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Effectiveness of dietary intervention for obese women in Jordan

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Abstract

Objective The aim was to evaluate the outcome of body weight loss consulting in an outpatient nutrition clinic.

Methods Forty-five adult females attended 10 individualized treatment one-to-one sessions. Weight and height were measured and the body mass index was calculated. Triceps, biceps, subscapular and suprailiac skinfold thickness were measured and the fat percentage was calculated. A hypocaloric diet was given to the women; the percentages of carbohydrate, protein and fat in the diet were kept between 50 and 55% for carbohydrates, between 15 and 20% for protein, and $\leq 30\%$ of fat.

Results Average weight loss was 7.4 kg, which was 8.4% of initial. Class III obese subjects achieved the highest weight loss (-9.4 kg). Weight loss was statistically significant after week 1, week 2, week 3, and week 4 ($P < 0.001$). The body mass index was significantly decreased ($P < 0.001$). The mean fat percentage was not significantly different.

Conclusions The results indicate the increasing importance of nutrition counselling in Jordan.

Keywords: Obesity, women

Introduction

Diet plays an important role in many diseases, including the most common health problems: heart disease, the aetiology of certain cancers, obesity, stroke, hypertension and type 2 diabetes (Key et al. 2004; Prentice 2004; Srinath Reddy and Katan 2004; Steyn et al. 2004; Swinburn et al. 2004). Dietary changes can be helpful in preventing or treating health problems such as obesity, hypertension and high blood cholesterol, and dietary counselling has been shown to reduce medication costs (Hourani et al. 1992; Franz et al. 1995; Sheils et al. 1999; Sikand et al. 2000; Pastors et al. 2002).

In developing countries, overweight and obesity have become a public health problem of increasing importance and the range of the problem continues to be undetermined. Studies have been conducted in many Middle East countries to estimate the prevalence of overweight and obesity in adults (El Mugamer et al. 1995; Al-Mannai et al. 1996; Al-Isa 1997; Kahder et al. 2008). Findings have shown that the

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prevalence of obesity is generally higher among females compared with males in developing countries (Low et al. 2009).

A modest weight loss of 5–15% significantly reduces obesity-related health risks (Hainer et al. 2008). Several treatments for obesity and overweight have been developed and studied, most of which include the use of behavioural modification techniques. The effectiveness of nutritional counselling in changing dietary habits has been found in a number of studies, and can be effective in weight loss counselling (Rippe et al. 1998; Dansinger et al. 2007; Estabrooks and Smith-Ray 2008; Hardcastle et al. 2008).

Behavioural strategies are designed to change the patient's eating and activity habits to reinforce reductions in caloric intake and increases in physical activity (Fujioka 2002). A large number of clinical studies have been conducted examining the effects of behavioural treatment on weight loss (Wadden and Foster 2000; Ramirez and Rosen 2001; Fabricatore 2007). However, there are no published data on the efficiency of treatment in this region. The aim of the present study was to evaluate outcome of body weight loss consulting in an outpatient nutrition clinic.

Subjects and methods

Subjects

Data presented in this paper were obtained from a private nutrition-counselling centre. Forty-five women were enrolled in this study. Subjects were adults, premenopausal and not currently pregnant or lactating, with body mass index (BMI) higher than 24.9 kg/m². Subjects with a history or presence of significant disease, endocrine disorders, or abnormal laboratory test results of clinical significance were excluded. All participants signed an informed consent form.

Anthropometric measurements

Body weight was measured, to the nearest 0.1 kg, using electronic weighing scales (Seca 770; SECA, Hamburg, Germany), with subjects wearing light clothing and no shoes. Height was recorded, to the nearest 0.5 cm, with subjects standing erect, head in the Frankfurt plane and without shoes. The BMI was calculated using the standard formula: weight (kg)/height (m)².

The tricep, bicep, subscapular and suprailiac skinfold thicknesses were measured using a Lange Skinfold Calliper (Beta Technology, Santa Cruz, CA, USA). The fat content as a percentage of body weight was calculated from the sum of the four measurements of skinfold thickness (Durnin and Womersley, 1974).

Intervention

Subjects attended 10 individualized treatment one-to-one sessions, held on a weekly basis for approximately 10 weeks. The initial session lasted 45–60 min; it included the collection of detailed data on socio-economic status, dietary habits, body weight and height measurements, and physical activity. This session included the planning of individualized daily menus dependent on dietary habits, and a tailored weight loss plan. The following sessions lasted 15–30 min and included educational contents in the areas of diet and eating behaviour and behaviour modification. The covered

nutrition topics are the caloric, fat, and fibre content of the meals, the role of breakfast and meal frequency for weight control, reducing portion size, strategies to reduce the diet's fat content, planning for special occasions such as parties, reducing hunger by increasing the fibre content of the meals, enlightening the myths of reducing diet foods and the importance of a well-balanced diet on the treatment of obesity.

