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Increased Social Support and Maintained Weight Loss Among Post Metabolic and Bariatric Surgery Patients Following a Support and Nutrition-Based Program

Sydney Mae McIntosh
University of Kentucky, smmc269@uky.edu
Author ORCID Identifier:
https://orcid.org/0009-0002-5315-3724
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Sydney Mae McIntosh, Student

Dr. Makenzie Barr-Porter, Major Professor

Dr. Dawn Brewer, Director of Graduate Studies

INCREASED SOCIAL SUPPORT AND MAINTAINED WEIGHT LOSS AMONG POST METABOLIC AND BARIATRIC SURGERY PATIENTS FOLLOWING A SUPPORT AND NUTRITION-BASED PROGRAM

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in Nutrition and Food Systems in the
College of Agriculture, Food and Environment
at the University of Kentucky

By

Sydney McIntosh

Lexington, Kentucky

Director: Dr. Makenzie Barr-Porter Assistant Professor of Dietetics and Human Nutrition

Lexington, Kentucky

2023

https://orcid.org/0009-0002-5315-3724

ABSTRACT OF THESIS

INCREASED SOCIAL SUPPORT AND MAINTAINED WEIGHT LOSS AMONG POST METABOLIC AND BARIATRIC SURGERY PATIENTS FOLLOWING A SUPPORT AND NUTRITION-BASED PROGRAM

Obesity, a prevalent health condition nationwide, has now been recognized as a diagnosable chronic health disease. With that prevalence we have seen a rise in obesity-related comorbidities which can be attributed to excess weight. Therefore, to combat obesity and related comorbidities, metabolic and bariatric surgery is becoming a more accepted and utilized treatment for individuals with obesity. Metabolic and bariatric surgery is the most effective and safest treatment for weight loss in individuals with obesity. However, metabolic, and bariatric surgery is a restrictive and/or malabsorptive procedure that requires significant lifestyle changes before and after the procedure. Patients who undergo metabolic and bariatric surgery must adhere to dietary recommendations, have regular physical activity, and have a strong support system. Without clinical support, achieving and maintaining lifestyle changes and adequate weight loss is very difficult. Therefore, the aim of this study was to pilot a 6-session support and nutrition-based program for 1-4 year post-metabolic and bariatric surgery patients to examine weight loss, perceived self-efficacy, and success and acceptability of the program. Implications for future research may include creating a standardized curriculum to support post-metabolic and bariatric surgery patients and influence weight loss.

KEYWORDS: [Nutrition Education, Post-Bariatric Surgery, Support Group, Self-Efficacy, Acceptability]

Sydney McIntosh

(Name of Student)

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Date

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By
Sydney McIntosh

Makenzie Barr-Porter, PhD, RDN, LD
Director of Thesis

Dawn Brewer, PhD, RDN, LD
Director of Graduate Studies

09/23/2023
Date

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CHAPTER 1. INTRODUCTION

1.1 Background

Obesity is the 5th leading cause of death in the United States. By 2030, obesity and other lifestyle-related diseases will be responsible for the initiation of 30% of deaths worldwide [1]. The World Health Organization (WHO) defines obesity as the abnormal or excess fat accumulation that may impair health [1]. Predominately, having overweight and/or obesity is caused through the imbalance of the consumption and exertion of calories [1]. Researchers also recognize other factors associated with the development of obesity including genetics, food environment, learned behaviors, cultural eating habits, and social factors [1]. According to the World Health Organization, body mass can be measured with a tool called body mass index (BMI). BMI is collected from measuring a patient's height and weight. After collecting height and weight, through a calculation, a health care provider can classify if a patient is overweight or obese. The World Health Organization classifies overweight as having a BMI between 25kg/m^2 and 29.9kg/m^2 and obese as having a BMI greater than or equal to 30kg/m^2 [2-4]. In 2019, 2 billion people were classified as overweight and obese around the world [5]. The WHO created a target to decrease obesity in half by 2025 [5]. However, trending rates, it is extremely unlikely to reduce obesity by a half [5].

Obesity is a complex disease and, in many cases will not be alleviated by lifestyle changes or pharmaceutical therapies. Lifestyle changes and pharmaceutical therapies could be unsuccessful because these therapies typically only target one hormonal, behavioral, or neural pathway [6]. To maintain homeostasis, the body may resist these

efforts and sequentially resist sustainable weight loss [6]. Obesity is complex because it is a disease that can affect many different organ systems in the body which may lead to the development of an obesity-related comorbidity [1]. There is an extensive list of possible comorbidities associated with obesity, the most common include insulin resistance, type 2 diabetes, hypertension, cardiovascular disease, dyslipidemia, non-alcoholic fatty liver disease, cancer, alternations in gastrointestinal, musculoskeletal, renal, respiratory, and immune function [1, 5, 7, 8].

Metabolic and bariatric surgery (MBS) is the most effective treatment for obesity to promote sustainable weight loss [6, 8, 9]. Metabolic and bariatric surgery promotes weight loss by modifying the stomach and intestines [10]. Two of the most performed procedures are the laparoscopic sleeve gastrectomy and the Roux-en-Y gastric bypass. Laparoscopic sleeve gastrectomy is a restrictive procedure where 80% of the stomach is removed [10, 11]. Roux-En-Y gastric bypass is a restrictive and malabsorptive procedure where a small stomach pouch is created and connected to the small intestines, effectively bypassing the rest of the stomach [10, 11]. The bypassed portion of the stomach is no longer used for storage but eventually the stomach acids and digestive enzymes from the bypassed stomach and small intestines will combine to break down food [10]. Currently, there is not concrete evidence determining which method is more effective in promoting weight loss. Despite the type of procedure, Bariatric surgery is an invasive and intensive procedure that alters multiple hormonal, behavioral, and neural pathways resulting in the greatest weight loss of the weight loss therapies [6]. Bariatric surgery, however effective, does come with a variety of risks that may outweigh the benefits if not executed properly. The National Institute of Health (NIH), the American College of Surgeons (ACS), and

the American Society for Metabolic and Bariatric Surgery (ASMBS) have created a list of qualifications as well as recommendations to guide the safety and success of the patients seeking bariatric surgery. NIH, ACS, and ASMBS recommend that a patient has a BMI greater than 40kg/m^2, more than 100 pounds overweight, or has a BMI greater than 35kg/m^2 and has at least one or more obesity-related co-morbidity such as type II diabetes (T2DM), hypertension, sleep apnea and other respiratory disorders, non-alcoholic fatty liver disease, osteoarthritis, lipid abnormalities, gastrointestinal disorders, or heart disease [2-4]. Along with the qualifications above, the NIH, ACS, and ASMBS recommend that a patient seek care at an accredited metabolic and bariatric surgery clinic. An accredited MBS clinic has a multidisciplinary team consisting of a board-certified surgeon, a registered dietitian, exercise specialist, and a mental health professional all specialized in metabolic and bariatric surgery [3, 4, 12].

