

Introduction

- Nearly 17% of adults living in the U.S. are unable to walk or have difficulty walking (1)
- Over 70% of people with physical disabilities (PD) are overweight or obese (2).
- The negative health consequences of obesity in the general population may be elevated for obese individuals with PD.
- People with mobility impairments and obesity have a higher risk of chronic conditions such as coronary heart disease and diabetes than obese people without a disability (3, 4).
- Obesity leads to additional risk of skeletal stress and atherogenesis, leading to further physical disabilities (5, 6).
- Obese individuals with PD, especially lower extremity disabilities, have a higher risk of secondary conditions including pressure sores, physical inactivity, depression, and fatigue (4, 7).

“For people with physical disabilities, obesity is doubly disturbing. It is not only linked to an increase in potentially disabling chronic conditions, but when paired with existing functional limitations, may also limit a person’s ability to engage in physical activity and participate in social events and community activities (p 321) (8).”

Goal

To produce weight loss in adults with mobility impairments using a combination of dietary training, incentives, monthly individualized coaching, and simple physical exercise. The study included a randomized control trial of two well-known diet approaches.



Method

Participants. We use the National Health Interview Survey Disability (NHIS-D) Supplement of 1994 definition of this group: individuals who report having any difficulty walking, climbing stairs, or standing, or who use a cane, crutches or other mobility device (9). Through recruitment at independent living centers, doctor’s offices, and accessible housing complexes, we enrolled 129 participants with the following characteristics:

- 17 males and 112 females ranging in age between 31-87 year
- Average BMI at enrollment was 45.43
- 55% had a diagnosis of Type II diabetes
- 91% had difficulty walking
- 71% used a wheelchair or other appliance for ambulation

The diet program consisted of 6 months of active dieting, followed by 12 months of either continued dieting or weight maintenance. (Only the first year of the project is reported here). Participants received the diet and exercise training program in the first meeting and met monthly with dietitian or exercise physiologist (project staff). For all meetings, participants met separately with the registered dietitian or exercise physiologist in their home or other place of their choosing. Participants were asked to choose a supportive person to attend monthly meetings with them, preferably someone who typically assisted with grocery shopping and food preparation. (Most of the participants required personal assistance due to their disability.)

Monthly meetings

During monthly meetings, project staff completed the following with each participant:

- Obtained weight
- Reviewed foods monthly food diary and food consumed in the last 24 hours
- Reviewed exercise during the month
- Distributed incentives
- Discussed and problem-solved barriers when weight loss was not achieved

Diets

Participants were randomly assigned to one of two diets using a computer-generated, randomized number system. Both diets are based on the concept of Volumetrics, eating high-volume foods (high in water and fiber) that increase the feeling of fullness (10) and are based on 1200-1300 calories per day.

Stoplight diet (SLD)

- at least 5 daily servings of fruits and vegetables.
- 2 meal replacement shakes provided by Health Management Resources (HMR*)
- 2 packaged entrees of 300 calories or less (e.g., Healthy Choice®, Lean Cuisine®, etc.)

Usual Care diet (11)

- at least 5 daily servings of fruits and vegetables
- appropriate-sized portions of protein, grains, and dairy

Exercise

A simple exercise program was recommended for each participant based on his/her physical capabilities. Staff provided Therabands™ and taught participants exercises using them. Those who were ambulatory were encouraged to walk. Those who were unable to bear weight but had movement in their legs or arms were encouraged to purchase an ergometer.

Incentives

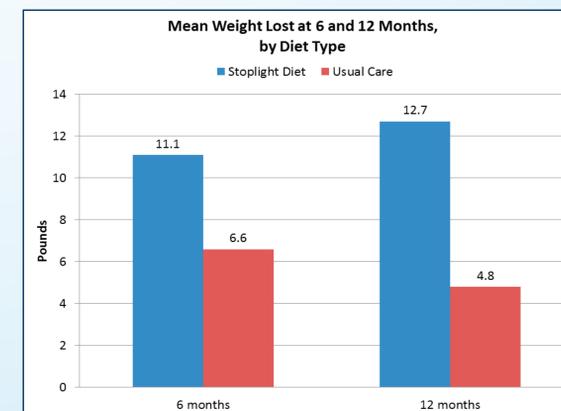
Participants were paid 5¢ for each icon circled on their food tracking form. If they lost a weight equal to a BMI (Body Mass Index) point, they were paid 10¢ for each icon. If they did not lose that amount of weight, the money was put into a “savings” account until the weight was lost. Participants were praised for exercise performed but did not receive a monetary reward.

