Determinant factors to discriminate the body weight loss in overweight people

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Introduction. Most studies have described how the weight loss is when different treatments are compared (1-3), while others have also compared the weight loss by sex (4), or have taken into account psychosocial (5) and lifestyle (6, 7) variables. However, no studies have examined the interaction of different variables and the importance of them in the weight loss.

Objective. Create a model to discriminate the range of weight loss, determining the importance of each variable.

Methods. 89 overweight people (BMI: 25-29.9 kg·m\(^{-2}\)), aged from 18 to 50 years, participated in the study. Four types of treatments were randomly assigned: strength training (S), endurance training (E), strength and endurance training (SE), and control group (C). All participants followed a 25% calorie restriction diet. Two multivariate discriminant models including the variables age, sex, height, daily energy expenditure (EE), type of treatment (T), caloric restriction (CR), initial body weight (BW), initial fat mass (FM), initial muscle mass (MM) and initial bone mineral density (BMD) were performed having into account two groups: the first and fourth quartile of the % of weight loss in the first model; the groups above and below the mean of the % of weight loss in the second model. The discriminant models were built using the inclusion method in SPSS allowing us to find a function that could predict the body weight loss range that an overweight person could achieve in a 6 months weight loss intervention.
**Results.** The first discriminant analysis predicted that a combination of the studied variables would discriminate between the two ranges of body weight loss with 81.4% of correct classification. The discriminant function obtained was (Wilks' Lambda=0.475, p=0.003):

\[
\text{Discriminant score} = -18.266 - (0.060 \times \text{age}) - (1.282 \times \text{sex}[0=\text{female}; 1=\text{male}]) + (14.701 \times \text{height}) + (0.002 \times \text{EE}) - (0.006 \times T[1=S; 2=E; 3=SE; 4=C]) - (0.047 \times \text{CR}) - (0.558 \times \text{BW}) + (0.475 \times \text{FM}) + (0.398 \times \text{MM}) + (3.499 \times \text{BMD})
\]

The second discriminant model obtained would discriminate between the two groups of body weight loss with 74.4% of correct classification. The discriminant function obtained was (Wilks' Lambda=0.725, p=0.005):

\[
\text{Discriminant score} = -5.021 - (0.052 \times \text{age}) - (0.543 \times \text{sex}[0=\text{female}; 1=\text{male}]) + (3.530 \times \text{height}) + (0.001 \times \text{EE}) - (0.493 \times T[1=S; 2=E; 3=SE; 4=C]) + (0.003 \times \text{CR}) - (0.365 \times \text{BW}) + (0.368 \times \text{FM}) + (0.296 \times \text{MM}) + (4.034 \times \text{BMD})
\]

**Conclusion.** The first developed model could predict the percentage of weight loss in the following way: if the discriminant score is close to 1.051, the range of weight loss will be from 7.44 to -4.64% and if it is close to -1.003, the range will be from -11.03 to -25.00% of the initial body weight. With the second model if the discriminant score is close to 0.623 the body weight loss will be above -7.93% and if it is close to -0.595 will be below -7.93% of the initial body weight.

**References.**


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