these effective strategies may benefit from more directive support as opposed to the autonomous supportive approach used in this program.

Participants in this study demonstrated an interest in lifestyle activity as a weight loss strategy: that is, incorporating increased activity into daily routines versus purposeful exercise. At baseline, 43% of participants reported using stairs instead of elevators and intervention participants reported increasing their daily steps at 3 months. Although there is some evidence that lifestyle activity can minimally enhance weight loss efforts among women and mixed-gender participants (Donnelly et al., 2009; Swift, Johannsen, Lavie, Earnest, & Church, 2014), daily step counts have been associated with weight loss among men in some (Young et al., 2015) but not all studies (Lubans, Morgan, Collins, Warren, & Callister, 2009). By involving more men in weight loss programs, the field will be better positioned to comment on whether lifestyle activity (e.g., increasing steps) has sufficient support to recommend as a weight loss strategy or if recommending longer bouts of physical activity (e.g., minimum of 30 minutes per day) should remain the focus for weight loss.

While the REFIT study did not include a prolonged maintenance phase, the strategies selected by men in this study may be sustainable over time. First, the REFIT program included periods of both weekly and monthly intervention contact. During the monthly contact phase, (i.e., between months 3 and 6), most of the strategies used by participants remained high. Although this does not represent long-term maintenance, there was also no significant decline in strategy use. Secondly, this program emphasized participants choosing strategies they preferred to use. The individual selection of strategies, versus following specific guidelines, indicates choice and potentially enhanced autonomy. Autonomously motivated behaviors are theorized to be longer-lasting than behaviors responding to external or controlling forces (Ryan & Deci, 2000).

In this analysis, the number of weight loss strategies used by participants mediated the relationship between the intervention group and weight loss. This finding demonstrates that the participants in the intervention group made changes that aligned with the strategies

measured (as intended) and that participants were at least moderately accurate in reporting the strategies they had used during the reporting period. Although men in the waitlist control condition were not discouraged from pursuing weight loss independently, there were no significant changes in the number of strategies used nor were there changes in any of the individual strategies. These results were expected given that there was no significant weight loss observed in the waitlist group.

Strengths and Limitations

This analysis used data from a successful men-only weight loss program to explore the weight loss strategies used by participants. This research is significant because it used data from a randomized trial to explore which behaviors men reported using to approximate preferences for weight loss rather than relying on reported preferences outside of a weight loss program. Additionally, this study was able to connect the use of the strategies to weight loss over a period of six months. Some limitations of this study include that, first, the results of this study may not generalize to other populations as it used a fairly homogeneous sample (including predominately white, educated, married men). Second, the outcome measure used here assessed 45 weight loss strategies. Although the strategies were extensive, this is not an exhaustive list of all potential weight loss strategies and thus may have not included all strategies used by the men in this study. Moreover, this measure relies on self-reported use of the strategies over the prior 3 months. As with other self-reported measures, this measure is subject to biases related to self-presentation or inaccurate recall. Third, this study was relatively short (6 months) and lacks long-term assessment. Fourth, the intervention tested in this study focused primarily on making changes to diet in the lesson content while physical activity was focused on as part of the tailored feedback. This focus may have influenced participants' reports of using structured physical activity as a weight loss strategy. Finally, this analysis used data only from those individuals who completed the assessments. Using only the available data without correcting for missing data may bias results toward overstating the intervention effects and may not accurately represent the strategies used by the men who did not return for the study assessments (10.3% of initial sample).

Future Directions

This study demonstrated that men successfully implemented many of the weight loss strategies recommended during the REFIT weight loss program and that a greater number of weight loss strategies used was associated with greater weight loss. Having demonstrated that using multiple weight loss strategies is important for success, these results could be used by future program developers to understand 1) which behavioral strategies could be more strongly supported (e.g., decrease portion sizes of desserts, increasing the number of fruits and vegetables consumed daily), 2) which strategies should be perhaps less utilized/targeted (such as using meal replacements and pre-portioned meals), and 3) which strategies are of interest to men but need further research to better determine their efficacy for weight loss (e.g., increasing daily steps). Future research may also benefit from investigating what motivated men to choose some strategies over others (e.g., greater perceived efficacy, perceived ease of implementation).

Implications for Practice

Based on the results of the mediation analysis, which found the number of strategies used explained a significant portion of the intervention effect on weight loss, future interventions and public health practitioners should focus on helping participants to develop a number of strategies that they can include in a “weight loss toolkit” rather than focusing on development of a limited number of strategies. Further, there should be a focus in practice that strikes a balance between encouraging the continued use of strategies participants are already using and new strategies with strong evidence bases that may help them to be achieve long term weight loss success.

