

# Achieving Weight Loss Goals at Lower Cost

Reviewed by Ruth P. Hertzman-Miller, MD, MPH

## STUDY

Jakicic JM, Tate DF, Lang W, Davis KK, Polzien K, Rickman AD, Erickson K, Neiberg RH, Finkelstein EA: Effect of a stepped-care intervention approach on weight loss in adults: a randomized clinical trial. *JAMA* 307:2617–2626, 2012

## SUMMARY

**Objective.** To determine whether a stepped-care weight loss intervention would result in greater weight loss than a standard behavioral weight loss intervention.

**Design.** A total of 363 overweight and obese adults were randomized to either a standard- or stepped-care weight loss intervention. During the

18-month trial period, all participants were placed on low-calorie diets, were prescribed increases in physical activity, kept self-monitoring diaries, and attended group counseling sessions.

The standard-care group was assigned to a fixed counseling program consisting entirely of group sessions: weekly for months 1–6, twice per month for months 7–12, and once per month for months 13–18. For the stepped-care group, counseling frequency, type, and weight loss strategies could be modified every 3 months in response to observed weight loss. Six steps of increasingly intensive contact were used, ranging from monthly group counseling alone to a multifac-

eted program that included group counseling, individual counseling, telephone contacts, and meal replacements (Table 1).

The primary endpoint was mean change in weight at the 18-month time point. Secondary endpoints included resting heart rate and blood pressure, waist circumference, body composition, fitness, physical activity, dietary intake, and cost of the program. The authors also reported the results of a regression analysis taking into account the changes in weight at all six of the 3-month time points.

**Subjects.** Most (82.6%) of the participants were female, with an average age of ~42 years. About 88% had at

**Table 1. Stages of Stepped-Care Intervention\***

Step	Group intervention sessions	Mailed lessons	Self-monitoring diaries	Telephone contact	In-person intervention session	Meal replacement
1	Monthly	Weekly	Weekly by mail			
2	Monthly	Weekly	Weekly by mail	<b>10 minutes monthly</b>		
3	Monthly	Weekly	Weekly by mail	<b>10 minutes twice/month</b>		
4	Monthly	Weekly	Weekly by mail	10 minutes twice/month	<b>Monthly</b>	
5	Monthly	Weekly	Weekly by mail	10 minutes twice/month	Monthly	<b>1 meal and 1 snack per day</b>
6	Monthly	Weekly	Weekly by mail	<b>10 minutes monthly</b>	<b>Twice monthly</b>	1 meal and 1 snack per day

\*Changes in each successive stage are shown in bold.

least some college education. About 28% were African American, and 67% were white. The average BMI was 32.95 kg/m<sup>2</sup>.

**Results.** The study had a 28.4% dropout rate, which was accounted for in the statistical analyses. Weights decreased by 8.1% in the standard-care group and 6.9% in the stepped-care group. The primary outcome, difference in weight loss at the 18-month time point, suggested a slight advantage of standard over stepped care (−1.2%, 95% CI −3.0 to 0.6%, *P* = 0.09). A regression analysis taking into account all time points likewise showed greater weight loss in the standard-care group. The sum of participant and payer costs for each participant (including the cost of participants' time) was \$1,357 (95% CI \$1,272–1,442) for the standard-care group compared to \$785 (95% CI \$739–830) for the stepped-care group (*P* < 0.001). Both groups had significant and comparable improvements in resting heart rate and blood pressure, waist circumference, body composition, fitness, physical activity, and dietary intake.

**Conclusions.** Among overweight and obese adults, a stepped-care weight loss program resulted in slightly less weight loss than a standard behavioral treatment during 18 months and cost far less to implement.

## COMMENTARY

Obesity is a rising problem in the United States and around the world. According to the World Health Organization, "Overweight and obesity are the fifth leading risk for global deaths. At least 2.8 million adults die each year as a result of being overweight or obese. In addition, 44% of the diabetes burden, 23% of the ischemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity."<sup>1</sup> In

addition to diabetes, hyperlipidemia, and hypertension, other conditions associated with obesity include sleep apnea and osteoarthritis.

Obesity plays a major role in the pathophysiology of type 2 diabetes. Weight loss is effective in both preventing diabetes in those who are susceptible and in treating diabetes. For patients with impaired glucose tolerance, intensive lifestyle modification, including dietary changes and exercise, has been described as "very cost-effective."<sup>2</sup> Physician counseling for obesity in the general population has also been found to be cost-effective.<sup>3</sup>

Past studies have tested many of the lifestyle modification regimens included in the stepped-care intervention. A review of different regimens of diet, exercise, and behavioral counseling found that, although no one regimen was clearly more effective than another, combinations of these three elements appear to be more successful than any single element alone.<sup>4</sup>

The type of counseling (group vs. individual) also has an effect on the degree of successful weight loss. Group counseling is generally more effective, although the studies in this area have been done largely in women, so the effect on men is less well understood.<sup>5</sup> Telephone counseling is approximately equivalent in effect to face-to-face counseling, with lower costs.<sup>6</sup> Adding meal replacements increases the effectiveness of weight loss programs.<sup>7,8</sup>

To date, the lifestyle modification interventions studied have been interventions whose format is stable over time. For example, in previous studies, those assigned to face-to-face counseling would continue with face-to-face counseling. A randomized, controlled trial comparing an intervention with increasing levels of intensity to a stable intervention has, to my knowledge and that of

the authors, not been performed until the current study by Jakicic et al. Such a flexible program has the potential advantages of decreased cost and decreased hassle to participants because only patients who do not lose weight with less intensive treatments are stepped up to more expensive and more time-intensive treatments.

