

## Go with the FLOW: Implementation of a psychological skills intervention in an exercise program for post-bariatric surgery patients

By: Sara M. Powell, Kimberly S. Fasczewski, [Diane L. Gill](#), and [Paul G. Davis](#)

Powell, S. M., Fasczewski, K. S., Gill, D. L., & Davis, P. G. (2018). Go with the FLOW: Implementation of a psychological skills intervention in an exercise program for post-bariatric surgery patients. *Journal of Health Psychology*. <https://doi.org/10.1177/1359105318793182>

**\*\*\*© The Authors. Reprinted with permission. No further reproduction is authorized without written permission from SAGE Publications. This version of the document is not the version of record. Figures and/or pictures may be missing from this format of the document. \*\*\***

### **Abstract:**

Bariatric surgery is an effective obesity treatment; however, most individuals regain weight following surgery. Following a Lifestyle of Wellness (FLOW) is a psychological skills intervention with strategies designed to increase self-efficacy and promote living a healthy lifestyle including regular physical activity. Eleven participants completed FLOW. Results indicated participants enjoyed the program and intended to continue this lifestyle upon program completion. Interviews indicated FLOW was effective for improving self-perceptions, and exercise motivation. The most effective sessions were goal setting, future planning, and stress management. Suggestions for program improvement were provided. This information can be used to improve the FLOW program and for implementation into other settings.

**Keywords:** bariatric surgery | behavior change | exercise behavior | obesity | physical activity | self-efficacy | social cognitive theory

### **Article:**

Currently, 66 percent of adults in the United States are overweight and 34.9 percent obese (Centers for Disease Control and Prevention (CDC), 2015a; Flegel et al., 2012). It is projected that at the current rate, by 2030, 86.3 percent of US adults will be overweight and 51 percent of adults will be obese (Wang et al., 2008). Various types of treatment for obesity have been identified, including lifestyle modification (diet, physical activity) with standard behavioral therapy, and bariatric surgery (Adams et al., 2012; ASMBS, 2015; Burke and Wang, 2011; Gagnon and Sheff, 2012).

The benefits of physical activity for weight management, decreasing disease risk, and improving quality of life in overweight and obese individuals are well established (CDC, 2015b; Morgan et al., 2014; Ross and Janssen, 2012). Physical activity is a viable adjunctive treatment for those who undergo bariatric surgery (Coen and Goodpaster, 2016; King et al., 2013; Moya et al., 2014; Steele et al., 2015). Therefore, to combat post-surgery weight regain and a sedentary lifestyle, the use of theoretically based exercise and behavior change intervention as supplemental treatments to bariatric surgery is recommended for obese individuals (Jassil et al.,

2015; King et al., 2013; McMahon et al., 2006). Social cognitive theory (SCT) has been found to be effective as a framework for promoting physical activity participation and adherence (Bandura, 2004; Brawley et al., 2012; Morgan et al., 2014; Palmeira et al., 2007). A key component of SCT, self-efficacy, is a foundational aspect of the present study.

Current research has demonstrated use of SCT and self-efficacy interventions can promote exercise adherence and behavior change in obese individuals (Annesi and Gorjala, 2010). Self-efficacy interventions have been explored within cardiac rehabilitation settings and were found to be beneficial for increasing patient self-efficacy. The use of positive reinforcement for exercise behavior, providing motivational resources, and educational information for overcoming perceived barriers, increased patient self-efficacy throughout the rehabilitation programs (Carlson et al., 2001; Song, 2013; Vibulchai et al., 2016). There is a gap in research examining the use of a SCT-based psychological skills intervention among a bariatric population (Hunt and Gross, 2009; Kalarchian and Marcus, 2015; Paul et al., 2015). Previous SCT-based studies with overweight and obese individuals (Brawley et al., 2012; Morgan et al., 2014) suggested future research focus on bolstering self-efficacy throughout the intervention to facilitate lasting physical activity adherence. Therefore, the current project used SCT as a framework by implementing specific interventions for increasing self-efficacy among a bariatric population partaking in a 16-week exercise program.

The purpose of this study was to implement a SCT-based intervention aimed at promoting positive self-perceptions, increasing levels of self-efficacy, and facilitating the transition to continued physical activity participation among overweight and obese individuals partaking in the Bariatric Exercise and Lifestyle Transformation (BELT) program, an existing 16-week exercise program for post-bariatric surgery patients. The insights gained from this research are useful for implementing exercise promotion strategies in a population of novice adult exercisers among bariatric populations.

