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## **The Importance of Quality of Life in Weight Loss Programs**

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## Abstract

The obesity epidemic has plagued the United States for over 50 years, but there is still much education and research that needs to be done to understand weight loss, specifically the relationship between weight loss and quality of life. This paper considers this relationship from three angles: first, by considering the different types of weight loss treatment, including traditional behavioral weight loss, surgery, acceptance-based programs, and internet weight-loss interventions; second, by considering the impact of weight loss on quality of life through the lens of specific demographics, specifically female, child, and elderly populations; and finally, by considering the impact of mood on both quality of life and weight loss through the scope of self-esteem and depression. These sections are designed to help consider the relationship between quality of life and weight loss from different angles and provide insights on future research that needs to be done.

*Keywords: Quality of Life, QOL, obesity, overweight, weight loss, weight loss treatment, behavioral weight loss, BWL*

## The Importance of Quality of Life in Weight Loss Programs

The obesity epidemic has frustrated scientists for the past fifty years. In 1948, the World Health Organization (WHO) recognized obesity as a disease; and since 1975, obesity rates have tripled (WHO, 2018). As of 2016, 8 million adults in the US and 600 million adults worldwide were labeled as obese, meaning that they had a Body Mass Index (BMI) of over 30 (Truong, 2016). At the same time, 39% of adults in the US were labeled as overweight, or having a BMI between 25 and 29.9. Excess weight is the fifth risk factor for death globally as it can lead to several issues in physical health, including diabetes, cardiovascular disease, stroke, metabolic syndrome, asthma, and sleep problems (Olson, 2017; Ozbey, et. al., 2020). Furthermore, those with obesity are likely to experience low self-esteem and higher rates of depression and anxiety (Vieira, et. al., 2013). Those with obesity are more likely to have depression, and vice versa: 43% of adults with depression have obesity (Ma, et. al., 2019). Furthermore, these people often experience prejudice within education, employment, and social settings: those who are overweight are typically describes as lazy, worthless, awkward, ugly, or lacking in self-esteem (Puhl & Brownell, 2001). Obese persons are paid less than they average-weight counterparts (Baum & Ford, 2004), and discrimination is prevalent in every-day settings. In a study of 94 adults with obesity, 72% received hurtful comments from others, 65% received similar comments from family members, and 61% received inappropriate comments from their doctor within the last month (Friedman, et. al., 2008). Sadly, those who experience obesity issues in adolescence are much more likely to experience these problems, both mental and physical, as an adult.

Despite its prevalence in our modern-day, there is still much work to be done on obesity and weight loss programs. According to a 2021 study, 96% of those with obesity are not being

treated (Annesi & Walsh, 2021); and less than 4% of adults are getting the minimum recommended amount of physical activity each day (Annesi, 2019). Although behavioral weight loss treatments – diet and exercise – are the most common remedy (Bray et. al., 2016), they are often unsuccessful beyond the short term. Most people (50-70%) drop out of their exercise programs within six months, and those who stay often fail to produce lifelong habits (Annesi, 2019). If diet and exercise habits are not sustained over time, individuals more than often gain their weight back (Kessler, et. al., 2018). For example, in a study by Kraschenewski and their colleagues, only 17.3% of participants reported successfully losing 10% of their initial weight and maintaining that loss for over a year (Kraschenewski, et. al., 2010). From this data, it is safe to assume that there is much needed to be done to lessen the obesity epidemic.

