

Individual versus group therapy for obesity: Comparison of dropout rate and treatment outcome

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ABSTRACT. AIMS: To compare outcome and dropout rates of an individual nutritional counselling (IT) and a cognitive behavioural group therapy (GT) after 6 months of treatment. **METHODS:** One hundred and twenty-nine women (72 in the IT and 57 in the GT group) aged 18-65 years, with body mass index (BMI) ≥ 25 kg/m². Body weight, height and waist circumference were measured. Obesity Related Well Being 97 questionnaire (ORWELL 97), Body Uneasiness Test (BUT), Symptom Check List 90 (SCL 90) and Binge Eating Scale (BES) tests were used to evaluate psychometrical variables. **RESULTS:** After 6 months, 37.2% (54.2% of initial IT sample and 15.8% of initial GT sample) of subjects abandoned the treatment programme. Completers were older ($p < 0.03$) and had a worse BUTa General Severity Index score ($p < 0.04$) than non-completers. IT had a higher dropout rate than GT. After 6 months of treatment completers lost 6.39% of initial weight and obtained improvements in all studied variables, except scores of SCL 90 and BUTb Positive Symptom Distress Index questionnaires. IT and GT groups did not differ significantly. **CONCLUSIONS:** Outcomes of IT and GT were comparable in all studied variables, whereas dropout rate of IT was higher than that of GT, suggesting that some characteristics of GT can contribute to the reduction of attrition. Younger age and better body image (measured by BUT) were associated to dropout. After weight loss we observed improvements in almost all variables in both groups without differences. (*Eating Weight Disord.* 12: 161-167, 2007). ©2007, Editrice Kurtis

INTRODUCTION

Obesity is a major health problem which causes premature death, morbidity, disability and psychosocial distress. It is a chronic disorder described by the World Health Organisation as a "global epidemic" (1). For these reasons a long-term treatment programme is needed, but poor maintenance of weight loss and high dropout rates are the major challenges in obesity management (2-5).

It is well established that a modest weight loss of 5-10% is associated to improvement of many obesity-associated morbidities (6, 7), which is sustained if weight loss is maintained (8). Nowadays, treatment success is defined as 5-10% weight loss maintained for at least 1 year (9). Conservative treatment, as cognitive behaviour therapy, typically produces this amount of weight reduction (10) but, when treatment ends, participants gradually abandon changes in lifestyle with a consequent weight regain of

30-50% of initial loss (3). One possible solution to this problem may be a long-term treatment (11).

Predictors of therapy success and attrition should be identified. Elfhag and Rössner (12) have described a profile characterising the "successful weight maintainer". This ideal person leads active life, controls overeating, with regular meals including breakfast and healthy foods, has less psychological problems such as depression and binge eating and has good social support.

Conventional treatment of obesity has been associated in many studies with high dropout rate. It has been shown that the most common reasons for withdrawal are lack of motivation, various personal problems, unrealistic weight-loss expectation and some psychosocial variables, i.e. binge eating, body image and psychological health (5, 13-15).

Even treatment option could be responsible for different dropout rates and treatment outcomes. Only few studies have compared

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group vs individual treatment for obesity, and the results were conflicting (16-19). Kingsley and Wilson (18) performed one of the first control studies about this subject and found that individually treated subjects regained weight at follow-up while group-treated subjects continued to lose weight at 12 months follow-up; also Renjilian et al. (17) found that group therapy produces greater weight loss than individual therapy. On the other hand, Pezzot-Pearce et al. (19) did not find differences in weight loss between individual, group and self-help therapies, and Hakala et al. (16) found that a more sustained effect was achieved by individual counselling.

The aim of the present study was to evaluate outcome and dropout rates of two different obesity treatments - an individual nutritional counselling and a cognitive behavioural group therapy - after 6 months of treatment. Attention was given to the evaluation of psychological factors because we hypothesized that there would be a relative advantage for group over individual therapy in terms of improvements in psychological variables and dropout rate.