## **Methods**

The BELT program, in collaboration with Cone Health, was designed to help overweight (body mass index (BMI)  $\geq 25$  kg/m<sup>2</sup>) or obese (BMI  $\geq 30$  kg/m<sup>2</sup>) individuals adopt a physically active lifestyle post-bariatric surgery. This program has been successfully operating for over 8 years with high adherence and positive participant feedback. The 16-week BELT program includes 1 hour of exercise 3 days per week for adults. Each 60-minute session includes 30 minutes of cardiorespiratory exercise followed by 30 minutes of resistance training. In addition, BELT includes educational sessions on goal setting, injury prevention, proper exercise technique, and nutrition. The current program lacked a theory-based behavioral change intervention and provides nothing to aid in the transition to lifestyle physical activity. Therefore, the Following a Lifestyle of Wellness (FLOW) program was developed as the behavioral component of the BELT program to increase participant self-efficacy for exercise, positive self-perceptions, and the transition to physical activity maintenance.

The FLOW intervention program

The FLOW intervention program was created and pilot tested over a 4-month time-period and served as the behavioral change component of BELT. This intervention was aimed at increasing participant self-efficacy and educating participants about the benefits of adopting a long-term physically active and healthy lifestyle. The FLOW program focused on fostering psychological skills important for behavior change such as goal setting, stress management, self-confidence, overcoming exercise barriers, and promoting positive body image perceptions. Each of the 16 weeks within the FLOW program focused on building a specific skill for behavior change, with an emphasis on skills necessary to maintain an active lifestyle during the last 8 weeks of the intervention. Throughout the first 8 weeks of the program, FLOW included sessions on goal setting, self-confidence, positive body image perceptions, and developing coping strategies to overcome barriers. These sessions were included based on recommendations of previous work with overweight and obese populations finding that education sessions on psychological skills improved self-regulatory skills, self-efficacy, and mood among participations (Annesi and Gorjala, 2010; Morgan et al., 2014). The second 8 weeks of the program focused on the transition to continued physical activity participation upon BELT program completion, with an emphasis on developing a physical activity plan, identifying potential barriers to continued activity, stress management, and commitment to exercise. Increased adherence to exercise has been demonstrated among overweight and obese individuals following education for overcoming barriers, relapse prevention, and planning for continued exercise (Buckworth et al., 2013; Morgan et al., 2014).

#### Data collection

This study utilized a qualitative approach with semi-structured interviews as the main method of data collection. A self-report measure detailing participants' age, gender, ethnicity, type of weight loss surgery, obesity-related comorbidities, occupation, and educational status was collected as a part of entrance testing into the BELT program and was included in the present study to describe the sample.

**Interviews.** All interviews were conducted by a trained graduate student and assistant professor external to the BELT program and lasted 30–45 minutes. Semi-structured interviews provided an in-depth perspective of the self-perceptions and experiences of each participant partaking in the FLOW intervention. Based on qualitative interview structuring outlined by Patton (2002), the interviews started with broad questions asking participants about their experience in BELT, then moved to specific questions about the FLOW program's effectiveness and potential changes the participants have seen within themselves over the course of the program. Interviews concluded with final thoughts about the program and inquired about means of program improvement. Probing questions were used to elicit further explanation or understanding of participant responses.

#### Data analysis

After completion, interviews were fully transcribed verbatim and analyzed by the principle investigator and same research team used in data collection. Pseudonyms were used in efforts to retain confidentiality of the participants. Raw data were then coded into main themes from the interview transcripts. This coding process, conducted by the primary investigator, followed the

procedure established specifically for qualitative research by Brinkmann and Kvale (2015) for open and axial coding. After transcripts were read and reread, an initial set of open codes was developed by labeling words and/or phrases in the transcripts. This included a line-by-line analysis of each transcript to determine those key words and phrases in each part of the interview. Similar codes were combined to form categories which described the data in groups based on key words and phrases. Once these categories began to emerge, the researchers went back through the transcripts and recoded the data using the common categories. From there, the researchers progressed into the axial coding process by connecting categories through developing themes in efforts to establish meaning and understanding of the data. A final list of categories was determined which provided a summation of responses among all participant interviews.

## Results

### Participants

All participants self-selected to be part of the program with the goal of improving their exercise participation and adherence over the course of the 16-week program duration and successfully transitioning into a physically active lifestyle. Eleven individuals (10 females, 1 male) completed the 16-week FLOW intervention program. Participants ranged in age from 29 to 55 years ( $M = 45.1$ , standard deviation (SD) = 9.6) with 73 percent ( $n = 8$ ) Caucasian and 27 percent ( $n = 3$ ) African-American individuals. Participants had undergone three types of bariatric surgery prior to the program including Roux-en-Y gastric bypass (18%,  $n = 2$ ), laparoscopic adjustable gastric banding (18%,  $n = 2$ ), or vertical sleeve gastrectomy (64%,  $n = 7$ ).

