



OBESITY HEALTH RELATED QUALITY OF LIFE AND BODY IMAGE FOLLOWING BARIATRIC SURGERY

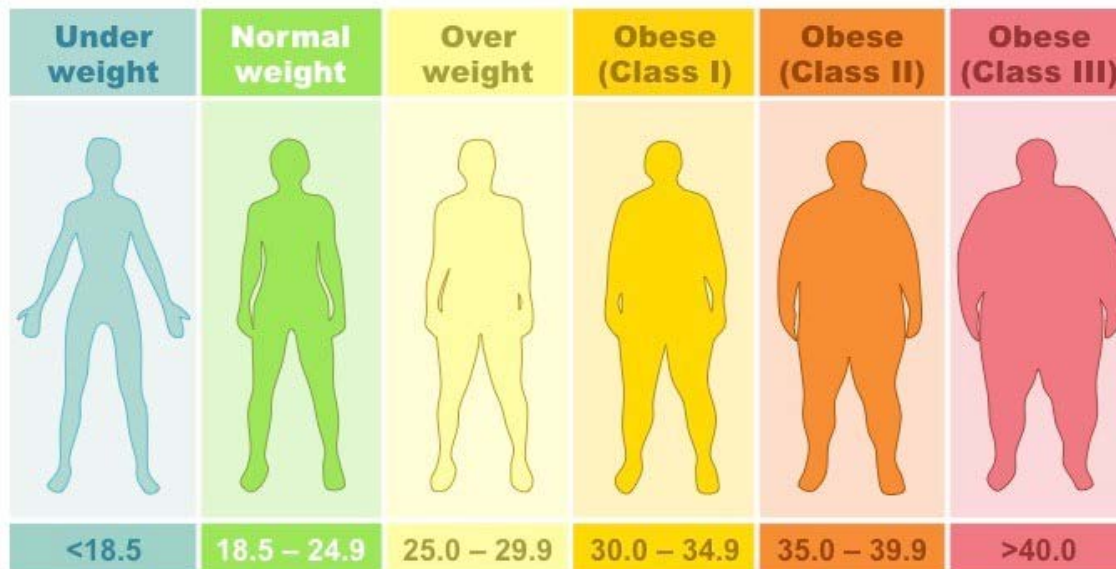
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- Obesity – the accumulation of adipose tissue
- Global obesity rates increased from 857 million in 1980, to 2.1 billion in 2013 (Ng et al., 2014).
- Globally there are now, 42 million children under the age of 5 who have been classified as having a BMI in the obese range (WHO, 2016).
- Obesity belongs to a cluster of four disorders classified as the metabolic syndrome (Grundy, 2016).
- The metabolic syndrome consists of
 - hypertension, high insulin levels, high levels of adipose tissue in the midsection and abnormal cholesterol levels.



Assessment of Obesity

- Body Mass Index (BMI) or waist circumference (WC).
- Most clinical studies measure obesity using Body Mass Index (BMI), this is calculated as a person's weight in kilograms divided by the square of their height in meters (kg/m^2) (Gloy et al., 2013; WHO, 2016).
- Obesity is defined as having a BMI ≥ 30



- Energy balance theory (Kennedy, 1966)
 - sustained imbalance between energy intake and energy acquisition results in long term accumulation of adipose tissue or positive energy balance
- Homeostasis and Allostasis (Cannon, 1969; Sterling, 2012)
 - stability is achieved by a biological sensor that identifies a variation from a “set-point”, the biological sensor then relays the error signal to the brain that mobilises resources in an attempt to restore the stable state.
 - In allostatic regulation, the amygdala is thought to regulate the body’s responses in order to cope with or adapt to future demands.

Food intake regulation and role of hormones

- Leptin is directly and indirectly responsible for long-term energy regulation, food reward responses and satiation signals in feeding behaviours
- Ghrelin plays a role in meal initiation
- Insulin a hormone made by the pancreas allows the body to use sugar (glucose) from carbohydrates.
- Insulin provides short-term satiety signals to the hypothalamus, stimulates fatty acid synthesis, improve circulation and triggers lipogenesis by reducing blood glucose levels (Pardal & López-Barneo, 2002).