In a study by Rothberg and their colleagues, 188 obese patients (with a 20% dropout rate) used the University of Michigan Weight Treatment, a behavioral treatment, for six months (Rothberg, et. al., 2014). This treatment involved a low-calorie diet and a moderate increase in physical activity (up to 40 minutes) in the first couple of months but then a switch to a moderate diet and vigorous exercise (60-90 minutes) (Rothberg, et. al., 2014). Rothberg believed that weight loss specifically instead of actual weight was the most important factor in determining quality of life, and he was right (Rothberg, et. al., 2014). His researchers found significant improvement in quality of life (QOL) amongst almost all categories, and he even went as far to conclude that previous researchers who fail to see the impact of QOL are wrong because they are not cross-sectionally analyzing their data (Rothberg, et. al., 2014). When measuring for these weight-related problems, one must consider quality of life which encompasses both the physiological and psychological well-being of patients. Unlike other measures of well-being, QOL predicts long-term health status by assessing the physical, environmental, and economic

factors that affect an individual's well-being (Avalos, et. al., 2020; Truong, 2016). Although there has been some debate amongst scholars, the general consensus is that weight change is directly related to QOL; but more specifically, this relationship is incredibly interdependent when weight increases (Kolotkin & Crosby, 2002). Vice versa, increased physical activity and maintaining weight loss are related to greater QOL, specifically health-related quality of life (HRQL) (Pearl, et. al., 2018; Vieira, et. al., 2013; Pinto, et. al., 2012). Health-related quality of life one of the most used forms of QOL when measuring weight loss as it is more sensitive to this relationship through cross-sectional analysis (Pinto, et. al., 2012; Rothberg, et. al., 2014). In other words, as BMI decreases, HRQOL increases significantly. As seen in Figure 1, the relationship between weight change and HRQOL has been shown to have an indirect effect on socio-demographic factors, health status, lifestyles, and weight status (So, 2019). For example, losing 5-10% of initial body weight is associated with both a lower risk of

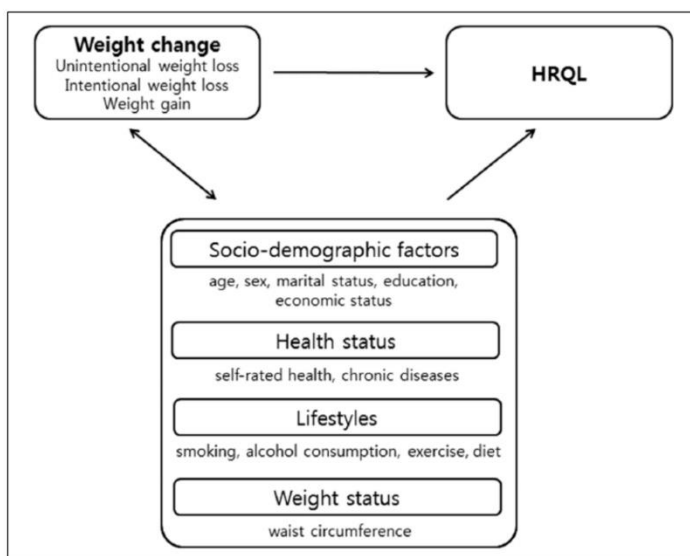


Figure 1. The relationship between weight change and HRQL (So, 2019).

cardiovascular disease and improvements in HRQOL (Pearl, et. al., 2018).

Weight-specific quality of life is the other most-commonly used form of quality of life when measuring for weight loss. This form of QOL was designed specifically for weight loss programs, as it “encompasses an individual’s subjective perception regarding their physical and psychological states, social relationships, and personal cultural beliefs in relationship to their lived environment [and weight loss]” (Avalos, et. al., 2020). Poor weight specific QOL is,

similarly to other forms of quality of life, associated with poor physical functioning, lower perceptions of overall health, lower psychological and emotional well-being that can adversely affect self-esteem, self-regard, and body image, and decreased interpersonal and family functioning (Avalos, et. al., 2020). Having this weight specific measure brings more clinical relevance than other, more generic measures; but they can be highly sensitive and may show heightened results (Pinto, et. al., 2012). However, it has been generalized to specific demographics (i.e., the Youth Quality of Life-Weight Instrument (YQOL-W)) to gain a clearer understanding of certain populations. Meanwhile, other researchers stray from these measurements altogether and use quality-adjusted life years (QALYs), which are measured through the person's age and their quality of life over their past years (Rothberg, et. al., 2014).