METHODS

Subjects

All participants were recruited consecutively from people who sought treatment for overweight and obesity at our outpatients department. One hundred and twenty-nine women were included in the study; they were assigned with a partial randomization to the two treatment options: 72 were assigned to the individual nutritional counselling (IT) and 57 to the cognitive-behavioural group therapy (GT). The assignment procedure was not totally randomized because subjects assigned to GT could accept or decline the proposal; in case of refusal they received individual counselling and were not included in the research protocol. At baseline the two groups were comparable for all variables evaluated in the study (Table 1).

Anthropometry

Patients were weighted wearing indoor clothing without shoes. Body weight was measured to the nearest 0.1 kg on a digital computerised platform scale and height to the nearest 0.5 cm with a stadiometer. Body mass index (BMI) was calculated as body weight adjusted for height (kg/m^2). Waist circumference was measured to the nearest 0.5 cm using a 1-cm wide measuring tape while subjects were standing; it was measured as the minimum abdominal circumference between the xyphoid process and the umbilicus.

Psychometrical measures

Four psychometrical questionnaires were evaluated.

- Obesity Related Well Being (ORWELL 97) questionnaire (20) measures obesity-related quality of life (ORQL). It is a self-reported questionnaire taking into consideration the intensity and the subjective relevance of physical and psychological distress caused by obesity. ORWELL 97 consists of 18 items divided into two factors:

- a) "Symptoms" (5 items) measures obesity-related somatic symptoms and physical functioning. The items on this scale evaluate the symptoms and the impairments of physical functioning which are most common in obese patients without concurring physical illnesses;
- b) "Psychosocial impact" (13 items) evaluates the impact of obesity on the patients' emotional status, obesity-related worries, and the effects of obesity on familial relationships, role functioning and social network.

For each item, patients are asked to score on a 4-point Likert scale the occurrence and/or severity of the symptoms (occurrence), and the subjective relevance of the symptom-related impairment in one's own life (relevance). The score is calculated as the product of occurrence and relevance. The total ORWELL 97 score is obtained as the sum of the scores of individual items. Higher ORWELL 97 scores mean a poor quality of life.

- Body Uneasiness Test (BUT) (21) is a self-report questionnaire assessing body image (BI) dissatisfaction and uneasiness. It is divided into two parts:

- a) BUTa, which consists of 34 clinical items divided into eight scales: weight phobia (fear of being or becoming fat, 8 items), body image concern (worries related to physical appearance, 9 items), avoidance (BI-related avoidance behaviour, 6 items), BI compulsive checking (compulsive checking of physical appearance, 6 items), depersonalization (detachment and estrangement feeling toward the body, 5 items);
- b) BUTb, which consists of 37 items, referred to evaluation of body parts, features (e.g. smell) and functions (e.g. sweating).

Subjects rated each item on a 6-point Likert-type scale (range 0-5, from "never" to "always", high rates indicating greater body uneasiness). For BUTa a global mean score (GSI: Global Severity Index) and mean scores for each sub-scale were calculated; for BUTb two measures were calculated: the number of items with a score ≥ 1 (PST: Positive Symptom Total) and the mean score of the items with a score ≥ 1 (PSDI: Positive Symptom Distress

Index). For this study we used GSI of BUTa and PSDI of BUTb.

- Symptom Check List 90 (SCL 90) (22) measures psychopathological distress. It is composed by 90 items organised in nine domains (somatization, obsessive-compulsive thought, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid conceiving, psychotic behaviour). The GSI is an indicator of overall psychological distress. Subjects respond on a 5-point Likert scale: values ≥ 1 in GSI and in the subscales are suggestive of psychological distress.
- Binge Eating Scale (BES) (23) is a questionnaire used to evaluate eating behaviour; in particular, it measures the severity of binge eating episodes. The 16 items examine both behavioural manifestations (eating large amount of food) and feeling/cognition during a binge episode (loss of control, guilt, fear of being unable to stop eating). There are two cut-offs: a score ≥ 17 is considered indicative of a possible binge eating disorder (BED), a score ≥ 27 indicates a probable BED.