Homeostatic Pathway Of Energy Balance

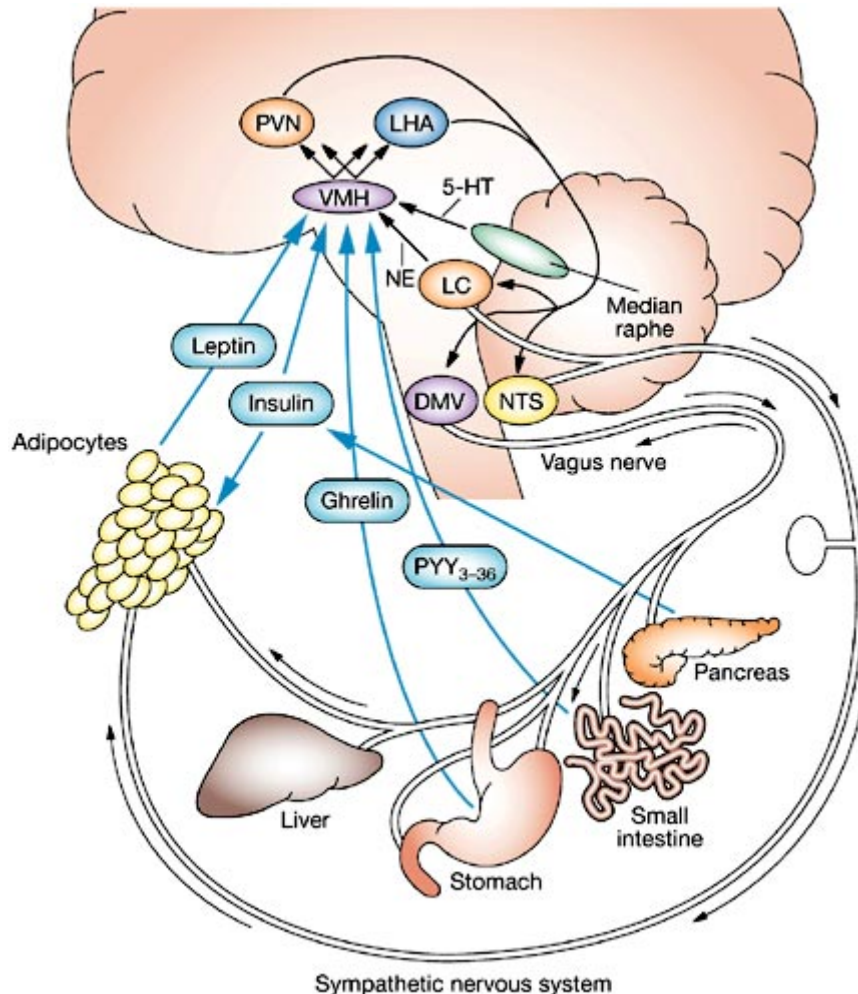