In the study by Jakicic et al., 56.97 and 49.49% of participants in the standard- and stepped-care interventions, respectively, had achieved the benchmark of 7% weight loss at the 6-month mark. These percentages are similar to those found at 24 weeks in the Diabetes Prevention Program (DPP), one of the best known and most comprehensive weight loss trials in the field of diabetes.<sup>9</sup> The costs of the current trial were also roughly similar to those in the DPP; the standard-care intervention cost \$1,357 during 1.5 years compared to \$1,399, \$679, and \$702 for the interventions in years 1, 2, and 3, respectively, of the DPP.<sup>10</sup>

In contrast, the stepped-care program is less expensive, in large part because 22% of participants assigned to this treatment successfully lost weight with just monthly group counseling and did not require additional interventions. The stepped-care program cost \$785, or 58% of the cost for standard care. The authors calculated that standard care cost \$409 per 1 kg of weight loss, whereas stepped care cost \$127 per kg.

Discussion is appropriate here about whether the trial results show a "significant" difference in percentage of weight lost between the treatment groups. Greenland<sup>11</sup> argues that using the confidence interval to inform interpretation of trial results offers more information than simply stating that a trial is positive or negative. By his argument, using the confidence interval

to inform our interpretation of the results, we can conclude that standard care might be better than stepped care by up to 3% of total body weight, or that stepped care might be better than standard care by up to 0.6% of total body weight (Figure 1). Thus, although the result is “not statistically different,” the preponderance of the confidence interval lies in the region to the left of 0, making it fairly likely that the standard-care intervention leads to greater weight loss.

The results of this study are likely to be reasonably generalizable. Historically, African-American women are less likely than white women to lose weight in standard behavioral interventions.<sup>12</sup> Therefore, it is helpful that a large proportion of African-American as well as white patients were enrolled in this trial, although the effects of race are not detailed in the article. Educational levels were generally high, suggesting that some caution is appropriate in applying the results to populations with lower educational levels. Likewise, caution is necessary in applying the results to men,

who made up only 17.4% of the study population.

Stepped care is less expensive than standard care, both overall and kilogram for kilogram. However, it is also arguably less effective than standard care. So, how do we choose between these two interventions? One solution would be to perform more analyses, maybe taking into account projected differences in morbidity and mortality. Another approach would be the pragmatic one; the intervention that is put into practice is the one that is best achieved with the resources available. In reality, obese patients and their health care providers often try many different interventions, either singly or in combination, in the effort to address this serious problem. Jakicic et al. are to be commended for capturing the complexity of this varied type of approach in their elegantly designed trial.

Regardless of the exact regimen, successful and sustained weight loss requires intensive effort on the part of both patients and their health care team. Unfortunately, appropriate compensation for health care

providers has been slow in coming. The 2011 decision of the Centers for Medicare and Medicaid Services to pay for obesity counseling by primary care physicians<sup>13</sup> was a good start to providing appropriate compensation but does not allow for counseling that is not face-to-face<sup>14</sup> or counseling by providers other than primary care physicians such as obesity specialists, nutritionists, or exercise physiologists.<sup>15</sup> No matter which option is chosen, weight loss remains an important goal for many patients, and payers should encourage the use of effective programs to achieve this goal.

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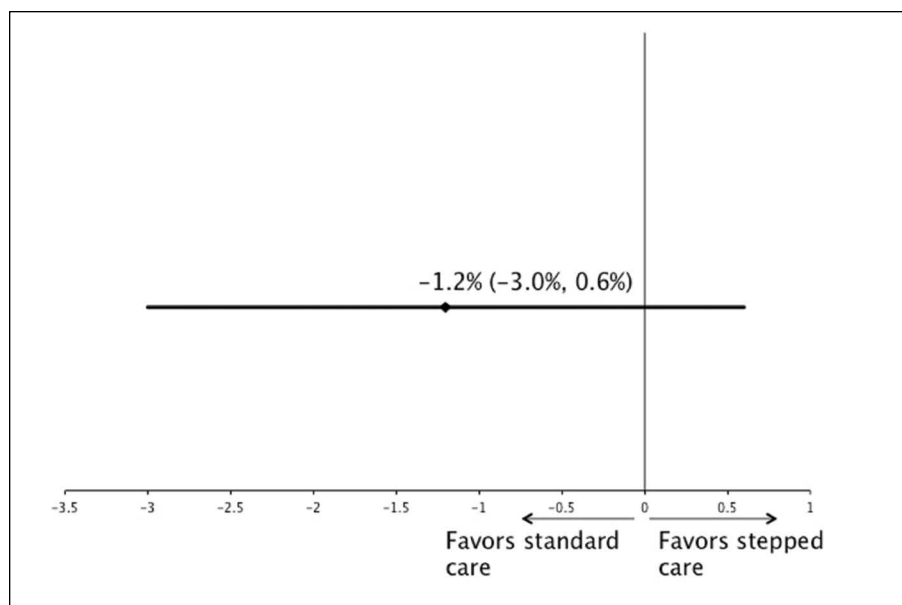


Figure 1. Difference in weight change at 18 months, with confidence interval.

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