




Behavioral Interventions After Bariatric Surgery

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Abstract

Purpose of Review Bariatric surgery is the most effective and durable treatment for severe obesity. Postoperative behavioral weight management approaches are available for optimizing weight change for both short- and long-term outcomes.

Recent Findings Varying settings such as groups and telemedicine along with techniques such as cognitive behavioral therapy have been assessed in the post-bariatric surgery population. The assessment and application of these programs have been limited due to methodological, financial, and attrition-related constraints.

Summary This review aims to summarize the current evidence for different postoperative behavioral interventions on postoperative outcomes, specifically highlighting weight loss. Future opportunities for study include mechanisms for overcoming some of the barriers to implementing these programs in clinical, non-research settings.

Introduction

Bariatric surgery is the most effective and durable treatment for severe obesity, producing 20–35% total body weight loss within 12 to 18 months [1]. The two most

commonly performed procedures, Roux-en-Y gastric bypass and sleeve gastrectomy, provide substantial reductions in body mass index (BMI) with modest

risks [2]. Laparoscopic bariatric procedures are consistently cited as one of the lowest risk abdominal or elective operations an individual can undergo, likely due to the comprehensive, interprofessional optimization of their care prior to surgery [3]. Postoperative optimization of care is an evolving area of practice with considerable limitations. However, more than 200,000 US adults undergo bariatric surgery each year; the number of individuals in need of effective, supportive postoperative care continues to increase [2].

When discussing postoperative behavioral interventions, acknowledging the limitations imposed upon postoperative care is necessary to better understand the context of the information presented. Of note, those who undergo bariatric surgery represent a small minority of the clinically eligible population for surgery—approximately 1%—and patients undergoing bariatric surgery are disproportionately White and female and of higher socioeconomic status [4, 5•]. This lack of representation of all patients with severe obesity calls into question the scalability of many of these interventions as the patient population reached increases in diversity. Additionally, variability in postoperative outcomes and limited research to predict

those at greatest risk of suboptimal outcomes create challenges around targeting those at greatest risk for weight regain and who may see the greatest benefit in these interventions [6•]. Specific to bariatric surgery, postoperative attrition is a continuous challenge of care with little consistency of which patients are at greatest risk of loss to follow-up and methods to improve rate of completion of postoperative visits [7]. High attrition rates create methodological hurdles for the design and evaluation of any postoperative interventions. Lastly, payer coverage of the most commonly assessed services such as nutrition, physical activity, and behavioral health is limited, leaving the majority of the available information based in research settings or limited by financial constraints [8, 9, 10]. Despite bariatric providers identifying postoperative counseling as an area of importance and need, most cite cost as the primary barrier to being able to provide these services [11]. With these postoperative challenges in mind, this article aims to summarize the current state of the literature on behavioral interventions after bariatric surgery and highlight opportunities for future research (Fig. 1).

Timing of interventions

Short-term interventions

Short-term interventions occur within the first year of surgery. Immediate postoperative behavioral counseling practices vary between programs and are not a new concept to care. A 2013 meta-analysis found that any postoperative behavioral intervention was associated with greater weight losses up to 3 years after surgery [12]. Specific to nutrition, Sarwer and colleagues randomized patients after bariatric surgery to receive nutrition counseling with a registered dietitian for the first 4 months after surgery or standard of care without standardized nutrition follow-up counseling ($n = 84$) [13]. Over the first two postoperative years, patients who met with a registered dietitian achieved greater weight loss, although the difference did not meet statistical significance. However, another study found that meeting with a registered dietitian at least once postoperatively was associated with larger body mass index losses [14]. The authors additionally found that each additional nutrition visit beyond the minimum of one was associated with greatly likelihood of additional BMI loss (odds ratio = 1.56, 1.02–2.38, 95% CI, $P = 0.04$) [14]. Unlike the randomized trial by Sarwer, however, those who completed additional visits were self-selecting. This limits the

