Psychosocial consequences of weight reduction: 
how much weight loss is enough? 

Thomas A Wadden, Suzanne N Steen, Barbara J Wingate, and Gary D Foster

ABSTRACT We reviewed the psychosocial consequences of 
weight reduction and concluded that weight loss is usually associated 
with improvements in mood in significantly obese individuals (≥ 20% overweight) who are treated by diet and lifestyle 
modification. Less is known about the psychologic effects of 
weight loss in mildly overweight individuals who reduce their 
weight on their own but the limited data suggest similarly positive 
effects. We recommend that significantly obese individuals seek 
10% reduction in body weight, a loss that is likely to be associated 
with improvements in psychologic as well as physical health. A 
loss of this magnitude is typically produced by 16–20 wk of 
treatment by diet and behavior modification. Persons who are 
mildly overweight (particularly those with health complications) 
are encouraged to reduce their weight by increasing their physical 
activity. Exercise is associated with modest but long-term weight 
losses and with improvements in mood and physical health. The 
recommendation that overweight Americans seek a healthier 
weight should be combined with efforts to promote healthier 
attitudes toward weight and shape in normal-weight women and 

KEY WORDS Obesity, weight loss, dieting, mood, 
psychologic status, depression, body weight, healthy weight

INTRODUCTION Every year millions of Americans try to lose weight to 
improve their health, fitness, and appearance (1). This is true of 
persons who wish to lose as little as 1 kg or as much as 100. Surprisingly, little research has been conducted on the psychologic 
effects of weight loss, although clinical findings suggest that 
they are largely positive and include improvements in mood, self-esteem, and body image (2). We briefly review the 
literature on this topic and provide recommendations for max-
izing the psychosocial benefits of weight loss.

PSYCHOSOCIAL CONSEQUENCES OF WEIGHT LOSS 
AND DIETING Early studies, published in the 1950s and 1960s, reported 
that weight-loss efforts were associated with adverse emotional 
reactions (3). Stunkard (4), for example, reported in 1957 that 
54% of patients complained of weakness, nervousness, and 
related problems while dieting—complaints that were 
confirmed by other investigators (3). Psychotic reactions were 
even described in some cases. These findings are in sharp 
contrast with reports during the past 25 y of positive changes in 
mood in persons treated in group behavioral weight-loss pro-
grams (2, 5–7). These studies revealed improvements in de-
pression and anxiety or, at a minimum, no worsening in affect.

Several factors appear to account for the discrepancy be-
tween the early and later studies (6). Reports in the 1950s and 
1960s were confined primarily to overweight patients who 
were undergoing psychodynamic psychotherapy (3), a sample 
population likely to have sought such treatment because of 
their increased emotional disturbance. By contrast, the more 
recent behavioral studies involved obese individuals who vol-
unteered specifically for weight-reduction studies and who 
received both group support and cognitive-behavioral therapy, 
each of which may have favorably influenced mood (6, 7). The 
relation of these variables to changes in mood is shown in 
Table 1, which summarizes the results of weight loss studies 
that reported changes in psychologic status that were either 
equivocally positive or negative (6).

The most telling difference, however, between the two sets 
of studies was the method by which mood was assessed (6). Early reports were based largely on psychiatrists’ clinical 
observations (ie, idiographic assessment) made over the course of 
treatment. The validity and reliability of these observations 
were not determined and are subject to criticism (6). By con-
trast, later findings of positive mood changes were obtained in 
response to well-validated self-report inventories (ie, nomo-
thetic assessment) that were usually administered before and 
after weight loss (6, 7). As shown in Table 1, 100% of the 
 studies that used idiographic assessment reported negative 
emotional responses to weight loss, whereas 100% of those 
that used well-validated, nomothetic instruments observed benign 
mood changes.

The differences in the two sets of findings may also reflect 
differences in times of assessment (6). Evaluation of mood 
only before and after weight loss, as in most behavioral studies, 
may capture primarily the positive effects of weight loss, 
whereas more frequent assessment of mood, as in the early 
studies, may reveal the daily stresses and strains of dieting. 
Such stresses may include feeling hungry and deprived or

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TABLE 1
Eight variables and their relation to affective outcome in studies with unequivocal results

<table>
<thead>
<tr>
<th>Variable and number of studies</th>
<th>Benign mood changes</th>
<th>Adverse mood changes</th>
<th>% of studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of assessment²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nomothetic (n = 16)</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Idiographic (n = 9)</td>
<td>0</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Frequency of assessment⁴</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before and after (n = 11)</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>More frequent (n = 13)</td>
<td>46.2</td>
<td>53.8</td>
<td></td>
</tr>
<tr>
<td>Clinical orientation⁴</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioral (n = 11)</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Medical (n = 10)</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Psychiatric (n = 8)</td>
<td>0</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Group or individual⁵</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group (n = 9)</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Individual (n = 18)</td>
<td>55.6</td>
<td>44.4</td>
<td></td>
</tr>
<tr>
<td>Treatment setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient (n = 11)</td>
<td>63.6</td>
<td>36.4</td>
<td></td>
</tr>
<tr>
<td>Outpatient (n = 18)</td>
<td>77.8</td>
<td>22.2</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥15 wk (n = 13)</td>
<td>76.9</td>
<td>23.1</td>
<td></td>
</tr>
<tr>
<td>≤10 wk (n = 13)</td>
<td>76.9</td>
<td>23.1</td>
<td></td>
</tr>
<tr>
<td>Weight loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 9 kg (n = 13)</td>
<td>53.8</td>
<td>46.2</td>
<td></td>
</tr>
<tr>
<td>≤9 kg (n = 13)</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Attrition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥11% (n = 12)</td>
<td>83.3</td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>≤10% (n = 12)</td>
<td>83.3</td>
<td>16.7</td>
<td></td>
</tr>
</tbody>
</table>