Treatment programmes

- IT: The programme of the IT consisted of periodical (every fortnight) individual meetings with a dietitian of at least 20-min duration and one control medical visit with a physician at the 3rd month, for a total of 12 meetings during the first 6 months of therapy. During the first meeting, information regarding obesity and nutrition counselling was given to the participants; in particular the therapist stressed the idea of the necessity to obtain a negative energy balance principally by reduction of fat intake. The subjects were advised to practise regular moderate physical activity for at least 20-30 min three days per week. At the onset of every subsequent meeting the participants were weighted and reported on progress and/or difficulties since previous session, the dietitian reinforced advices given in the first meeting and introduced and explained new eating and exercise-related strategies as well as basic behavioural techniques.
- GT: The programme of the GT consisted of 10 weekly group meetings, one control medical visit with a physician at the 3rd month and 2 booster sessions (at the 4th and 6th months), for a total of 12 meetings during the first 6 months of therapy. Each meeting lasted 90 min and was conducted by a psychologist and a dietitian. At the outset of the session all subjects reported their weight and their self-monitoring records were read and commented on. During this first part of the session, the therapists facilitated a group discussion focused on providing positive

feedbacks to the successes and group problem solving of difficulties. During the second part of the meeting the therapists, dietitian and psychologist in turn, introduced and explained new eating and exercise-related subjects. The therapy approach was cognitive-behavioural and some themes of interest were eating pyramid, emotional eating, physical activity, stimulus control, motivation and assertivity. After the 10 group meetings subjects participated to 2 booster sessions whose goals were maintenance of weight loss and prevention of relapse.

Statistical analysis

Results are shown as mean \pm standard deviation, as well as percentages.

Differences in anthropometrical and psychometrical variables between the two groups at baseline and after 6 months of treatment were calculated using the independent sample t-test (for normally distributed variables) and Mann-Whitney U test (for not normally distributed variables).

Differences within subjects in all variables evaluated after 6 months of treatment were calculated using a paired sample t-test (for normally distributed variables) and Wilcoxon test (for not normally distributed variables).

Predictors of dropout were analysed by comparing the baseline characteristics of the completer and non-completer groups using the

TABLE 1
Characteristics of subjects at baseline.

	Individual treatment	Group treatment	p-values
N	72	57	
Age (yr)	47.15 \pm 11.46	49.00 \pm 10.79	0.44
Weight (kg)	93.36 \pm 14.91	91.46 \pm 14.79	0.42
BMI (kg/m ²)	34.81 \pm 5.91	35.78 \pm 5.10	0.78
Waist (cm)	102.74 \pm 11.85	100.46 \pm 11.86	0.34
Obesity-related diseases (N)	1.59 \pm 1.67	1.57 \pm 1.47	0.95
SCL 90 GSI	0.59 \pm 0.41	0.65 \pm 0.37	0.77
BES	8.79 \pm 5.85	10.41 \pm 6.82	0.15
ORWELL 97 Symptoms	9.35 \pm 6.80	8.76 \pm 6.74	0.63
ORWELL 97 Psychosocial impact	24.33 \pm 14.06	26.13 \pm 17.42	0.52
BUT GSI	1.08 \pm 0.50	1.23 \pm 0.78	0.48
BUT PSDI	2.40 \pm 1.02	2.32 \pm 1.19	0.70

Quantitative data are shown as mean values and standard deviations. Two-sample independent t-test and Mann-Whitney U test were used. BES=Binge Eating Scale; BMI=body mass index; BUT=Body Uneasiness Test; GSI=Global Severity Index; ORWELL 97=Obesity Related Well Being 97; PSDI=Positive Symptom Distress Index; SCL 90=Symptom Check List 90.