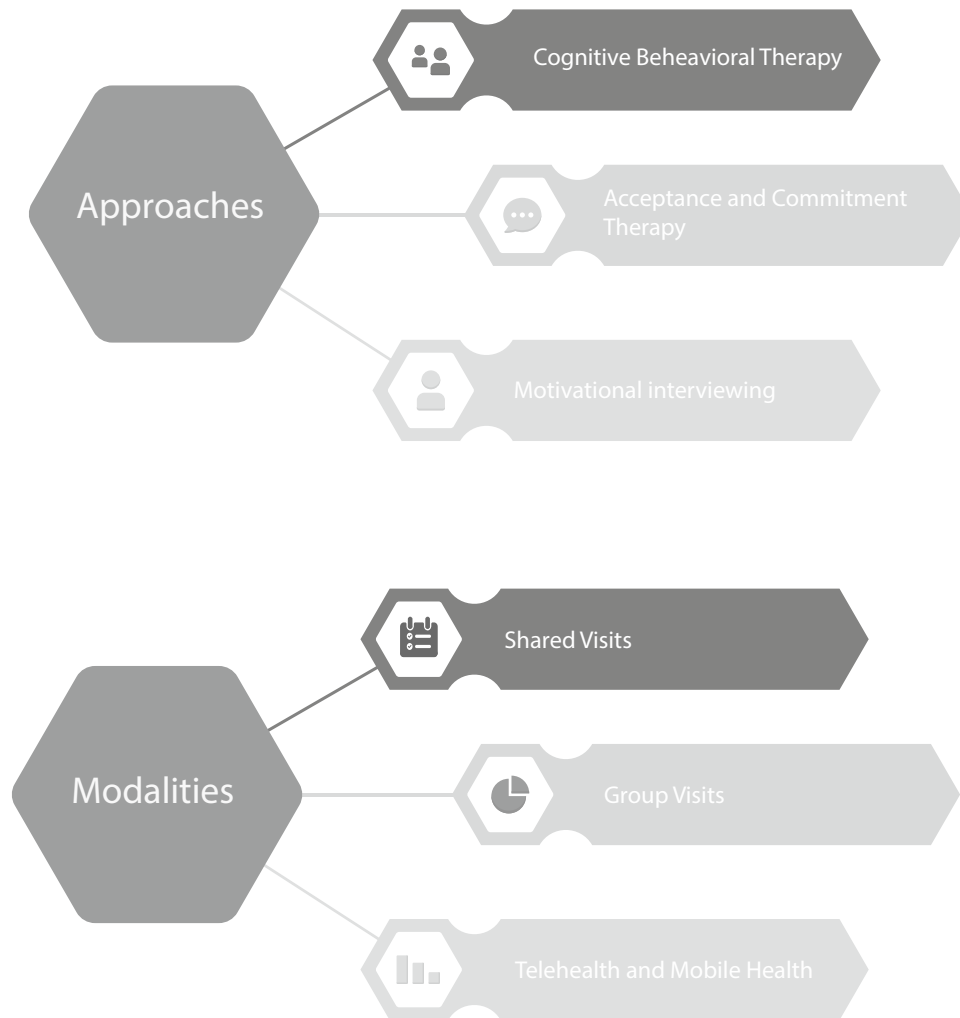


Fig. 1 Behavioral approaches and modalities studied and discussed for post-bariatric surgery care

applicability of the findings, as more nutritionally engaged patients may be more likely to request those appointments. The current evidence of the effects of postoperative medical nutrition therapy on postoperative weight loss are limited in number and mixed in results [15]. Most recently, a randomized controlled trial assessing a single meeting with a registered dietitian postoperatively did not appear to effect 2-year weight outcomes [16]. This may speak to the well-understood concept in non-surgical weight loss and behavioral management that greater intensity of interventions has proven most effective and low intensity or one time interventions have limited effects [17]. Yet, in looking at a medium-term intervention, one program found that patients who participated in a telephone-based nutrition counseling program from 2 to 11 months postoperative experienced greater weight loss (1.97% (95% CI 0.7, 3.3)) when compared to patients

who completed surgery alone after the nutrition program had been discontinued [18].

In the immediate postoperative period after surgery, initial behavioral interventions appear to have beneficial results. When assessing immediate surgical complications, Garg and colleagues found that patients who received postoperative nutrition intervention in the initial days following surgery experienced fewer readmissions related to nutrition [19]. A core component of the national Decreasing Readmissions through Opportunities Provided (DROP) program included a discharge phone call and visit with a registered dietitian within the first 30 postoperative days [20, 21]. In particular, for postoperative complications, including postoperative multidisciplinary support has been shown to be associated with a reduction in overall complications, more specifically reducing pain postoperatively [22]. While it is unclear whether many of the immediate postoperative interventions have longer-term impacts, immediate postoperative support appears to be correlated with improved short-term outcomes.