A registered dietitian that is specialized in metabolic and bariatric surgery plays an important role on the multidisciplinary team [13, 14]. Research has shown that having a registered dietitian on the multidisciplinary team may result in fewer readmissions associated with dietary issues, improved nutritional biochemistries, greater resolution of co-morbidities, less nutritional complications, and greater weight loss [13, 15]. The tasks of the registered dietitian pre-operation include assisting in the patient's eligibility screening, evaluating and correcting the patients' nutrient deficiencies through medical nutrition therapy, accessing the patient of readiness to change, educating the patient on proper physical activity, and eating techniques, and making appropriate dietary recommendations including supplementations and diet progression post-operation.

Post-operation, the task of the registered dietitian varies depending on the clinic. Patients who follow-up with a registered dietitian experience greater success in weight loss [13, 15, 16]. The requirements for following up with a registered dietitian post-operation is not consistent across the clinics and currently do not have a national standard. However, a general recommended timeline to follow-up with a member of the multidisciplinary team following post-metabolic and bariatric surgery includes within 2 weeks after surgery, 6 weeks after surgery, 3 months after surgery, 6 months after surgery, 12 months after surgery, and annually after one-year post-operation[17]. However, it is important to note that the registered dietitian may not attend all these meetings and generally attends the first appointment, the one-year follow-up, then annually after that [17]. The registered dietitian can be requested three extra times without additional cost to the patient [17].

Out of all of the patients in the United States that receive MBS, 20-30% have inadequate weight loss [13, 18]. Research has shown that inadequate weight loss can be a result of dietary and lifestyle non-adherence after operation [13]. Examples of non-adherence after operation include excessive snacking, inadequate protein and fluid intake, poor vitamin and mineral intake, physical inactivity, and behaviors not conducive with weight loss success [13]. Literature shows that unsuccessful outcomes after bariatric surgery can be correlated with the lack of support and lack of eating self-efficacy in the first two years after surgery [16, 18-21]. Eating self-efficacy refers to an individual's confidence to control food consumption in challenging situations, research shows that patients who claim to be self-efficacious are more successful after bariatric surgery in sustaining weight loss [21, 22]. Along with self-efficacy, patients who attend support

groups led by a healthcare professional specialized in bariatric surgery experience greater weight loss [13, 18, 20].

Research displays the need for post-bariatric surgery support, however, there is a need for more research to establish a curriculum to encourage optimum success in achieving sustainable weight loss and adhering to dietary and lifestyle post-operation. The purpose of this study is to design and pilot a nutrition and support program for individuals who are between one and four years of post-metabolic and bariatric surgery.

1.2 Research Aims

Research Aim 1:

Determine if a six-session support and nutrition-based program created for post-operative metabolic and bariatric surgery patients is acceptable for promoting nutrition education and support.

Hypothesis 1.0:

It is hypothesized that following a six-session support and nutrition-based program designed for post-operative bariatric surgery patients, 70% of the participants will agree or strongly agree that the program was acceptable to reinforce nutrition education and support.

Research Aim 2:

Assess self-efficacy of post-metabolic and bariatric surgery patients to perform healthy lifestyle behaviors after 6-session intervention**.**

Hypothesis 2.0:

It is hypothesized that 50% of the participants will have an increase in self-efficacy of eating healthy food, exercising, and being a healthy version of themselves after the six-session support and nutrition-based program.

Research Aim 3:

To determine if a six-session support and nutrition-based program created for post-operative bariatric surgery patients influences weight loss.

Hypothesis 3.0:

It is hypothesized that there will be a 1% decrease in total body weight by the conclusion of the program.

1.3 Significance

In the United States, obesity is considered a major public health concern. Globally, obesity is the 5th leading cause of death. Obesity is a complex disease that can contribute to the development of comorbidities and decrease quality of life. Today, metabolic and bariatric surgery is considered the most effective and safest treatment for obesity. Metabolic and bariatric surgery can assist in weight loss and resolution of comorbidities caused by obesity. However, the procedure can also propose risks and does not guarantee long-term weight loss without proper patient buy-in to lifestyle changes. Following bariatric surgery, some patients are unable to adhere to dietary recommendations and do not feel supported by healthcare professionals. Patients who establish a long-term support system and adhere to appropriate lifestyle changes following surgery have greater chances of success[23]. Therefore, the significance of this study involves establishing if

the developed curriculum to provide support and nutrition education to post-metabolic and bariatric surgery patients is acceptable and an adequate way to promote self-efficacy and weight loss. In addition, the findings from this program can be utilized to develop and implement future support and nutrition-based programming for this population.

CHAPTER 2. REVIEW OF LITERATURE

Limited research exists that demonstrates an acceptable and feasible modality for healthcare workers to provide support and nutrition education to post-metabolic and bariatric surgery patients. In addition, there is a lack of research indicating the most beneficial curriculum to utilize when implementing programming for post-metabolic and bariatric surgery patient support. Post- metabolic and bariatric surgery programs may provide benefits to the patient in terms of alleviating and maintaining weight loss and promoting self-efficacy [18-20]. This literature review aims to examine the need for post-metabolic and bariatric surgery programing in promoting self-efficacy, and weight loss.

The following review will examine the severity of obesity and obesity-related comorbidities, how the steady rise of obesity has led to the increase in popularity of metabolic and bariatric surgeries, and with that increase how post-procedure programming is vital to the success of the patient. This literature review will conclude with discussing gaps in the literature.

2.1 Obesity and Co-morbidities

Locally, the Centers for Disease, Control, and Prevention (CDC) has announced that Kentucky has the 2nd highest prevalence of obesity suggesting that over 40% of the adult population is classified as obese[24]. Due to increased prevalence of obesity and obesity-related comorbidities, the WHO has established obesity as a major threat to public health[1, 25]. One widely used technique for classifying overweight and obesity is a tool called body mass index (BMI) [1, 26]. BMI is calculated by [(weight (kg))/ (height (m))^2] [1, 26]. An individual who has a BMI between 25 kg/m^2 and 29.9 kg/m^2 is

classified as overweight and an individual who have a BMI greater than 30 kg/m^2 is classified as obese [1, 26]. This tool is used and recommended by the NIH, ACS, and ASMBS for establishing which patients are eligible for metabolic and bariatric surgery [2-4]. Current qualifications include a patient who has a BMI greater than $40kg/m^2$, more than 100 pounds overweight, or has a BMI greater than $35kg/m^2$ in addition to having at least one or more obesity-related co-morbidity [2-4]. Prominent obesity-related comorbidities include but are not limited to insulin resistance, type 2 diabetes, hypertension, cardiovascular disease, dyslipidemia, non-alcoholic fatty liver disease, altered behavior and cognition, some forms of cancer, alterations in gastrointestinal, musculoskeletal, renal, respiratory, and immune systems [2-4].

