The influence of cognitive factors in the treatment of obesity: Lessons from the QUOVADIS study

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ABSTRACT

Weight-loss maintenance remains a problematic issue in lifestyle modification programmes, but a small percentage of individuals are able to maintain a significant long-term weight loss. This means cognitive mechanisms may effectively contrast the biological pressures to regain weight arising from an obesiogenic environment. Aims of this review were to summarizes and synthesizes the data on the cognitive factors associated with program attrition, weight loss and weight maintenance derived from the QUOVADIS (QUality of life in Obesity: eVAluation and DIsease Surveillance), an observational study on quality of life in 1944 obese patients seeking treatment in 25 medical centres in Italy, and discuss its results in light of other literature. The data obtained suggest that some cognitive factors are associated with treatment discontinuation (namely higher weight-loss expectations, appearance-based primary motivation for weight loss, and unsatisfactory progress), while others with the amount of weight lost (i.e., increased dietary restraint and reduced disinhibition) or with long-term weight loss maintenance in patients who interrupted the treatment (i.e., satisfaction with results achieved, confidence in being able to lose weight without professional help). All these findings have important clinical implications.

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Introduction

The short-term outcomes of weight-loss lifestyle modification programmes are generally satisfactory. Indeed, data from randomized controlled trials of structured group weight-loss interventions indicate that, on average, 80% of patients who enrol in such programmes go on to complete the treatment (Wadden & Butryn, 2003), with completers achieving a mean weight loss of 8—10% of their initial body weight within roughly 30 weeks (Wadden & Butryn, 2003). According to the 2013 Guidelines for the Management of Overweight and Obesity in Adults (Jensen et al., 2014), this amount of weight loss can be considered successful (i.e., in line with a 5—10% reduction of initial weight), being associated with a significant reduction in the incidence of type-2 diabetes (Knowler et al., 2002), and clinical improvements in weight-related medical comorbidities (e.g., sleep apnoea, diabetes, hypertension, hyperlipidaemia) (Jensen et al., 2014), and psychosocial outcomes (e.g., mood, quality of life, and body image) (Dalle Grave et al., 2007; Faulconbridge et al., 2012; Fontaine, Barofsky, Bartlett, Franckowiak, & Andersen, 2004).

However, in the year following treatment, obese participants in standard lifestyle-modification programs typically regain about 30—35% of the weight lost during treatment (Wadden, Butryn, & Byrne, 2004). Although weight regain tends to slow down after the first year, by 5 years post-treatment, 50% or more patients are likely to have returned to their baseline weight (Wadden, Sternberg, Letizia, Stunkard, & Foster, 1989). This indicates that a greater focus on long-term maintenance of weight loss is required for such programmes to be considered successful in real terms.

Thankfully, better long-term weight-loss outcomes have been demonstrated in trials of the latest generation of lifestyle modification programmes that include the most innovative and powerful procedures that the state of the art can offer. The most striking example is the Look AHEAD study, a long-term randomized trial of 5100 overweight participants with type-2 diabetes randomly assigned to either intensive lifestyle intervention (ILI) or diabetes support and education (DSE) (Ryan et al., 2003). At year 1, more ILI than DSE participants had lost ≥5% of their initial weight (68.0% vs.

13.3%), with the ILI group showing an average weight loss of 8.5%, significantly greater than the 0.6% seen in DSE participants. After 8 years, the weight-loss gap between the two groups had narrowed somewhat, with ILI and DSE participants having lost means of 4.7% and 2.1% of their starting weight, respectively, but about half of the ILI participants (50.3%) had maintained a loss of ≥5% of their initial body weight, as compared to only 35.7% in DSE participants (Look AHEAD Research Group, 2014). Despite these promising results in terms of long-term weight-loss outcome with respect to previously studied lifestyle modification programmes, it is clear that Look AHEAD was not able to definitively resolve the problem of weight regain in a large percentage of its participants.

In order to elucidate the factors implicated in the long-term maintenance of intentional weight loss, in-depth study of the characteristics of individuals who successfully achieve this goal is indispensable. To this end, the National Weight Control Registry (NWCR) compared the behavioural strategies adopted by successful individuals in this regard (i.e., an average weight loss of 37 pounds maintained for over 7 years) with those of regainers and weight-stable controls. This report revealed that, in addition to reporting higher levels of strenuous physical activity and a greater frequency of self-weighing, long-term maintainers continued to use many more behavioural strategies to control their dietary fat intake. (McGuire, Wing, Klem, & Hill, 1999). This report was not, unfortunately, set up to answer the central question, namely why some individuals do manage to continue to practice weight-control behaviours, and therefore maintain weight-loss long term, while others do not.