Long-term interventions

Long-term attrition is a continuous challenge of bariatric surgery care, particularly in developing long-term behavioral programs, or programs initiated at least a year after surgery. Due to the previous lack of standardization of long-term follow-up recommendations, long-term attrition variables as a correlate of weight loss are inconsistent and difficult to predict [23]. More recently, completion of postoperative follow-up visits has been suggested to be associated with larger weight losses [24]. Regular follow-ups with a registered dietitian long-term after surgery are associated with improved weight maintenance [25]. A multidisciplinary center offering treatment for postoperative weight regain found that while patients responded well to comprehensive lifestyle intervention as a part of standard of care, the addition of pharmacological agents significantly increased weight loss and reversal of weight regain [26]. With the variability in practice and evidence limited primarily to retrospective data review of individual programs, the impact of these reports on patient care is not well understood.

Separate from postoperative visits, patients have reported a desire for more comprehensive behavioral programs for long-term management. More than 4 out of 5 patients after bariatric surgery report wanting a postoperative program aimed at stopping or reversing weight regain [27]. In response to this demand, Bradley and colleagues developed and assessed a 10-week behavioral program for patients struggling with weight regain at least 18 months postoperatively [28]. Participants completed weekly sessions via online modules focusing on a willingness to experience distressing thoughts, feelings, and sensations in order to live a life in accordance with one's key long-term values and were instructed to self-monitor caloric intake and weight. The intervention led to reversal of weight regain with mean weight loss of $5.1 \pm 5.5\%$

total weight loss and was maintained 3 months post-intervention. Despite the provider support and patient demand for these programs, few exist due to cost constraints. Future studies assessing the financial risks and benefits of these programs are needed to address the current challenges to providing these services.

Intervention settings

Group or shared visits

Group-based interventions are common within bariatric surgery—most frequently in the form of support groups. Attendance at support groups post bariatric surgery is associated with larger weight losses and therefore strongly recommended both before and after surgery [12]. Group-based interventions have long been utilized and proven to be effective settings for post-bariatric surgery intervention [29]. Group visits that include all members of the interdisciplinary team (exercise, nutrition, psychology) have been successfully integrated into postoperative care previously [30]. The full benefit of these groups and whether they are more advantageous than individual sessions is not clear. Group interventions may not be necessary in all areas of care. Marcon and colleagues found adding a cognitive behavioral therapy (CBT)-based group intervention to a 4-month postoperative exercise intervention had little effect on weight loss, functional capacity, nor cardiometabolic outcomes [31]. Employing group settings also poses logistical challenges of scheduling and determining individual appropriateness for group treatment. A potential option for clinical groups is to offer shared visits, where a patient sees multiple clinicians or disciplines in one encounter, rather than scheduling separate visits for each clinician. Shared visits in postoperative bariatric surgery are common, most often combining visits with surgical providers with visits with a dietitian [32]. As discussed in immediate postoperative interventions, integrating in a behavioral or nutrition component into postoperative care may reduce the risk of complications or improve nutrition and weight measures. This approach additionally brings operational and counseling challenges in that patients have fewer appointments which may minimize barriers such as transportation, time off from work, or coordinating childcare; however, this scheduling method lengthens appointments which may have larger, unknown implications.

Telehealth and mobile health interventions

Telehealth and mobile health approaches are not a new concept but are increasing in popularity. Remote assessments and interventions have been previously proposed as a mechanism to deliver these interventions [33].

However, with the effects of COVID-19, many bariatric programs have been able to overcome many of the barriers to implementing this care and, in turn, expand access for patients without compromising quality [34, 35]. Based on retrospective analysis, bariatric clinicians have suggested that in-person sessions are not necessary to screen for potential postoperative issues. Patients report wanting these options as well. Seventy-one percent of patients post-bariatric surgery report a desire for more Internet-based programs [27]. These remote interventions can be provided in a variety of ways. One program provided telephone-based nutrition interventions over the course of the first year postoperatively, completion of which was associated with greater postoperative weight losses [18]. As few as six telephone-delivered, behavioral intervention sessions provided to patients post-bariatric surgery have been shown to prevent weight regain [36]. Half of patients post-bariatric surgery report interest in mobile-health-based programs specific to bariatric surgery [27]. To address this need, Bradley and colleagues successfully developed an acceptance-based behavioral intervention delivered using online modules [37]. These modalities can be leveraged in future behavioral interventions and research within bariatric surgery.