Many factors contribute to the onset of obesity and obesity-related comorbidities including lifestyle, genetics, learned behaviors, social factors, and cultural factors [2, 16]. Therefore, alleviating overweight and obesity can be initiated by recognizing the variety of factors that contribute to the disease. Research has found that lifestyle changes and/or weight loss drugs contribute to treating this disease but do not promote substantial change alone [2, 16, 27]. In addition of healthy lifestyle adherence, metabolic and bariatric surgery is the most effective and safest treatment to promote sustainable weight loss [6, 8, 9].

2.2 Metabolic and Bariatric Surgery as a Treatment

Individuals with obesity may seek lifestyle changes and/or pharmacological therapies to initiate weight loss. However, lifestyle changes and pharmacological therapies tend to fail in the long-term because the body is unable to differentiate weight loss efforts and starvation [6, 27, 28]. On average, lifestyle modifications used to initiate

weight loss only produce 5-10% weight loss and are generally not sustained overtime [27, 28]. In addition, pharmaceutical therapies may produce weight loss, but the long-term safety of this route is not fully understood [27, 29]. Therefore, research has established that metabolic and bariatric surgery is the safest and most effective therapy for weight loss in individuals who are severely obese [6, 8, 9]. In addition to being effective and safe, metabolic and bariatric surgery can alleviate obesity-related comorbidities [6, 26]. A common comorbidity among severely obese individuals is type II diabetes (T2DM) [9, 30]. The combination of weight loss and hormonal signaling initiated by metabolic and bariatric surgery contribute to the alleviation of type II diabetes almost immediately following the surgical procedure [30-32]. Therefore, research supports that metabolic and bariatric surgery is the most effective treatment for T2DM in severely obese individuals [9, 30]. In addition, weight loss associated with metabolic and bariatric procedures has been found to be correlated with improvements in hypertension, dyslipidemia, decreased of risk of cancer, decreased sleep apnea and improved osteoarthritis [6, 9, 30]. Overall, comorbidity resolution following metabolic and bariatric surgery has been found to contribute to decreased mortality in severely obese individuals [9, 33-35].

There is a positive correlation between obesity prevalence and the number of metabolic and bariatric procedures performed [6, 30, 36, 37]. Though there are multiple types of metabolic and bariatric procedures, the most common as well as most researched are the sleeve gastrectomy (61%), Roux-en-Y Gastric Bypass (17%), and the adjustable gastric band (<2%)[3, 6, 9, 38]. Current research does not demonstrate significant differences between the sleeve gastrectomy and Roux-en-Y gastric bypass in terms of weight loss after surgery with both reaching significant weight loss in the years following

[39, 40]. However, the popularity in the sleeve gastrectomy has grown exponentially within the last ten years **(Figure 1)**. Research suggests that the emerging popularity of the sleeve gastrectomy over the other types of bariatrics surgeries could be due to the increase in research and development in this specific procedure[41, 42]. To continue, researchers have found that the sleeve gastrectomy has lower long-term risks and less revision procedures associated than the Roux-en-Y gastric bypass [42-44]. Although, all types of bariatric procedures embody a unique set of benefits and risks, the recommended qualifications of surgery do not differ.

Bariatric procedures affect multiple factors that influence weight maintenance and regulation. The complexity of the procedure requires attention from a diverse group of healthcare providers with varying specialties [3, 8, 19]. The NIH, ACS, and ASMB recommend that a patient seeking bariatric surgery, do so at a clinic with a multidisciplinary team [3, 4, 8]. The multidisciplinary team typically includes a board-certified surgeon, registered dietitian, exercise specialist, and a mental health professional all specialized in metabolic and bariatric surgery [3, 4, 13].

As recommended by NIH, ACS, and ASMB a registered dietitian specialized in metabolic and bariatric surgery should be on the multidisciplinary team. A registered dietitian nutritionist (RDN) prepares and facilitates a healthy and sustainable weight loss journey for the patient seeking treatment. Researchers observed that having a RDN on the multidisciplinary team induces fewer nutrient-related readmissions, improved nutritional status, increased resolution of comorbidities, greater weight loss, and less nutritional complications [8, 13, 45]. The RDN has an essential role pre- and post-operation that is vital to the success of the patient. Prior to the procedure, the RDN plays a role in patient

selection, assessing the patient's nutrient status and readiness to change, establishing potential barriers, encouraging physical activity, and determining social support [8, 14, 45]. Evidence supports a correlation between the patient's nutrient status prior to surgery and overall health after procedure [8, 13, 45]. If nutrient deficiencies are not corrected prior to surgery, then this could result in increased deficiencies that may lead to complications and readmission into the hospital [13, 46]. Many patients who seek metabolic and bariatric surgery have nutrient deficiencies [13, 46, 47]. Notable nutrients that are evaluated prior to surgery include vitamin D, vitamin C, vitamin B_{12}, folic acid, iron, and serum zinc [13, 45, 46, 48]. After surgery, the RDN is responsible for delivering adequate diet education which includes the importance of protein and vitamin supplementation [8, 13, 49]. The literature shows that patients who follow-up with their RDN after surgery have greater weight loss and comorbidity resolution than a patient who does not seek to follow-up with a RDN post-operation [8, 13, 16, 45].

Approximately 20-30% of patients who undergo metabolic and bariatric surgery do not obtain adequate weight loss [20, 50]. Inadequate weight loss after surgery is the leading inducement of revisional bariatric surgery [51, 52]. It is important to note that weight regain after surgery is probable, however, there is a point where weight regain can become excessive and weight loss becomes inadequate [53]. Research suggests a need for a standardized measure to predict successful weight loss [53-55]. Current research suggests that successful weight loss can be defined as greater than or equal to 20% total weight loss and/or greater than or equal to 50% excess weight loss [50, 53].

Inadequate weight loss may occur due to difficulty adhering to the post-operation diet and lifestyle [8, 9, 16, 20]. Multiple reasons could explain why a patient does not

adhere to the recommended diet and lifestyle. However, research shows that patients who seek counsel from a RDN and attend support groups post-operation have greater weight loss and overall success after surgery [13, 16, 19, 20, 56]

2.3 Promoting Successful Outcomes After Bariatric Surgery

Self-efficacy is defined by (Bandura 1997) as one's perceived ability to perform a task [22, 57, 58]. Current findings have established that there is a correlation between self-efficacy and quality of health outcomes in individuals pursuing treatment [21, 57, 59]. Self-efficacy and similar constructs are used in many behaviors change theories. Behavior change theories (BCT) that directly utilize self-efficacy are the Health Belief Model and the Social Cognitive Theory. The Health Belief Model is a widely used model that predicts health behaviors based on individual's perceptions [60, 61]. The Social Cognitive Theory describes how experiences, specifically social experiences, and environmental influences effect an individual's perceived ability to complete a task [62, 63]. The Social Cognitive Theory is the most used behavior change theory among dietitians conducting nutrition education interventions [22, 64].Literature explains that bariatric patients who express confidence in pursuing recommended lifestyle changes post-procedure, tend to have greater success with weight loss [18, 21, 56, 65, 66]. In addition to attaining confidence to pursue necessary lifestyle changes, bariatric patients who express eating-self-efficacy tend to have more beneficial outcomes after surgery including weight loss and quality of life [21, 22, 66, 67]. However, eating self-efficacy has been identified as a substantial barrier among post-metabolic and bariatric surgery patients [21, 67]. Eating self-efficacy can be defined as a person's confidence to make food-related choices in challenging situations [21, 68, 69]. Understanding patient barriers

like eating self-efficacy can promote appropriate council from the registered dietitian [64, 70]. Dietitians widely use behavior change theories in providing appropriate care for post-metabolic patients to efficiently promote sustainable change [64, 70].

