Relation of Dieting and Voluntary Weight Loss to Psychological Functioning and Binge Eating

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■ **Voluntary weight loss in obese patients consistently reduces negative emotions such as depression and anxiety in the short term. Dieting by persons of normal weight is associated with low self-esteem and depressive symptoms. Dieting is linked to the development and maintenance of eating disorders such as anorexia nervosa and bulimia nervosa, although the precise nature of this association is unclear. Dieting cannot be a sufficient causal condition and must combine with other still undetermined vulnerabilities to cause eating disorders. Identification of these risk factors must precede the development of effective programs to prevent eating disorders.**

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Dieting and Weight Loss in Obese Persons

Weight loss treatments combining dietary control with increased exercise and other lifestyle changes are effective in producing weight loss in persons with mild (20% to 40% overweight) to moderate (40% to 100% overweight) obesity (1). This weight loss is successfully maintained in the short term (6 to 12 months) in roughly two thirds of patients (2-4). Both positive and negative psychological sequelae of these weight loss treatments have been reported.

The most extensively studied psychological consequence of diet-induced weight loss has been depression. Although studies completed before 1980 found that weight loss was associated with increased depression (5), subsequent studies have shown decreases in depression of 50% or more in the short term (4, 6). In a comprehensive review of the literature, Smoller and colleagues (7) argued that changes in depression occurring after weight loss have been primarily a function of the method used to assess psychological effects. Reported adverse reactions may have been the result of interpretive bias in that they were ascertained through retrospective and subjective assessment. Reported beneficial effects of weight loss have been shown by more objective outcome measures. Although dietary and behavioral treatments have produced reliable and significant decreases in depression and anxiety from pre- to post-treatment stages, transient increases in negative affect have been noted during the course of treatment (7). In one study, 54% of patients reported an increase of 25% or more in depressive symptoms at some point during the course of treatment (8); however, transient emotional changes are common in psychological therapy for most clinical disorders. Furthermore, the absence of a nondieting control group in these studies precludes the attribution of these transient mood fluctuations to dieting itself.

Behavioral weight control treatments also result in other beneficial short-term psychological effects. Body-image dissatisfaction is decreased and body-size estimation is reduced (9, 10). Enhanced self-esteem, improved interpersonal functioning, and increased marital satisfaction have also been reported. Surgical treatments of morbid obesity have produced consistently beneficial effects on self-esteem, mood, body image, interpersonal functioning, and sexual relations in most patients (11, 12).

Dieting and Weight Loss in Normal-Weight Persons

Persons of normal weight show reactions to dieting that differ markedly from those seen in overweight persons. The negative effects of extreme dieting were shown by Keys and colleagues' (13) study of young men on a semistarvation diet that resulted in the loss of roughly 25% of their body weight. Extreme negative emotional reactions were common. More conventional, self-initiated dieting is also associated with adverse psychological effects in young women of normal weight. Cross-sectional studies of adolescent girls have indicated that, independent of the effect of body weight itself, dietary restraint is correlated with feelings of failure, lowered self-esteem, and depressive symptoms (14-16). Dieting has also been shown to predict stress (17); however, stress is not a predictor of dieting.

The Link of Dieting to Eating Disorders

Bulimia nervosa is an eating disorder characterized by the uncontrolled consumption of large amounts of food (binge eating), compensatory behaviors aimed at avoiding weight gain (for example, purging), and abnormal attitudes toward body weight and shape. Anorexia nervosa is marked by the same attitudinal disturbance and a body weight of at least 15% less than expected. Roughly one half of patients with anorexia nervosa also binge or purge (18). A striking feature of these eating disorders is that they are largely confined to women. The gender-related prevalence of eating disorders seems to be linked directly to the fact that women, driven by psychosocial pressure to achieve the culturally determined ideal of physical beauty, diet more frequently than do men.

Anorexia Nervosa and Bulimia Nervosa

Several lines of evidence suggest that dieting is closely linked to anorexia nervosa and bulimia nervosa.

Clinical descriptions consistently indicate that patients with bulimia nervosa almost always report that their binge eating began when they were on a diet (19, 20). Dieting is a prominent, albeit often neglected, feature of bulimia nervosa (21) and is one of the most difficult to change. In addition, renewed dietary restriction after successful treatment of bulimia nervosa is a common cause of relapse.