Behavioral approaches

Within the studies discussed, the vast majority base their content on widely available approaches to behavioral weight loss with slight modifications specific to bariatric surgery. While patients who have undergone surgery may face slightly different challenges related to supplementation and surgical management, the current consensus supports that behavioral intervention does not differ much from well-established comprehensive lifestyle interventions. This section includes behavior modification modalities and summarizes the literature of the application of these modalities in post-bariatric surgery settings.

Cognitive behavioral therapy

Cognitive behavioral therapy (CBT) was first developed in the 1960s as an intervention for behavior modification with the three core tenants: (1) Cognitive activity affects behavior; (2) cognitive activity can be monitored and altered; and (3) desired behavior change may be effected through cognitive change [38]. Since its development, CBT has been employed in a variety of areas, including behavioral weight loss. These techniques have then been integrated into behavioral weight loss interventions for bariatric surgery patients. The majority of studies assessing the use of CBT in bariatric surgery demonstrate improved outcomes [39]. An 8-week postoperative CBT-based intervention led to significant and meaningful benefits in psychological well-being in

patients after surgery that were maintained up to 3 months after the intervention ended [40]. For patients further out from surgery, Sockalingam and colleagues conducted a pilot study evaluating the effects of cognitive behavioral therapy in patients at least 6 months out from surgery. The authors found the intervention led to improvements in reported emotional eating, depressive symptoms, and anxiety symptoms [41]. With respect to preventing weight regain, employing CBT approaches appears to be effective in reducing behavioral risk factors for weight regain after bariatric surgery [42, 43]. This extends to responses to weight regain. For example, a combined CBT and dialectical behavior therapy program delivered over 6 weeks for patients who had weight regain experienced a significant reduction in weight and improvement in depressive symptoms, grazing patterns, and subjective binge eating episodes [44]. Cognitive behavioral therapy has been the primary behavioral intervention utilized in non-surgical weight management, which has extended into bariatric surgery care.

Motivational interviewing

Motivational interviewing (MI) is a counseling style employed in multiple areas of health behavior modification [45]. This style focuses on empathetic listening and strategies to explore a person's values and goals and how they relate to the identified problem in order to elicit motivation for change. This approach centers around patient readiness, ambivalence, and resistance. The empirical assessment of MI use in postoperative bariatric surgery care is limited. In one of the only published assessments, a single session of MI post-bariatric surgery led to patients reporting improvements in readiness to change, confidence, and self-efficacy [46]. While MI may have larger uses in this arena, little is currently known about its efficacy in post-bariatric surgery counseling.

Acceptance and commitment therapy

Acceptance and commitment therapy (ACT) was initially developed in the 1990s as an approach to behavior change [47]. This technique employs cognitive defusion, where patients are encouraged to change the context of their thoughts in relation to behavior, rather than the content and identify non-avoidant motivations. The application and evaluation of ACT in behavioral weight loss is emerging; however, it is not a widely utilized approach in standardized interventions [48]. Within bariatric surgery, ACT use is even more limited. In one of the only studies assessing ACT in bariatric surgery, Bradley and colleagues found a 10-week acceptance-based behavioral intervention was effective at reversing postoperative weight regain [37]. Use of ACT approaches in bariatric surgery postoperative care is a needed area of research to better understand its efficacy within this population.

Conclusion

Bariatric surgery case volumes have continued to increase over the past decade as the most effective treatment option for severe obesity. A variety of options for postoperative interventions are available for implementation; however, employing these interventions is often difficult due to payer constraints and patient attrition. Clinicians have a variety of options to integrate into care including group-based interventions and telemedicine, along with specific behavioral approaches to enhance care. Future studies can focus on interventions that translate well into existing clinical operations given current constraints to identifying and providing optimal postoperative bariatric surgery care.

Declarations

Conflict of Interest

Colleen Tewksbury declares that she has no conflict of interest. Kellene Isom declares that she has no conflict of interest.

Human and Animal Rights and Informed Consent

This article does not contain any studies with human or animal subjects performed by any of the authors.

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