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## Effect of weight loss and exercise on frailty in obese older adults: A correlation study

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### Abstract

The number of obese older persons in the United States has markedly increased in the last 25 years because of an increase both in the total number of older persons and in the percentage of the older population who are obese. All subjects had evidence of mild to moderate frailty, as defined by meeting at least 2 of 3 criteria: modified Physical Performance Test (PPT) score of 18 to 32, peak oxygen consumption of 11 to 18 mL/min per kilogram of body weight, and self-reported difficulty or need for assistance in 2 instrumental ADLs or 1 basic ADL. These criteria are based on measures that have established predictive validity for disability and mortality in older populations. We screened 40 obese older volunteers and eventually randomized 27 frail obese older volunteers to treatment or control groups. Treatment consisted of 6 months of weekly behavioral therapy for weight loss in conjunction with exercise training 3 times per week. Physical function was evaluated with measurements of frailty (Physical Performance Test, peak oxygen consumption, and Functional Status Questionnaire); strength, gait, and balance tests; body composition with dual-energy x-ray absorptiometry; and quality of life using the Medical Outcomes Survey 36-Item Short-Form Health Survey. Results are reported as mean  $\pm$  SD. Moderate weight loss and exercise training improves both objective and subjective measures of physical function and ameliorates frailty in obese older adults. Therefore, diet and exercise should be considered as primary therapy in frail obese older adults. Additional studies are needed to determine the independent and additive effects of weight loss and regular exercise on physical function and whether lifestyle intervention can prevent institutionalization of the growing number of obese older adults in our population.

**Keywords:** weight loss, frailty, obese older adults

### Introduction

The number of obese older persons in the United States has markedly increased in the last 25 years because of an increase both in the total number of older persons and in the percentage of the older population who are obese <sup>[1, 2]</sup>.

We evaluated the effect of diet induced weight loss in conjunction with regular exercise on physical function, body composition, and quality of life in frail obese older adults. We hypothesized that weight loss and exercise training will improve physical function and ameliorate frailty while preserving fat-free mass.

It is estimated that 20.3% of US adults aged 65 or older are obese <sup>[3]</sup>. Obesity has important functional implications in older men and women because it exacerbates the age-related decline in physical function <sup>[4]</sup>.

Obesity exacerbates the age-related decline in physical function and causes frailty in older persons. Obesity has important functional implications in older men and women because it exacerbates the age related decline in physical function.

Data from cross sectional studies <sup>[5-7]</sup> and longitudinal studies <sup>[8, 9]</sup> have consistently demonstrated a strong link between increasing body mass index (calculated as weight in kilograms divided by the square of height in meters) and worsening physical function in older persons. High body mass index is associated with self-reported impairment in activities of daily living (adls), limitations in mobility, decreased physical performance, and increased risk for functional decline <sup>[7-11]</sup>.

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the square of height in meters) and worsening physical function in older persons.

## Methodology

**Study design:** A correlation study

**Study area:** The study will be conducted at Satguru health center, Rajkot

**Study population:** The study will be conducted on Obese (body mass index, 30), older (age, 65 years) men and women.

**Study sample:** A total of 40 persons will be assessed which will be randomly selected. Study duration: 2 months

All subjects had evidence of mild to moderate frailty, as defined by meeting at least 2 of 3 criteria: modified Physical Performance Test (PPT) score of 18 to 32, peak oxygen consumption of 11 to 18 mL/min per kilogram of body weight, and self-reported difficulty or need for assistance in 2 instrumental ADLs or 1 basic ADL. These criteria are based on measures that have established predictive validity for disability and mortality in older populations.

We screened 40 obese older volunteers and eventually randomized 27 frail obese older volunteers to treatment or control groups. Treatment consisted of 6 months of weekly behavioral therapy for weight loss in conjunction with exercise training 3 times per week.

Physical function was evaluated with measurements of frailty (Physical Performance Test, peak oxygen consumption, and Functional Status Questionnaire); strength, gait, and balance tests; body composition with dual-energy x-ray absorptiometry; and quality of life using the Medical Outcomes Survey 36-Item Short-Form Health Survey. Results are reported as mean  $\pm$  SD.

## Result and Discussion

It has been suggested that successful weight loss is difficult to achieve in the older population because of ingrained, lifelong diet and activity habits, and attempts to change these habits will cause distress and anxiety. In contrast, we found that most of our subjects looked forward to the weekly group meetings and regular exercise sessions, and embraced lifestyle change. However, these results may not necessarily apply to the general obese older adults' population because we selected subjects who volunteered for the study and were able to participate in a weight loss and exercise program. Nevertheless, our results provide evidence that successful weight loss and adherence with exercise training are feasible in the obese older adults, and a group intervention program may provide important social interactions that enhance compliance.

The strengths of our study include the randomized controlled design, the comprehensive weight loss and exercise program, the high rate of compliance of our study subjects, and the use of both objective and subjective measures of physical function. Our sample size was small, yet we were able to detect significant improvements in functional outcome, demonstrating the marked efficacy of therapy. A limitation of our study is that we evaluated a combined intervention of weight loss and exercise, which does not allow rigorous assessment of the independent effects of each therapy. However, data from partial correlation analyses suggest that the effect of each therapy was independent of each other. The duration of our study was only 6 months; therefore, additional studies are needed to evaluate long-term maintenance of

weight loss and exercise therapy. A limitation of our study is that we evaluated a combined intervention of weight loss and exercise, which does not allow rigorous assessment of the independent effects of each therapy. However, data from partial correlation analyses suggest that the effect of each therapy was independent of each other. The duration of our study was only 6 months; therefore, additional studies are needed to evaluate long-term maintenance of weight loss and exercise therapy.

## Conclusion

Moderate weight loss and exercise training improves both objective and subjective measures of physical function and ameliorates frailty in obese older adults. Therefore, diet and exercise should be considered as primary therapy in frail obese older adults. Additional studies are needed to determine the independent and additive effects of weight loss and regular exercise on physical function and whether lifestyle intervention can prevent institutionalization of the growing number of obese older adults in our population.

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