

Obesity and Depression:-Is There Any Link?

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Introduction

Both obesity and common mental health disorders account for a significant proportion of the global burden of disease. There are bi-directional associations between mental health problems and obesity, with levels of obesity, gender, age and socioeconomic status being key risk factors. The mental health of women is more closely affected by overweight and obesity than that of men. There is strong evidence to suggest an association between obesity and poor mental health in teenagers and adults. This evidence is weaker for younger children. The relationships between actual body weight, self-perception of weight and weight stigmatisation are complex and this varies across cultures, age and ethnic groups. The perception of being obese appears to be more predictive of mental disorders than actual obesity in both adults and children. Weight stigma increases vulnerability to depression, low self-esteem, poor body image, maladaptive eating behaviours and exercise avoidance.

Obesity has become a serious public health problem, with approximately 32.2% of Americans classified as obese (1). Obesity has been found to be associated with negative health outcomes (2), functional impairment (3), and increased mortality (4). Similarly, depression is one of the most serious mental health problems in the country with substantial consequences of human suffering, loss of life, and lost productivity (5).

Obesity is a state of excess adipose tissue mass. Although often viewed as equivalent to increased body weight, this need not be the case since lean but very muscular individuals may be overweight by numerical standards without having increased adiposity. Body weights are distributed continuously in populations, so that choice of a medically meaningful distinction between lean and obese is somewhat arbitrary. Obesity is therefore more effectively defined by assessing its linkage to morbidity or mortality. Although not a direct measure of adiposity, the most widely used method to gauge obesity is the body mass index (BMI), which is equal to weight/height² (kg/m²). Other approaches to quantifying obesity include anthropometry (skin-fold thickness), densitometry (underwater weighing), CT or MRI, and electrical

impedance. Using data from the Metropolitan Life Tables, BMIs for the midpoint of all heights and frames among both men and women range from 19-26 kg/m² at a similar BMI, women have more body fat than men. Based on data of substantial morbidity, a BMI of 30 is most commonly used as a threshold for obesity in both men and women. Most authorities use the term overweight (rather than obese) to describe individuals with BMIs between 25 and 30. A BMI between 25 and 30 should be viewed as medically significant and worthy of therapeutic intervention, especially in the presence of risk factors that are influenced by adiposity, such as hypertension and glucose intolerance (6).

One of the most commonly-used and respected instruments to measure depression is the Beck Depression Inventory (BDI). It includes two subscales i.e. cognitive and somatic subscale. The cognitive subscale contains 8 symptoms which includes self-dislike, pessimism, past failures, guilty feelings, punishment feelings, self-criticalness, suicidal thoughts or wishes and worthlessness. The somatic subscale has 13 items which includes sadness, loss of pleasure, crying, agitation, loss of interest, indecisiveness, loss of energy, change in sleep patterns, irritability, change in appetite, concentration difficulties, tiredness and/or fatigue and loss of interest in sex.

Pathophysiology

The relationship between obesity and depression is complex. There are several theories about how the two are linked. Behavioral mechanisms, such as functional impairment and repeated dieting, cognitive mechanisms, such as body image dissatisfaction (BID) and poor self-rated health, and social mechanisms, such as stigma, may all play a role in the pathway from obesity to depression. There are two common mechanisms to explain the link between obesity and depression viz., a "health concern" pathway by which markedly obese individuals may experience functional impairment and poor self-rated health, resulting in depression, as well as an "appearance concern" pathway, whereby women and those of high SES (Socio economic status) may be more vulnerable to

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depression through a pathway involving BID and dieting. Functional impairment and disability are associated with obesity and depression (7). Obese individuals report worse health-related quality of life (8,9) with impairment increasing as degree of obesity increases especially in relation to physical functioning (10,11). Obesity is also associated with both upper and lower body disability (12), which interferes with basic activities of daily life (ADL) (13). Furthermore, obesity at age 30-49 is associated with increased odds of ADL limitations later in life, and fewer years of life free from ADL limitations after age 50 (14). These limitations may also impact participation in regular physical activity, which has been found to be related to the development of depressive symptomology (15). Self-Rated Health. There is now mounting evidence that obesity is associated with an increased risk for poorer perceived health, as well as an increase in the presence of chronic disease (16). Based on results of the NHANES-III study, it appears that the relationship between self-rated health and obesity is linear (17). Poor self-rated health may contribute to depression through cognitive mechanisms in that individuals who believe their health to be poor may also hold other related depressogenic beliefs. They may believe that they are unable to engage in certain activities, or that they will not be able to have a long and fulfilling life. Body Image Dissatisfaction. Researchers have suggested that one mechanism by which obesity confers risk for depression is through BID (18). BID is linked to low self-esteem, which is linked to depression. Repeated Dieting. The evidence about the relation between weight and dieting history and depression in obese individuals is equivocal, and methodological differences in mood measurement may account for differential findings (19). While some studies have suggested that no relation exists between repeated dieting or weight cycling and depression (20), recent evidence suggests that repeated dieting is associated with depression, and that repeated diet failure may have a particularly deleterious effect on mood (21).