It is also important to consider the form of measurement used for health-related and weight-specific quality of life. Through our analysis, it seemed the most popular measure of health-related quality of life was the Short-Form Health Survey (SF-36), which measured QOL through physical functioning, mental and general health, emotional role limitations, social functioning, vitality, and bodily pain (Vieira, et. al., 2013; Pinto, et. al., 2012). However, other weight-related QOL measures are common, including the Weight of Quality of Life-Lite, which measures QOL through sexual life, public distress, self-esteem, and work life; the Impact of Weight on Quality of Life (IOFQOL) scale; the health utilities index (HUI); the short form 6D (SF-6D); and non-obesity measurements such as the Beck Depression Inventory (BDI) (Vieira, et. al., 2013; Walsh, et. al., 2018; Pinto, et. al., 2012). However, a meta-analysis in 2012 found that non-preference-based measures (SF-36, IWQOL, and BDI) are favored for measuring HRQL. BDI should be used with caution due to its lack of assessing all aspects of life, specifically physical health.

When considering these different forms of quality of life, it is important to consider the measurement's consistencies, demographics, and the researcher's focus. Some measures of quality of life, such as weight specific quality of life, are incredibly sensitive to weight-related measures and may show greater impacts of treatments than are there. Furthermore, these different types of quality of life are known to differ among ethnic populations (Griffiths, et. al., 2001). For the sake of this paper, most quality of life measurements will focus on health-related quality of life, since it is not too specific but still does a decent job of assessing quality of life amongst different populations.

In this paper, we will address how quality of life truly impacts weight loss treatment by focusing on different forms of weight loss treatment, the demographics of weight loss treatment, mental health's impact on quality of life, and whether weight loss is essential for better quality of life outcomes; and we suggest ways to better assess this relationship.

### **Forms of Weight Loss Treatment and QOL**

#### **Behavioral Weight Loss (BWL) Treatments**

Behavioral weight loss (BWL) intervention, commonly known as diet and exercise, is the most well-known treatment for quick weight loss and almost always leads to higher quality of life; but the relationship between these two variables has been debated for some time (Vieira, et. al., 2013; Nicol, et. al., 2019). In fact, recent research suggests that it is not the actual exercise which has the biggest impact on HRQOL. Instead, increased physical activity often leads to improvements in self-efficacy and mood, which in turn lead to better self-regulation, coping, mood, self-esteem, body image, and self-efficacy (Annesi & Walsh, 2021; Baker & Brownell, 2000, p. 311). It is this positive mood and general enjoyment that are the key factors in determining whether exercise leads to an increased quality of life, especially in the long run.



Enjoyment often leads to a greater intrinsic motivation to exercise, which in turn leads to more enjoyment. Mood and motivation are the most reliable discriminators of success and failure of exercise treatment for weight loss and increase QOL (Vieira, et. al., 2013; Annesi & Johnson, 2015). Further research has continued to assess when this mood change is the most important; but although many say that the first few weeks are key, others suggest enjoyment in later years is what leads to a permanent commitment to exercise (Annesi, 2019). From this research, we can conclude that exercise treatment is only effective if the person is doing something that they enjoy: this enjoyment is really what creates motivation to continue exercising and make it a regular habit. Similarly, diets must be able to be maintained to have a lasting effect. If the person has no intrinsic motivation, behavioral weight loss interventions will do little in improving both weight loss and quality of life.