Energy intake (EI) was estimated using a simplified dietary history for specific dietary behaviours such as sweet desserts, sweetened tea, fried foods, and caloric beverages. The average caloric intake was 9.6 MJ/day (2,287 kcal/day).

The dietary intervention was structured such that a nutritionist explained the diet plan in detail and counselled subjects using personalized sample menus and recipes. Throughout the study, subjects were prescribed a hypocaloric balanced diet providing 5.0–6.7 MJ/day (1,200–1,600 kcal/day) and 15–20% of energy as protein, 50–55% of energy as carbohydrate, and $\leq 30\%$ of energy as fat. Three meals (breakfast, lunch, and dinner) and one snack (between lunch and dinner) were recommended. The diet plan uses the American Diabetes Association/American Dietetic Association food exchange system (American Diabetes Association and American Dietetic Association 2003) to monitor energy and nutrient intake as presented in Table I. Energy intake was based on a food exchange table, with the number of food exchanges adjusted to encourage the above percentage distribution of carbohydrate, protein and fat. Individual preferences for various food items were integrated into the diet plan. All meals and snacks were prepared from self-selected, conventional foods. Dietary compliance was measured through a food exchange checklist. The participants were trained on keeping a food intake record using a semiquantitative method based on household measurements. The planned weight loss ranged between 0.5 and 1.0 kg/week.

Statistical methods

Data are presented as the mean and standard deviation. The statistical analyses are based on treatment effects (change from baseline) to 10 weeks within the same gender. Analysis methods are therefore paired *t*-test. All tests are two-tailed and $P < 0.05$ was considered statistically significant. Statistical analyses were performed using the Statistical Package for Social Sciences (version 10.05; SPSS, Chicago, IL, USA).

Results

Mean values for age, height, initial weight and BMI are presented in Table II. Weight loss data reported in the present study refer to 10 weeks of dietary instructing. After

Table I. Example diet plan containing 1,300 kcal.

	Number of exchanges
Milk (skim)	2
Vegetables	4
Fruits	4
Bread and cereals	5
Meat (lean)	3
Fat	5

Table II. Initial characteristics of clients.

Characteristic	Mean \pm standard deviation
Age (years)	32.2 \pm 8.9
Height (cm)	157.6 \pm 5.3
Initial weight (kg)	88.2 \pm 16.5
BMI	35.5 \pm 6.1
Fat percentage (%)	37.4 \pm 4.2
Haemoglobin (g/dl)	13.2 \pm 1.2

10 weeks of the intervention programme, the average weight loss was 7.4 kg, the weight loss per week was 0.7 kg, BMI was 32.5 and the fat percentage was 36.7%, as shown in Table III. The highest weight loss was among obese class III, which was 9.4 kg. Weight loss was statistically significant after week 1, week 2, week 3, and week 4 ($P < 0.001$) as shown in Table IV. Figure 1 shows the percentage of weight loss, which was 8.4% of the initial weight.

Discussion

This is the first study performed in Jordan; it was aimed at examining the effect of short-term individualized dietary interventions on weight changes in overweight or obese subjects. The principles of weight management in overweight and obesity are to achieve clinically significant weight loss and to maintain weight loss (Finer 2001).

Randomized controlled trials assessing the impact of low-calorie diets in obese patients concluded that low-calorie diets produced weight loss regardless of the duration of treatment, and body weight was reduced by an average of 8% over 3–12 months (National Institutes of Health 2000). A diet that is individually planned to help create a deficit of 500–1,000 kcal/day should be part of any programme aimed to achieve weight loss of 1–2 lb/week (Berkel et al. 2005; Lang and Froelicher 2006). To achieve such goals, it is important to reduce dietary fat as well as dietary carbohydrates to facilitate calorie reduction.

The main finding of our study was that compliance with dietary modification prescribed by a nutrition specialist in an outpatient clinic resulted in desirable weight reduction. Results from studies reporting the effect of individual weight-loss programmes are generally consistent with this study. The mean weight loss reported in the present study is also in agreement with results of structured weight-loss

Table III. Mean weight changes of participants after 10 weeks of intervention.

	Mean \pm standard deviation
Average weight loss (kg)	7.4 \pm 4.8
Weight loss (kg) for overweight clients	5.9 \pm 1.2
Weight loss (kg) for obese class I clients	5.6 \pm 5.1
Weight loss (kg) for obese class II clients	8.6 \pm 4.1
Weight loss (kg) for obese class III clients	9.4 \pm 5.7
Weight loss per week (kg)	0.7 \pm 0.48
BMI	32.5 \pm 5.7
Fat percentage (%)	36.7 \pm 4.0

Table IV. Weight changes (kg) from baseline of participants.

