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Psychological Variables Associated with Weight Loss in Obese Patients Seeking Treatment at Medical Centers

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ABSTRACT

Background The identification of process and treatment variables associated with successful weight loss could be a pivotal strategy to reduce attrition and improve effectiveness of dietary treatment in obesity and could help find new therapeutic strategies.

Objective The aim of study is to identify the psychological predictors of weight loss in patients with obesity compliant to continuous treatment at medical centers.

Design Longitudinal observation of a large cohort of obese subjects entering weight-loss programs in the years 2000-2002.

Subjects/setting Five hundred obese patients who completed 12-month weight-loss treatment by Italian medical centers offering different programs (78.8% females; age 46.2±10.8 years; body mass index [BMI; calculated as kg/m^2] 37.3±5.6).

Main outcome measured Measurements were obtained at baseline and after a 12-month weight-loss program. Psychological distress, binge eating, body uneasiness, and attitude toward eating were evaluated by self-administered questionnaires (Symptom Check List-90, Binge Eating Scale, Body Uneasiness Test, and Eating Inventory [Dietary Restraint, Disinhibition, and Hunger]), together with BMI changes. Weight-loss expectations and primary motivation for seeking treatment (health or improving appearance) were also recorded.

Results At follow-up, mean percent weight loss was similar in males and females. Both hierarchical regression and logistic regression analysis revealed that increased dietary restraint and decreased disinhibition were the only independent psychological predictors of BMI change after controlling for age, sex, and baseline BMI (5% weight loss at 12 months: Eating Inventory Restraint (odds ratio [OR]: 1.15; 95% confidence interval [CI]: 1.09 to 1.21) and Disinhibition (OR: 0.92; 95% CI: 0.85 to 0.99); 10% weight loss: Restraint (OR: 1.11; 95% CI: 1.06 to 1.16) and Disinhibition (OR: 0.91; 95% CI: 0.85 to 0.98). Adjustment for centers did not change the results.

Conclusion Successful weight loss was associated with increased dietary restraint and reduced disinhibition in obese patients seeking weight-loss treatment in several medical centers throughout Italy.

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The identification of factors associated with successful weight loss is an important research area to improve the outcomes of obesity management. A close matching between treatment features and patients' pretreatment needs could be a pivotal strategy to reduce treatment attrition and to improve the effectiveness of therapy. Process and treatment variables associated with weight loss could help find new therapeutic strategies to improve outcomes.

In the past 30 years, several research trials have investigated the baseline predictors of successful obesity treatment and the results, often inconsistent, have been summarized in review articles (1,2) and books (3,4). Among patients' pretreatment variables, a very recent review found that little previous dieting, few weight-loss attempts, self-motivation, general efficacy, and autonomy were the best prospective predictors of successful weight management (5). Initial body mass index (BMI; calculated as kg/m^2) was associated with weight loss only in studies that included participants with severe obesity (ie, mean BMI >35), whereas the effects of body-image dissatisfaction, low self-esteem, unrealistic weight-loss expectations, and external locus of control remain controversial (5). Other psychological factors, such as binge eating, depression, eating disinhibition (ie, tendency to lose control, overeating when hungry or when exposed to external stimuli or negative mood states), dietary restraint (ie, perceived cognitive ability to restrain food intake in order to modify body weight and shape), perceived hunger, personality, general cognitive style, and

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perceived social support, did not systematically predict the amount of weight loss (5). The most recent studies confirmed the predictive role of self-efficacy (6,7) and baseline BMI in severely obese patients (8), but not in overweight individuals (9). Finally, no association has been observed between pretreatment weight-loss expectations and end-of-program weight loss (10-14), but the attrition rate was higher in patients with higher than expected 1-year BMI loss (15).

Several process variables were positively associated with the amount of weight loss, including an increase in dietary restraint (16), early weight loss, and continuous attendance to controls (3,17), higher frequency of self-monitoring (18-20), and consistent self-monitoring of weight (21). Finally, treatment factors affecting weight loss include an increased duration of treatment (22), the prescription of higher intensity physical activity (23), the provision of food (24), and the association of behavior therapy with weight-loss drugs (20).