### **Weight Loss Surgery**

Although a much less common treatment, weight loss surgery is typically recommended to improve comorbid health outcomes (So, 2019). However, many have suggested in the past that surgery is much less effective because the patients are much less intrinsically motivated to make lasting health commitments; but these assumptions could be further from the truth. Those who undergo bariatric surgery are already making lifestyle changes to go under the knife and keep the weight off; and often, they have a full-time dietician preparing them both before and after surgery (Kessler, et. al., 2018; Hult, 2020). Surprisingly, weight loss through either surgery or exercise leads to a higher quality of life (Vieira, et. al., 2013). In a study with 250 women from northwestern Europe, researchers asked why participants sought surgery, if they were satisfied, and measured physical activity and eating behaviors post-surgery (Hult, 2020). They found that participants expect to lose about 80% of their excessive weight after surgery; but it was the

lifestyle changes afterwards which led to such great satisfaction and increased quality of life (Hult, 2020). We can assume two ideas from this research: first, that bariatric surgery is an effective tool in both weight loss and increasing quality of life; and second, that intrinsic motivation is again a key in these factors.

### **Acceptance-Based Treatments**

Because of the importance of motivation in weight loss treatments, researchers have attempted to create more self-esteem focused treatments, the most common being acceptance-based treatments (ABT). ABT was based in acceptance and commitment therapy, which teaches patients to accept internal experiences by adopting a “non-judgmental stance towards thoughts and feelings” (Forman & Butryn, 2015). Instead of a simple exercise and diet program, ABT teaches individuals strategies on motivation and self-regulation (Forman & Butryn, 2015). These treatments, although popularized, are largely unsuccessful in actual weight loss outcomes; however, they are known to drastically improve quality of life (Evans, et. al., 2019; Schumacher, et. al., 2019). In a 2019 study, researchers compared a 12-month ABT program to a standard, year-long behavioral treatment; and they found that those who underwent ABT had greater psychological flexibility and quality of life but not weight loss outcomes (Schumacher, et. al., 2019). Another study found that ABT led to more consistent behaviors but again did not measure for weight loss (Foreman et. al., 2016). Due to these inconsistent results, ABT should be used not for basic overweight patients but for those with binge eating behaviors and depressive symptoms (Godfrey, et. al., 2019). These acceptance-based treatments help develop more flexible attitudes about food and self-esteem, leading to a better quality of life (Evans, et. al., 2019).

## **Internet Weight-Loss Interventions**

Internet weight-loss interventions, especially text-related interventions, have become more popular over the recent decade. Among adolescents 12-17, 88% own a mobile phone, and text is now the preferred method of contact across most populations (Lenhart, 2015). Studies have found that text interventions have been incredibly effective for weight loss in both adults and adolescents, no matter if they are combined with specific treatment programs or not (Siopsis, et. al., 2015; Duncan, et. al., 2011; Spark, et. al., 2015; Jensen, et. al., 2019). These texts are preferred since they help with self-monitoring and create a tailored intervention for the individual (Jensen, et. al., 2019). For example, a 2019 study placed 47 overweight adolescents, ages 13-18, in a 6-month program of monitored weight, diet, and physical activity (Jensen, et. al., 2019). In this study, the experimental group was given adaptive text messages three times a day during meals, while the control group was not given such (Jensen, et. al., 2019). These researchers found that BMI decreases significantly when using text interventions compared to the average treatment (Jensen, et. al., 2019). A further understanding of these internet programs could be incredibly beneficial, especially since the future of weight loss programs may depend on the rising importance of technology.

## **Weight Loss Treatment across Demographics**

### **Female Populations**

Women are particularly vulnerable to the impact of quality of life in relation to weight loss and obesity. 67% of women in the US are technically overweight and 30.5% of these are classified as obese (Yang & Colditz, 2015; Anessi, 2019), and life expectancy has decreased 1.5 years for women since the obesity epidemic began (Preston & Stokes, 2011). Overweight women are at a higher risk of developing Type 2 Diabetes, coronary heart disease, and breast,

endometrial, and ovarian cancer, leading to an increased mortality (Austin, et. al., 2017).