Weight	Mean \pm standard deviation
Baseline weight	88.2 \pm 16.5
After 1 week	85.9*** \pm 16.2
After 2 weeks	84.8*** \pm 16.1
After 3 weeks	83.9*** \pm 16.0
After 4 weeks	82.9*** \pm 15.8
After 5 weeks	82.2 \pm 15.4
After 6 weeks	82.0 \pm 15.9
After 7 weeks	81.5 \pm 15.6
After 8 weeks	80.9 \pm 15.2
After 9 weeks	80.8 \pm 15.9

*** $P < 0.001$.

programmes (Ayyad and Andersen 2000) and do thus demonstrate the effectiveness of individual counselling.

In terms of weight loss, the dietary intervention in this study resulting in an 8.4% weight loss over a period of 10 weeks, which is consistent with recommendations (National Institutes of Health 2000; Wing 2002). The subjects of this study achieved 0.7 kg weight loss per week, which is consistent with most typical behavioural programmes.

Focusing on the total weight loss, participants of this study achieved a total weight loss of 7.4 kg in 10 weeks. These results also confirm previous reports of the benefits of lifestyle modification. Stevens et al. (2001) reported that the mean weight change from baseline in the intervention group was -4.4 kg at 6 months by an individual counselling session. Tuomilehto et al. (2001) found that the mean weight lost between baseline and the end of year 1 was 4.2 kg in the intervention group that received individualized counselling aimed at reducing weight, total intake of fat and intake of saturated fat and increasing intake of fibre and physical activity. Hakala et al. (1993) studied 60 patients who were randomly assigned to a group-counselling programme associated with an initial 2-week inpatient period and an individual-counselling

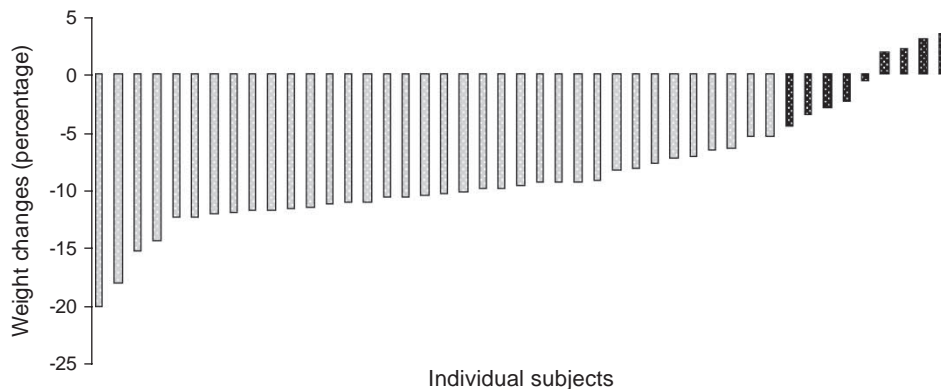


Figure 1. Individual weight change after 10 weeks (percentage). Grey bars, subjects who lost more than 5% of their initial weight; black bars, subjects who did not lose weight or who gained weight.

outpatient programme. Results were superior in the individual outpatient programme with a mean weight loss at 2 years of 15.6 and 10.4 kg in men and women, respectively.

In this study there was a decrease in BMI and fat percentage. These findings are consistent with the findings in other studies. In a study aimed to estimate the short-term health effects of 15 weeks of intensive lifestyle intervention composed of physical activity, dietary changes and personal development in severely obese subjects of both sexes, Pedersen et al. (2006) reported that the fat percentage and BMI were reduced by 4% and 11%, respectively. A systematic review suggests that, on average, dietary counselling interventions for weight loss have resulted in a net loss of approximately 2 BMI units (6%) at 12 months compared with usual care (Dansinger et al. 2007).

The use of a food exchange system in this study assured an adequate intake of most nutrients at recommended levels when overweight and obese women followed it. The result of this study was consistent with Benezra et al. (2001).

In conclusion, a weight-loss programme should be tailored to the patient's weight-loss goals and level of motivation. Effective strategies of weight loss require management strategies in a combined approach of dietary therapy and physical activity using behavioural interventions. Visiting a nutrition specialist to receive individual counselling and prescription of a balanced low-calorie diet is part of a positive behaviour change leading to body weight loss. Consequently the clients who complied with diet modification as prescribed by the nutritionist achieved desirable weight loss

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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