Metabolic and bariatric surgery is a restrictive and/or malabsorptive procedure that can induce sustainable and safe weight loss [6, 8, 9]. However, to receive the benefits from this procedure social support, clinical support, and individual self-efficacy is necessary [6, 9, 13]. There are recommendations in place by the NIH, ACS, and ASMBS to prepare the individual for metabolic and bariatric surgery that are vital to ensure the patient is well informed and ready for the procedure [3, 4, 71]. Although preparation prior to surgery is important, it is not enough for a procedure this invasive [72, 73]. Many post-metabolic and bariatric surgery patients struggle with mental and physical health after surgery [72, 73]. This population has reported lack of support from healthcare providers post-procedure, which could contribute to weight regain and unfavorable health outcomes [16, 19, 20]. Unfortunately, there is not a national requirement for health care providers to provide continued support for this population. Some metabolic and bariatric clinics encourage following up with a registered dietitian and may even have a recommendation of meeting times but whether that happens is determined by the patient. The recommendations for following up with a registered dietitian post-operation are not consistent across the clinics nationally. However, an example follow-up schedule that a Kentucky clinic recommends includes meeting with a registered dietitian one week after surgery, one year after surgery, and then annually [17]. A patient may request to meet with a registered dietitian three additional times without any added costs to the patient [17]. According to the literature, patients who follow-up with a registered dietitian and

attend post-bariatric surgery programs have greater success adhering to the post-operation lifestyle [13, 16, 19]. Despite the benefits of clinical support post-bariatric procedure, a proper curriculum for a post-bariatric surgery program has not been developed. However, post-metabolic and bariatric surgery programs that have a nutrition education aspect are vital for promoting successful outcomes [13, 19, 73].

2.4 Gaps in Literature

Within the current body of literature there is a lack of research describing the most effective way for health-care providers to support metabolic and bariatric surgery patients' post-procedure. In addition, more research is required to establish acceptable and feasible resources and programming to encourage post-procedure lifestyle adherence to promote health after metabolic and bariatric surgery. The current study will provide insight into if the established curriculum created using evidence-based methods for a support and nutrition-based program created and facilitated by a registered dietitian specialized in metabolic and bariatric surgery, a nutrition graduate student, and a nutrition undergraduate student is acceptable and successful in improving self-efficacy and promoting sustainable weight loss of patients between one- and four-years post-operation.

CHAPTER 3. METHODS

3.1 Research Design

A pre/post study design was used to determine if a 6-session support and nutrition-based program for 1-4 year post-metabolic and bariatric surgery (MBS) patients was acceptable, promoted weight loss, and increased perceived self-efficacy related to nutrition and food related choices. University of Kentucky's Institutional Review Board (#77600) approved this study prior to execution (Appendix).

3.2 Setting

This study was conducted at Kentucky Bariatrics Institute located in Georgetown, Kentucky for six sessions between September 2022 through October 2022. The location was where the participants had received surgery to ensure comfortability. The program was held in a conference room with television access to ensure sharing of materials.

3.3 Participants

Recruitment materials were sent to the institute's post-operative patient listserv by a registered dietitian at the institute. Participant eligibility criteria included being 18 years of age or older, had bariatric surgery between 1-4 years ago, had the sleeve gastrectomy or Roux-En-Y Gastric Bypass as the initial procedure, can read, speak, and understand the English language, and are not currently pregnant. Those meeting the eligibility criteria were invited to complete the baseline survey. Following the baseline survey, participants received a $25 Amazon gift card for their time and were invited to enroll in the 6-session in-person program. Participants who attended in-person sessions were enrolled in a raffle each session for a gift basket that was related to the theme of the

session. Data was used from participants who attended at least 50% of the in-person sessions. Participants were identified by the last 5 digits of their phone number. Identification was used to evaluate changes from pre-intervention to post-intervention and used to differentiate in-person intervention participants and control participants. Concluding the intervention, both control and intervention participants who completed the repeat REDCap survey received a $25 Amazon gift card.

3.4 Control Group

A convenience control group was developed from participants who completed the baseline survey through REDCap but were not interested in participating in the 6-session in-person program. Participants in the control program were also invited to complete a repeat REDCap survey after the 6-session intervention program was complete.

3.5 Procedures

The 6-session support and nutrition-based pilot program was designed utilizing concepts from the framework of the Social Cognitive Theory. Content was developed in collaboration with a registered dietitian with expertise in bariatric surgery, a nutrition graduate student, and a nutrition undergraduate researcher. Components in the program were comprised of:

- *Introduction:* overview of the program, research, and gaining participant input on future topics and information
- *Postoperative nutrition guidance:* nutrition recommendations, example meals and snacks, helpful tips and suggestions for shopping, budgeting, and choosing foods

- *Micro and macronutrient recommendations for post-bariatric surgery:* importance of nutrients, where to find nutrients, importance of multivitamin compliance and high micronutrient food examples
- *Gentle activity:* activities included group walks around facility, chair yoga, and deep breathing
- *Mindfulness*: engagement in a mindful eating exercise, discussed mindful self-care activities such as journaling, meditation, and yoga
- *Individual and social support*: participants were invited to bring a support person(s) to the session as well as engage in inter-session support discussions
- *Sustainability of behavioral change*: maintaining motivation, working toward goals, sustaining behavior change long-term

The 6-session, in-person group program was held once weekly, across 6-weeks, for approximately one hour in the evenings. Printed materials, activities, and sample food or snack items were shared weekly related to the topic.

3.6 Measures

All survey questions were created in collaboration of a registered dietitian specialized in metabolic and bariatric surgery, a nutrition graduate student, and a nutrition undergraduate student utilizing evidence-based resources. Participants completed a baseline survey online through REDCap that included descriptive characteristics. All data received from the baseline survey was self-reported. Categorical descriptive characteristics included biological sex, race, ethnicity, surgery date, surgery type, when weight regain began, insurance type, and employment. Continuous descriptive characteristics included age, number of obesity-related health conditions before and after

surgery, current weight (pounds), weight prior to surgery (pounds), lowest weight (pounds), weight regained after surgery (%), and weight regain after surgery (pounds). Obesity-related conditions were shown categorically on the baseline survey through 13 items (including type 2 diabetes, joint pain, asthma) but was converted to a continuous variable to compare prevalence.

