

Obesity Management

Is social support associated with greater weight loss after bariatric surgery?: a systematic review

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Summary

Social support may be associated with increased weight loss after bariatric surgery. The objective of this article is to determine impact of post-operative support groups and other forms of social support on weight loss after bariatric surgery. MEDLINE search (1988–2009) was completed using MeSH terms including bariatric procedures and a spectrum of patient factors with potential relationship to weight loss outcomes. Of the 934 screened studies, 10 reported on social support and weight loss outcomes. Five studies reported on support groups and five studies reported on other forms of social support (such as perceived family support or number of confidants) and degree of post-operative weight loss (total $n = 735$ patients). All studies found a positive association between post-operative support groups and weight loss. One study found a positive association between marital status (being single) and weight loss, while three studies found a non-significant positive trend and one study was inconclusive. Support group attendance after bariatric surgery is associated with greater post-operative weight loss. Further research is necessary to determine the impact of other forms of social support. These factors should be addressed in prospective studies of weight loss following bariatric surgery, as they may represent ways to improve post-operative outcomes.

Keywords: Bariatric surgery, social support, support group, weight loss.

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Introduction

Obesity rates in the USA have risen over the past two decades and have recently stabilized. Currently about 15 million people in the USA are morbidly obese, generally defined as a body mass index (BMI) over 40 kg m^{-2} (1). Obesity is a known risk factor for diabetes, cardiovascular disease and certain types of cancer.

Conservative measures such as dieting and pharmacology generally lead to only modest weight loss for patients with this degree of obesity (2). Bariatric surgery has proven to be an effective and safe alternative. However, up to 20%

of patients fail to lose sufficient weight, which is generally defined as 50% excess weight loss (%EWL) or less with resolution of comorbidities (3,4). The variation in outcomes has been correlated with a multitude of factors including patient age, gender, baseline BMI, eating and exercise habits (5,6).

Morbidly obese patients frequently have psychiatric comorbidities such as depression, anxiety and poor self-esteem (7,8). Family and social support are hypothesized to improve weight loss following surgery by helping patients to deal with psychosocial stressors and dietary changes, yet the overall impact is not known nor what type of support is most beneficial (9). Understanding the role of social support following surgery may help identify those at greatest risk for not achieving successful weight loss.

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Ensuring that patients have adequate ancillary support to prepare them and help to cope with the dramatic lifestyle changes they will encounter post-operatively may optimize outcomes.

Support groups are an ideal platform to provide consistent and standardized psychological, nutritional and other counselling for bariatric patients. The American Society for Metabolic and Bariatric Surgery has developed the Bariatric Surgery Centers of Excellence programme (10). A part of the requirement is to provide organized, supervised support groups with a licensed healthcare professional present at the meetings. It remains to be seen whether patients who attend support groups or have other forms of social support have greater weight loss after bariatric surgery.

This systematic review analyses the association between support group attendance or other forms of social support (such as perceived family support or number of confidants) and weight loss after bariatric surgery. Additional information regarding the instruments used to measure social support and the details of support groups is also assessed.

Materials and methods

Identification and selection of studies

This study is part of a larger systematic review examining patient factors associated with degree of weight loss after bariatric surgery. Relevant studies evaluating social support were identified by searching MEDLINE (1/1/1988–3/4/2009) under the search words ('bariatric surgery' [Mesh : NoExp] or 'weight loss surgery' or 'obesity surgery' or 'weight reduction surgery' or 'biliopancreatic diversion' [Mesh] or 'duodenal switch' or 'laparoscopic band' or 'lap band' or 'gastric band' or 'gastric bypass' [Mesh] or 'gastroplasty' [Mesh] or 'gastric sleeve' or 'sleeve gastrectomy') and 'obesity' [Mesh] and ('social support' [Mesh] or 'family relations' [Mesh] or 'self-help groups' [Mesh] or 'life stress' or 'life stressors' or 'friend support' or 'marital status' [Mesh] or 'sponsor'). We mined the reference lists of retrieved studies to identify additional publications.