TABLE 2
Characteristics of completers and non-completer subjects at the baseline.

	Completers	Non-completers	p-values
N	81	48	
Age (yr)	49.46±11.99	45.09±9.24	0.03
Weight (kg)	91.43±13.93	94.38±16.23	0.38
BMI (kg/m ²)	35.58±4.94	36.17±6.49	0.83
Waist (cm)	101.51±11.14	102.15±13.11	0.90
Obesity-related diseases (N)	1.68±1.48	1.44±1.74	0.40
SCL 90 GSI	0.65±0.40	0.56±0.37	0.18
BES	9.99±6.34	8.70±6.30	0.27
ORWELL 97 Symptoms	8.89±6.35	9.44±7.44	0.66
ORWELL 97 Psychosocial impact	25.62±15.54	24.27±15.73	0.64
BUT GSI	1.22±0.64	1.02±0.62	0.04
BUT PSDI	2.30±1.03	2.47±1.20	0.41

Quantitative data are shown as mean values and standard deviations. Two-sample independent t-test and Mann-Whitney U test were used. BES=Binge Eating Scale; BMI=body mass index; BUT=Body Uneasiness Test; GSI=Global Severity Index; ORWELL 97=Obesity Related Well Being 97; PSDI=Positive Symptom Distress Index; SCL 90=Symptom Check List 90.

independent sample t-test (for normally distributed variables), the χ^2 test (for nominal data) and the Mann-Whitney U test (for not normally distributed variables).

SPSS 12.0 for Windows was used for statistical analysis. In all analysis we considered p-values below 0.05 to be statistically significant.

RESULTS

At baseline, the two groups (IT and GT) did not differ significantly for any evaluated variables (Table 1).

At the 6th month, 48 of 129 subjects (37.2%) had abandoned the treatment programme. Among these dropouts 39 (54.2% of initial sample) were in the IT group and 9 (15.8% of initial sample) in the GT group. In particular, 26.8% of subjects in the IT group vs 1.8% in the GT group abandoned the treatment after the assessment and the treatment assignment, 19.4% vs 5.4% after the first medical control visit and 13.9% vs 8.9% between the 4th and the 6th months. The two treatments differed significantly for dropout rates ($\chi^2=20,05$, $p<0.001$).

Age (49±12 vs 45±9 years) and BUTa GSI (1.22±0.64 vs 1.02±0.62) were significantly higher in completers than in non-completers (Table 2).

Completers lost 6.39±4.63% of initial weight and obtained improvements in all variables studied except SCL 90 and BUTb PSDI (Table 3).

The independent t-test between changes in all variables after 6 months of treatment in completers in the IT and GT groups (IT n=33 and GT n=48) did not indicate significant differences (Table 4).

TABLE 3
Differences between baseline and after 6 months in completers.

	Baseline	After 6 months	p-values
Weight (kg)	92.52±14.83	86.43±14.85	0.001
BMI (kg/m ²)	35.80±5.54	33.60±5.30	0.001
Waist (cm)	101.75±11.87	97.67±13.12	0.001
SCL 90 GSI	0.61±0.35	0.55±0.47	0.297
BES	10.21±6.40	6.58±4.80	0.001
ORWELL 97 Symptoms	8.17±6.19	6.24±5.04	0.005
ORWELL 97 Psychosocial impact	22.96±14.06	16.15±12.60	0.001
BUT GSI	1.15±0.64	0.73±0.61	0.001
BUT PSDI	2.20±0.99	1.88±0.84	0.055

Quantitative data are shown as mean values and standard deviations. Two-sample dependent t-test and Wilcoxon test were used. BES=Binge Eating Scale; BMI=body mass index; BUT=Body Uneasiness Test; GSI=Global Severity Index; ORWELL 97=Obesity Related Well Being 97; PSDI=Positive Symptom Distress Index; SCL 90=Symptom Check List 90.