¹ From reference 6, with permission.
²-⁵ Chi-square P values as follows: ² P < 0.0001, ³ P < 0.01, ⁴ P < 0.05, ⁵ P < 0.001.

The second factor is that most studies were limited to assessing decreases in negative emotions such as depression or anxiety, rather than increases in positive experiences such as the pleasure of participating in new recreational activities (2, 5). Thus, studies are needed that assess changes in quality of life across a variety of areas including self-esteem, body image, and energy level, as well as satisfaction with appearance, work, and intimate relationships (15, 16). Research is needed not only on significantly obese patients in organized programs but, more importantly, on the millions of slightly overweight individuals who undertake weight loss on their own each year.

Future studies should also be sensitive to the possibility that weight loss has different psychosocial consequences in different types of patients. A large weight loss, for example, may lead some individuals to reevaluate their relationships with family members and friends and to seek changes in these relationships (2). Although such changes may ultimately be positive, they can be disruptive in the short term, as in, for example, individuals who leave their unsatisfactory marriages after successful surgical treatment of their obesity (17). In rare cases, weight reduction may precipitate feelings of increased anxiety and vulnerability; this has been reported in some women with a history of sexual abuse (18).

EFFECTS OF DIFFERENT TREATMENTS

Research is also needed to assess whether the method by which weight is lost significantly affects psychosocial functioning. For example, some investigators believe that dieting (ie, energy restriction) produces unrealistic, unhealthy attitudes toward food and eating that may lead to dysphoria and binge eating in obese individuals (19–21). More serious adverse consequences, including anorexia and bulimia nervosa, occur in a small but significant percentage of normal-weight adolescent girls who diet too aggressively (19, 20). Dieting is not a sufficient cause of eating disorders, given that the great majority of dieters, whether only slightly overweight or very obese, do not develop such complications (22). Instead, dieting appears to contribute to disordered eating in persons with preexisting vulnerabilities, including low self-esteem, affective disturbance, or a genetic predisposition (22).

In contrast with dieting, exercise is almost universally associated with improvements in mood and self-esteem (23). Compared with most dietary interventions, exercise (when used alone) produces modest weight losses but these losses may be better maintained for ≥1 y after treatment than are losses produced by diet (24). Moreover, the addition of exercise to dietary interventions clearly improves long-term weight loss compared with diet alone (25), a finding that investigators attribute to the positive psychologic effects of physical activity (26). Thus, further research is needed to compare the effects of different treatments on short- and long-term changes in psychologic status, as well as on weight and physical health.

AMOUNT OF WEIGHT LOSS NEEDED FOR PSYCHOSOCIAL IMPROVEMENT

It is common when examining weight reduction and changes in blood pressure or cholesterol to calculate a dose-response relation. Thus, for example, Datillo and Kris-Etherton (27)
found that for every 1-kg decrease in body weight there was a 0.05-mmol reduction in total cholesterol. It is possible, but more difficult, to calculate a dose-response relation between changes in weight and psychosocial functioning. This calculation is difficult because psychosocial functioning covers multiple domains, including satisfaction with one’s weight, intimate relationships, and work, compared with the singular and clearly defined endpoints of total serum cholesterol concentration or diastolic blood pressure.

Moreover, as discussed above, changes in psychosocial function are likely to be a function of the method by which weight is lost rather than simply of the amount of weight lost (25). In their review of the literature, which was published in 1974, Stunkard and Rush (3) concluded that larger weight losses (>9 kg) were more likely to be associated with adverse emotional reactions. Although this finding may have held true with some methods of weight reduction, subsequent research revealed positive changes in psychosocial status in patients who lost 20–30 kg by adhering to a very-low-energy diet (14) or ≥50 kg as a result of surgical intervention (28).

The lack of a clear dose-response relation is further illustrated by recent findings that significantly obese individuals who were encouraged to stop dieting and to accept their bodies achieved significant improvements in their mood and self-esteem while gaining rather than losing weight (29). Studies of obese individuals treated by cognitive-behavioral therapy for their binge eating (30) or body-image disturbance (31), but not their excess weight, yielded similar findings. Thus, it is possible to improve overweight individuals’ psychosocial functioning by persuading them to change their self-perceptions rather than their weight. It is highly unlikely that such an approach would improve weight-related complications such as hyperlipidemia or hypertension.