However, women are much more likely to have a lower quality of life and health related quality of life due to obesity (Zabelina, et. al., 2009; Mond & Baune, 2009). This deficit could be because women are more likely than men to be dissatisfied with their weight and engage in weight loss treatment (Annesi & Walsh, 2021; Austin, et. al., 2017). Again, intrinsic motivation and quality of life were key in predicting the outcomes of these women in treatment. Women who start weight management with a lower QOL are much more likely to drop out of programs or lose less weight (Teixeira, et. al., 2004). Furthermore, a study by Vieira and their colleagues compared quality of life in two groups of overweight Portuguese women: one group which had a goal to lose weight and another whose goal was to maintain weight (Vieira, et. al., 2013). Vieira found that women who had a higher QOL and wanted to lose weight were the most likely to increase their quality of life and body image satisfaction after the weight loss program (Vieira, et. al., 2013). Similar studies have focused on similar populations, including Mexican American women (Austin, et. al., 2017). These studies show the importance of quality of life before and after treatment. Although women are more susceptible to obesity problems than men, quality of life is still incredibly important in predicting the success of treatment.

### **Adolescent Populations**

As mentioned previously, childhood obesity specifically can lead to more problems in both childhood and adulthood. Obesity in childhood leads to possibility of Type 2 diabetes, asthma, cardiovascular disease, and skin conditions in adulthood, as well as bullying, social exclusion or marginalization, negative body image, discrimination, negative school performance, teasing and bullying, and decreased self-esteem in childhood and adulthood (Avalos, et. al., 2020; Puhl & Brownell, 2001; Sahoo, et. al., 2015; Griffiths, et. al., 2001; Caprio, et. al., 2008;

Jensen & Steele, 2012). All these factors are subsequently related to lower quality of life among adolescents; although research has found that the intrinsic factors such as body image and self-esteem have a higher impact than extrinsic factors on both quality of life and motivation for weight loss (Jensen, et. al., 2014). Obesity is more prevalent in kids with autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD), and it can lead to depressive behaviors early in life (Nicol, et. al., 2019; Colon, et. al., 2019).

For children and adolescents, the Epstein's Stoplight Eating Plan, which consists of dietary changes such as consuming fruits and vegetables and fewer foods high in sugar and fat, has been widely used (Wilfley, et. al., 2007). Behavioral self-monitoring programs are highly effective; but because of the effectiveness of these programs, there is not much evidence on the efficiency of behavioral weight loss treatments in children (Jensen, et. al., 2019). Furthermore, measurements like the Youth Quality of Life-Weight Instrument (YQOL-W), which measures a child's perceptions of their self, social life, and environment, have been made for children (Avalos, et. al., 2020; Knopfli, et. al., 2008).

Because of the interdependence of child and parent, many behavioral treatments have focused on the family relationship. For example, the "TEAM UP" program was created to teach parents of ASD children how to monitor their child's food and exercise routine (Matheson, et. al., 2019). Similarly, a 2019 study measured body the child and parent report of quality of life and obesity treatment response. In this study, quality of life was not a predictor of weight reduction but was related on the similarity between the child self-report and parent-report on child (Colon, et. al., 2019). However, this study only used the Beck Depression Inventory in assessing quality of life instead of the other standard measures. By involving the parents in family-based behavioral weight loss treatment (FBT), researchers attempt to gain a better picture

of a child's quality of life. Through these treatments, researchers have found that there is an indirect relationship between familism and QOL measures (Avalos, et. al., 2020). There is, however, more research that needs to be done to understand the relationship between childhood obesity and quality of life.

### **Elderly Populations**

Because of their bodily differences, elderly people should treat weight loss and quality of life differently than the average population. Due to aging, weight often naturally reduces in the abdomen; but regular behavioral treatments recommend losing a significant amount of weight in this area (Alibhai, et. al., 2005). Sadly, this miscommunication often leads to a deterioration in health and functional status (Alibhai, et. al., 2005). Instead of losing weight, it is often recommended that elderly people should try to maintain their weight to improve their health-related quality of life (So, 2019). There needs to be more education done and elderly-specific treatments created to help this population increase their quality of life and stay healthy overall.

