

ABSTRACT

EFFECT OF A STRUCTURED MEAL REPLACEMENT PROGRAM ON WEIGHT LOSS: AN EIGHT-WEEK MOBILE APP-ASSISTED INTERVENTION. **Francis C. Lau**, PhD, FACN; Bruce P. Daggy, PhD, FACN and Jamie F. McManus, MD, FAAFP. Shaklee Research Center, Pleasanton, CA.

Recent studies have shown that structured meal replacement plans combined with educational support and tools via the Internet may be effective in achieving and maintaining weight loss goals. Here we assessed the initial weight loss outcomes from a commercial program in subjects self-monitoring their weight loss progress through online tools.

Participants selected a customizable 3-meal-a-day structured meal plan featuring 2 meal replacements daily. Self-reported data were collected via a mobile-app. A total of 417 participants (mean age 45.3 years and mean BMI of 31.5 kg/m² at baseline; 80% females) completed an 8-week program. Weekly data were analyzed on individuals reporting their body weight. Data were normalized by baseline transformation. Two-tailed *t*-test was used for baseline comparison at specific time points and ANOVA was used for comparisons at different time points. *P*-values < 0.05 were considered statistically significant.

At the end of 8 weeks, significant reductions in body weight (9.7 lb; *p*<0.0001) and BMI (1.5 kg/m²; *p*<0.0001) were observed as compared to the initial values. Categorical shift towards effective weight loss occurred such that the percent of obese subjects was reduced from 51 to 42%. Gender-stratified analysis demonstrated that men lost significantly more weight than women (-5.9% vs. -4.6%; *p*<0.0001). A significant body weight reduction was seen at the end of first week (2.7 lb; *p*<0.0001).

The findings thus far suggest that this structured meal replacement program promoted a healthy weight loss in a relatively short time frame. Long-term studies are underway to evaluate the effects of this program on weight loss and weight loss maintenance over an extended period of usage.

BACKGROUND AND OBJECTIVES

Structured meal replacement plans consisting of optimized macronutrient composition and easily accessible motivational support have been shown to promote weight loss by providing convenient alternatives to the typical high fat, hyperglycemic, and supersized American diets.

This study was designed to evaluate the effects of a commercially available, mobile app-assisted, structured meal replacement plan on weight loss. The diet plan consisted of 2 hypocaloric, high protein, low glycemic meal replacements and one self-prepared meal based on recipes provided. Low caloric snacks were available between meals.

Effect of a Structured Meal Replacement Program on Weight Loss: An Eight-Week Mobile App-Assisted Intervention

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METHODS

Study design: time series observational study

Subject population: customers who purchased commercially available meal replacement kits (Shaklee 180) and signed up for an online mobile app to track their body weight while they were on the meal replacement program.

Data collection: weekly data were collected on individuals reporting their body weight via mobile app for 8 weeks.

Diet program: two meal replacements and snacks between meals plus a self-prepared meal.

Meal replacements: low-glycemic shakes and bars each providing approximately 20 - 24 g of protein, 3 - 7 g of fat, 30 - 37 g carbohydrate, 6 - 7 g of fiber, and 23 vitamins and minerals for a total of 260 – 270 Calories per serving. Snacks contain 6 – 10 g of protein, 2 – 3 g of fiber, and 100 – 140 Calories per serving.

Self-prepared meals: recipes were included in the meal replacement kits and were also available online. Typically meals consist of 4 oz. protein from skinless chicken, pork tenderloin or lean beef; 1 cup of steamed vegetables; a small serving of carbohydrate such as a small baked potato, $\frac{1}{3}$ cup of brown rice or a 6" tortilla; a small salad of healthy leafy greens with low-calorie dressing.

Online support: online tools and mobile app providing information on daily caloric intake, recipes, exercise programs, etc. were readily available to motivate participants.

Statistics: Weekly data were normalized by baseline transformation. Two-tailed *t*-test was used for baseline comparison at specific time points and ANOVA was used for comparisons among different time points. *P*-values < 0.05 were considered statistically significant.

RESULTS

Table 1. Baseline demographic data

Parameter	Value (n = 417*)
Female [n (%)]	333 (80%)
Age (years)	45.3 ± 0.6
Weight (lb)	196.1 ± 2.5
Height (in)	66.0 ± 0.2
BMI (kg/m ²)	31.5 ± 0.4

Values are expressed in Mean ± SEM where applicable.

*Based on the participants reporting 8-week body weight data.