### Interview data

The qualitative interviews conducted upon FLOW program completion at week 16 were fully transcribed and coded into themes. After reading and coding the data, seven categories emerged. These categories include positive overall BELT program experiences, positive FLOW program experiences, accountability and social support, positive facilitator interactions, most impressionable psychological skills sessions, positive impact on self-perceptions, and program improvement.

***Positive BELT program experiences.*** All participants reacted positively to their experiences in BELT and indicated they felt the program was helpful for learning to exercise properly, increasing motivation to exercise, and increasing self-confidence for exercising in a gym setting. Positive reactions also included memorable interactions with the BELT staff, especially regarding learning how to push themselves physically and mentally during exercise bouts. Many participants mentioned how helpful the student trainers were during the program, and their sense of comfort found in exercising with a group of individuals “like them” who have also experienced bariatric surgery. These individuals felt fortunate for their experiences in BELT. As one participant described her experiences:

I think the gym is wonderful. The students are wonderful. [The BELT program Director] is great. I just think overall experience is something that everybody should have. I know

friends who have weight loss surgery in other areas, and the level of support after surgery is nothing like I've had.

No suggestions for program improvement were given by any participants regarding the overall BELT program, even when prompted. Participants noted that positive experiences carried over from the overall BELT program to the specific FLOW intervention sessions.

***Positive FLOW program experience.*** In addition to the overall BELT program, all participants reacted favorably toward the overall FLOW intervention. Participants felt the FLOW program helped them realize their strengths and weaknesses and further motivated them to exercise. One participant noted how much progress she saw from beginning to end with the help of the FLOW program facilitator:

[Program facilitator] had been sending updates all along, and I was following along, but then at the end when we did our exit meeting or whatever and she presented all that stuff to me, I hadn't realized how much work I had actually done until I had seen it.

The amount of information provided as a part of the FLOW program was also noted as a strength. Participants felt that they were always updated and informed about upcoming sessions, progress they were making, and felt supported and encouraged throughout the intervention.

***Accountability and social support.*** Accountability and social support were cited by multiple participants as a key factor in their success. For many participants, being a part of a group and feeling a sense of belonging was one of the most important parts of the program. One participant noted, "The group experience was the most important. It was helpful to have a plan and people to support it." Multiple other participants indicated the positive impact of having a group experience and felt that it added value to the program. Another participant mentioned feeling a sense of belonging by indicating an advantage of the FLOW intervention, "... you get to have this nice little group, everybody knows everybody. Most people have all experienced the same thing ... You get to know each other and you start hearing their stories."

Support of the group members was a key element to successful intervention completion. One participant noted, "It is great to have people to help you, and to guide you, and to make you come on a day when you really don't feel like it." Many participants also mentioned that the support and encouragement they received from others allowed them to feel accountable for exercising program days.

Support from the FLOW facilitator was also important for many participants. "Encouragement from the FLOW facilitator" helped them feel they were progressing in the program which helped them feel more confident in their ability to continue exercising and achieve their goals:

I think having somebody available to me to be that person that I was accountable to was very helpful. Because like I said, I can make a goal. I can write a goal, but telling it to someone and actually doing it was I think the necessary piece for me.

This sense of accountability and social support extended from group members and program staff to the FLOW facilitator. Some of the most notable program interactions occurred between participants and the FLOW facilitator over the course of the intervention.

***Positive facilitator interactions.*** During the 16-week FLOW intervention, each participant had one-on-one interaction with the FLOW facilitator which created a sense of trust and rapport. Participants felt comfortable opening up to the FLOW facilitator and mentioned, “she knows how to motivate you and give you pointers on what you should do if you’re starting to overthink or have second thoughts ... she’s very good at that.” Another participant noted the amount of encouragement she received from the FLOW facilitator: “She’s always complimenting us as we’re going along, taking about how strong we’ve gotten with the workout sessions and everything.” Participants felt encouraged and were able to understand the intervention material through clear and detailed explanation of each psychological skill. They felt comfortable learning skills and setting goals, and also felt the FLOW facilitator “encouraged us to try and look at ourselves better,” or “she saw barriers that perhaps I didn’t see.” One participant particularly noted her love of the individualization aspect of the FLOW program and attention she received from the facilitator:

Well, I think that [the FLOW facilitator] probably needs to be cloned. Yeah I think that would be the first place to start. She was spending time with me. I couldn’t imagine how she was also following up with everybody else ... There was sometimes we had a whole conversation for the whole time I was doing cardio for a half hour. I was like are these other people getting this too or is this just something that is special to me? ... She knew where everybody was at.

The organization and preparedness of the FLOW facilitator was evident to the participants throughout the intervention and their interactions with her.