3.6.1 Anthropometric Data Collection

Height and weight were collected by trained research staff. Height was measured the first session and weight was collected every session. Height was gathered from a Seca manual stadiometer. Weight was taken via Tanita electrical impedance scale. Socks and shoes were removed prior to stepping on the Tanita electrical impedance scale, all other clothing items were kept on. Objective measures were recorded to compare to self-reported height and weight.

3.6.2 Outcome Measures of Success

% Excess weight loss (before and after intervention), and % total weight loss (before and after intervention) were variables used to indicate success in weight loss. Percent excess weight loss (%EWL) before the intervention was calculated as (initial weight – weight prior to intervention) / (initial weight – ideal weight) x 100. Similarly, %EWL post-intervention was calculated as (initial weight – weight post-intervention) / (initial weight – ideal weight) x 100 [40]. Outcomes that are greater than 50% are considered successful by current literature starting one-year post-metabolic and bariatric surgery [74]. Percent total weight loss is another variable that characterizes success after 1-year post-metabolic and bariatric surgery. Current literature recognizes success post-

MBS can be defined as %TWL greater than 20% [74]. In this study, %TWL prior to intervention was calculated as (weight before surgery – weight prior to intervention)/ (starting weight) x 100. %TWL after surgery was calculated as (weight before surgery – weight post-intervention)/ (starting weight) x 100 [75]. %EWL and %TWL were calculated using self-reported data extracted from the baseline survey.

3.6.3 Perceptions of Success and Confidence

Perceptions of self-efficacy were measured through questions regarding diet compliance, perceived success with post-procedure lifestyle, and perceived confidence to pursue post-procedure lifestyle. The survey question regarding diet compliance were asked on a Likert scale items (1=very compliant, 10= very non-compliant). Survey questions regarding perceptions of success after surgery included three Likert scale items (1=strongly agree to 7=strongly disagree). The questions included "I've had success with weight loss after surgery", "I've had success with physical activity after surgery", and "I've had success with choosing healthy foods after surgery".

To understand participant's perceived confidence in performing healthy lifestyle behaviors, a series of three Likert scale items (1=strongly agree to 7=strongly disagree) were collected. The questions included, "I feel confident in my ability to eat healthy," "I feel confident in my ability to exercise," and "I am confident that I am able to be a healthy version of myself."

3.6.4 Program Satisfaction and Acceptability

To understand satisfaction and acceptability of the approach used to provide support and nutrition education to post-metabolic and bariatric surgery patients, individuals

participating in the in-person group program were asked questions regarding their feedback on the program. To avoid excessively neutral response patterns, each item was scored on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree) with no neutral mid-point [76]. Examples of questions that were asked regarding program satisfaction and acceptability include "I am satisfied with the program approach used to provide nutrition and support for post-bariatric surgery," "the in-person program was useful for gaining nutrition knowledge," and "the in-person program provided a sense of social support."

3.7 Analysis

Distributions were run on all continuous variables for normality using Shapiro-Wilk Goodness of Fit test. Descriptive statistics are shown in frequencies and measures of central tendency (means and standard deviation) for the entirety of the cohort of post-operative bariatric surgery patients who completed the baseline survey. Data included in the descriptive statistics include age, sex, race, ethnicity, surgery date, surgery type, when weight regain began, insurance type, and employment. All descriptive categorical data was analyzed through Pearson Chi Square test. Age and total co-morbid conditions (i.e., type 2 diabetes, sleep apnea, hypertension) before and after procedure, are continuous non-normal variables and analyzed using Mann Whitney U.

Self-reported and measured weight was compared to identify if self-reported weight was a reliable measure to use in analysis. Spearman Rho Correlation was used to assess accurate association between the variables. A correlation coefficient closer to 1 indicates a strong association between the two variables while a correlation coefficient closer to -1 indicates a weak association between the two variables [77]. In this context, a strong

correlation would indicate that the participants accurately reported their weight, whereas a weak correlation would describe the opposite.

Change in weight specific variables included current weight (in pounds), weight prior to surgery (in pounds), lowest weight (in pounds), percent of weight regained after surgery, weight regained after surgery (in pounds). Each weight specific variable was analyzed between groups using an independent t-test.

Outcome variables of success which included %EWL and %TWL were found to be normally distributed variables analyzed using an independent t-test between groups at pre- and post-intervention.

Questions regarding diet compliance were asked on a diet compliance Likert scale (1= very compliant, 10=very non-compliant) and shown through means and standard deviations. Questions regarding success and confidence were asked on a continuous Likert scale (1=strongly agree, 7=strongly disagree) and shown through means and standard deviations. Questions regarding diet compliance, success, and perceived confidence was analyzed through Wilcoxon Rank Sum test to determine changes from pre-to post-intervention.

Program evaluation survey questions (cross-sectional) were asked on a continuous Likert scale (1=strongly disagree, 6=strongly agree) to avoid excessively neutral responses. Data are presented through means and standard deviations of responses.

CHAPTER 4. RESULTS

4.1 Descriptive Information

The study included a convenience sample of 18 participants with 8 participants in the intervention group who attended the in-person program and 10 serving as a control group who completed pre-and post-surveys. Descriptive characteristics of participants are shown in **Table 1**. The mean age of the participants who completed the intervention was 50 years and the mean age of the control participants was 40 years. There were no significant differences between the intervention and control participants based on age, sex, race, and ethnicity (all $p>0.05$). Overall, most participants were female (88.9%), Caucasian (94.4%), and were not Hispanic or Latino (89.9%). Though not a significant difference between surgery date, most participants had metabolic and bariatric surgery 2-3 years ago (44.4%), 33.3% of participants had metabolic and bariatric surgery between 1-2 years ago, 22.2% had metabolic and bariatric surgery 3-4 years ago. All the participants received the same type of metabolic and bariatric surgery, sleeve gastrectomy. There is no evidence of statistical significance between intervention and control participants based on when the participant regained weight after metabolic and bariatric surgery. Overall, most of the weight regain among the participants occurred 18 months after metabolic and bariatric surgery (33.3%). To continue, 16.67% of participants did not experience weight regain following metabolic and bariatric surgery, 22.2% experienced weight regain 12 months after metabolic and bariatric surgery, 16.67% of participants experienced weight regain 2.5 years after surgery, 5.56% experienced weight regain 9 months after surgery, and 5.56% of participants experienced weight regain 2 years after surgery. Insurance providers were examined by intervention

and control groups. Of the intervention group, 50% participants had Blue Cross Blue Shield insurance, 12.50% of participants had Medicaid, 12.50% of the participants reported not having insurance, and 25% reported having an insurance not listed. To compare, 44.4% of the control participants had Blue Cross Blue Shield Insurance, 22.2% had Medicaid, and 33.3% had WellCare. On average the intervention participants had approximately 3 comorbidities before surgery and approximately 2 after surgery. To compare, the control participants had approximately 4 comorbidities prior to surgery, and approximately 2 after surgery. In terms of employment, there are not statistically significant differences between the intervention and control group. Most of the participants (60%) worked full-time. None of the participants worked part-time, 5% were unemployed, 10% were retired, 10% were disabled to work, 10% were homemakers, 5% were students, and none of the participants were self-employed.