Table 2. Summary of change in weight category

Parameter	Baseline	8 Weeks	% change
BMI (kg/m ²)	31.52±0.36	29.97±0.34*	1.55
Obese (n)	213	176	-17.4
Overweight (n)	141	108	-23.4
Normal (n)	61	88	44.3

*P<0.0001

Figure 1. Change in Body Weight Over 8 Weeks

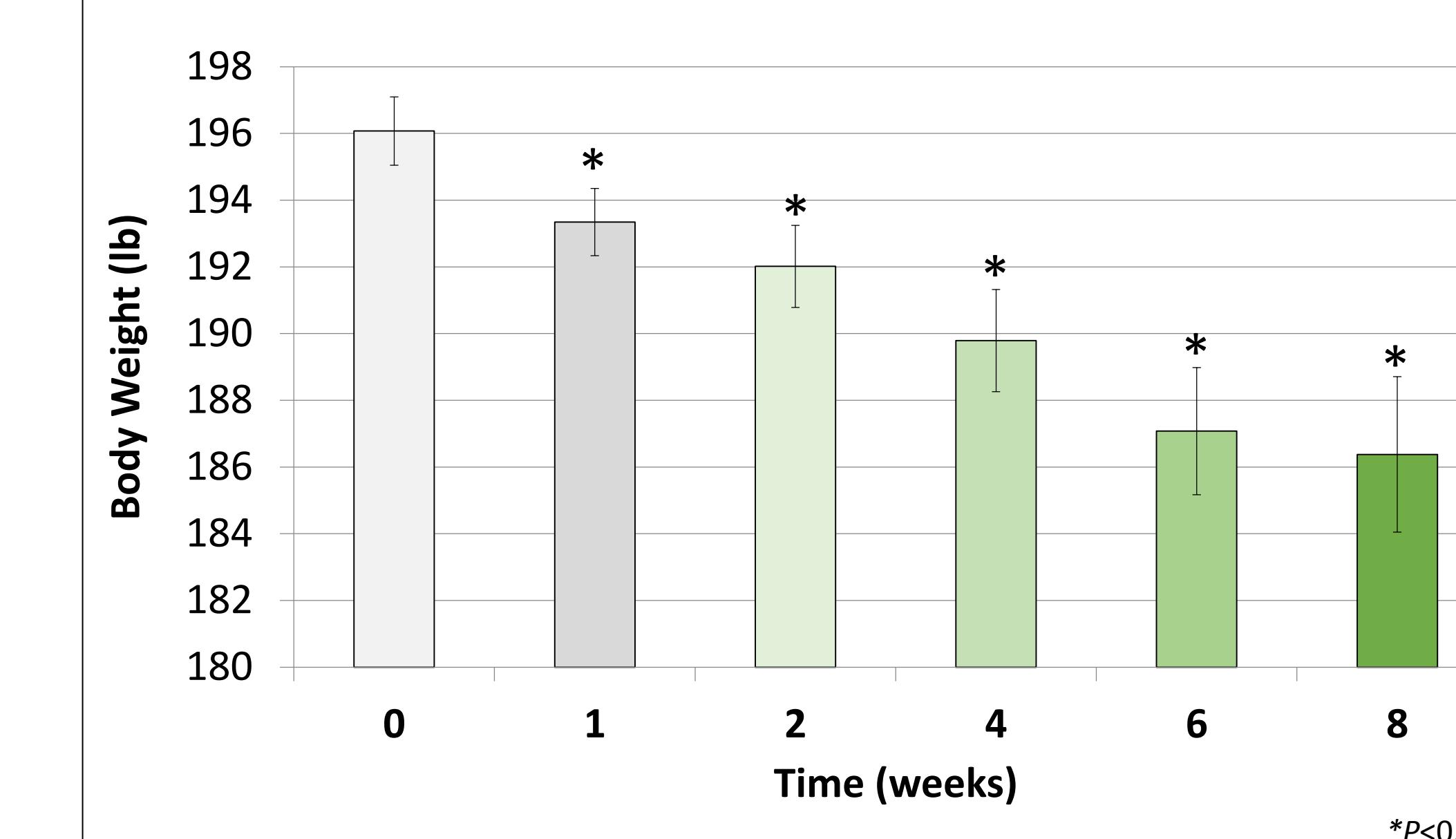
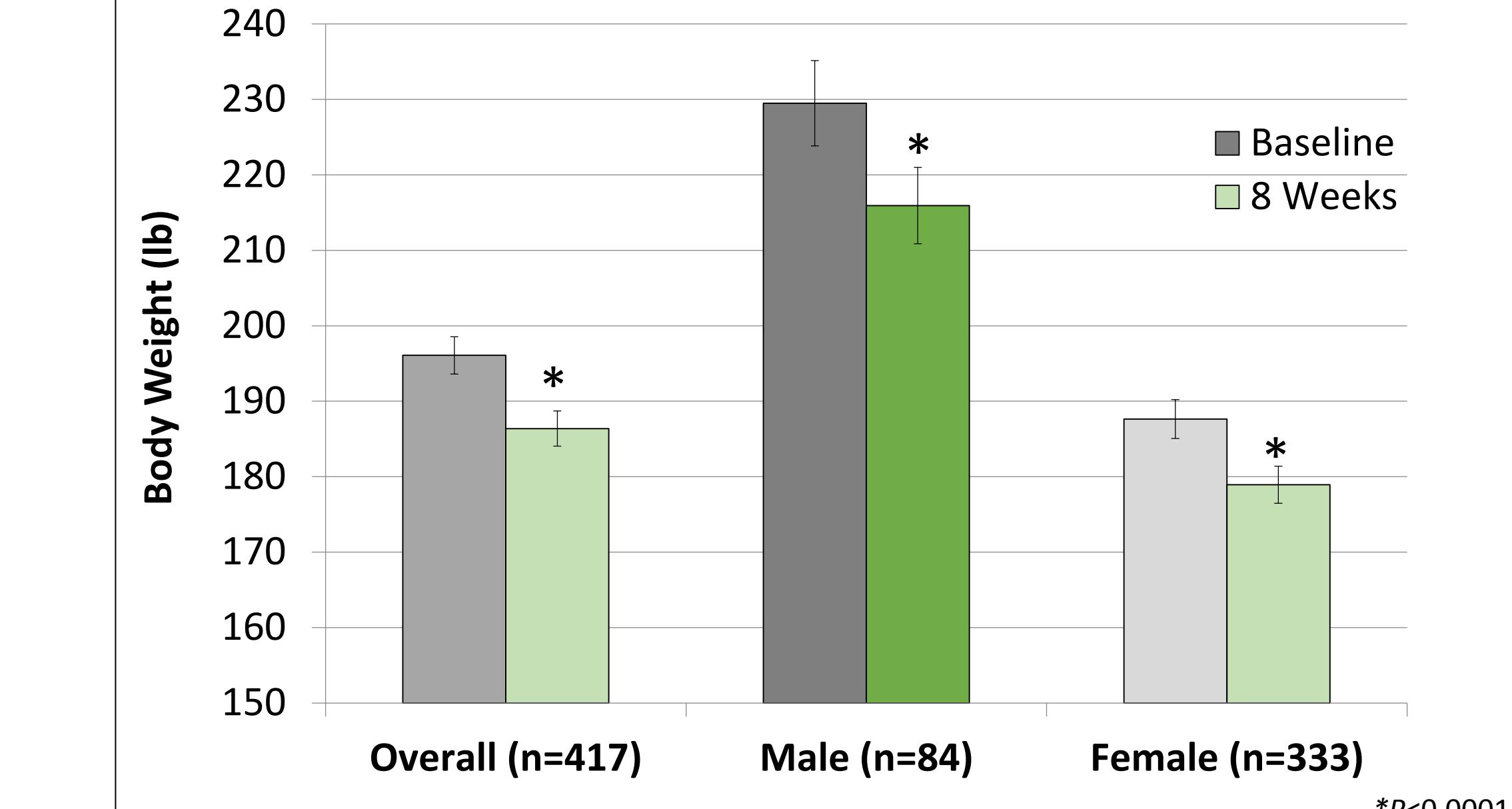


Figure 2. Gender Difference in the Rate of Weight Loss



*P<0.0001

SUMMARY

- Significant decrease in body weight by 9.7 lb (5% of initial body weight) after 8 weeks (Fig.1)
- Significant reduction in BMI by 1.55 kg/m² after 8 weeks (Table 2)
- Significant weight loss was observed as early as after 1 week resulting in an average of 2.7 lb weight reduction (Fig. 1)
- Gender-stratified analysis showed that men lost significantly more weight than women (-13.6 lb vs. -8.7 lb or -5.9% vs. -4.6%) (Fig. 2)
- Categorical shift occurred such that 37 out of the 213 obese participants had a BMI < 30 at the end of 8 weeks (Table 2)

CONCLUSIONS

Shaklee 180 structured meal replacement program promoted a healthy weight loss in a relatively short time frame. People on this diet program lost a weekly average of 1.2 lb over 8 weeks. Long-term studies are underway to evaluate the effects of this program on weight loss and weight loss maintenance over an extended period of usage.