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Figure.
Number of weight loss strategies at 3 months mediate treatment effect at 6 months.
*** indicates significant path $p < 0.001$

Table

Percentage of Participants Regularly Using Weight Loss Strategies by Treatment Group and Assessment ^a

Weight Loss Strategy	Between Groups			
	BL	3 mo.	6 mo.	6month (p-value)
Frequently Recommended in REFIT				
Weighed yourself daily	Intervention	21	82*	81*
	Waitlist	13	12	16
Reduced your calorie intake by 500–1000 per day	Intervention	6	72*	57*
	Waitlist	7	2	14
Recorded or graphed your weight	Intervention	13	68*	55*
	Waitlist	6	4	8
Recorded or graphed your physical activity	Intervention	13	52*	43*
	Waitlist	13	8	20
Exercise for periods of 30 minutes or more	Intervention	26	42	49
	Waitlist	30	34	33
Occasionally Recommended in REFIT				
Cut out/reduced late night snacking	Intervention	26	78*	64*
	Waitlist	19	26	29
Decreased how much or how often you drank sweetened beverages (e.g., soda, sweet tea)	Intervention	43	72	77*
	Waitlist	44	38	55
Decreased how much or how often you drank high calorie coffee drinks (e.g., caramel macchiato)	Intervention	38	76*	62
	Waitlist	32	36	47
Decreased how much or how often you drank other sweetened beverages (e.g., sweetened fruit juice)	Intervention	38	74*	72*
	Waitlist	39	32	53
Cut out/reduced sweets or junk food	Intervention	30	74*	60
	Waitlist	32	28	39
Decreased frequency or portion sizes of desserts	Intervention	23	64*	72*
	Waitlist	20	28	29
Decreased the number of times that you ate out at fast food restaurants	Intervention	45	64	70

Weight Loss Strategy	Between Groups				
	BL	3 mo.	6 mo.	3Month (p-value)	6month (p-value)
Reduced portion sizes	Waitlist	43	38	33	
	Intervention	17	70*	57*	<0.001
	Waitlist	19	22	22	
Made one or two small changes to your diet every day	Intervention	4	66*	49*	<0.001
	Waitlist	9	6	8	
	Intervention	11	66*	47*	<0.001
Cut out/reduced between meal snacks	Waitlist	15	24	22	0.01
	Intervention	30	64*	60	<0.001
	Waitlist	30	26	22	
Increased fruits and vegetables	Intervention	42	60	60	0.08
	Waitlist	43	40	41	
	Intervention	13	56*	57*	0.002
Drank less alcohol or changed type of alcoholic drink to reduce calories	Waitlist	19	24	27	
	Intervention	19	54*	45	<0.001
	Waitlist	17	16	18	0.005
Removed high calorie foods from your home, office, or room	Intervention	13	50*	43*	0.01
	Waitlist	17	10	18	
	Intervention	6	44*	30	<0.001
Ate less fat	Waitlist	6	4	4	0.001
	Intervention	15	40*	30	0.29
	Waitlist	28	20	20	
Recorded or wrote down the type and quantity of food eaten	Intervention	6	34*	30*	0.04
	Waitlist	19	16	14	0.07
	Intervention	6	32*	26	0.59
Decreased the number of times that you ate out at other restaurants	Waitlist	11	8	20	
	Intervention	19	38	36	0.001
	Waitlist	17	10	20	
Avoided eating while watching TV	Intervention	17	10	20	
	Waitlist	17	10	20	
	Intervention	17	10	20	
Kept healthy ready-to-eat or portion controlled snacks for yourself	Waitlist	17	10	20	
	Intervention	17	10	20	
	Waitlist	17	10	20	
Ate less meat	Intervention	17	10	20	
	Waitlist	17	10	20	
	Intervention	17	10	20	

Weight Loss Strategy	Between Groups					
	BL	3 mo.	6 mo.	3Month (p-value)	6month (p-value)	
Changed food preparation techniques	Intervention	8	32	28	0.03	0.06
	Waitlist	13	14	12		
Not included in REFIT						
Used the stairs instead of the elevator	Intervention	51	66	68	<0.001	0.001
	Waitlist	35	32	33		
Increased your daily steps	Intervention	25	62 *	55	<0.001	0.004
	Waitlist	22	28	27		
Make one or two small changes to your activity every day	Intervention	4	46 *	32 *	<0.001	0.04
	Waitlist	9	12	14		
Shopped from a list	Intervention	28	38	45	0.11	0.17
	Waitlist	15	24	33		
Ate less carbohydrates	Intervention	11	34	26	0.02	0.86
	Waitlist	15	14	25		

Notes.

^aTable includes only strategies endorsed by at least 25% of study group at a minimum of one time point (i.e., reduce TV, use frozen entrees, use liquid meal replacements, exercise at gym, follow specific diet, use commercial weight loss program, use meal plan, leave bites on plate, skip meals, internet program, use home exercise equipment, use meal replacement bars, use pedometers, use personal trainer).

^bWaitlist Group: baseline n = 54; 3 months n=50; 6 months n=49.

^cIntervention group: baseline n = 53; 3 months n=50; 6 months n=47.

* indicates a significant within group change from baseline (McNemar test) at p = 0.001.