Table 1: Descriptive Characteristics of Intervention and Control Participants (n=18)

Variable and Category	**Total (n=18)**	**Intervention (n=8)**	**Control (n=10)**	**p-value**
Age (Years) mean ± SD	44.67 ± 10.47	50.13 ± 11.04	40.30± 8.04	0.0558
Sex (%)				0.8668
Female	16 (88.89)	7 (87.50)	9 (90.00)	
Male	2 (11.11)	1 (12.50)	1 (10.00)	
Race (%)				0.3574
African American or Black	1 (5.56)	0.00	1 (10.00)	
Caucasian	17 (94.44)	8 (100)	9 (90.00)	
Ethnicity (%)				0.2451
Hispanic or Latino	1 (5.56)	1 (12.50)	0.00	

Continued				
Not Hispanic or Latino	16 (88.89)	6 (75.00)	10 (100)	
Unsure	1 (5.56)	1 (12.50)	0	
Surgery Date (%)				0.7985
Between 1-2 years	6 (33.33)	2 (25.00)	4 (40.00)	
Between 2-3 years	8 (44.44)	4 (50.00)	4 (40.00)	
Between 3-4 years	4 (22.22)	2 (25.00)	2 (20.00)	
Surgery Type (%)				
Sleeve Gastrectomy	18 (100)	8 (100)	10 (100)	
When Weight Regain Began				0.3211
N/A	3 (16.67)	0	3 (30.00)	
9 months	1 (5.56)	1 (12.50)	0.00	
12 months	4 (22.22)	2 (25.00)	2 (20.00)	
18 months	6 (33.33)	2 (25.00)	4 (40.00)	
2 years	1 (5.56)	1 (12.50)	0	
2.5 years	3 (16.67)	2 (25.00)	1 (10.00)	
Insurance				0.1781
Blue Cross Blue Shield	8 (47.06)	4 (50.00)	4 (44.44)	
Medicaid	3 (17.65)	1 (12.50)	2 (22.22)	
WellCare	3 (17.65)	0.00	3 (33.3)	
Other	2 (11.76)	2 (25.00)	0.00	
None	1 (5.88)	1 (12.50)	0.00	
Comorbidities				
Total Conditions Prior to surgery	2.94±2.15	3.75±1.16	2.30±2.58	0.1227
Total Conditions after surgery	2.16±2.38	2.1±1.46	2.20±3.01	0.4637

Continued				
Employment				
Full time	12 (60.00)	4 (20.00)	8 (40.00)	0.1797
Part time	0	0	0	0.0000
Unemployed	1 (5.00)	1 (5.00)	0	0.2500
Disabled	2 (10.00)	1 (5.00)	1 (5.00)	0.8668
Retired	2 (10.00)	2 (10.00)	0	0.0935
Self-employed	0	0	0	0
Homemaker	2 (10.00)	1 (5.00)	1 (5.00)	0.8668
Student	1 (5.00)	1 (5.00)	0	0.2500

Pearson Chi Square Test was used to analyze categorical demographic variables. Mann Whitney U was used to analyze continuous demographic variables (age).

4.2 Weight

Table 2 is a comparative table demonstrating differences between self-reported data collected from the baseline survey and measured data collected from a Tanita scale used in the in-person intervention. Spearman's rho indicating good agreement (0.98, $p<.01$) as participants were able to accurately self-report their weight. Self-reported measures from the survey were used for future measures of weight status and post-surgery success (total weight loss, excess weight loss).

Table 2: Comparing Self-Reported and Measured Weight of Intervention Participants

Self-Reported Weight (pounds)	**Measured Weight (pounds)**	**Spearman's rho (p (p-value))**
207.94±41.05	209.51±42.02	0.9816 (<.0001)

Spearman's Rho test used to assess reliability of self-reported weight to measured weight.

Independent t-test was used to analyze weight-specific characteristics of

participants. Due to the small sample size of both the intervention (n=8) and the control (n=10), weight was assessed by sex to understand if there were sex-related differences

among weight variables. From an independent t-test analysis grouping by sex, weight was statistically significantly (p-value=0.0046) higher in males than females. %EWL and %TWL are adjusted as a percentage when assessing for sex and socioeconomic status differences. Socioeconomic factors that were analyzed include food insecurity, limited food budget, rurality status, and occupation. Analysis found that there were not statistically significant differences between men and women or socioeconomic factors ($p>0.05$) in relation to %EWL and %TWL. As %EWL and %TWL are the accepted weight measures in metabolic and bariatric surgery they were used as the primary weight variables throughout the rest of this study.

An independent t-test was used to analyze descriptive characteristics specific to weight to compare differences between the intervention and control group. Based on the results, shown in **Table 3**, there were not statistically significant (p-value > 0.05) differences between the two groups.

The average current weight of the intervention participants was 209 pounds and the average current weight for the control participants was 210 pounds. The mean weight of the control group prior to surgery was higher (313 pounds) than the intervention participants (290 pounds). The mean of the lowest weight of the intervention participants was 196 pounds compared to the mean lowest weight of 200 pounds of the control participants. On average, the percent of weight regained after metabolic and bariatric surgery of the intervention participants was 6% while the average percent weight regain of the control participants was 4%.

Table 3: Weight Specific Descriptive Characteristics of Intervention and Control Participants

Variable and Category	Intervention (n=8)	Control (n=10)	p-value
	mean ± SD	mean ± SD	
Current Weight (Pounds)	209.38 ± 42.51	210.00 ± 70.38	0.7898
Weight prior to surgery (Pounds)	290.13 ± 64.90	313.00 ± 79.49	0.5335
Lowest weight (Pounds)	196.13 ± 37.93	200.10 ± 61.82	0.8589
Weight regained after surgery (%)	6.09 ± 4.02	4.39 ± 6.02	0.1803
Weight regained after surgery (Pounds)	16.25 ± 9.48	13.00 ± 15.84	0.2645

Independent t-test used to assess weight specific demographic characteristics between intervention and control participants.

%EWL and %TWL are accepted measures of weight loss success for metabolic and bariatric surgery patients. %EWL and %TWL were analyzed through an independent t-test. **Table 4** demonstrates percent excess weight loss (%EWL) of intervention and control participants pre-and post-intervention. Based on the excess weight loss standards (>50% EWL) both the intervention participants and control participants were classified as successful both pre-and post-intervention. Before the intervention, on average %EWL was 62% for intervention participants and 67% for control participants. After the intervention, the average %EWL was 64% for the intervention participants and 69% for the control participants.