***Impressionable psychological skills sessions.*** Similar to the overall intervention evaluations, which ranked each of the psychological skills sessions highly, a few key psychological skills sessions were highlighted during the interviews as particularly useful. These sessions included goal setting, stress management, and exit strategies.

***Goal setting.*** The goal setting session emerged as a key element of the FLOW program as the participants worked to set and achieve goals. Many participants felt that setting goals gave them a “point of reference” for their progress throughout the 16-week program and allowed them to “see improvements” along the way. One participant noted, “I thought the goal evaluating was great. It gave me something to work toward and [the FLOW facilitator] checked by the end to see how the goals were going, if I was able to achieve any of those.”

Many goals mentioned by participants included wanting to lose weight, increase strength and endurance, or fit into a certain clothing size. Some of these goals extended beyond the duration of the program. One participant noted she felt “determined to take control of her health and fitness,” while another mentioned, “I have been challenged by my brother to run a half-marathon in 10 months. I’m going to do it.” Another participant cited the importance of setting goals for establishing a sense of direction:

Because when you've been heavy all your life and you stay in that same pattern, same rut all the time, you kind of have to have a little bit of guidance somewhere along the way to help get you pointed in the right direction.

***Stress management.*** Stress management was another session participants found particularly helpful. Identifying potential stressors and coping mechanisms was an important skill for their health behavior change and weight loss journey, and also for their interactions with work, family, and friends. While some participants mentioned they had used some stress management techniques previously, some of these techniques were not health minded. Multiple participants indicated they had previously used food as a coping mechanism. It was noted that the FLOW facilitator encouraged them to think about new techniques for managing stress such as staying present focused, deep breathing, and walking when they felt stressed:

If you have a stressful moment, instead of sitting down and eating in front of the TV, get up and take a walk. Do something a little different ... All of the suggestions that she gives for that is really helpful ... It's just better to, like she says, get up and go for a walk, do a little exercise, get up and do something. Go outside if you're inside. Something to change it up so you're not thinking about eating.

Using exercise as a form of stress relief was a new technique for many participants in the program. One participant noted this in response to using exercise to manage stress, "I have to look at it as an opportunity instead of something I have to do or am being made to do. It is a gift I am giving to myself." While this was not something she had previously turned to in times of excessive stress, she mentioned how the FLOW program was helping her reframe her thought process to find healthier ways to manage stressful situations.

***Exit strategies.*** The final session that participants noted to be especially helpful throughout the FLOW intervention concerned exit strategies. This session focused on identifying goals and plans for participants to continue exercising once they finished BELT and identifying potential barriers that may prohibit future exercise. Some of the barriers identified included laziness, poor diet, physical limitations, or returning to an inactive lifestyle. One participant noted she was afraid of regressing back to old habits upon leaving the program:

I'd always have some excuse as to why not to work out. Now I know ... for me to stay my path that I want to take to get to the end, I have to do that. If not, I'll go right back to the same pattern that I was in. Being sedentary.

While a few participants were concerned with returning to their old inactive lifestyles, most participants indicated they felt confident to continue exercising on their own and hopeful about future opportunities to remain active. Potential plans for continued activity after completing the program included transitioning into a similar on campus exercise program, working out at home using videos, walking outside, joining another fitness facility, or finding a student sponsor to join the campus gym (where the current program is held). One participant reported the benefits she has gained from being physically active outweigh the barriers of inactivity, "I know how

important it is to have the physical activity and it does make you feel better ... I am stronger. It makes me feel better to do it.”

***Positive impact on self-perceptions.*** Participants reported the FLOW intervention program was beneficial for helping enhance positive self-perceptions. Many participants learned to take time to look at themselves from a different perspective than they had previously considered. One participant noted, “I didn’t realize that I had some of the opinions that I had about myself until I was asked to repeat them.” This sentiment was echoed by other participants as well. It was mentioned that individuals would often receive feedback from those around them concerning their weight loss or changes in physical appearance, but was difficult for them to internalize due to a lack of positive self-perception. The FLOW program helped to facilitate this change:

[The FLOW facilitator] encouraged us to think about our confidence not with how our bodies look but what they can do for us every day. Things we are capable of. She really made me see some other points, and things to be proud of about our bodies, not just what it looks like. What it does for us every day. I still carry this self-confidence reminder around with me every day.

Other participants noted this information was “eye opening” and they were grateful for the opportunity to see themselves differently than they had before. All participants noted their enthusiasm for FLOW program participation and for the time the facilitator invested in helping participants learn more about themselves. Notable self-discoveries included newfound strength to move forward and increased confidence from setting and achieving goals:

I think that as far as my dealing with self-image and things like that, I can really say it really helped. I’ve always been an outgoing person. When it comes down to your health and your weight, that hits you at your heart. It really helped motivate me as talking about being more confident. Being kind to yourself. You got to be kind to yourself and be thankful for the little goals that you have met. As far as being self- confident, that really, really boosted me a lot. Things that I’m doing now ... Don’t know if I would do that a year or so ago.