TABLE 4
Differences between individual treatment and group treatment after 6 months of therapy.

	Individual treatment	Group treatment	p-values
N	33	48	
Weight (kg)	4.89±4.00	6.39±4.45	0.16
BMI (kg/m ²)	1.89±1.58	2.51±1.71	0.14
Waist (cm)	3.98±5.22	4.52±5.74	0.72
Weight loss (%)	5.21±4.22	7.10±4.77	0.10
SCL 90 GSI	0.06±0.46	0.05±0.35	0.91
BES	4.88±4.47	2.97±5.55	0.21
ORWELL 97 Symptoms	1.83±3.5	1.97±5.39	0.92
ORWELL 97 Psychosocial impact	7.22±9.30	6.61±12.54	0.86
BUT GSI	0.51±0.59	0.32±0.55	0.24
BUT PSDI	0.41±0.94	0.27±1.26	0.69

Quantitative data are shown as mean values and standard deviations. Two-sample independent t-test was used. Two sample-independent t-test and Mann-Whitney U test were used. BES=Binge Eating Scale; BMI=body mass index; BUT=Body Uneasiness Test; GSI=Global Severity Index; ORWELL 97=Obesity Related Well Being 97; PSDI=Positive Symptom Distress Index; SCL 90=Symptom Check List 90.

DISCUSSION

Our study showed that outcome of the two treatments was comparable in all studied variables, anthropometrical and psychometrical, whereas dropout rate in IT was higher than in GT. Variables associated to dropout were younger age and better body image. At the end of treatment, we observed an improvement in anthropometrical measures and BES, ORWELL 97 and BUT GSI tests in both groups without significant differences.

Previous studies have reported a wide range of dropout rates (10-80%), depending on different study designs and different dropout definitions. Stunkard (24) reported a ratio of only 10% patients still in treatment after one year.

A few studies have evaluated the reasons of attrition. Wadden and Letizia (25) reported a relationship between attrition and binge eating, high susceptibility to hunger, low dietary restriction, dissatisfaction due to small weight losses and life stress events. Recently some studies have analysed the influence of age and anthropometrical measures on dropout rate (5, 14, 15, 26-28) with controversial results. Moreover, only few studies have evaluated the effect of psychometrical variables (15) and treatment option (15, 27, 28).

The dropout rate observed in our study was in line with that reported in the literature: 37.2% of the initial group withdrew from treatment during the first 6 months. People who dropped out differed from completers for age, BUTa GSI and treatment option.

Completers were older than non-completers in accordance with previous studies (4, 14, 26, 27) but not others (5, 15). Differences in the study designs could be responsible for these discrepant results: our group was composed of 18-65-years-old women, whereas Inelmen et al. (5) considered a wider age range (15-82 years) and Teixeira et al. only a male study group (15).

In agreement with Andersson and Rössner (26) and Dalle Grave et al. (14), we did not observe differences in weight, BMI and waist circumference between completers and dropouts. These data suggest that severity of overweight does not influence the dropout pattern; however, our findings are in contrast with those of Inelmen et al. (5), who found that completers had higher weight, BMI and waist circumference than non-completers, and Teixeira et al. (15), who found that completers' BMI was lower than that of dropouts.

In our study, completers had a GSI at BUTa questionnaire significantly worse than non-completers, suggesting that appearance is one of the main reasons for seeking treatment for

overweight, at least in women. To our knowledge, only Dalle Grave et al. (14) evaluated the influence of BI on attrition using BUT: in contrast with our results, they did not find differences between completers and dropouts in the GSI score, but a better score in the weight phobia subscale in completers.