Similarly, there were no statistically significant differences between the intervention and control participants based on %TWL before or after the intervention. However, by %TWL standards (> 20%) both the intervention and control were classified as successful before and after the intervention. Specifically, before the intervention, the

intervention participants on average had 27% total weight loss and the control participants had 33% total weight loss. After the intervention, the intervention participants had a 28% TWL on average and the control had 34% TWL on average.

Table 4: Outcome Measures of Success: Weight Changes of Participants Prior to the Intervention to After

Variable Category (range in pounds)	**Intervention**	**Control**	**p-value**
	mean ± SD	**mean ± SD**	
%EWL baseline (35-123)	62.07 ± 16.53	67.74 ± 28.69	0.6074
%EWL post (39-124)	64.76 ± 15.32	69.23 ± 28.61	0.6781
p-value (by time)	0.7413	0.9090	
%TWL baseline (15-53)	27.35 ± 6.12	33.28 ± 12.16	0.2004
%TWL post (16-54)	28.50 ± 4.08	34.06 ± 12.18	0.2027
p-value (by time)	0.6662	0.8880	

%EWL: Percent Excess Weight Loss; %TWL: Precent Total Weight Loss. Independent t-test was used to examine %EWL and %TWL.

4.3 Self-Efficacy

To assess the changes in perceived self-efficacy from before the intervention to after, a Wilcoxon Rank Sum test was conducted. Before the intervention, intervention participants reported being statistically significantly (p-value <0.05) less confident in being able to be the healthiest versions of themselves compared to the control participants. However, when analyzing changes from pre-to post-program there were not statistically significant (p-value >0.05) differences in self-efficacy from before the intervention to after the intervention between intervention participants and control participants. As shown in **Table 5**, there is evidence showing increased self-efficacy in complying in post-metabolic and bariatric surgery diet among the intervention participants (0.04±0.38), success with weight loss after surgery (0.50±0.18), success with

physical activity after surgery (0.37±0.17), confidence in their ability to exercise (0.50±0.18), and confidence to be healthy (1.25±0.32).

Table 5: Self -efficacy Changes from Pre-intervention to Post-intervention by Control

Variable (range)	Pre (Mean ± SD)	Post (Mean ± SD)	p-value
Perceived post-operation diet compliance			
Intervention (2-8)	4.75 ± 2.05	4.71 ± 2.43	0.9531
Control (2-7)	4.00 ± 1.50	4.50 ± 2.00	0.6253
Success with weight loss after surgery			
Intervention (1-3)	2.25 ± 0.89	1.75 ± 0.71	0.2207
Control (1-3)	1.70 ± 0.82	1.50 ± 0.71	0.5840
Success with physical activity after surgery			
Intervention (1-6)	2.75 ± 1.58	2.38 ± 1.41	0.6650
Control (1-6)	2.50 ± 1.43	2.70 ± 1.49	0.6941
Success with choosing healthy foods after surgery			
Intervention (1-5)	2.75 ± 1.28	3.00 ± 1.41	0.7037
Control (1-4)	2.30 ± 0.67	2.10 ± 0.88	0.4028
Confidence in ability to eat healthy			
Intervention (1-7)	3.13 ± 1.55	3.50 ± 2.07	0.7888
Control (1-5)	2.50 ± 1.18	2.10 ± 0.74	0.4458
Confidence in ability to exercise			
Intervention (1-6)	3.25 ± 1.67	2.75 ± 1.49	0.5898
Control (1-7)	2.80 ± 1.69	2.40 ± 1.17	0.5508
Confidence to be healthy version of myself			
Intervention (1-6)	3.88 ± 1.73*	2.63 ± 1.41	0.1347
Control (1-4)	2.10 ± 0.99*	2.10 ± 0.74	0.8719

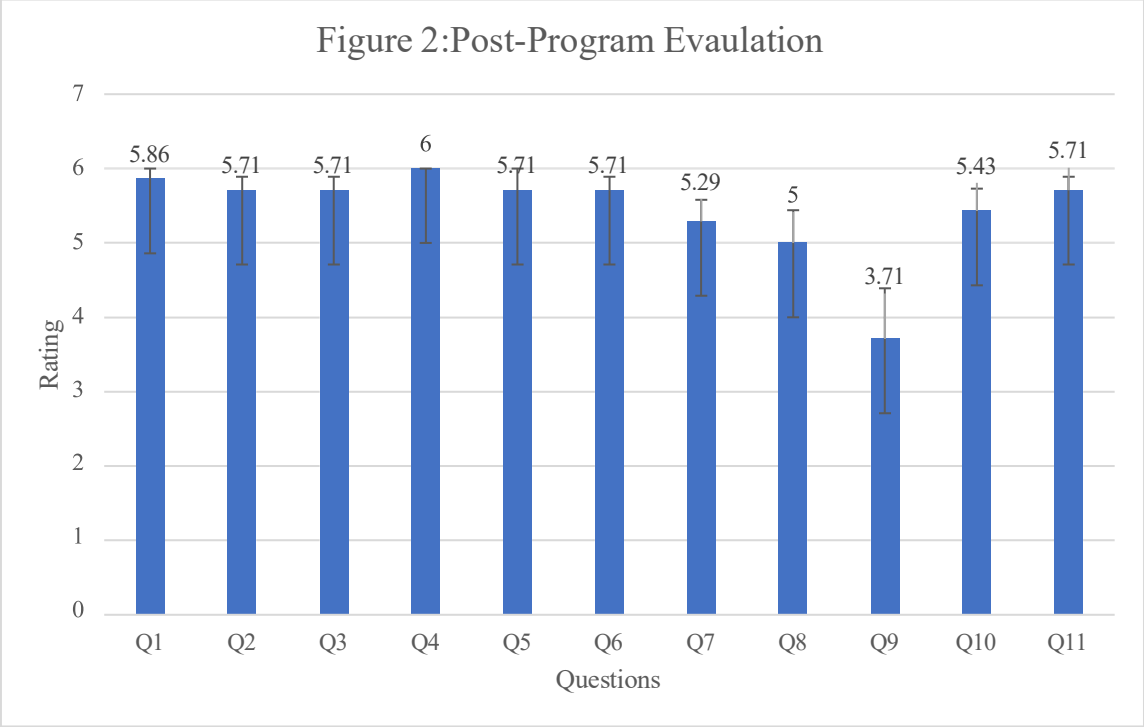
Wilcoxon Rank Sum test used to assess diet compliance, success, and self-efficacy by group and by time. Diet Compliance Likert scale (1 being very compliant, 10 being very non-compliant). Success and Confidence Likert scale (1=strongly agree, 7=strongly disagree). *p<0.05

4.4 Program Evaluation

A statistical distribution was conducted to determine the acceptability and success of the program based on 12 questions answered only by the intervention participants,

Figure 2. Since the data was only collected from the intervention participants (n=8) probabilities were used. Based on the results, 86% of the intervention participants strongly agree that they were satisfied with the interventions approach to provide nutrition and support for post-bariatric surgery patients (average score). Seventy-one percent (71%) strongly agreed the program length was reasonable and useful for gaining nutrition knowledge. One hundred percent (100%) of the participants strongly agreed that the intervention provided social support and 86% strongly agreed that the program was helpful for accountability after bariatric surgery. Seventy-one percent (71%) strongly agreed that the in-person program was useful for overall healthy living recommendations and 43% agreed that the intervention improved confidence in living a healthy lifestyle. Forty-three (43%) of the participants strongly agreed that they have changed their diet habits throughout the intervention and 29% strongly agreed that they have not made dietary changes but plan to following the program. Fifty-seven percent (57%) strongly agreed that they plan to use information from this program moving forward and 71% strongly agree that they would recommend this program for post-bariatric surgery individuals.