REASONABLE WEIGHT-LOSS GOALS

We believe that individuals with obesity-related health complications should be encouraged to lose weight to improve their health. Such individuals, however, do not necessarily have to reduce to an “ideal” weight, and many apparently cannot, whether because of biological or behavioral limitations. Thus, we recommended that patients seek a “reasonable” weight—one that is consistent with their weight history and that is more likely to be obtainable (32, 33). A proposed definition of a reasonable weight is the lowest weight since the age of 21 y that the patient was able to maintain for 1 y without excessive exercise or dieting (32).

These criteria for reasonable weight have yet to be empirically validated and there are obstacles to doing so. In addition, a review of the weight histories of 50 women in a recent study found that most would have to lose ≥25 kg to achieve even the proposed definition of a reasonable weight (34). Losses of this magnitude are beyond the reach of most obese women (35).

Thus, we believe that it is more prudent to speak of a reasonable weight loss. A loss of 10% of initial weight appears to be an appropriate first goal for most significantly obese individuals, as suggested by Blackburn and Kanders (36, 37). Three factors support this recommendation. First, it is obtainable. Patients treated for 20 wk with an ~5.0–6.3-MJ/d (1200–1500-kcal/d) diet and behavior modification lost an average of 9–10% of their initial weight (35). Second, a weight loss of this magnitude is associated with significant improvements in cholesterol, blood pressure, blood glucose, and other health indexes, as reported by several investigators (36–38). Third, a 10% weight reduction can be maintained for ≥1 y, either by biweekly group behavior-modification sessions (14, 39) or by long-term treatment with fenfluramine and phentermine (40).

Neither of these interventions, however, appears to be sufficient in most significantly obese individuals to induce and maintain weight losses ≥15% of initial weight (41). Surgical procedures are typically successful in inducing and maintaining (for 5 y) reductions of ≥25% of initial weight but are appropriate only for the 2% of obese individuals who are ≥100% over their recommended weight (42, 43).

PSYCHOSOCIAL BENEFITS

Is a 10% reduction in initial weight associated with improvements in psychosocial functioning? The answer, based on the positive results of behavioral weight-loss programs described previously, is “yes” (6, 7, 14). Moreover, patients frequently report improvements in mood after only the first few treatment sessions before they have reduced their weight by even 5% (2). They feel better as a result of taking charge of their eating and exercise habits and, ultimately, their weight.

Our clinical experience suggests that, to ensure the most favorable improvements in psychosocial functioning, practitioners must persuade patients that a 10% reduction in initial weight is a success, even if the patient remains significantly obese after weight loss. This can be done by showing patients that their physical health has improved with weight loss and that they are able to participate in new recreational and social activities. Cognitive behavioral therapy may be particularly helpful for persons who continue to report marked body-image dissatisfaction after weight loss or who feel that their weight prevents them from leading a satisfying life (31).

THE PROBLEM OF WEIGHT REGAIN

Although weight loss is usually associated with improvements in both psychologic and physical health, these benefits alone do not appear to be sufficiently reinforcing to maintain long-term reductions in body weight (44). Most patients treated in research and commercial programs regain their lost weight within 5 y, for reasons that are not well understood (44).

There have been few studies of the psychosocial consequences of weight regain but investigators fear ill effects. Patients in a pilot investigation reported that weight regain negatively affected their self-esteem, self-confidence, general degree of happiness, and satisfaction with their appearance (45). Additional studies showed that patients’ depression scores increase as they regain weight (14, 46), although scores generally do not exceed baseline, even with full weight regain (45). Further study is needed of this issue as well as of the long-term psychologic effects of cycles of weight loss and regain (34).

It is not known whether there is a dose-response relation between weight regain and psychologic distress. Clinical experience, however, suggests that large fluctuations in body weight (ie, weight loss and regain) may have more adverse
effects than do small ones (2, 5). This possibility, as well as the clear difficulty in maintaining weight losses > 10–15% of initial body weight, argues in favor of significantly obese individuals seeking only modest reductions in weight. Ultimately, empirical studies are needed to provide guidance in this area.

WEIGHT LOSS IN THE GENERAL POPULATION

The data reviewed in this paper are primarily from studies of significantly obese individuals who were treated in research trials. We believe, however, that the finding of positive changes in psychosocial status with weight loss is applicable to obese individuals in the general population who reduce their weight on their own, as well as to persons who are only mildly overweight (< 20% over their recommended weight). Persons in this latter group should be encouraged to lose weight, particularly if they have upper-body obesity, are younger, and have weight-related complications or a family history of such complications (47). Increased physical activity is the treatment of choice for such persons because it is associated with long-term improvements in weight as well as in psychological and physical health (23, 26).

Special care must be taken to ensure that young women and girls do not misconstrue the recommendation that overweight Americans take steps to achieve a healthier weight. Too many normal-weight or near-normal-weight adolescent girls already report that they are dissatisfied with their weight and figure; for them, dieting has become the national pasttime (48). Aggressive weight reduction efforts by such individuals usually do not enhance self-esteem but instead reflect its absence. Thus, the recommendation that overweight Americans seek a healthier weight should be combined with efforts to promote healthier attitudes toward weight and shape in young women and girls.

REFERENCES