Participants found it helpful to continue focusing on positive aspects of their journey as opposed to negative ones. The FLOW program provided for opportunities for this positive focus through self-reflection and self-discovery during conversations with the FLOW facilitator. One participant noted, “We were told to ‘focus on what we gained’ instead of the weight we were losing, that was really helpful.”

***Program improvement.*** While most of the feedback concerning the FLOW intervention program was positive, some suggestions for improvement were given. Session implementation was mentioned by some participants as an area where changes could be made. Two individuals noted that they felt it was difficult to have FLOW sessions occurring simultaneously during cardiovascular exercise sessions. While most individuals considered the sessions a welcome distraction from the physiological stress of exercise, a few felt it was hard to concentrate on two tasks at the same time. Another suggestion regarding session implementation included finding a more private space to hold sessions. One participant reported she felt apprehensive talking about

sensitive issues while in a gym where she felt other people may be able to overhear the conversation. She liked having education sessions while doing cardio, but would have preferred perhaps moving to walking on the indoor track instead of on a cardio machine surrounded by other individuals.

Some suggestions were also given regarding the session content. One participant indicated potentially including more examples of different stress management techniques. Two participants felt that having a bit more guidance for forward progress would be beneficial, "... some of us would still need a little more guidance, ... there's some people that need a little more pushing." And two participants mentioned wanting to have more distinct tracking of goal progress throughout the intervention, such as keeping a journal or spreadsheet to help them indicate where progress has been made on certain goals and where they can continue to work for improvement.

Finally, suggestion for program improvement included adding more staff. As previously discussed, participants were impressed by the abilities of the sole FLOW facilitator to tackle every aspect of the intervention but they understood this was not sustainable. It was mentioned that perhaps more program staff would be beneficial for the future of the FLOW program.

## **Discussion**

The purpose of this study was to examine the feasibility of the FLOW intervention program to promote positive participant self-perceptions, increase self-efficacy, and encourage continued physical activity among program participants, as well as to assess the practicality of integrating the FLOW intervention as a part of the existing BELT program. Overall, FLOW program participants provided anecdotal evidence of the usefulness of information provided, feelings of increased self-efficacy for exercise, and displayed confidence in their abilities to continue exercising upon graduation from the FLOW and BELT programs. Educational interventions have been found effective for increasing self-efficacy (Carlson et al., 2001; Song, 2013; Vibulchai et al., 2016) and this appears to hold consistent in this intervention.

Social support and accountability play an important role in behavioral change interventions (Buckworth et al., 2013; Dishman et al., 2012). Participants indicated having social support made them feel more comfortable sharing their thoughts and feelings about intervention topics (Buckworth et al., 2013; Heath, 2013) and increased their ability to feel confident while exercising (Alqout and Reynolds, 2014; Hunt and Gross, 2009; Morgan et al., 2014). This was found in the interview theme surrounding positive FLOW program experiences, positive facilitator interactions, and the program's positive impact on self-perceptions. The increased sense of confidence has impacted the hope of participants to successfully maintain a physically active lifestyle. Although this was not a direct goal of the FLOW intervention, it clearly emerged as an important factor in participants' successes. Future interventions should continue to build on this social support and accountability as a means to further develop self-efficacy and maintain long-term behavior change. This type of group benefit also points to the possible creation of a maintenance-type group exercise program for BELT/FLOW program graduates that inherently promotes this social support.

While participants stated positive overall program experiences, interview responses indicated that the most impactful FLOW program interventions were goal setting, self-confidence, and stress management. Goal setting has been found to be a key component of behavioral change interventions (Annesi and Gorjala, 2010) and useful for long-term adherence and behavioral change (Buckworth et al., 2013; Burton and Weiss, 2008; Locke and Latham, 1990; Murphy, 2005). FLOW program participants indicated learning to set goals increased their ability to feel confident in exercise settings and gave them something to focus their energy toward in a positive direction (Annesi and Gorjala, 2010; Murphy, 2005). It is evident from the participants' experiences that goal setting played a major role in the development of self-efficacy for long-term exercise adherence and contributed to the overall program success. Future versions of the FLOW program should continue to develop goal setting as a key component.