Unfortunately, most data on the psychosocial factors associated with weight loss come from studies including mainly overweight women or obese women in the BMI range of 30 to 35, or are generated in research settings and cannot be generalized to the heterogeneous "real world" of the medical centers treating obesity.

Baseline and process-related psychological variables (eg, psychological distress, body uneasiness, binge eating, dietary restraint, disinhibition, and weight-loss expectations, as well as their changes at 1-year follow-up) are expected to play a major role in weight-loss outcomes in subjects with obesity. The aim of the present analysis was to analyze the role of psychosocial factors associated with weight loss in male and female patients with obesity, entering weight-loss programs offering prescriptive diet counseling (with or without additional antiobesity drug therapy) or cognitive-behavioral treatment in a large multisite Italian observational study (25). In the absence of a robust theory supported by empirical findings on the psychological factors associated with weight loss, the study included several psychological variables potentially relevant in the care of obese patients tested in previous research studies (5,26-28).

METHODS

QUOVADIS Study Planning and Protocol

The Quality of Life in Obesity: Evaluation and Disease Surveillance (QUOVADIS) study planning and protocol were described in detail in a previous article (25). The QUOVADIS study is an observational analysis of quality of life, psychological distress, and attitude toward eating in obese patients seeking weight-loss treatment at obesity medical centers accredited by the Italian Health Service. The centers were located in urban areas throughout Italy. The study design was observational and the centers treated patients according to their slightly different specific protocols, including dieting, cognitive behavioral therapy, and drugs.

All obese subjects (BMI $\geq$30) seeking treatment at participating medical centers in the years 2000 to 2002 were eligible for the QUOVADIS study, provided they were not on active treatment at the time of enrollment, were in the age range between 25 and 65 years, and agreed to fill in a package of self-administered questionnaires. All evaluations were carried out at baseline, approximately 1 week before the beginning of treatment, and were repeated after 12 months in 18 centers. Subjects entering protocols of bariatric surgery ($<$2% of total patients) were excluded.

In the course of the study, a large dropout rate was observed and the predictors of attrition have already been reported (15,29). The present analysis is based on the longitudinal data of subjects on continuous care at 12 months (500 cases, 21.2% males and 78.8% female) (Table 1). A post hoc analysis showed only minor differences between this selected population and the general QUOVADIS cohort (see Results: Baseline Characteristics). All data were stored in a large database, accessed by each center through an extranet system and electronic forms.

The general QUOVADIS protocol was approved by the committees of the various centers, after approval by the ethical committee of the coordinating center (Azienda Ospedaliera di Bologna, Policlinico S. Orsola-Malpighi). All participants gave written informed consent for participation.

Measures

Case Report Form. Physicians filled in the case report form at the time of enrollment by directly interviewing patients. It included demographic and weight data, a detailed diet history, expected 1-year weight loss, maximum acceptable weight, and desired weight. Expected 1-year loss was defined as "the amount of weight that patients were expecting to lose with treatment in the following 12 months." To help subjects quantify their expectations, this value was categorized in multiples of 10 kg. Maximum acceptable weight was defined as "the heaviest body weight that patients could accept and tolerate to reach after treatment," whereas desired weight was defined as "the body weight that they were hoping to achieve with treatment, however unrealistic it was." The case report form also included a question about reasons for seeking treatment. For this specific purpose, patients were asked to choose the main reason for entering a weight-loss program among three different answers: improving appearance, improving future health, or improving present health.

Psychosocial Measures. At baseline and at follow-up, participants completed a battery of questionnaires measuring psychological distress, binge eating, body uneasiness, and attitudes toward eating.

The Symptom Checklist-90R (SCL) (30) was used to identify psychological distress. For each item, patients scored how much that problem had distressed them during the previous week, with responses ranging from 0 (not at all) to 4 (extremely). The 90 items of the test were used to compute the Global Severity Index, an indicator of overall psychological distress (30). A value $\geq$1 in SCL-Global Severity Index or in a specific subscale is suggestive of psychopathology (1.00 to 1.49, mild; 1.50 to 1.99, moderate; $\geq$2.00, severe).

The internal consistency coefficients α for the nine dimensions of SCL ranged from .77 to .90 (30).

The Binge Eating Scale (31) was used to measure the severity of binge eating. It examines in 16 items, both behavioral signs (eating large amounts of food) and feel-