Eating disorders are most common in the specific groups that are most involved in dieting and weight loss—predominantly white, middle- to upper-class women. An overall correlation appears to exist between cultural pressure to be thin and prevalence of eating disorders both across and within different ethnic groups (22). Eating disorders occur more frequently among persons involved in occupations (23) and sports (24) that require low body weight.

Two prospective studies have linked dieting to the development of eating disorders. Patton and colleagues (25) studied a representative sample of 15-year-old school girls in London. Compared with nondieters, dieters were significantly at risk for developing an eating disorder within 1 year. Only a small portion of the girls who were dieting at the beginning of the study (21%) subsequently were diagnosed as having an eating disorder, but dieters were eight times more likely than nondieters to develop an eating disorder. The second prospective analysis comes from Kendler and associates (26), who studied more than 1000 female twins located through the Virginia Twin Registry. Self-reported weight fluctuation (maximum to minimum weight) and current dieting status predicted the diagnosis of bulimia nervosa during a subsequent interview conducted 1 to 3 years later.

Additional evidence comes from laboratory studies of what Polivy and Herman (27) have called "restrained eaters." Restrained eaters typically consume less food than their unrestrained counterparts (28). Although the findings from laboratory studies of restrained eating are complex, attention has been focused on the finding that restrained eaters differ from unrestrained eaters in the amount of food they eat after having consumed an actual or perceived high-calorie preload (29). In these studies, unrestrained eaters typically regulate their eating so that they eat less after a preload than do those who do not receive a preload. Restrained eaters have been shown to regulate their intake in the absence of a preload but to eat significantly more in a taste test conducted after consumption of a preload. This pattern of disinhibited eating has been called counter-regulation and has been put forward as an experimental analog of binge eating. Restrained eaters have shown similar disinhibition of consumption under the influence of a negative emotional state (30), which is also characteristic of clinical binge eating.

Binge Eating in the Obese

Approximately 30% of obese patients seeking weight control treatment meet the diagnostic criteria of what Spitzer and colleagues (31) have described as binge-eating disorder. Persons with this disorder engage in recurrent binge eating but do not meet the diagnostic criteria for bulimia nervosa because no compensatory behavior (for example, purging) or comparable attitudinal disturbance exists. The available evidence on the association between dieting and binge eating in obese patients is less clear, however, than in anorexia nervosa and bulimia nervosa.

Comparisons of obese binge eaters and non–binge eaters have not shown greater dietary restraint in the former, although differences in assessment methods and patient samples make comparisons among studies difficult. Two comparisons of obese patients with and without binge eating showed no difference on the restraint scale of Stunkard and Messick's (32) Three Factor Eating Questionnaire (33, 34). Wilson and coworkers (35) found that only a minority of obese binge eaters reported being on a strict diet at the time that binge eating began. Furthermore, binge eaters did not differ from nonbingers on several diet-related activities, such as restriction of food to influence body weight, avoidance of eating, avoidance of specific foods, and adherence to definite rules about food intake.

Using a semistructured clinical interview (the Eating Disorder Examination) (36), Marcus and colleagues (37) found that obese binge eaters practiced less dietary restraint than did patients of normal weight who had bulimia nervosa and did not differ from normal-weight, nonbulimic restrained eaters on dietary restraint. Similarly, Rossiter and colleagues (38) found that overweight patients with binge-eating showed less dietary restraint than did patients with bulimia nervosa, but more restraint than normal, on self-monitored caloric intake during binge-free days and on a questionnaire measuring dietary restraint. These investigators suggested that it is advisable for such overweight persons to restrict their food intake to lose weight. The alternative view is that continued dietary restriction serves only to perpetuate binge eating and should be discouraged (39, 40).

Concern has been expressed that, because of their restriction and rigidity, very-low-calorie diets (VLCDs) might precipitate binge eating. In a study of obese patients with type II diabetes, Wing (6) compared the rates of dietary lapses during behavioral treatment combined with either a VLCD (400 kcal/d) or a balanced diet (1000 to 1500 kcal/d). The two dietary programs did not differ on either objective (intake of food 20% or more above daily calorie goal) or subjective (patients' perceptions that they had transgressed calorie limits) lapses. Telch and Agras (41) assessed the frequency of binge-eating episodes during a combined VLCD and behavioral weight-loss program. After the VLCD ended and patients were reintroduced to food, 30% of those who had been identified as non–binge eaters before treatment subsequently reported binge-eating episodes. These preliminary data highlight the potentially adverse effects of severe dieting on binge eating.

A Necessary but Not Sufficient Condition?

