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Review article

# Health-related quality of life after bariatric surgery: a systematic review of prospective long-term studies

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**Abstract** Impaired health-related quality of life (HRQoL) is common in bariatric surgery candidates and is often one of the motivating factors for seeking bariatric surgery. Although many studies have reported changes in HRQoL after bariatric surgery, few are long-term prospective studies and no systematic review has been conducted. A systematic database search identified studies reporting HRQoL preoperatively and ≥5 years after bariatric surgery. Change in HRQoL over time was the outcome variable, divided into primary and secondary outcomes. Seven prospective cohort studies met the inclusion criteria. Eight HRQoL measures and 6 surgical methods were identified. Long-term follow-up time ranged from 5–10 years, sample sizes from 44 to 655 patients, and follow-up rates from 61% to 92%. None of the 7 studies were randomized controlled trials, and only 2 studies used control groups. Six of 7 studies showed statistically significant improvements in all of the primary outcomes, and 1 study showed statistically significant improvements in 1 of 2 primary outcomes. Of the statistically significant HRQoL improvements, 92% were clinically meaningful. Peak improvements in primary HRQoL outcomes were typically observed during the first years of follow-up, followed by a gradual decline that seemed to stabilize 5 years postoperatively. Long-term HRQoL scores typically remained improved relative to preoperative scores but were somewhat below population norm scores. In conclusion, while bariatric surgery candidates reported impaired HRQoL presurgically, their HRQoL improved considerably after bariatric surgery and much of the initial HRQoL improvements were maintained over the long term. (Surg Obes Relat Dis 2015;11:466–473.)


*Keywords:* Health-related quality of life; Quality of life; Bariatric surgery; Obesity; Systematic review

Severe obesity, defined by a body mass index (BMI) ≥40 or ≥35 with obesity-related disease [1], is associated with a multitude of co-morbidities, shorter life span, and impaired health-related quality of life (HRQoL) [1–3]. HRQoL is a multidimensional construct of the individual's perception of the negative impact of an illness, capturing the physical, psychological, and social dimensions of health

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[4,5]. Among patients with severe obesity, bariatric surgery candidates are at a particularly increased risk of having reduced HRQoL [6], and the desire for an improved HRQoL is often a major motivation for seeking bariatric surgery [7,8]. Although many studies have reported significant improvements in HRQoL after bariatric surgery [9], there are few long-term prospective studies (e.g., ≥5 years). Furthermore, no systematic reviews of long-term HRQoL outcomes after bariatric surgery have been conducted. A recent systematic review of HRQoL outcomes in 53 randomized trials for weight loss interventions included only 4 bariatric surgery studies, with follow-ups ranging between 52 and 104 weeks [10]. Thus, the aim of this study was to conduct a systematic review of prospective studies reporting HRQoL data at least 5 years after bariatric surgery.

## Methods

This review was conducted in accordance with the Meta-analysis Of Observational Studies in Epidemiology Guidelines [11].

### *Search strategy*

OVID was used to search in MEDLINE, Embase, and PsycINFO for prospective studies published in the year 2000 or later. Searches were limited to full-text articles written in English. The search terms were as follows: (bariatric surgery OR weight loss surgery OR obesity surgery OR weight reduction surgery OR biliopancreatic diversion OR duodenal switch OR laparoscopic band OR lap band OR gastric band OR gastric bypass OR gastroplasty OR gastric sleeve OR sleeve gastrectomy) AND (obesity) AND (quality of life OR health-related quality of life OR health status). Manual searches also were conducted for additional articles. The last search was conducted on May 22, 2014.

### *Selection criteria*

Studies were eligible and considered to be of acceptable quality if (1) study participants were 18 years or older; (2) study participants had severe obesity, defined by a body mass index (BMI) ≥40 or ≥35 with co-morbidity; (3) HRQoL was measured with a validated generic and/or obesity-specific measure, or validated measures of physical or mental HRQoL (e.g., Hospital Anxiety and Depression Scale); (4) HRQoL was measured before and at least 5 years after the surgery (according to the American Society for Metabolic and Bariatric Surgery, a ≥5-year follow-up is defined as a long-term study [12]); (5) attrition rate was <50%; and (6) the study had the power to detect ≥.5 standard deviation change from baseline using a two-sided paired test providing 90% power, $P < .05$, indicating at least 44 paired observations [13].

### *Data collection and analyses*

Two of the authors independently reviewed the literature to identify studies meeting the criteria. Disagreement was resolved by consensus. The authors successfully contacted the first authors of 2 included papers to obtain more information on HRQoL standard deviations [14] and raw HRQoL scores [15]. Change in HRQoL ≥5 years postoperatively compared with baseline was the main outcome. The HRQoL outcomes were divided into primary and secondary outcomes to simplify reporting of the results and to minimize the problems associated with multiple comparisons [5]. Primary outcomes were defined as summary scores of generic or obesity-specific measures or a measure of overall health status or overall well-being. Secondary outcomes were defined as domain scores, such as social interaction, physical appearance, and self-regard. When available, comparisons with HRQoL scores from the general population (norm scores) were also studied for comparison. The effect sizes of the HRQoL changes over time were obtained by dividing the change scores by the standard deviations (SD) of the baseline scores. Effect sizes are reported in SD units of change. Changes over time were considered to be trivial (<.2 SD units), small (.2 to <.5 SD units), moderate (.5 to <.8 SD units), or large (≥.8 SD units) according to guidelines proposed by Cohen [16]. Changes over time were also considered to be clinically meaningful if the effect size was at least .5 SD units [13]. The size of the difference between HRQoL scores of the patients compared with population norms also were calculated by dividing the difference scores by the SDs of the patient group. Interpretation of these comparisons also followed Cohen's guidelines. A meta-analysis was considered inappropriate due to heterogeneity.

## Results

### *Overview of HRQoL Measures*

As can be seen in Table 1, 8 HRQoL measures were used in the reviewed studies, resulting in 9 primary HRQoL outcomes (SF-36 Physical Component Summary [PCS] and Mental Component Summary [MCS] are counted as separate primary outcomes). Of these 8 HRQoL measures, 5 were generic (General Health Rating Index, General Well-being, 15-D, Nottingham Health Profile II, and SF-36) and 3 were obesity-specific (Obesity-Related Problems scale, Weight Distress, and Impact of Weight on Quality of Life-Lite). Despite heterogeneity of HRQoL instruments, 3 studies [15,17,18] reported SF-36 summary score changes, allowing the authors to illustrate the trajectory of change after bariatric surgery.