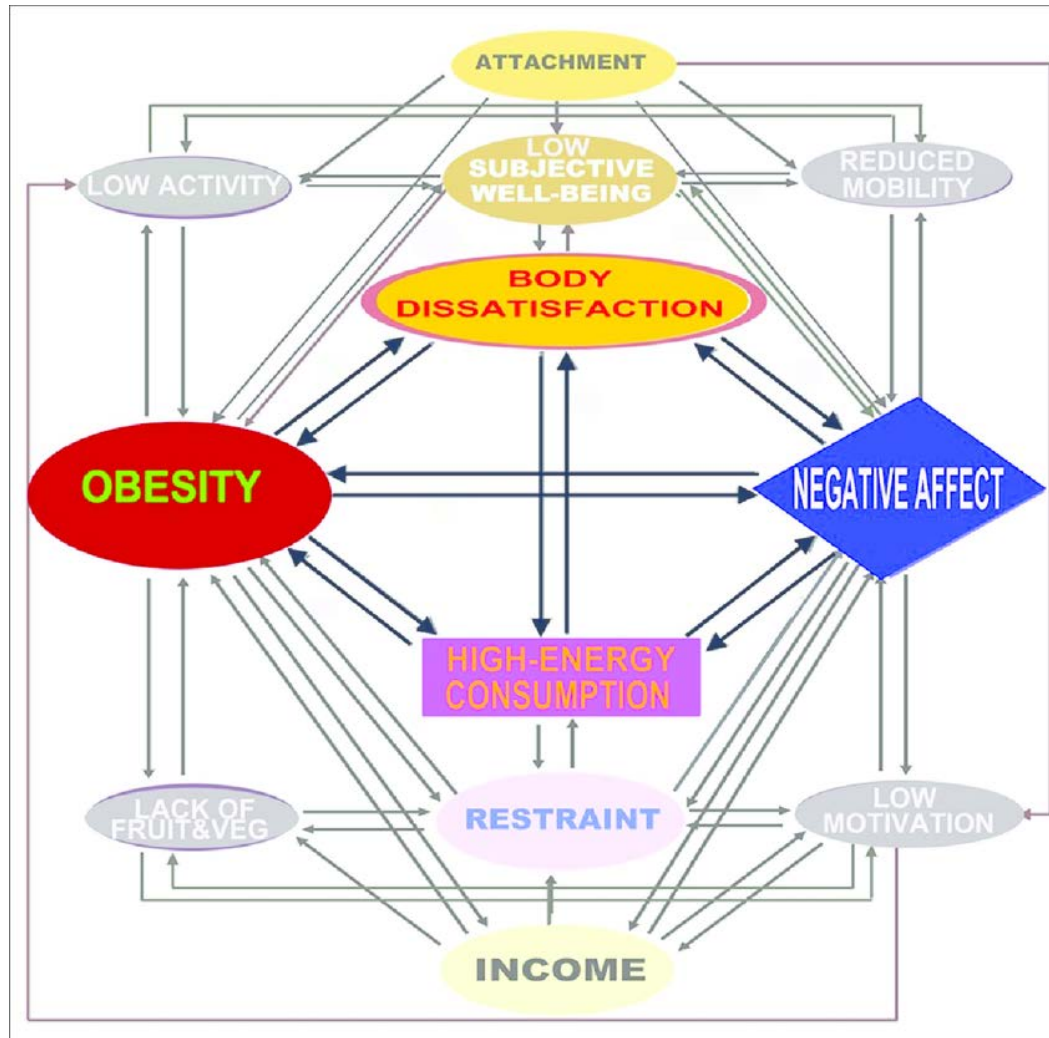