Factors affecting obesity and depression (22-24)

A. Mediating Factors

The mediating factors relating to obesity and mental health disorders in adults include:

a. Obesity as a cause of mental health disorders, b. *Behavioural*: dieting and binge eating, c. *Biological*: increased rates of chronic disease, body pain, reduced physical activity, sleep problems, medication side effects, d. *Psychological*: poorer perceived health, low self-esteem and body image concern, e. *Social*: weight-related stigma. Mental health disorders as a cause of obesity, f. *Behavioural* (25): adoption of unhealthy lifestyles, use

of food as a coping strategy, attrition from weight loss programs, g. *Biological*: medication side effects, h. *Psychological*: low expectations of weight loss attempts, i. *Social*: reduced support from family and friends.

B. Moderating Factors (26)

The following factors could affect the direction of the relationship between obesity and common mental disorders

a. Level of obesity: appears to be an independent risk factor for common mental health disorders. Several reviewers have suggested that severe obesity puts individuals at greater risk of depression.

b. Gender: has been shown to modify the association between obesity and common mental health disorders, with some studies demonstrating a positive association for women and a negative relationship for men. Alcohol abuse also appears to be related to depression and obesity in young women but not their male counterparts (27).

c. Socioeconomic status and level of education: have been identified as potentially important risk factors for common mental health disorders in obese individuals. However, the relationship between obesity and socioeconomic status remains unclear. It also appears that among the obese, high socioeconomic status (28) may in fact increase the risk of depression.

d. Other factors (29) : Age is also likely to be a moderating factor between obesity and common mental disorders (30). Younger women appear to be at an increased risk of both obesity and mental health disorders (31). Older people may also be at greater risk, as health problems associated with aging might cause both weight gain and depression or anxiety. Cumulated exposure to common mental disorders in older age groups is associated with increased risk of obesity (32).

Management

Treatments for obesity and depression overlap in two important ways and can be informed by identified causal pathways. Specifically, treatment of both conditions focuses on improved life functioning. For example, behavioral activation, which has demonstrated efficacy in the treatment for depression can also be helpful in managing obesity, as it encourages individuals to engage in activities that give them a sense of mastery, which may include exercise and healthy eating strategies. Similarly, both treatments involve stress management; depression treatment such as cognitive-behavioral therapy addresses coping strategies for dealing with potential setbacks, such as avoiding all-or-none thinking and planning for difficult situations, and obesity treatments typically involve skills that help individuals choose alternatives to unhealthy eating behaviors in order to cope

with stress.

Management is multipronged. Both obesity and common mental health disorders have similar symptoms such as sleep problems, sedentary behaviour and poorly controlled food intake, for the most part they are treated as separate health problems, often leading to poor treatment outcomes. So whenever possible these should be clubbed for better compliance (33).

It has been recommended that the risk for co-morbidity should be considered in the treatment of the obese and the depressed patients (34). So it is important that in depressive patients, weight should be monitored and in overweight or obese patients, mood should be monitored (35). A comprehensive review of psychological interventions for overweight or obesity shows that behavioural and cognitive behavioural therapies make a significant difference to the success of weight management interventions, especially when combined with diet and physical activity (36).

A. *Reduction of weight*: Numerous studies have shown that weight-loss treatment may have a substantial but temporary effect on mood, which is not related to actual weight loss and may decline on cessation of treatment (23).

B. *Physical activity*: Whilst there is strong evidence that physical activity is associated with decreased anxiety and depression, enhanced mood, improved self-worth and body image, it may be challenging for patients to adhere to it. Giving patients practical suggestions for adding small amounts of exercise in their daily routine and stressing the importance of lifestyle modification, may be as effective as prescribed physical activity (23).