Self-confidence was reported as another favorite session. Many participants indicated they had never taken the time to consider how their thoughts and feelings integrated into the behavior change process, which is important for making lasting behavioral changes (Alqout and Reynolds, 2014; Annesi and Gorjala, 2010). Increased self-confidence leads to feelings of self-efficacy within certain tasks, particularly among exercise settings as proposed by SCT (Bandura, 2004). These increased feelings of efficaciousness may lead to an increased likelihood of physical activity adherence over the long-term, especially among overweight and obese individuals (Bandura, 2004; Brawley et al., 2012; Morgan et al., 2014; Palmeira et al., 2007) and are therefore an important piece of the future FLOW intervention.

Stress management was the third session indicated to be the most helpful by program participants. Learning effective strategies for managing stress and overcoming obstacles is an essential skill for avoiding relapse to previously unhealthy behaviors (Lazarus and Folkman, 1984). Stress may be temporarily reduced as a result of physical activity (Buckworth et al., 2013); however, education about emotional regulation is also important for long-term maintenance of stress and being able to adequately adapt and manage stressful situations (Murphy, 2005). FLOW program participants indicated that suggestions for stress management were immensely helpful for not only health-related behavior change, and translated to coping with stress in other areas of their personal lives. This increased their feelings of efficacy for maintaining a physically active lifestyle by being able to manage stress and cope with unforeseen events.

This study aimed to fill the gap in research by adding a SCT-based behavioral change intervention to an exercise program for post-bariatric surgery patients (Hunt and Gross, 2009; Kalarchian and Marcus, 2015; Paul et al., 2015). While the FLOW intervention was feasible for the current researcher to implement into BELT, it should be noted that a few modifications may need to be made for future program implementation. As currently designed, the FLOW program met its designed objectives and provided a positive experience for program participants and the researcher.

### Program improvement

Although the program was successful, areas were identified by both program participants and the FLOW interventionist, for future improvements. One potential area involved the setting of the

intervention sessions. The decision to conduct sessions during exercise was made to negate participants losing time for cardiovascular exercise during their hour BELT participation, but was not preferable for some participants. In the future, a choice could be offered to participants regarding the setting of their intervention to be conducted with exercise or without. In addition, the privacy of the intervention setting needs more consideration. Some participants felt it was difficult to fully divulge information to the FLOW facilitator for fear of being overheard by others nearby. This could be solved by suggesting the participant and facilitator find a more remote area for exercising during the intervention sessions to provide more privacy and comfort for the participant which would likely increase the usefulness of the sessions for participants (Buckworth et al., 2013; Heath, 2013).

Program logistics also warrant further consideration. Combining some of the interventions sessions would increase the ease of program implementation. Concurrently, an increased number of trained FLOW program staff would aid in successful large-scale intervention implementation. While the initial intervention was successful with one facilitator on a small scale, additional program staff is necessary for long-term effective implementation. One interventionist was initially used to provide consistency of session content and delivery for this study, however, moving forward FLOW program staff must be increased to maintain the effectiveness of intervention implementation.

#### Limitations

As with all research, this project was not without limitations. One potential limitation was the lack of feedback regarding program improvements from participants. In both intervention evaluations and interviews, participants provided few suggestions for program improvement. This could be due to their close relationship with the FLOW facilitator. Although the FLOW facilitator (primary investigator) did not conduct the interviews to avoid response bias, this still may have been an issue for eliciting feedback from participants.

Attrition was also a limitation, as some individuals did not complete the entire 16-week BELT exercise program. While 11 out of 18 participants completed the program, seven of these individuals dropped out within the first 5 weeks. This is consistent with previous research demonstrating roughly a 40 percent dropout rate for individuals adhering to behavior change programs (Buckworth et al., 2013). Reasons for dropping out were stated as changes in employment, family issues, or injury. There may have been certain characteristics of program dropouts that may have added value to the study; however, little data could be collected from this part of the sample.

#### Future directions and implications

While the FLOW intervention was successful in a sample of post-bariatric surgery patients, this intervention should be extended to include a wider range of individuals in other clinical populations. Additional populations of interest may be overweight or obese individuals who have not had bariatric surgery and are partaking in exercise programs (Annesi and Gorjala, 2010; Morgan et al., 2014). The FLOW intervention can transfer to multiple clinical settings

based on the broad scope of individuals who may benefit from a psychological skills intervention aimed at behavior change (Bandura, 2004).

In addition, efforts should be made to make the FLOW intervention more user friendly for both program participants and the FLOW facilitator. Reducing the number of sessions through combination of similar topics will be beneficial from a logistical standpoint and encourage more participant engagement in each session. Conducting a follow-up period would also be beneficial moving forward to assess the maintenance of physical activity over the long-term. Future studies should include tracking participants for at least 6 months upon intervention completion in efforts to assess if the maintenance stage of exercise adherence has been reached (Buckworth et al., 2013; Dishman et al., 2010).