Articles were screened based on their full text by two researchers. The selection criteria included studies published in English with patients over the age of 18 years old (studies that included patients both over and under 18 years old were accepted) who underwent bariatric surgery (open or laparoscopic gastric bypass, laparoscopic gastric banding, biliopancreatic diversion, vertical banded gastroplasty or gastric sleeve; other bariatric procedures or not bariatric surgery were excluded). Accepted study designs included case series/cohort, case control and randomized control trials; studies with a sample size of less than 10

were excluded. Studies that did not report on an association between social support and post-operative weight loss were excluded.

Data extraction

Data were abstracted from each study by two physicians. The following relevant information was recorded: study design, type of operation, baseline patient demographics, number of patients, post-operative weight loss, and details regarding social support or support groups. For the purpose of this review, participation in group counselling sessions with other bariatric surgery patients (i.e. support groups) is considered a unique form of social support and is analysed separately. Studies were therefore divided into two categories, those dealing with support groups and those dealing with other forms of social support.

A study was defined as showing a positive association if patients who attended support groups lost significantly more weight than those who did not ($P < 0.05$). For the latter category, the form of social support was based on the instrument used in the study. A positive or negative association was defined by a significant correlation between social support and post-operative weight loss ($P < 0.05$), while a non-significant correlation was labelled as a trend (P -value between 0.05 and 0.15). Weight loss is generally reported as percentage of excess weight loss (%EWL), although some studies report the actual weight lost in kilograms while others report the change in BMI. One study looked at patients who had successful weight loss, defined as greater than 52.8 %EWL at 1 year after surgery, vs. those who failed to achieve this weight loss goal. Because of heterogeneity in weight loss reporting, mean follow-up time and definition of social support, data pooling was not possible.

Results

Description of the selected studies

The search strategy yielded 42 studies reporting on social support and weight loss after bariatric surgery, 10 fulfilled the inclusion criteria (Fig. 1). Excluded articles did not report an association between social support and post-operative weight loss. Two studies were from the same research group and included the same patient sample with different lengths of follow-up, so they were analysed together as a single study (11,12).

The included studies report on 735 patients with a mean age ranging from 34 to 47 years. All studies have a majority of female patients except Song *et al.* (13), and baseline BMI ranges from 35 to 52 kg m⁻² (Table 1). Most studies focus on either open or laparoscopic Roux-en-Y gastric bypass or laparoscopic adjustable gastric banding, although Canetti

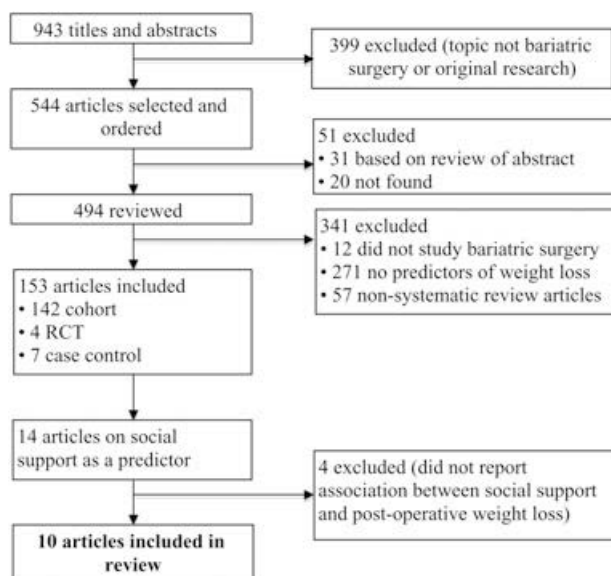


Figure 1 Flow diagram of included and excluded studies for review. RCT, randomized controlled trial.

et al. enrolled patients undergoing vertical banded gastroplasty or laparoscopic adjustable gastric banding (14) and Orth *et al.* include patients who underwent any of the above procedures or revisional bariatric surgery (15). Because of the search strategy, all studies have post-operative weight loss as their primary outcome. The mean length of follow-up varies from 12 to 33 months.

There were no randomized control trials looking at the effect of social support on bariatric surgery outcomes. Four studies focused on the association between support groups and surgical outcomes, while the remaining five looked at other aspects of social support such as perceived family support or number of confidants. All studies looking at the role of support groups are retrospective cohorts and all report on the attendance of post-operative meetings. The majority classify patients as either having attended group meetings or not based on varying criteria (11–13,15), while one study does not separate patients into groups (16).