We found that people who attended group sessions had a dropout rate significantly lower than people assigned to IT. Only few studies compared dropout rates between treatment options. Melin et al. (28) compared two treatment programmes, both including behaviour modification, nutrition counselling, very low calorie diet and a continuous monitoring of metabolic and anthropometrical status, but differing in intensiveness: every fortnight during the first year, and 6 meetings during the second year or every third month during the 2 years. They did not find significant differences in dropout rate, compliance and weight reduction between the two groups. Honas et al. (27) used 4 protocols of treatment that consisted of 16 weekly behavioural meetings and differed from each other for physician visits frequency and daily energy intake. People were assigned to one of four protocols based on BMI and comorbidities (Protocol I: BMI >40 kg/m², weekly physician monitor, 520 kcal minimum; Protocol II: BMI ≥35 and <40 kg/m², biweekly physician monitoring for 8 weeks, than every 4 weeks, 800 kcal minimum; Protocol III: BMI <35 kg/m², nurse visit every 4 weeks, 800 kcal minimum; Protocol IV: BMI <35 kg/m², no medical supervision, 1200 kcal); like Melin et al., they did not observe differences in dropout rates among the 4 protocols. These discrepant results may be due to differences in the study design; in particular, we evaluated two conceptually different kinds of treatment, whereas the other authors (27, 28) evaluated different intensiveness levels of the same treatment. We believe that, in contrast with IT, therapeutic factors of GT, in particular social support, could have positively influenced the attendance to treatment protocol. As Elfhag et al. (12) have recently emphasized, social support is demonstrated to be positively correlated with weight maintenance and could have an important role in motivating and supporting patients to cope with the weight-loss programme. It is also important to underline that the difference in frequency of meetings between the two kinds of therapy (every fortnight for 6 months in IT and 10 weekly meetings plus 2 booster sessions at the 4th and 6th months) could be responsible of these differences: the more frequent meetings in the GT could have determined the creation of better helping alliance which accounted for the lower dropout rate.

Therapeutic factors of GT and high frequency of meetings can explain the minor dropout during the treatment but is not sufficient to explain the differences in dropout rate after the assessment: 26.8% of the IT group vs 1.8% of the GT group abandoned the programme before its beginning. It is possible to hypothesize that people who accepted to be involved in the GT were more motivated to treatment. Future studies should clarify the complex link among motivation and attrition.

Our study failed to observe significant differences between the two treatments in weight reduction. After 6 months of treatment, 49 of the 81 completers (60.5%) had reduced their body weight by 5-10% or more. This amount of weight loss is universally recognised a realistic goal in obesity treatment (9) because accompanied by improvement of many obesity-associated morbidities (6-7). Our findings are in agreement with previous studies that have compared GT vs IT for obesity: Kingsley and Wilson (18) reported no differences between behavioural individual and group therapies during the first 6 months of treatment, and Pezzot-Pearce et al. (19) demonstrated that the degree of therapist contact (individual vs group) had no significant effect on weight loss. On the other hand, Renjilian et al. (17) found that GT produced significantly greater reductions in weight and body mass than IT, and Hakala et al. (16) found the same results during the first 3 months.

Surprisingly, GT did not produce greater improvement in psychological variables. In both groups (IT and GT) eating behaviour, ORQL and BI improved significantly after 6 months.

These results demonstrate that both treatment programmes are effective to improve anthropological and psychological measures. For this reason weight loss is the only variable that could explain the improvement observed in our study. These findings are consistent with those of previous studies that have also reported improvements in psychometrical variables after weight loss despite differences in treatment options (17, 29, 30). Probably a longer term of evaluation could be necessary to observe differences between different kinds of treatment. Nonetheless, short-term lower dropout rate and cost of GT compared to IT argues for a wide use of this therapeutic approach.

Three limitations of our study are worth noting. First, we were able to evaluate only women seeking treatment, and thus our results cannot be generalised to the whole obese population. Second, our assignment procedure was only partially randomized because not all partici-

pants enrolled in the GT accepted to participate. The main reasons of refusal were excessive intensiveness of meetings and working problems. For this reason, the GT group was composed by subjects who could have been more motivated and thus showed less dropout rate. Finally, our study is relatively short (6 months): follow-up (at least 6 months) is necessary to evaluate the maintenance of weight loss as well as the effects on psychological improvements. Our future study will include a 6-month follow-up or longer.