The goal of this study was to implement a SCT-based psychological skills intervention into an exercise program for post-bariatric surgery patients. Findings indicated this intervention was feasible to implement into the existing BELT program, rated positively by participants, effective for increasing exercise self-efficacy, enhanced positive self-perceptions, and facilitated the transition to continued physical activity participation among program participants. Future research should consider implementing this intervention with other clinical populations and improving the existing intervention. While behavior change may be an arduous task, a simple solution is to go with the FLOW.

#### **Declaration of Conflicting Interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

#### **Funding**

The author(s) received no financial support for the research, authorship, and/or publication of this article.

#### **References**

Adams, TD, Davidson, LE, Litwin, SE. (2012) Health benefits of gastric bypass surgery after 6 years. *The Journal of the American Medical Association* 308: 1122–1131. [Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

Alqout, O, Reynolds, F (2014) Experiences of obesity among Saudi Arabian women contemplating bariatric surgery: An interpretative phenomenological analysis. *Journal of Health Psychology* 19(5): 664–677. [Google Scholar](#) | [SAGE Journals](#) | [ISI](#)

American Society for Metabolic and Bariatric Surgery (ASMBS) (2015) Estimate of bariatric surgery numbers, 2011-2014. Available at: <https://asmbs.org/resources/estimate-of-bariatric-surgery-numbers>. [Google Scholar](#)

Annesi, JJ, Gorjala, S (2010) Changes in theory-based psychological factors predict weight loss in women with class III obesity initiating supported exercise. *Journal of Obesity* 2010: 171957. [Google Scholar](#) | [Crossref](#) | [Medline](#)

- Bandura, A (2004) Health promotion by social cognitive means. *Health Education & Behavior* 31(2): 143–164. [Google Scholar](#) | [SAGE Journals](#) | [ISI](#)
- Brawley, L, Rejeski, WJ, Gaukstern, JE. (2012) Social cognitive changes following weight loss and physical activity interventions in obese, older adults in poor cardiovascular health. *Annals of Behavioral Medicine* 44: 353–364. [Google Scholar](#) | [Crossref](#) | [Medline](#)
- Brinkmann, S, Kvale, S (2015) *InterViews: Learning the Craft of Qualitative Research Interviewing* (3rd edn). Thousand Oaks, CA: SAGE. [Google Scholar](#)
- Buckworth, J, Dishman, RK, O'Connor, PJ. (2013) *Exercise Psychology* (2nd edn). Champaign, IL: Human Kinetics. [Google Scholar](#)
- Burke, LE, Wang, J (2011) Treatment strategies for overweight and obesity. *Journal of Nursing Scholarship* 43(4): 368–375. [Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)
- Burton, D, Weiss, C (2008) The fundamental goal concept: The path to process and performance success. In: Horn, T (ed.) *Advances in Sport Psychology* (3rd edn). Champaign, IL: Human Kinetics, pp. 339–375. [Google Scholar](#)
- Carlson, JJ, Norman, GJ, Feltz, DL. (2001) Self-efficacy, psychosocial factors, and exercise behavior in traditional versus modified cardiac rehabilitation. *Journal of Cardiopulmonary Rehabilitation* 21(6): 363–373. [Google Scholar](#)
- Centers for Disease Control and Prevention (CDC) (2015a) *Adult Obesity Facts*. Atlanta, GA: U.S. Department of Health and Human Services. [Google Scholar](#)
- Centers for Disease Control and Prevention (CDC) (2015b) *Facts about Physical Activity*. Atlanta, GA: U.S. Department of Health and Human Services. [Google Scholar](#)
- Coen, PM, Goodpaster, BH (2016) A role for exercise after bariatric surgery? *Diabetes, Obesity and Metabolism* 18(1): 16–23. [Google Scholar](#) | [Crossref](#) | [Medline](#)
- Dishman, RK, Dunn, AL, Sallis, JF. (2010) Social-cognitive correlates of physical activity in a multi-ethnic cohort of middle-school girls: Two-year prospective study. *Journal of Pediatric Psychology* 35(2): 188–198. [Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)
- Dishman, RK, Heath, GW, Lee, I-M (2012) Adopting and maintaining a physically active lifestyle. In: Dishman, RK, Heath, GW, Lee, I-M (eds) *Physical Activity Epidemiology* (2nd edn). Champaign, IL: Human Kinetics, pp. 503–553. [Google Scholar](#)
- Flegel, KM, Carroll, MD, Ogden, CL (2012) Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999–2010. *The Journal of the American Medical Association* 307: 491–497. [Google Scholar](#) | [Crossref](#)
- Gagnon, LE, Sheff, EJK (2012) Outcomes and complications after bariatric surgery. *The American Journal of Nursing* 112(9): 26–36. [Google Scholar](#) | [Crossref](#) | [Medline](#)