Three social support studies were prospective cohorts. Canetti *et al.* compare a group of surgical patients vs. a group treated by conservative measures (14,17). Lutfi *et al.* divide patients into two groups based on marital status (married or single) (18), and Ray *et al.* separate patients by their number of confidants (19). The remaining two social support studies are retrospective, one of which separates patients by gender (20), while the other includes all patients in a single group (21,22).

Measurement of social support

Three studies use validated instruments to assess amount of social support, and one study used a self-developed survey.

Table 1 Baseline characteristics of studies included in the review

Author (year)	Category	Study design	Operation	No. of patients	Mean age, years (SD)	% female	Baseline BMI (SD)
Orth <i>et al.</i> (2008) (15)	Support group	Retrospective cohort	Variety*	46	42 (8.7)	14	52.8
Song <i>et al.</i> (2007) (13)	Support group	Retrospective cohort	Lap RYGB	78	42 (9.7)	12	49.7
Elakkary <i>et al.</i> (2004, 2006) (11,12)	Support group	Retrospective cohort	LAGB	38	45.5 (15.1)	100	42.6 (5.5)
Hildebrandt (1998) (16)	Support group	Retrospective cohort	RYGB†	102	43.1 (12.4)	92.9	45.4 (5.5)
Canetti <i>et al.</i> (2009) (14)	Other social support	Prospective cohort	VBG, LABG	44	44.5/39.68	88.2	303.7 (60.7) lb‡
Shiri <i>et al.</i> (2007) (21)	Other social support	Retrospective cohort	LAGB	47	34.2 (10.0)	86.3	45.1 (7.7)
Lutfi <i>et al.</i> (2006) (18)	Other social support	Prospective cohort	LAGB	31	42.8 (11.5)	64.7	35.4 (7.2)
Ray <i>et al.</i> (2003) (19)	Other social support	Prospective cohort	RYGB†	180	40 (9.7)	81	45 (5.6)
Delin <i>et al.</i> (1995) (20)	Other social support	Retrospective cohort	RYGB†	149	43.7 (10.4)	85	48 (5.6)
				20	39 (10)	81	52 (10)
					F 41.3 (9.7)	80	F 114.8 (12.8) kg‡
					M 47 (8.6)		M 131.5 (28.5) kg

*RYGB (lap and open), LABG, revision surgery.

†Not stated if laparoscopic or open technique.

‡No BMI reported.

BMI, body mass index; F, female; LABG, laparoscopic assisted gastric banding; lap, laparoscopic; M, male; RYGB, Roux-en-Y gastric bypass; VBG, vertical banded gastroplasty.

None of the instruments used is specific to bariatric surgery patients. Delin *et al.* include the Medical Outcomes Study (MOS) Social Support Survey, which is a self-administered series of 20 questions (23). It has one question to measure structural support (number of close friends and relatives) and four other subscales: emotional/informational support, affection, tangible support and positive interaction. Canetti *et al.* utilize Receiving Social Support, a 10-item scale that assesses social support provided by the closest person that the patient meets at least once weekly (24). Shiri *et al.* use the Perceived Social Support Scales–Family, which measures perceived fulfilment of support needs by a patient’s family (25). Ray *et al.* include a self-developed survey entitled the Gastric Bypass Candidate Questionnaire, with a question regarding the number of family or friends the patient confides in (19).

Support groups

All four studies report a positive association of support groups on the degree of post-operative weight loss (Table 2). Song *et al.* report that weight loss between patients who attend support groups vs. those who do not is similar up to 6 months post-operatively, but by 9 months this difference becomes significant (53.6 %EWL vs. 45.1 %EWL, $P = 0.002$). This difference is sustained at 12 months. Elakkary *et al.* found that support group patients have significantly greater weight loss starting at 6 months and continuing at 12 months. Hildebrandt *et al.* note that when controlling for time elapsed since surgery, the number of group meetings attended explains some variance in weight loss (16). This association is not present when predicting weight regained.

The criteria for each study for whether or not patients were placed in the group that attended support meetings as opposed to those that did not attend also varied. Orth *et al.* accepted any attendance of post-operative support groups, while Elakkary *et al.* required attendance of at least 50% of meetings. Song *et al.* separated patients by attendance of greater than five vs. less than five support group meetings, with the former group attending an average of 10 meetings while the latter had an average of 2.7 meetings.