## **The Impact of Mental Health on QOL**

### **Body Satisfaction and Self-Esteem**

Another mediator in the relationship between quality of life and weight is body satisfaction. These factors are directly linked, even when BMI is not a factor (Olson, 2017; Wilson, et. al., 2013). Greater body dissatisfaction often leads to more emotional eating and lower diet efficacy, which in turn leads to lower overall quality of life (Olson, 2017). Even when people have tried basic BWL interventions, body satisfaction leads to poorer adherence and attention (Austin, et. al., 2017). Furthermore, in those who have greater body dissatisfaction, unintentional weight loss is associated with lower HRQL in mobility, pain and discomfort, usual activities, and self-care, again showing that weight loss is not a key factor in determining the

relationship between QOL and weight loss (So, 2019). From this data, we find that those with lower body satisfaction have a lower quality of life with or without weight loss; furthermore, we can assume that there is a direct relationship between self-esteem and quality of life (Avalos, et. al., 2020).

### **Mental Disorders' Impact on Quality of Life**

Due to this relationship between self-esteem and quality of life, researchers have taken a step further in measuring the impacts of depression. 10-34% of those initiating behavioral weight loss treatments have depressive symptoms (Godfrey, et. al., 2019). While previous studies have suggested that behavioral weight loss programs lessen depression (Wing, et. al., 2002), studies that measure quality of life suggest that depressive symptoms play much more of a factor in overall weight loss. In those with continuing depressive symptoms after program completion, quality of life measures can be much lower than their non-depressed counterparts (Truong, 2016). Furthermore, those with obesity report a lower quality of life when specifically combined with depressive symptoms or binge eating tendencies (De Wit, et. al., 2010). Even when combined with weight loss, depression has a significant impact on weight loss and needs to be treated separately for patients to grasp the full effects of behavioral weight loss treatments.

Because of these new findings, mood-related weight control studies have been created to target both mood and weight. As mentioned previously, acceptance-based treatments (ABT) have been found to be significant in improving mood and overall quality of life; but results vary on their impact on weight loss (Sasdeli, et. al., 2018). Due to the difficult nature of battling depression and obesity, patients are much more likely to drop out and not reap the full benefits of the program (Sasdeli, et. al., 2018). A new program named Research Aimed at Improving Both Mood and Weight (RAINBOW) has been specifically created to improve both obesity and

depression. In this 12-month program, both BMI and BDI scores decrease significantly compared to “usual care” (i.e., behavioral weight loss treatments) (Ma, et. al., 2019). RAINBOW and similar programs could be the future of weight loss programs, especially for those dealing with mental illness.

### **Is Weight Loss Essential to Increase Quality of Life?**

Previously, we have understood that weight loss is a definite factor in increasing quality of life and that motivation is key in predicting an increase in weight loss and quality of life; however, is actual weight loss needed for these treatments, especially behavioral treatments, to be effective in bettering quality of life? Early investigators of weight loss treatments believed that those who bring back their weight more at risk to eating disorders or depression, but recent research has taken a step further in understanding that those with an increase in QOL have the easiest time keeping weight off (Vieira, et. al., 2013). These people often report having an increased energy, mood, mobility, and self-confidence (Vieira, et. al., 2013). In a 2019 study, Meyer and their colleagues compared two groups: weight acceptance and weight loss (Meyer, et. al., 2019). Surprisingly, Meyer found that those in the weight acceptance group were much happier, self-compassionate, and often had a higher quality of life after treatment (Meyer, et. al., 2019). To understand this idea, researchers connect quality of life and weight treatment programs to a concept called psychological flexibility, or “An individual’s ability to be connected with and conscious of the present moment and to engage in values-consistent behavior even in the presence of difficult emotions, thoughts, memories, or sensations” (Hayes, Storsahl, & Wilson, 1999). It seems that many people simply need an increase in their psychological flexibility to gain a better appreciation for themselves and in turn a higher quality of life. While weight loss is



important, it is useful to understand that weight does not need to decrease for people to still have a better quality of life and self-esteem.