Some investigators consider dieting to be a necessary but insufficient cause of eating disorders (22). Blundell (42), however, questions whether "dieting is a genuine precursor (i.e., a necessary precondition) or is it simply

an inevitable antecedent (with no causal significance)?" The available data do not provide a definitive answer to this question. In linking dieting to the development of disordered eating and eating disorders, it is important to be aware of the different types of dieting and dieters (43). Dieters vary both in the pattern and content of daily eating behavior (28). A subgroup of restrained eaters who appear to have achieved stable, long-term weights that are lower than their previous weights have been called "successful dieters" or "weight suppressors" by Lowe and Kleifield (44). They differ functionally from other restrained eaters in that they do not show counter-regulation in the laboratory. Tuschl (43) concluded that "some forms of dietary restraint are more apt to disarrange intake regulation than others. It can be hypothesized that the more chaotic the everyday eating behavior, the higher the risk of developing bulimia."

Most adolescent and young adult women in the United States diet. Yet, the lifetime prevalence for bulimia nervosa in women is estimated to be 1.5% to 2% (45). Some other factor must interact with dieting to cause eating disorders. These risk factors may range from genetic predisposition and biological vulnerability, through personality and individual psychopathologic factors, to familial influences (22). We do not know the nature of these risk factors or their psychopathologic mechanisms.

Mechanisms whereby Dieting Might Lead to Binge Eating

Dieting has various biological, cognitive, and affective consequences that may predispose persons to binge eating. Among biological effects, short-term dieting in normal persons produces an increase in the prolactin response to the administration of L-tryptophan, which the investigators interpreted as evidence of reduced 5-hydroxytryptamine (5-HT) in the brain (46). Patients with anorexia nervosa have been found to have low levels of the 5-HT metabolite, 5-hydroxyindoleactic acid, in their cerebrospinal fluid (47), suggesting reduced levels of brain serotonin.

At the cognitive level, unrealistically rigid standards of dietary restraint, coupled with a sense of deprivation, leave the dieter vulnerable to loss of control after perceived or actual transgression of the diet. A lapse leads to an "all-or-nothing" cognitive reaction. In this phenomenon, called the abstinence violation effect (48), the person attributes the lapse to a complete inability to maintain control, abandons all attempts to regulate food intake, and overeats. This mechanism has been advanced to explain counter-regulation, but direct empirical support is lacking.

Dieting can be associated with different conditioning processes that may predispose a person to binge eating. First, it may increase the appeal of "forbidden" or "binge" foods (typically those high in fat and sugar) directly by nutritional preference conditioning (49). Second, terminating meals because of a self-imposed limit rather than satiation, combined with variability in intake (skipping meals), can extinguish conditioned satiety responses and lead to increasingly larger meal sizes (43, 50). Finally, dieting may cause stress (17) or make the dieter more vulnerable to its effects. Stress is reported to be a precipitant of binge eating (18).

Future Research Directions

Implications for Obesity Treatment

The short-term effects of weight loss cannot be considered apart from the consistent finding that this reduction is not maintained in the long term (39). For most obese patients, weight loss inevitably means weight regain. For most patients, this cycle is one of recurring success and failure. Although the biological consequences of weight cycling have been studied in some detail (51, 52), the putative psychological impact has been neglected (39). Critics of dietary treatments of obesity assert that the impact is typically devastating, sabotaging self-esteem and adding to the existing social stigma of obesity (53). The validity of these claims must be determined by systematic research rather than by anecdotal observations.

How is Dieting Linked to Eating Disorders?

Dieting is associated with the onset of binge eating, but we do not know what type of dieting may predispose to an eating disorder. Similarly, a group of persons at greatest risk for such disorders has not been identified. Identification of the biological or psychological vulnerabilities that combine with dieting to trigger eating disorders is the pressing need. Simply knowing that dieting is a risk factor for the development of eating disorders severely limits our ability to design effective prevention strategies. Most young women in our society diet. Thus, a prevention program would have to be targeted somewhat indiscriminately at most young women.

A preferred alternative for pursuing research on prevention of eating disorders is to identify those adolescents and young adults who are at the greatest risk for developing eating disorders. Fairburn and Beglin (45) have proposed a case-control design in which the first step is to screen a sufficiently large population to obtain a sample of representative cases of eating disorders. Second, the rates of occurrence of putative (theory-driven and clinically based) risk factors would then be compared in the cases and carefully matched controls. An observed difference in the rates would suggest that the factors might be of etiologic significance and would ideally be pursued through prospective research (45).

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