Figure 1. The homeostatic pathway of energy balance. Afferent (blue), central (brown), and efferent (white) pathways are delineated. The hormones insulin, leptin, ghrelin, and peptide YY₃₋₃₆ provide afferent information to the ventromedial hypothalamus, relating to short-term energy metabolism and energy sufficiency. From there, the ventromedial hypothalamus elicits anorexigenic (alpha-melanocyte stimulating hormone, cocaine-amphetamine regulated transcript) and orexigenic (neuropeptide Y, agouti-related protein) signals to the melanocortin 4 receptor in the paraventricular nucleus and lateral hypothalamic area. These signals lead to efferent output via the locus coeruleus and the nucleus tractus solitarius, which activates the sympathetic nervous system and causes adipocytes to

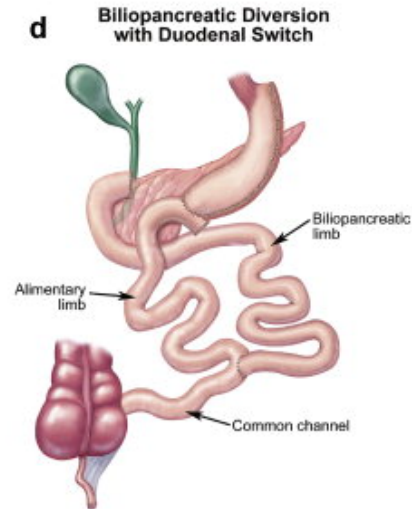
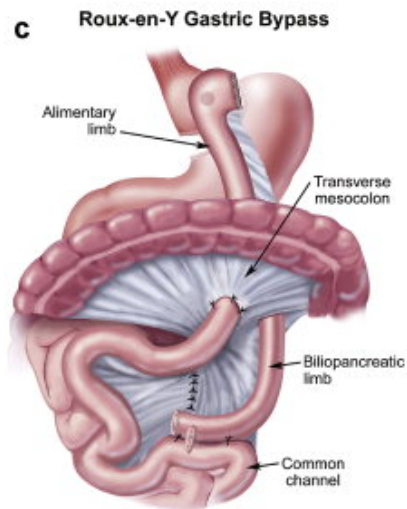
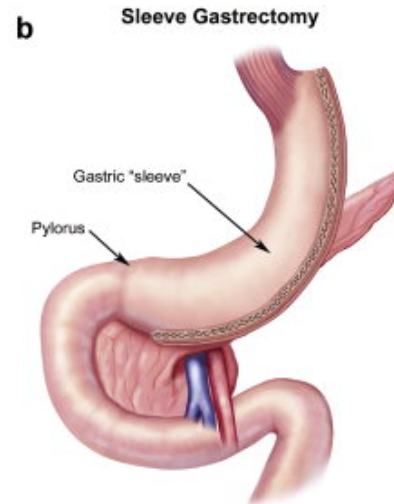
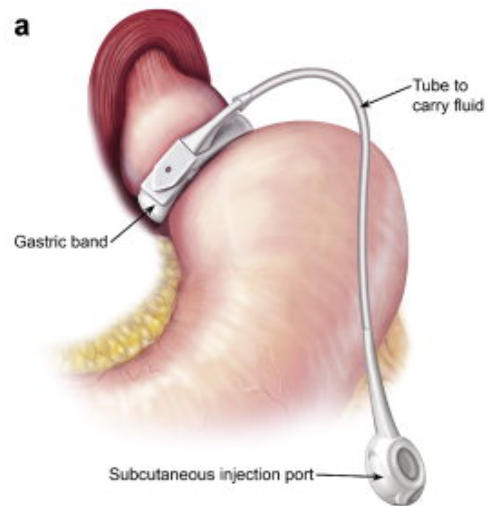
- Hedonic theory of obesity (Harris, 1990)
 - Over-eating occurs in response to reward mechanisms and exposure to an obesogenic environment
- Homeostatic theory of obesity and the Circle of Discontent (Marks, 2015)
 - Disruption to homeostasis stimulated by discontent (body dissatisfaction, negative affect, obesogenic environments, overconsumption) results in obesity

Homeostatic theory of obesity and the Circle of Discontent (Marks, 2015)



- Bariatric surgery refers to the group of surgical interventions applied for weight loss.
- There are four types of bariatric surgery;
 - a) Laparoscopic adjustable gastric banding (GB),
 - b) Sleeve gastrectomy
 - c) Roux-en-Y gastric bypass (RYGB),
 - d) Duodenal switch with biliopancreatic diversion (Figure 1).
- Weight loss is achieved through these interventions by various methods of stomach reduction that in turn reduce hunger drive and the individual's ability to consume large portions of food. Bariatric surgery is not considered a stand-alone treatment for obesity.

Types of Bariatric Surgery



Bariatric surgery outcomes

- Effectively treats all biological conditions of the metabolic syndrome, with patients having diabetes in remission or significantly reduced diabetes 12 months after surgery (Picot et al., 2009; Saunders et al., 2013; Sjöström, 2013).
- Cochrane systematic reviews of randomised trials (Colquitt, Pickett, Loveman, & Frampton, 2014) consistently report that all types of bariatric surgery demonstrate higher weight loss, greater reduction in some comorbidities and improvements to aspects of quality of life when compared with results from non-surgical interventions.
- Bariatric surgery immediately treats the biological components of obesity, by changing adipokine (Adami, Scopinaro, & Cordera, 2016), leptin, ghrelin and insulin responses (Nijhuis, van Dielen, Buurman, & Greve, 2004; Yang, Feng, Zhong, Wang, & Liu, 2014). However these results have not been measured past two years (Nijhuis et al., 2004; Yang et al., 2014), when weight regain begins to emerge.

Bariatric surgery outcomes

- Non-surgical interventions result in weight increase (post treatment body weight that exceeds pre-treatment body weight) (Sjöström, 2013).
- Bariatric surgery, is indicated to produce rapid and sustained weight loss results for approximately 18-24 months post-surgery (Magro et al., 2008).
- Gradual weight regain emerges and in some cases becomes clinically significant with patients gaining up to 48% of the weight lost (Magro et al., 2008; Sjöström, 2013).