The studies looking at support groups differ in who led the group, what content was discussed and the frequency of meetings. All studies include an exercise and nutritional counselling component. Orth *et al.*’s study is the only study to specify that suggestions for how to lose weight were provided on an ongoing basis, while Hildebrandt *et al.*’s study is the only study mentioning psychiatric counselling (i.e. coping with depression, anxiety and need for psychiatric treatment after surgery) (16). Song *et al.* report that support groups were led by a surgeon, nurse practitioner or nutritionist. Elakkary *et al.* state that the support group consisted of a dedicated registered nurse, nutritionist,

Table 2 Association between support groups and post-operative weight loss

Author	F/U (mo)	Groups (n)	Weight loss at F/U (95% CI)	Weight loss at 6 mo (95% CI)	Units of weight loss	Results
Orth <i>et al.</i> (2008) (15)	23–27	SG (18) NSG (28)	42%*† 32%	–	% BMI decrease (only for RYGB patients)	NSG patients more likely to feel that support groups are not needed after bariatric surgery (5.3 vs. 7.1).
Song <i>et al.</i> (2007) (13)	12	SG (28) NSG (50)	55.5* (50.7–60.3) 47.1 (43.4–50.7)	44.4 (39.6–49.3) 41.3 (37.7–44.9)	%EWL	Weight loss similar up to 6 months, then diverged.
Elakkary <i>et al.</i> (2004, 2006) (11, 12)	12	SG (10) NSG (28)	9.7* (8.5–10.9) 8.1 (7.3–8.9)	5.4 (3.03–7.85) 4.0 (2.54–5.52)	BMI points decrease	More weight loss in SG patients starting at 6 months.
Hildebrandt (1998) (16)	15	–	63.3	–	%EWL	Number of meetings attended explains variance in pounds lost beyond time elapsed since surgery ($R^2 = 0.09^*$).

* $P < 0.05$.

†No standard deviation or confidence intervals reported.

BMI, body mass index; %EWL, percentage of excess weight loss; NSG, non-support group; RYGB, Roux-en-Y gastric bypass; SG, support group.

facilitator and the surgeon, as well as a personal trainer who participates every 2–3 months to instruct patients on the required physical activities and exercise. Orth *et al.* and Hildebrandt *et al.* do not mention specific group leaders. Song *et al.*'s study is the only study where attendance of pre-operative support groups (monthly for six sessions) was mandatory for patients to be candidates for bariatric surgery. The other studies mention that some patients did attend pre-operative support groups but not that this was a requirement.

How to motivate patients to attend support groups was discussed in each study. Based on patient feedback, Orth *et al.* report that factors that may encourage support group attendance include different meeting times or weekend meetings, discussion of relevant topics (specifically nutrition and weight loss) in a structured manner with new information provided at each meeting and the presence of a physician. Distance travelled to attend support group was not a factor in patient attendance. Elakkary *et al.* found that patients who attended some but less than 50% of support groups either did not attend because of their busy schedules or because they did not perceive a difference in their lifestyle or behaviours.

Other types of social support

Only one study found a significant positive association when looking at other aspects of social support and surgical outcomes (Table 3). Lutfi *et al.* found that married patients had an over 2.6 times greater odds ratio of failing to achieve successful weight loss compared with single patients ($P = 0.04$). Canetti *et al.* report a trend for greater weight loss in surgical patients who have more social support, although this correlation is significant for patients in the non-surgical group ($r = 0.31$, $P < 0.05$). Ray *et al.* found that bariatric patients have an average baseline of four confidants, and those with greater than nine confidants trended towards greater weight loss ($P = 0.13$) (19). Delin *et al.* examine a variety of social support components (e.g. emotional support and number of close friends and relatives) but none correlates with post-operative weight loss.

Discussion

Attending support groups appears associated with a greater degree of weight loss following bariatric surgery. The influence of other forms of social support is less clear. A causal association between support groups and weight loss cannot be proven with the types of studies identified in our review as all were observational, cohort studies. However, three of four of the support group studies were prospective and as such suggests that our findings are hypotheses-generating and more work in this area is warranted.