### **Future Research**

There are multiple important factors to consider when understanding the relationship between weight loss and quality of life. First, from our analysis, we understand that behavioral weight loss has stayed true to its reputation in being the best form of treatment for weight loss. The simple combination of diet and exercise through these programs reap significant benefits in both weight loss and quality of life. However, other treatments can be considered depending on a person's situation. Weight loss surgery is significantly beneficial to many people; and unlike its reputation, surgery does a great job in getting rid of weight loss while also increasing quality of life. Further research should ultimately be done to understand this relationship better, since there are currently only hypotheses about whether the increase in quality of life has to do with the surgery itself or its accompanying diet programs. Furthermore, there needs to be more research done to prove the effectiveness of acceptance-based treatments: currently, it seems as though these treatments may have an impact on weight loss, but they are much better about increasing quality of life. However, a meta-analysis of these studies could truly conclude whether ABT has a significant effect on weight loss. While other treatments may be more practical depending on the person's situation, though, behavioral weight loss should continue to be the go-to route for improving weight and quality of life.

Next, it seems that even more research needs to be done on specific populations to understand the impacts of behavioral weight loss across demographics. Many populations have multiple factors which complicate the relationship between weight loss and quality of life: for example, in elderly populations, weight loss should not be taught, since it can be more harmful

then beneficial. Instead, weight maintenance programs should be taught to elderly populations, and this understanding should be included in all weight loss education to avoid significant problems when older. Furthermore, childhood populations include multiple factors when considering weight loss: first, most children in weight loss treatment programs are not admitted of their own will, which may affect their motivation and overall weight loss; second, family relationships are known to have a significant impact on a child's weight loss treatment and quality of life; and third, childhood obesity is known to have a significant impact on adult quality of life. These factors should be better assessed to understand the relationship between weight loss and quality of life and to create the best program possible for childhood demographics. Ultimately, these additional factors need to be considered when applying weight loss treatment programs to specific populations.

It is also important to understand the importance of mental disorders on weight loss treatment. Depression and binge eating disorder specifically can significantly decrease quality of life, even after weight loss treatment; and they can make quality of life even lower during obesity. These disorders need to be treated first before considering care, or certain programs such as the RAINBOW could be used to treat both mood and weight loss. Further education needs to be done across demographics to help people understand that mental health is the most important priority before engaging in weight loss treatment, especially since depression (10-34%), binge eating tendencies (34-77%), and binge eating disorder (27%) are so prevalent among those who engage in weight loss programs (Godfrey, et. al., 2019). Only after treating these disorders can patients fully reap the benefits of weight loss treatment and have an increase in quality of life over time.

Through these assessments, it is possibly most important to consider that it is mood and self-esteem which are the true factors in increasing quality of life. Across studies, it seems that quality of life increases with body acceptance and not just weight loss. Furthermore, specific weight loss treatments such as exercise may prove to be such effective because of their impacts on mood and self-esteem over time. Replication treatments should be done to prove the relationship between psychological flexibility, quality of life, and weight loss; and people should be educated in this relationship before engaging in behavioral weight loss treatment. For some, improving mood and self-esteem may be more effective than the average weight loss treatment. Understanding this relationship could be incredibly helpful to those who have issues with self-esteem and obesity.

While we understand that there is a significant relationship between weight loss and quality of life, other factors need to be considered before engaging in weight loss programs. Although behavioral weight loss treatment is most effective across the board, other treatments could be considered, especially when engaging with specific demographics such as the elderly or children. Furthermore, there needs to be better education and research on the relationship between mood, quality of life, and weight loss. Only after this education can people be the most prepared when engaging in weight loss programs.

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