In conclusion, our results showed that outcome of IT and GT were comparable in all studied variables, anthropometrical and psychometrical, whereas dropout rate of IT was higher than that of GT, suggesting that some characteristics of GT can contribute to the reduction of attrition. Variables associated to dropout were younger age and better BI. After weight loss we observed an improvement in anthropometrical measures and BES, ORWELL 97 and BUT GSI tests in both groups without differences. The finding of equivalent weight loss and psychological improvements for GT vs IT, associated to lower dropout and cost for GT compared to IT, argues for a wide use of this therapeutic approach in the treatment of obesity.

REFERENCES

1. World Health Organisation. Obesity: preventing and managing the global epidemic. Geneva, World Health Organisation, 1997.
2. Kramer F.M., Jeffery R.W., Forster J.L., Snell M.K.: Long-term follow-up of behavioural treatment for obesity: patterns of weight regain among men and women. *Int. J. Obes.*, 13, 123-136, 1998.
3. Jeffery R.W., Drewnowski A., Epstein L.H., Stunkard A.J., Wilson G.T., Wing RR, Hill D.R.: Long-term maintenance of weight loss: current status. *Health Psychol.*, 19, Suppl., 5-16, 2000.
4. Richman R., Burns C.M., Steinbeck K., Caterson L.: Factors influencing completion and attrition in a weight control programme. In: Ailhaud G., Guy-Grand B., Lafontan M., Ricquier D. (Eds.), *Obesity in Europe 91*. London, John Libbey, 1992, pp. 167-171.
5. Inelmen E.M., Toffanello E.D., Enzi G., Gasparini G., Miotto F., Sergi G., Busetto L.: Predictors of drop-out in overweight and obese outpatients. *Int. J. Obes. (Lond.)*, 29, 122-128, 2005.
6. Goldstein D.J.: Beneficial health effects of modest weight loss. *Int. J. Obes. Relat. Metab. Disord.*, 16, 397-415, 1992.
7. Kanders B.S., Blackburn G.L.: Reducing primary risk factors by therapeutic weight loss. In: Wadden T.A., Van Itallie T.B. (Eds.), *Treatment of seriously obese patient*. New York, The Guilford Press, 1992, pp. 213-230.
8. Wing R.R., Jeffery R.W.: Effects of modest weight loss on changes in cardiovascular risk factors: are there

