

Qualitative Research

Effects of Cognitive-Behavioral Treatment for Weight Loss in Family Members

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ABSTRACT

The possibility that lifestyle changes may be shared by the family members of subjects with obesity attending cognitive-behavioral treatment (CBT) for weight loss has been scarcely evaluated. The purpose of this study was to measure the changes in body weight, lifestyle habits, and stage of change toward physical activity in the family members of 149 subjects with overweight/obesity enrolled into a weekly group CBT for weight management in the years 2007-2008. 230 adult (aged >18 years) family members (129 spouses, 72 children (43 female, 29 male), 29 with a different family relationship) completed a self-administered questionnaire at baseline and soon after the end of the completion of their relatives' program (approximately 6 months later). The questionnaire consisted of qualitative information regarding food choices, estimation of energy and food intake, self-report of height and weight, and motivation toward physical activity. At baseline, self-reported body mass index was normal in 115 cases, in the range 25 to 29.9 in 80 and ≥ 30 in 35. Following CBT of their relatives, the family members significantly reduced their average daily energy intake (-232 kcal/day; $P < 0.001$) and the reported body weight decreased on average by 1 kg ($P = 0.001$). The analysis of food choices revealed a reduced average daily amount of energy from dressings (-40 kcal, $P < 0.001$), main courses with cheese or fat meat (-24 kcal, $P = 0.002$), refined carbohydrates (-16 kcal, $P < 0.001$), bread (-58 kcal, $P < 0.001$), breakfast biscuits (-23 kcal, $P = 0.005$), chocolate (-7 kcal, $P = 0.024$), and nonalcoholic beverages (fruit juices and carbonated drinks; -10 kcal; $P = 0.013$),

whereas fruit consumption was increased ($+10$ kcal; $P = 0.023$). There was also a shift in the stage of change toward exercising. Body mass index changes of family members and CBT subjects were significantly correlated, mainly within spouses. In conclusion, CBT for weight loss positively influences the lifestyle habits of family members of participants, reducing energy intake and promoting a more favorable attitude toward physical activity. *J Am Diet Assoc.* 2011;111:1712-1719.

Interpersonal relationships can exert a social influence on obesity (1), and the importance of the dynamics within the family in the transfer of dietary habits has been extensively demonstrated in adults. The Framingham Heart Study showed that weight gain in one person is associated with consecutive weight gain in his or her siblings and spouse (1). In Canadian populations, cross-sectional (2) and longitudinal analyses (3) showed marked similarities in spousal adiposity, in keeping with the possibility that shared dietary habits may favor obesity. A few reports (4,5) showed that the types of food purchased and stored after shopping significantly correlated with dietary intake and the importance of home food environment on children's and adolescents' eating pattern (6) is well established. A recent systematic review and meta-analysis showed that child-parent resemblance in dietary intake, although moderate-to-weak and variable in different countries and ethnic groups (7-9), may be high in a few nutrients (namely, fat intake) and at young ages (10).

By contrast to the mimetic weight gain suggested above, interventions aimed at healthier lifestyles could have positive effects on adiposity in other family members. Studies in the cardiovascular and cancer area indicate that dietary interventions produce a ripple effect on energy intake and food choices of spouses (11-13). In particular, there were changes in fat intake, independent of the type of dietary intervention (14,15).

Cognitive-behavioral treatment (CBT) is considered the most effective nonsurgical strategy in the treatment of overweight and obesity. CBT for weight loss is designed to provide patients with a set of principles and techniques to modify their eating and activity habits (16). A modified eating and physical activity pattern during the weight-loss phase of CBT is also likely to influence the lifestyle and weight of family members cohabitating with the treated patient, but this issue has been rarely evaluated. In the Look AHEAD (Action for Health in Diabetes) trial measuring the effects of intentional weight loss in subjects with type 2 diabetes, Gorin and colleagues (17)

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showed a ripple effect of changes in the home food environment. The spouses of subjects randomized to the intensive lifestyle intervention lost more weight, had greater reductions in reported energy intake and percent of energy from fat than spouses in the control arm, treated by the usual diabetes support and education care.

This article reports our observational analysis of the influence of CBT on lifestyle habits and body weight of family members of subjects attending a weight loss program in a secondary care center, not limited to the spousal relationship. The purpose was to test the hypothesis that the beneficial effects of CBT extend to family members also outside specific research settings.