Results

- At enrollment, the 129 participants in the study had a mean BMI of 45.43.
- One hundred and two individuals (73.3%) completed the full 6-month diet phase. Those who did not complete the diet phase (n=27; 26.7%) participated for an average of 2.07 months; among these, the 19 who completed at least one month lost an average of 4.02 pounds or 1.35% of baseline weight.
- The 102 participants who completed the diet phase had an average weight loss of 8.72 pounds or 3.3% of baseline.
 - Those who lost weight (n=75; 73.5%) lost a mean of 15.4 pounds (range: 1.0 to 41.1 pounds).
 - Those who gained weight (n=25; 24.5%) gained a mean of 10.7 pounds (range: 2.4 to 32.0 pounds).
- Seventy participants (54.3%) reported participating in physical activity. Most reported forms of exercise were walking (n=34), upper body strengthening (n=13), and lower body strengthening (n=13)
- More than 88% (n=90) of the 102 participants who finished the diet phase completed the entire 6-month follow-up phase (11 dropped out; 1 passed away).
 - During the follow-up phase (months 7-12) 25 of the participants who had lost weight continued to lose, and 13 started losing weight. Thirty-four of those who had lost weight regained some weight, but only 9 (10.0%) of these regained as much or more than they had lost.
- The 90 (88.2%) completing the follow-up phase achieved a mean cumulative weight loss of 8.48 pounds.
 - Those who lost weight (n=61; 67.8%) lost a mean of 18.2 pounds (range: 0.7 to 50.8 pounds).
 - Those who gained weight (n=29; 32.2%) gained a mean of 11.9 pounds (range: 0.6 to 37.0 pounds).

	Stoplight Diet	Usual Care Diet	Total Group
Total Sample	n = 65	n = 64	n = 129
6 Months (Diet Phase)			
% completed	53.9%	54.9%	73.3%
Mean Weight Loss	11.11	6.68	8.72
12 Months (Follow-up Phase)			
% completed	64.6%	75.0%	69.8%
Mean Weight Loss	12.67	4.81	8.48

Those in the Stop Light Diet group lost more weight at both 6 and 12 months than those in the Usual Care Diet.



Discussion

- This project involved a randomized controlled trial of two diet programs for adults with mobility impairments. The diets consisted of inexpensive and easy to prepare foods. Participants from both groups received clear visual instructional materials that required no understanding of calories.
- Participants in the Stoplight Diet group lost more weight on average than the Usual Care participants during the weight loss phase. Although the difference at this point (6 months) was not statistically significant, by the project’s 12 months mark, the Stoplight Diet participants had increased the weight loss margin to significantly (t = -2.102, p = .047) more than the Usual Care weight loss.
- Over 73% of the participants lost weight in the 6-month diet phase. The mean percentage of weight loss among those who lost weight (6.1%) exceeds the suggested clinically relevant 3% weight loss (12) and is close to the 7% weight loss recommended by the Diabetes Prevention Program (13).
- A critical factor to the success of this diet intervention may have been the increased opportunity to obtain social supports and interaction at monthly meetings.
- Notably, many of the participants in this study experience one or more chronic conditions (heart disease, diabetes, et cetera) and take medications to treat them. These conditions and the associated medications may not only make it more difficult to lose weight but can also cause weight gain. Additionally, at least 5 people were hospitalized during the study.
- In summary, this intervention produced a clinically significant weight loss for a majority of participants with mobility impairments, a finding not previously reported with adults in this population. Furthermore, most participants sustained or continued weight loss for 6 months beyond the study’s diet phase, a finding seldom reported for adults without disabilities. Given the disparities in obesity in this population, there is a pressing need for replication of our results and analysis of our methods.

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