Heath, GW (2013) Behavioral approaches to physical activity promotion. In: Ehrman, JK, Gordon, PM, Visich, PS. (eds) *Clinical Exercise Physiology* (3rd edn). Champaign, IL: Human Kinetics, pp. 19–32. [Google Scholar](#)

Hunt, HR, Gross, AM (2009) Prediction of exercise in patients across various stages of bariatric surgery: A comparison of the merits of the theory of reasoned action versus the theory of planned behavior. *Behavior Modification* 33(6): 795–817. [Google Scholar](#) | [SAGE Journals](#) | [ISI](#)

Jassil, FC, Manning, S, Lewis, N. (2015) Feasibility and impact of a combined supervised exercise and nutritional-behavioral intervention following bariatric surgery: A pilot study. *Journal of Obesity* 2015: 693829. [Google Scholar](#) | [Crossref](#) | [Medline](#)

Kalarchian, MA, Marcus, MD (2015) Psychosocial interventions pre and post bariatric surgery. *European Eating Disorders Review* 23(6): 457–462. [Google Scholar](#) | [Crossref](#) | [Medline](#)

King, WC, Kalarchian, MA, Steffen, KJ. (2013) Associations between physical activity and mental health among bariatric surgical candidates. *Journal of Psychosomatic Research* 74(2): 161–169. [Google Scholar](#) | [Crossref](#) | [Medline](#)

Lazarus, RS, Folkman, S (1984) *Stress, Appraisal, and Coping*. New York: Springer. [Google Scholar](#)

Locke, EA, Latham, GP (2002) Building a practically useful theory of goal setting and task motivation. A 35-year odyssey. *American Psychologist* 57: 705–717. [Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

McMahon, MM, Sarr, MG, Clark, MM. (2006) Clinical management after bariatric surgery: Value of a multidisciplinary approach. *Mayo Clinic Proceedings* 81(10): S34–S45. [Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

Morgan, PJ, Scott, HA, Young, MD. (2014) Associations between program outcomes and adherence to social cognitive theory tasks: Process evaluation of the SHED-IT community weight loss trial for men. *International Journal of Behavioral Nutrition and Physical Activity* 11(1): 89. [Google Scholar](#) | [Crossref](#) | [Medline](#)

Moya, M, Hernandez, A, Sarabia, JM. (2014) Bariatric surgery, weight loss and the role of physical activity: A systematic review. *European Journal of Human Movement* 32: 145–160. [Google Scholar](#)

Murphy, S (2005) *The Sport Psych Handbook. A Complete Guide to Today's Best Mental Training Techniques*. Champaign, IL: Human Kinetics. [Google Scholar](#)

Palmeira, AL, Teixeira, PJ, Branco, TL. (2007) Predicting short-term weight loss using four leading health behavior change theories. *International Journal of Behavioral Nutrition and Physical Activity* 4: 14. [Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

Patton, MQ (2002) *Qualitative Research and Evaluation Methods* (4th edn). Thousand Oaks, CA: SAGE. [Google Scholar](#)

Paul, L, van Rongen, S, van Hoeken, D. (2015) Does cognitive behavioral therapy strengthen the effect of bariatric surgery for obesity? Design and methods of a randomized and controlled study. *Contemporary Clinical Trials* 42: 252–256. [Google Scholar](#) | [Crossref](#) | [Medline](#)

Ross, R, Janssen, I (2012) Physical activity, fitness, and obesity. In: Bouchard, C, Blair, SN, Haskell, WL (eds) *Physical Activity and Health*. Champaign, IL: Human Kinetics, pp. 197–214. [Google Scholar](#)

Song, KJ (2003) The effects of self-efficacy promoting cardiac rehabilitation program on self-efficacy, health behavior, and quality of life. *Taehan Kanho Hakhoe Chi* 33(4): 510–518. [Google Scholar](#) | [Medline](#)

Steele, T, Cuthbertson, DJ, Wilding, JPH (2015) Impact of bariatric surgery on physical functioning in obese adults. *Obesity Reviews* 16(3): 248–258. [Google Scholar](#) | [Crossref](#) | [Medline](#)

Vibulchai, N, Thanasilp, S, Preechawong, S (2016) Randomized controlled trial of a self-efficacy enhancement program for the cardiac rehabilitation of Thai patients with myocardial infarction. *Nursing & Health Sciences* 18: 188–195. [Google Scholar](#) | [Crossref](#) | [Medline](#)

Wang, Y, Beydoun, MA, Liang, L. (2008) Will all Americans become overweight or obese? Estimating the progression and cost of the US obesity epidemic. *Obesity* 16(10): 2323–2330. [Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)