Table 3 Association between social support and post-operative weight loss

Author	F/U (mo)	Groups	Weight loss (95% CI)	Units of weight loss	Instrument	Results
Canetti <i>et al.</i> (2009) (14)	12	Surgery Diet	45.1 (38.5–51.6) 10.0 (7.0–13.0)	Kilograms lost	Receiving Social Support	Correlation between social support and weight loss in surgery group ($r = 0.14$).
Shiri <i>et al.</i> (2007) (21)	12	–	11.8 (10.0–13.6)	BMI points decrease	Perceived Social Support Scales–Family	Correlation between perceived family support and change in BMI ($r = 0.337$).
Lutfi <i>et al.</i> (2006) (18)	12	Single Married	89.8* 77.7	%EWL	–	More single vs. married patients had successful [†] weight loss (89.8% vs. 77.7%).
Ray <i>et al.</i> (2003) (19)	12	>9 confidants ≤9 confidants	80 (59.0–101.0) 59 (55.5–62.5)	%EWL	Gastric Bypass Candidate Questionnaire	Greater weight loss in patients with >9 confidants.
Delin <i>et al.</i> (1995) (20)	F 22, M 33	F M	90.1 (79.0–110.2) 87.5 (55.0–120.1)	%EWL	MOS Social Support Survey	No correlation between any social support variables and %EWL.

* $P < 0.05$; ** $P = 0.13$.

[†]No standard deviation or confidence intervals reported for single vs. married patients; mean EWL (95% CI) for all patients: 70.1% (67.6–72.6).

[‡]Successful weight loss defined as %EWL > 52.8% at 12 months.

BMI, body mass index; %EWL, percentage of excess weight loss; F, female; M, male; MOS, Medical Outcomes Study.

It is well recognized that surgery is one component of a successful bariatric programme. Patients must make changes in their dietary and exercise habits to achieve and sustain optimal weight loss. This significant lifestyle adjustment requires support to help cope with stresses and prevent old habits from resurfacing. Patients will often not remember advice that was given to them pre-operatively (26). Support groups can help to provide continuing education after surgery and are associated with post-operative weight loss.

There are no standardized guidelines for how bariatric support group meetings should be set up (Table S1). A comprehensive programme should likely address at least nutrition and exercise topics and be led by a surgeon and/or a registered nurse or nurse practitioner. Further research is needed to identify the key components needed for a successful support group. It also remains to be seen if there is a threshold for the number of support groups attended to confer a benefit in outcomes. As all studies found a positive association between support group attendance and weight loss after bariatric surgery, it is important to consider how more bariatric patients can be persuaded to attend post-operative support group meetings. Flexible meeting times and a comprehensive, structured agenda with novel topics discussed at each group should encourage participation.

In the non-support group studies, different aspects of social support are analysed in each one. The lack of association between social support other than support groups and post-operative weight loss may be due to the limited aspects of support that were analysed. There is no bariatric-specific social support instrument that has been validated in the literature. Surveys such as the MOS Social Support Survey or Perceived Social Support Scales may not be adequate to assess social support in this population. The negative association between married status and degree of post-operative weight loss seen by Lutfi *et al.* may be due to earlier return to work or more time available for regular physical activity. The effect of social support may be multifactorial and influence eating habits, psychological stressors or exercise.

This review has some limitations mainly related to heterogeneity of the studies. The variation in how weight loss is defined, with some studies reporting %EWL while others include BMI points or kilograms lost, and makes comparing across studies difficult. The criteria for support group attendance also varied, with different frequencies of attendance and structure of meetings reported by individual studies. Although studies found a positive association between attendance of post-operative support groups and weight loss, this does not prove that a causal relationship exists. There is a potential for selection bias in that participation in support groups is recommended but not mandatory after surgery, so that patients who choose to attend may be inherently more motivated from the start. To show

that this relationship is not only an association would require prospective randomized trials or prospective matched cohorts. In addition, our search was restricted to the English language and the under representation of studies not finding any association may be due to publication bias.

In summary, patients who attend support groups after bariatric surgery have an associated greater degree of weight loss. Future work with prospective, intervention-based studies is needed to determine the type of support group that is beneficial. Failure to attend support groups can possibly be used to identify patients who may be at risk for unsuccessful weight loss, allowing for early intervention. Research is needed to look in closer detail at other forms of social support to see if patients with poor support systems are at higher risk for decreased weight loss and need additional support from the surgical team to optimize their outcomes.

Conflict of Interest Statement

None.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Table S1 Topics for support group meeting discussion.

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