- differences between men and women or between weight loss and maintenance? *Int. J. Obes. Relat. Metab. Disord.*, 19, 67-73, 1995.
9. Institute of Medicine. *Weighting the options: criteria for evaluating weight-management programs*. Washington, DC, National Academy Press, 1995.
 10. Perri M.G., Fuller P.R.: Success and failure in the treatment of obesity: where do we go from here? *Medicine, Exercise, Nutrition and Health*, 4, 225-272, 1995.
 11. Perri M.G.: The maintenance of treatment effects in the long-term management of obesity. *Clinical Psychology: Science and Practice*, 5, 526-543, 1998.
 12. Elfhag K., Rössner S.: Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain. *Obes. Rev.*, 6, 67-85, 2005.
 13. Lantz H., Peltonen M., Agren L., Torgerson J.S.: A dietary and behavioural programme for the treatment for obesity. A 4-year clinical trial and a long-term post-treatment follow-up. *J. Intern. Med.*, 254, 272-279, 2003.
 14. Dalle Grave R., Calugi S., Molinari E., Petroni M.L., Bondi M., Compare A., Marchesini G., QUOVADIS Study Group: Weight loss expectations in obese patients and treatment attrition: an observational multicenter study. *Obes. Res.*, 13, 1961-1969, 2005.
 15. Teixeira P.J., Going S.B., Houtkooper L.B., Cussler E.C., Metcalfe L.L., Blew R.M., Sardinha L.B., Lohman T.G.: Pretreatment predictors of attrition and successful weight management in women. *Int. J. Obes. Relat. Metab. Disord.*, 28, 1124-1133, 2004.
 16. Hakala P., Karvetti R.L., Rönnemaa T.: Group vs individual weight reduction programmes in the treatment of severe obesity - a five-year follow-up study. *Int. J. Obes. Relat. Metab. Disord.*, 17: 97-102, 1993.
 17. Renjilian D.A., Perri M.G., Nezu A.M., McKelvey W.F., Shermer R.L., Anton S.D.: Individual versus group therapy for obesity: effects of matching participants to their treatment preferences. *J. Consult. Clin. Psychol.*, 69, 717-721, 2001.
 18. Kingsley R.G., Wilson G.T.: Behaviour therapy for obesity: a comparative investigation of long-term efficacy. *J. Consult. Clin. Psychol.*, 45, 288-298, 1977.
 19. Pezzot-Pearce T.D., LeBow M.D., Pearce J.W.: Increasing cost-effectiveness in obesity treatment through use of self-help behavioural manuals and decreased therapist contact. *J. Consult. Clin. Psychol.*, 50, 448-449, 1982.
 20. Mannucci E., Ricca V., Barciulli E., Di Bernardo M., Travaglini R., Cabras P.L., Rotella C.M.: Quality of life and overweight: the obesity-related well-being (ORWELL 97) questionnaire. *Addict. Behav.*, 24, 345-357, 1999.
 21. Cuzzolaro M., Vetrone G., Marano G., Batacchi M.W.: BUT: una nuova scala per la valutazione del disagio relativo all'immagine del corpo. *Psichiatria dell'infanzia e dell'adolescenza*, 66, 417-428, 1999.
 22. Derogatis L.R.: *Symptom Check List 90 manual*. Baltimore, John Hopkins University Press, 1977.
 23. Gormally J., Black S., Daston S., Rardin R.: The assessment of binge eating severity among obese persons. *Addict. Behav.*, 7, 47-55, 1982.
 24. Stunkard A.J.: An overview of current treatments for obesity. In: Wadden T.A., Van Itallie T.B. (Eds.), *Treatment of seriously obese patient*. New York, The Guilford Press, 1992, pp. 38-43.
 25. Wadden T.A., Letizia K.A.: Predictors of attrition in weight loss in patients treated by moderate and severe caloric restriction. In: Wadden T.A., Van Itallie T.B. (Eds.), *Treatment of seriously obese patient*. New York, The Guilford Press, 1992, pp. 383-410.
 26. Andersson I., Rössner S.: Weight development, drop-out pattern and changes in obesity-related risk factors after two years treatment of obese men. *Int. J. Obes. Relat. Metab. Disord.*, 21, 211-216, 1997.
 27. Honas J.J., Early J.L., Frederickson D.D., O'Brien M.S.: Predictors of attrition in a large clinic-based weight-loss program. *Obes. Res.*, 11, 888-894, 2003.
 28. Melin I., Karlström B., Lappalainen R., Berglund L., Mohsen R., Vessby B.: A programme of behaviour modification and nutrition counselling in the treatment of obesity: a randomised 2-y clinical trial. *Int. J. Obes. Relat. Metab. Disord.* 2003, 27: 1127-1135.
 29. Vansant G., Hulens M., van der Borgh W., Demyttenaere K., Lysens R., Muls E.: A multidisciplinary approach to the treatment of obesity. *Int. J. Obes. Relat. Metab. Disord.*, 23, Suppl. 1, 65-68, 1999.
 30. Rapoport L., Clark M., Wardle J.: Evaluation of a modified cognitive-behavioural programme for weight management. *Int. J. Obes. Relat. Metab. Disord.*, 24, 1726-1737, 2000.