C. *Diet*: Many studies have concluded that good nutrition is just as important for mental as it is for physical health and that a number of conditions, including depression, may be influenced by dietary factors (37).

D. *Stress management*: Assisting patients to effectively manage stress should have a positive impact on their ability to control both mood and weight.

E. *Psychological Therapies* (38,39): Psychological therapies are cornerstone in this management. Because they act as double edged sword. Overeating and poor exercise levels are health issues which may be helped via a Motivational Enhancement Therapy (MET) approach. Behavioural Activation (BA) may also help mood and weight, and has been used in obese depressed adults with some success.

F. *Pharmacological treatment for depression*: just as dieting may negatively impact mood, the pharmacological treatment of depression have negative impact on treatment of obesity. Options that are available

include TCA, MAO inhibitors and SSRI. Selective serotonin reuptake inhibitors (SSRI), cause weight gain (40,41). This is a major reason for nonadherence to treatment in the population of depressed individuals not selected by weight. While inconvenient and unpleasant in normal weight individuals, the side effect of weight gain is medically unsafe for obese individuals (42). There is evidence that SSRIs have preferable side effect profiles with respect to weight gain in comparison to TCAs and MAOIs, and that some SSRIs are preferable to others.

Goodman and Whitaker evaluated a cohort study of 9,374 adolescent girls in grades 7 to 12, and found baseline depressed mood predicted obesity at the 1-year follow-up among subjects who were obese at baseline as well as those who were not obese (43). Obese people seeking weight-loss treatment may have elevated rates of depressive disorders (44). In community studies, obesity is associated with major depressive disorder in females (45). The results were explained as an effect of binge eating, especially known in women, and depression may increase the risk of weight gain (46). Li *et al.* found the obese elderly were less likely to suffer from depressive

Symptoms than normal-weight elderly in Hong Kong (47). Gender differences in the associations of BMI and depression have been found in several studies. Carpenter *et al.* found decreased BMI in men and increased BMI in women were associated with major depression in a national survey (48). Underweight people may have low self-esteem and depressive symptoms because of their negative body image. Depressive symptoms may also lead to a poor appetite and subsequent loss of body weight. Obese females particularly tend to underreport their weight, while males with obesity are inclined to overestimate both their height and weight (49). Binge eating may be an important mechanism by which depression confers risk for obesity. There is evidence that negative mood precipitates episodes of binge eating among obese women and that emotional overeating is associated with binge frequency and depression among these (50). Multiple studies document that children, adults, and even healthcare professionals who work with obese persons hold negative attitudes toward them. Consequently, overweight and obese persons may be subject to discrimination by peers, employers, and clinicians who hold antifat attitudes (51). Considering that social support has been shown to be related to weight loss the lack of social support of the depressed individual may make it more difficult to lose weight (52). Body dissatisfaction is also associated with depression after accounting for the relationship between body satisfaction and BMI. This finding is consistent with the hypothesis

that obesity contributes to depression by way of stigmatization and reduced self-esteem (53). Depression may be associated with either increased or decreased appetite⁵⁴. Increased appetite associated with depression tends to be consistent across episodes although this is not an universal finding (55,56).

Conclusion

Obesity is a serious and prevalent condition, with grave risks for morbidity and mortality. While the physical consequences of obesity have been well studied, the psychological correlates are less well understood. Behavioral mechanisms, such as functional impairment and repeated dieting, cognitive mechanisms, such as body image dissatisfaction (BID) and poor self-rated health, and social mechanisms, such as stigma, may all play a role in the pathway from obesity to depression. Regarding obesity causing depression there may be both a direct physiological and an indirect psychosocial pathway that link depression to obesity. Specifically, there may be a direct pathway through the biological effect of increased stress reactivity with hormonal change, and an indirect pathway through which mechanisms, such as poor adherence, binge eating, negative thoughts, and reduced social support, make it more difficult for the depressed person to care for themselves effectively, leading to weight gain. Many studies have suggested important risk factors and causal mechanisms in the association between obesity and depression. There is a bidirectional causal relation by which each of these conditions may contribute to the other. Studies testing the differential effects of specific elements of this association clarify these associations. Longitudinal studies should be preferred in order to prospectively predict which obese individuals are likely to become depressed, and vice versa, and intervene prophylactically.

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