

## Amsterdam University of Applied Sciences

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## Effectiveness of a combined lifestyle intervention using dietary counselling and resistance exercise in obese older adults with type 2 diabetes (the PROBE study)

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### Introduction

Current guidelines for type 2 diabetes focus on weight loss, with loss of muscle mass as potential negative side effect. This study evaluated the effect of a 3-month lifestyle intervention including dietary counselling and resistance exercise on body composition and glycemic control in obese older adults with type 2 diabetes, with additional protein supplementation.

### Methods

Older adults between 55-85 y with obesity and (pre-) type 2 diabetes followed a hypocaloric diet (-600 kcal/day) including 10x/week a 21 g whey protein drink enriched with leucine and vitamin D (800 IU) or isocaloric control drink (150 kcal), combined with strength and interval training provided by personal trainers (1 hour, 3x/wk). Participants received individual dietary counselling (6 sessions, 2½ h in total) and 1-hour educational group sessions, biweekly. At baseline and after 13 weeks, total body weight, fat mass, fat free mass, visceral fat, total lean body mass (Dual-Energy X-ray Absorptiometry), waist circumference, HbA1c, 400m walk time, and leg strength (10-RM leg press) were recorded. Changes in study parameters were tested using a paired samples t-test (p<0.05).

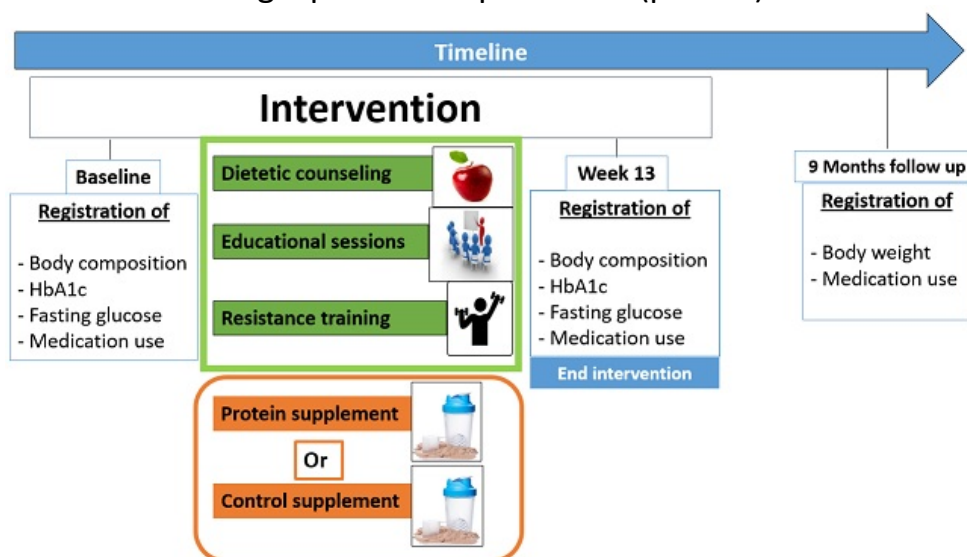


Figure 1. Study overview

### Conclusions

The combined lifestyle intervention using dietary counselling and resistance exercise preserved fat free mass during weight loss and improved HbA1c and physical performance in obese older adults with type 2 diabetes.

A whey protein drink enriched with leucine and vitamin D increased total body lean mass during the intervention.

### Results

Dropout rate in this combined lifestyle intervention was 15 % (18/123 participants). Mean age was 66±6 y and 65 % was male. Subjects lost 2.7 ± 3.0 kg (p<0.001) body weight, while total lean body mass was preserved (+0.1 ± 1.9 kg, p=0.62) and fat mass was reduced (-2.6 ± 2.3 kg, p<0.001). Waist circumference (-4 ± 4 cm, p<0.001), visceral fat (-8 ± 17 %, p<0.001), and HbA1c decreased (-4.9 ± 7.8 mmol/mol, p<0.001) and 29 % of participants lowered their diabetes medication. 400m walk time decreased (-9 ± 27 s, p=0.002) and leg strength increased (+52 ± 42 kg, p<0.001). Participants consuming the protein drink increased total lean body mass compared to the control group (+0.56 vs. -0.34 kg, p=0.017).

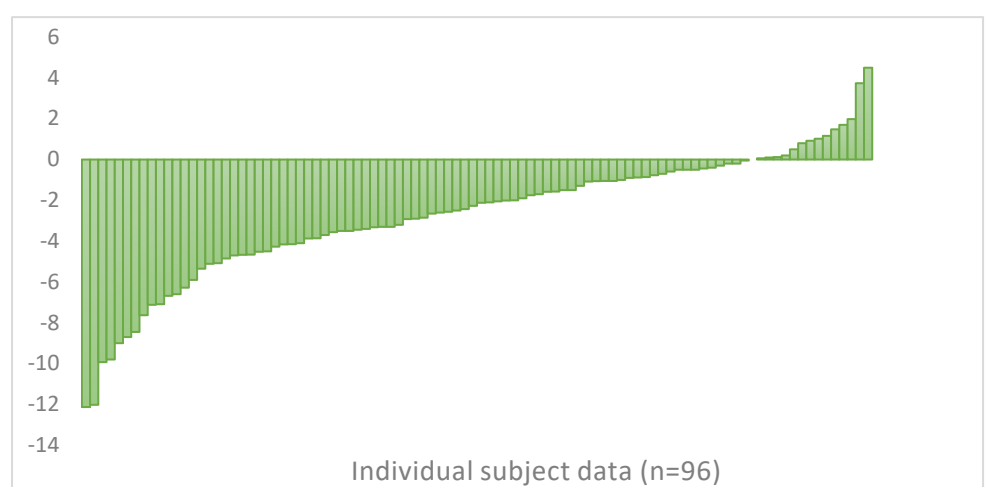


Figure 2. Individual changes in body weight (kg)



Figure 3. Individual changes in fat mass and fat free mass (kg)