It has been suggested that the driving force behind weight regain is the biological pressure on individuals to overeat in order to restore their original weight (the set-point theory) (Keesey & Hirvonen, 1997). However, both the Look AHEAD and the NWCR studies clearly show that many individuals are able to overcome these pressures in the long-term and to maintain a significant weight loss through lifestyle modification. If biological pressures are not entirely to blame, it is conceivable that cognitive mechanisms interacting with specific changes in diet and physical activity may play a pivotal role in long-term weight maintenance. Indeed, the "complex behaviours" involved in lifestyle modification, in this case adopting and persisting with the strategies required to lose and maintain weight, are in part influenced by conscious cognitive processes. Nevertheless, cognitive factors have largely been overlooked in traditional weight-loss lifestyle modification programmes, which could be one of the main reasons for their limited effectiveness in promoting long-term weight loss (Cooper & Fairburn, 2001).

However, intriguing clues as to the cognitive factors associated with attrition, weight loss and weight maintenance are coming to light, in particular from the QUOVADIS study (QUality of life in Obesity: eVAluation and DIsease Surveillance). QUOVADIS was set out to investigate the quality of life of 1944 treatment-seeking obese patients in a "real-world" setting, represented by 25 medical centres authorized to treat obesity by the Italian National Health Service (Melchionda et al., 2003). The study was purely observational; all subjects received an anthropometric and clinical evaluation and were asked to complete a large number of self-administered questionnaires, to explore the psychological status, quality of life, body image and psychiatric distress. Patients were evaluated at baseline, approximately 1 week before beginning the treatment in question, and again 6 and 12 months after treatment. In 18 of the participating centres, an additional telephone interview follow-up was scheduled, on average 36 months after enrolment. All centres were expected to treat patients according to their own specific programmes, which included dieting and/or cognitive behavioural therapy, drugs and/or bariatric surgery (<2% of

patients). The protocol was approved by the ethical committees of different centres, as well as by the co-ordinating centre (Azienda Ospedaliera di Bologna, Policlinico S. Orsola — Malpighi), and informed written consent was obtained from all patients.

This review summarizes the QUOVADIS data on cognitive factors associated with attrition, weight loss and maintenance, and discusses the results with reference to the literature.

Cognitive factors and attrition

The association of some cognitive factors with attrition was tested in the large group of Italian obesity patients, 51.7% of whom interrupted their treatment programme after 12 months. The strongest predictors of attrition were lower age and higher expected one-year BMI loss, and attrition was also high in subjects with a primary motivation for weight loss based on their appearance. As regards the initial weight loss expectations, at baseline the group as a whole reported a mean dream body mass index (BMI) that would entail an overall weight loss of 32%, and a maximum perceived acceptable BMI corresponding to weight loss of 23% (Dalle Grave et al., 2004). These values are in fairly good agreement with data reported by a large randomized controlled trial combining behavioural and pharmacological intervention for weight loss (Fabricatore et al., 2007). The risk of dropout increased systematically per unit increase in expected BMI loss at 12 months, and was particularly high in the first 6 months (Dalle Grave, Calugi, et al., 2005). After 36 months, only 15.7% of the patients in the 15 medical centres that provided a continuous care programme remained in active treatment (Dalle Grave, Melchionda, et al., 2005). Again, the strongest predictors of adherence were lower expected 1-year BMI loss and older age (Table 1). These observations raise three key issues that need to be addressed in order to improve long-term outcomes of obesity treatment, namely (i) patients seeking treatment have unrealistic weight loss expectations; (ii) the greater the expected BMI loss, the shorter the time to dropout; (iii) goals other than weight loss, such an overriding motivation to improve appearance, are also associated with attrition.

Although the data on attrition from the QUOVADIS study are clear, and supported by other research linking higher initial weight-loss expectations with a higher dropout rate (Teixeira et al., 2004), two studies have failed to find an association with initial expectations and behavioural therapy attendance (Fabricatore et al., 2007; Linde, Jeffery, Finch, Ng, & Rothman, 2004). Accordingly, a recent review stated that the importance of setting realistic goals for

Table 1
Univariate analyses of pre-treatment factors associated with 3-year dropout in the QUOVADIS population. Only demographic variables, data of weight history and weight loss expectations were considered in the analysis. Data are presented as odds ratios (OR) and 95% confidence intervals (CI).

	OR	95% CI	P value
Demographic variables			
Age (years/10)	0.79	0.72—0.86	<0.001
Male gender	1.21	0.97—1.52	0.097
BMI (kg/m²/5)	1.00	0.93—1.08	0.982
Body weight history			
BMI at age 20 (kg/m²/5)	1.09	0.99—1.19	0.074
Age at first dieting (years/10)	0.88	0.81—0.97	0.008
Maximum weight loss in previous dieting (%/10)	1.08	0.97—1.21	0.173
Weight loss expectations			
Maximum Acceptable BMI (kg/m²/5)	0.91	0.82—1.02	0.120
Dream BMI (kg/m²/5)	0.78	0.67—0.90	<0.001
Expected One-Year BMI Loss (kg/m²/5)	1.05	1.02—1.07	<0.001

Note that the probability of dropout increased systematically with increasing weight loss expectations and with lower Dream BMI, age and age at first diet.