MATERIALS AND METHODS

Participants

In a longitudinal study the eating habits of a convenience sample comprising 230 adult (>18 years) family members of 149 subjects with overweight/obesity were evaluated. The participants had been enrolled into a CBT program for weight management at the center of Metabolic Diseases and Clinical Dietetics, University of Bologna, in the years 2007-2008.

The study was included in the in-hospital clinical activity and was approved by the Senior Staff Committee of the Department, an institution comparable to an Institutional Review Board regulating noninterventive studies. All family members signed an informed consent to record and transmit their data.

Intervention

CBT program participants completed an intensive program of 12 to 15 weekly group sessions of 120 minutes each, based on the Lifestyle, Exercise, Attitudes, Relationships, Nutrition program for weight control (18), carried out by registered dietitians and supported by a residential manual (19). During the group sessions (12 to 15 subjects), the participants were instructed on the principles of counting kilocalories, on monitoring their daily food intake (eating diary), on behavior strategies for stimulus control, and on a pattern for regular eating. Cognitive strategies focused on identifying high-risk situations responsible for binge eating and regaining a pattern of regular eating, learning problem-solving skills and identifying and coping with dysfunctional cognition, and identifying and restructuring dysfunctional cognition to maintain improvement and to prevent relapse. The last two topics were dealt with in two sessions carried out by a psychologist.

Methods

Family members completed a self-administered, original questionnaire (the "Quanto Mangio Veramente?" [in English: "How Much Do I Really Eat?"]), developed to obtain qualitative and quantitative information about food and energy intake. The tool was validated by comparison with a semistructured interview conducted by an experienced dietitian (20), with an error within 5% in the range between 1,500 and 3,000 kcal/day. The questionnaire is based on the weekly consumption and portion size (on a

5-point Likert scale) of 18 items related to habitual food intake, and a final item on the number of meals not consumed at home during the week (to account for the possible extra food intake when eating at restaurant). To help subjects with portion size, pictures are included to visually explain what is considered small-sized, medium-sized, or large-sized, whereas a few questions specifically investigate the number of certain items consumed during an average week (eg, number of fruits, number of sugar cubes or coffee-spoons). Each portion size is given an estimate (value) of its energy content (as multiple of a quantum of 50 kcal, to simplify calculations). The products of the number of the weekly intake of each item times the estimated kilocalorie value are summed to give the weekly energy intake, which is multiplied by 7 to obtain the average daily energy intake. An example is reported in Figure 1. The questionnaire has been extensively used by specialists and by general physicians in the area of Bologna (21). CBT program participants filled in the questionnaire during the first visit with the help of a registered dietitian, and were given additional copies to be filled at home by all adult family members living in their household, both at the beginning of the CBT program and at the time of the first control visit of their relatives, approximately 6 months after the first assessment.

On both occasions, adult family members were also asked to provide self-assessed data on height and weight and on a few habits (eg, alcohol intake, smoking, and habitual physical activity), closely linked with lifestyle behavior.

Motivation to physical activity according to stage of change in the Prochaska's transtheoretical model (22) was tested by a single question derived from the University of Rhode Island Changing Attitude (URICA) program (23), with modifications. The question "Have you been practicing regular physical activity (eg, brisk walking, aerobics, jogging, cycling, or swimming) three to five times per week for a total of at least 60 minutes?" had five possible answers, scored from 1 to 5: 1=Yes, for more than 6 months; 2=Yes, for less than 6 months; 3=No, but I am planning to start in the next 30 days; 4=No, but I think of starting in the next 6 months; and 5=No, and I do not think I'll start in the next 6 months.

Statistical Analyses

All data were implemented into a general database and analyzed using Stat View 5.0 (1998, SAS Institute Inc, Cary, NC). Descriptive analysis was carried out by the use of mean and standard deviation, or median and interquartile range for non-normally distributed variables. Comparisons between pre- and post-CBT values were carried out using parametric (paired t) and nonparametric (paired sign) tests. Correlation analyses were also carried out between body mass index (BMI) changes in family members and those observed in CBT participants. Values of $P < 0.05$ were considered statistically significant.

RESULTS

Index Cases

The study comprised 149 subjects with obesity (101 women, 48 men) who attended a CBT program during the

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