Psychological impact of having bariatric surgery

- Weight regain and diminishing quality of life are evident in all longitudinal studies, regardless of the type of bariatric surgery and baseline BMI. Although weight regain is lower and QOL is higher in bariatric individuals compared to non-bariatric individuals, the diminishing QOL and weight regain indicate that the initial treatment effect of surgery is not sustained over time.
- A recent systematic review of longitudinal randomized control and case serious studies (Baldrige et al., 2015), indicated that although RGYB and GB surgery resulted in substantial weight loss, and improvements to comorbid conditions, weight regain in bariatric surgery was significant and impacted on the initial health benefits achieved at optimum weight loss.

Quality of Life

- QOL – an individual’s subjective assessment of their capacity in relation to the physical, emotional, material and social well-being domains of their life (Emerson, 1985).
- The WHO further quantifies measurement of HRQoL as the distance between the patient’s present overall state in the; physical, psychological, independence, social , environmental and spirituality domains of life, and their intended goal post treatment

Obesity and QoL

- Treatment –seeking individuals with obesity present with depression and diminished HRQoL (Fabricatore, Wadden, Sarwer, & Faith, 2005)
- Depression and binge eating were significantly correlated with HRQOL, and treatment-seeking women (N=135) had higher scores on the Orwell-97 compared with men, indicating diminished HRQOL for these women (Marzocchi, Moscatiello, Villanova, Suppini, & Marchesini, 2008).

Obesity and Body Image

- Some individuals continue to feel dissatisfied with their body image after bariatric surgery.
- Dissatisfaction is related to emergence of excess skin; some improvement with body contouring surgery but this leaves scarring (de Zwaan et al., 2014; Song et al., 2006).
- Bariatric surgery patients demonstrate significant improvements in body image satisfaction and quality of life in the first 2 years after surgery and these improvements are correlated with percentage of weight-loss (Sarwer et al., 2010)

- To examine obesity health-related quality of life and body image satisfaction in a group of individuals having undergone bariatric surgery.

Hypotheses

- Individuals who have undergone bariatric surgery will have better obesity related quality of life.
- Individuals who have had bariatric surgery will have high scores on the subscales of the MBSRQ: Appearance Evaluation (AE); Appearance Orientation (AO); Overweight Preoccupation (OP); Self-Classified Weight (SCW); Body Areas Satisfaction Scale (BSS).
- Obesity health related QoL will be predicted by the change in BMI from before to after surgery, and body image.

Method

Sample

415 responded to survey (401 complete surveys); average age 42 years; predominantly female (n=352, 88%);

96 had not had surgery

305 obese persons having had bariatric surgery; most had surgery in the last 10 years; Mean BMI change 12.12 (sd=6.61); Mean heaviest BMI=47 (sd=9.2); Mean current BMI=36 (sd=2.7)

Type of Surgery	N	%
Gastric Bypass (Rouxen-Y)	55	11.4
Adjustable Gastric Banding (Lap Band Surgery)	41	8.5
Vertical Sleeve (Gastrectomy)	207	42.8
Intragastric Balloon (Gastric Balloon)	2	.4

- Orwell97 is a valid and reliable measure of obesity specific health related quality of life in the somatic, physical function, emotional state and social engagement domains of life (Kolotkin et al., 2001).
- 36 questions split into two subscales: ORWELL 97-O and ORWELL 97-R.
- The ORWELL 97-O, has 18 questions measuring to the intensity of the occurrence of obesity specific symptoms affecting health, psychological status and social adjustment.
- The ORWELL 97-R, contains 18 questions that measure the subjective relevance of the identified specific symptoms affecting physical health, psychological status and social adjustment.
- The measure uses a 4 point response format ranging from “not at all” to “much”.

