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Research Paper

# A comparison of two weight management programs for adults with mobility impairments

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## Abstract

**Background:** Individuals with physical disabilities experience disparities in obesity; yet few interventions have incorporated accommodations necessary for weight loss in this population.

**Objective/Hypothesis:** This project compared the effectiveness of two weight loss interventions among individuals with physical disabilities.

**Methods:** Adults with physical disabilities who were overweight or obese were randomized across two diet approaches: a modified version of the MyPlate diet (usual care (UC)) and a modified Stoplight Diet (SLDm) supplemented with portion-controlled meals. Project staff met monthly with each participant to measure weight, 24-recalls of diet intake, self-tracking of foods and beverages, and physical activity during the preceding month.

**Results:** Of 126 enrollees, 70% completed the initial 6-month diet phase and 60% of these completed a 6-month follow-up phase. Participants in the SLDm group reduced weight and BMI during the 6 month intervention, and maintained or lost more weight during the 6 month maintenance period. Alternately, the UC diet resulted in a reduction in weight and BMI only at 6 months. BMI from baseline was significantly more improved for SLDm than UC and, among those who lost weight, the SLDm group lost more weight at 6 and 12 months.

**Conclusions:** These results demonstrate that interventions with proper design and accommodations can overcome the barriers to weight loss unique to individuals with mobility impairments with low income. Additionally, the results suggest that using portion control may be more effective than teaching portion sizes. Published by Elsevier Inc.

*Keywords:* Physical disability; Mobility impairment; Weight loss; Intervention

According to the Centers for Disease Control and Prevention, 35.8 million non-institutionalized adults over the age of 18 living in the U.S. reported a physical functioning difficulty (PD) and 16.7% of adults reported they were unable or had difficulty walking.[1] Further, the prevalence of physical difficulties, including mobility impairments, increases with age. More than 60% of adults over the age of 65 report difficulty in at least one basic action or complex activity limitation.[1] In addition, research has identified obesity as a health disparity for individuals with PD compared to the general population.[2] Specifically, analyses of the Medical Expenditures Panel Survey show an age-adjusted prevalence of overweight and obese Body Mass Indexes (BMIs) among 70.6% of people with PD compared to 59.7% of the general population.[3]

In the general population, people who are obese also have a higher prevalence of total mortality,[4] heart disease,[5] diabetes,[6] hypertension,[7,8] and some cancers.[9,10] Studies show that these negative outcomes may be elevated for obese individuals with PD. For example, people with PD and obesity have a higher risk of chronic conditions such as coronary heart disease and diabetes than obese people without a

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disability.[11,12] Studies also suggest that obesity leads to additional risk of skeletal stress and atherogenesis, leading to further physical disabilities.[13,14] Additionally, obese individuals with PD, especially disabilities involving lower extremities, have a higher risk of secondary conditions including pressure sores, physical inactivity, depression, and fatigue.[12,15] Moreover, as Liou et al (2005)[12] state: ''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).''

Moreover, people with PD are vulnerable to the same risk factors related to obesity as those without disabilities, but at greater frequency. For example, poverty is a widely accepted risk factor for overweight and obesity, and significantly more people with disabilities (21.2%) than those without a disability (7.5%) have an income below the poverty level.[16] People with PD also face additional risks not faced by the general population. They encounter barriers to exercising such as limited availability of accessible exercise facilities, pain and muscle weakness,[17] cost of programs,[18] lack of accessible, affordable transportation[18,19] poor understanding about the capacity and skills needed for exercise, limited social support, and inaccessible equipment at fitness facilities.[20,21] People with disabilities also report barriers to a healthy diet including reliance on others to shop and/or cook.[22] In addition, biologic characteristics of the disability or effects of prescription medication may predispose them to weight gain.[12,23] Yet, few weight loss programs have been designed and implemented to address the unique needs and barriers individuals with physical disability face.[24]

This intervention addresses the multi-dimensional and complex issues surrounding weight loss for individuals with PD, a population that is at significantly greater risk for obesity and morbidity associated with obesity than those without PD. Specifically, the purpose of this study was to assess the weight loss effectiveness of a diet intervention for individuals with mobility impairments based on portion-controlled meals and education compared to a usual care diet recommended by the United States Department of Agriculture (USDA).

## Methods

### *Participants*

Low-income adults with mobility difficulties were enrolled in the weight management study and randomly assigned to one of the two diet groups, using a 1:1 computer-generated randomization table. Project staff (a registered dietitian and an exercise physiologist) recruited participants by hanging flyers and talking with health care and other providers in hospitals, clinics, doctor's offices, and agencies serving individuals with physical disabilities. Participants were eligible if they (a) had a self-reported mobility impairment, (b) were overweight or obese ((BMI) $\geqslant$ 25), (c) qualified or were eligible for Medicaid, and (d) lived within 60 miles of Wichita, KS. Limiting the sample to those with low income had a two-fold purpose. First, as indicated above a large proportion of people with disabilities live in poverty and are overweight. Second, we wanted to examine the effect of participation on health utilization by analyzing Medicaid claims for participants pre- and post-intervention (to be reported in a future publication). Potential participants were excluded if they had a diagnosis of Type 1 diabetes, acute heart disease, cancer, or other medical conditions that would affect energy metabolism, or if they had participated in another weight loss program within the last year.

Staff conducted an initial meeting with eligible participants to provide information about the diet program. Interested persons also were encouraged to invite someone to attend future meetings and act as a study partner, preferably someone who assisted with grocery shopping and food preparation. Study partners were optional, however, and several chose not to have another person at their meetings.

The University of Kansas' Human Subjects Committee approved all procedures before the project start. A personal consent to participate and a physician's consent were required prior to enrollment. Those who wished to participate in an exercise program required an additional physician's consent to exercise.

### *Overview of diet and exercise program*

The diet programs consisted of 6 months of active dieting, followed by either 6 months of additional dieting or weight maintenance (chosen by the participant, 12 months total). Throughout the project, participants met once a month with project staff, in their homes or other place of their choosing.

Staff obtained baseline data and project eligibility through interview and measurement, including height, weight, a standardized multiple-pass 24-h dietary recall of foods and beverages, current medications, type of mobility impairment, use of assistive devices, exercise status, and demographic information. The presence of a physical disability was determined by asking if the applicant had difficulty walking, climbing stairs, or standing for long periods; what if any, assistive device was used to aid in ambulation, and if the physical disability hindered the ability to work or schooling in or outside the home. Assessment of regular exercise routines was determined by asking the applicant exercised, and if so, how many days a week, what were the forms of exercise, and where the exercise was performed. Following the baseline meeting, participants were assigned one of two diets (discussed below) and a research staff member met with the participant and the study partner for 60–90 min to explain the diet and exercise program.