Multidimensional Body-Self Relations Questionnaire –AS 34

- The MBSRQ- AS 34 is the shortened version of the 69 item MBSRQ attitudinal body image assessment. The measure uses a 5-point response format ranging from 1 “definitely disagree” to 5 “definitely agree” (Brown, Cash, & Mikulka, 1990; Cash, 2004). This study used all 5 of the MBSRQ- AS 34 appearance subscales
 - Appearance Evaluation (AE)
 - Appearance Orientation (AO)
 - Overweight Preoccupation (OP)
 - Self-Classified Weight (SCW)
 - Body Areas Satisfaction Scale (BSS)

Results

Predicting Obesity-related QoL from MBSRQ subscales for Vertical Sleeve
Gastrectomy

Predictor variable	Unstandardized B	Std. Error	Beta
Appearance evaluation	-4.95	.889	-.401**
Appearance orientation	2.53	.957	.160
Weight Classification	5.07	1.17	.311**
R ²	.400		
F=36.73,df(3,165),p=.000			

** p=.000

Results

Hierarchical Regression of Obesity-related QoL for Vertical Sleeve Gastrectomy with BMI change and body image as predictors

Predictor variable	Step 1		Step 2	
	B	β	B	β
BMI change	.686	.437**	.410	.261**
Appearance orientation			2.55	.162*
Appearance evaluation			-4.88	-.404**
Self-classified weight			3.21	.203*
R ²	.19		.464	

** p=.000; *P<.05

Results

Hierarchical Regression of Obesity-related QoL for total surgical sample with BMI change and body image as predictors

Predictor variable	Step 1		Step 2	
	B	β	B	β
BMI change	.849	.505**	.662	.394**
Appearance orientation			2.84	.178*
Appearance evaluation			-5.27	-.386**
Self-classified weight			-.434	-.027
R ²	.255		.408	

** p=.000; *P<.05

Results

- There were no significant differences between the different types of surgery received and any of the body image subscales of the MBSRQ.
- There were no significant differences between the different types of surgery received and either subscale of the ORWELL 97 ie. the intensity of the occurrence of obesity specific symptoms affecting health, psychological status and social adjustment, or the subjective relevance of the identified symptoms.
- Comparing individuals who had had weight-loss surgery with those who had not, independent samples t-test revealed a difference on **obesity QoL intensity of symptoms**, and **overweight preoccupation**. Those who had undergone bariatric surgery were more preoccupied with their appearance than those who had not had surgery. The intensity of obesity symptoms affecting health, psychological status and social adjustment was higher for the non-surgery group.

- Kolotkin et al., (2012) found improvement to HRQOL for individuals following bariatric surgery when compared to a community obese group.
- A randomised control study (Isacsson, Frederiksen, Nilsson, & Hedenbro, 1997) reported an initial improvement in self-esteem, intimate partner relationship and social adjustment in bariatric patients, but no significant difference to controls in overall HRQOL at 5 years
- Improvements noted for scores on depression, health related quality of life, body image and sustained weight loss for individuals who elected bariatric surgery treatment for obesity compared to those who elected conventional treatments (Sjöström, 2013)
 - Difficult to compare to these studies as different measures of QoL used
 - randomized controlled trials or community comparisons

Discussion

- There was support for the hypothesis that body image would predict obesity health related QoL. This was found in the regression for the group having had vertical sleeve gastrectomy. **Appearance evaluation** (Beta=-.401) and **self-classified weight** (Beta=.311) both predicted QoL.
- If surgical patients had positive and satisfied perceptions of physical appearance and attractiveness, this served to increase their obesity related QoL. Having had the vertical sleeve surgery did not necessarily increase QoL as these individuals still perceived themselves as obese. High scores on self-classified weight (high subjective and internalized perception of self as obese) were related to lower QoL. Individuals who are positive and satisfied with their perception of appearance and attractiveness do not perceive themselves as obese and have increased QoL.



Limitations

- Survey data;
- No pre-post surgery data;
- Not a randomized controlled trial
- Small sample of obese individuals who had not had surgery
- Female obese group over-represented

Future directions

- Randomized controlled trial to compare differences between those who have undergone bariatric surgery to a wait-list or community control sample on obesity health related QoL and body image; weight loss
- Longitudinal data on post-surgery outcomes beyond 2 years
- Pre-post measures of QoL, body image, BMI

Conclusion

- BMI Weight change predicts obesity-specific QoL
- Of the body image constructs measured by the MBSRQ appearance evaluation and internalized perception of self as obese are significant determinants of QoL
- One explanation for obese individuals who had undergone bariatric surgery not having improved body image could be that they were dissatisfied with the results from bariatric surgery and had unmet expectations in regards to treatment goals.
- Further research is needed to understand obese individuals' long-term treatment goal expectations for weight and body image following bariatric surgery.

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Thank You

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