Figure 1: Self-Reported Acceptability and Success of Nutrition and Support-Based Program



q1=I am satisfied with the program approach used to provide nutrition and support for post-bariatric surgery;q2=the program length was reasonable (6 sessions, 1 hour each);q3=the in-person program was useful for gaining nutrition knowledge;q4=the in-person program provided a sense of social support;q5=the in-person program was helpful for accountability after bariatric surgery;q6=the in-person program was useful for recommendations on overall healthy living;q7=this program improved my confidence in living a healthy lifestyle;q8=I have changed my diet habits throughout the program;q9=I haven't made any changes yet, but plan to make dietary changes following this program;q10=I plan to use information from this program in my lifestyle moving forward;q11=I would recommend this in-person program for post-bariatric surgery individuals.

CHAPTER 5. DISCUSSION

A 6-session pilot study was designed to establish an effective program for post-metabolic and bariatric surgery patients to offer nutrition education and support. Aims of this study included determining if a program for post-metabolic and bariatric patients was acceptable for providing tailored nutrition education and social support for this population, assessing self-efficacy of patients to perform necessary lifestyle changes after metabolic and bariatric surgery, and to inquire if a 6-session post-metabolic and bariatric surgery program would induce weight loss. This study served to advance the research on an appropriate and acceptable curriculum to support post-metabolic and bariatric surgery patients.

5.1 Promoting Nutrition and Support

The study aimed to determine if a 6-session nutrition and support-based program was acceptable to promote nutrition education and social support among post-metabolic and bariatric surgery patients 1-4 years post-operation. Post-metabolic and bariatric surgery programs are recommended to be a required part of treatment to avoid adverse effects [15]. In addition, patients will endure more benefits when clinical support is given by a multidisciplinary team that includes a registered dietitian specialized in bariatric surgery [15]. A hypothesis of the current study was that after participating in a support-based intervention, at least 70% of the post-bariatric participants would agree or strongly agree that the program was acceptable to reinforce nutrition and support. As implemented in this thesis document acceptability was measured through a post-program survey distributed to the intervention participants in the last session. Survey items included 11 questions regarding the overall program, measured on a Likert scale item (1=strongly

disagree, 6 strongly agree) to avoid neutral responses. Responses from the post-program success and acceptability survey showed that all the participants strongly agreed or agreed with 10 out of the 11 questions. Comparable studies are scarce, however, a similar study evaluating the effectiveness of an exercise program for post-metabolic and bariatric surgery patients found comparable results regarding the importance of social support and health education for this population [78]. Qualitative results from Gill et al., indicated participants noted that gaining knowledge about exercise improved their health and fitness. Participants also reported that social support was an important benefit in developing exercise habits [78].

Complementary questions included on the current study's post-program evaluation survey to establish success and acceptability of the program included statements such as, "the in-person program provided a sense of social support", which all the participants strongly agreed with. Many patients who undergo metabolic and bariatric surgery report struggling to find the support they need [79]. Specifically, patients tend to struggle to ask for help and to find support from friends, family, and clinical staff [80]. Previous investigations suggest that there is a need for continuous and/or long-term support options for this population after surgery to not only aid in weight loss and physical health but also the psychological health of the patient [80, 81] indicating the need for studies such as the one completed in this thesis [79].

Partaking in nutrition education can be linked to diet adherence [82]. Unfortunately, specific data regarding nutrition education programs influence on post-metabolic and bariatric surgery patients is limited. However, a longitudinal study among healthy adolescents exploring the impact of a nutrition education-based program on the

adherence to the Mediterranean diet and physical activity show comparable results to the findings of this thesis [82]. Authors found that adherence to the Mediterranean diet statistically significantly increased from before the nutrition education program (24.71%) to after the nutrition education program (43.52%). Findings from this study support the theory that populations who have access to, and engage in, nutrition education are more likely to adhere to the given diet. To compare, a clinical trial to determine the effectiveness of a community-based fruit and vegetable education program on changes of fruit and vegetable consumption among individuals with overweight and obesity found significant evidence that proper nutrition education increases the consumption of fruits and vegetables [83]. Specifically, the trial found that participants in the education group from pre-to post-intervention had a significant mean increase of frequency of fruits and vegetables of 6.5 times per week [83]. In relation, significant increases of fruit and vegetable consumption were not reported in the group that did not receive nutrition education [83]. This study serves as another example of how proper nutrition education can positively influence a individuals diet [83].

Over 90% of questions asked on the post-program success and acceptability survey inspired “strongly agree” or “agree” responses indicating in our small cohort, the program was deemed successful and acceptable in delivering nutrition education and support to post-metabolic and bariatric surgery patients. However, responses to one of the eleven questions, “I haven’t made any changes yet, but plan to make dietary changes following this program”, did not inspire the same responses as the corresponding questions. 29% of the participants strongly agreed with the statement, “I haven’t made any changes yet, but plan to make dietary changes following this program”. Lack of

positive feedback from this question could be due to the wording of this question which could have been understood in a variety of ways. A participant could have made changes during the program and/or before they received this survey. Another possibility is that the participant had already made the necessary changes and did not attend the program for the nutrition aspect but to gain social support.

5.2 Self-Efficacy

Post-metabolic and bariatric surgery patients who attend behavioral medicine interventions post-surgery have greater confidence to purse a healthy post-metabolic and bariatric surgery lifestyle [84]. Interventions that incorporate behavior change into the curriculum, including self-efficacy are shown to be more effective in promoting sustainable behavior change than interventions that do not [85]. Many behaviors change theories include self-efficacy and are frameworks in which several behavior-based interventions are grounded. There are several ways of promoting self-efficacy explained by Bandura, including setting and achieving goals, observing someone else similar to themselves successfully performing a behavior, and verbal persuasion [86]. Theories such as the self-determination theory and social cognitive theory (SCT) include self-efficacy and are utilized to identify common mechanisms for lifestyle change [85, 87]. The self-determination theory has been highlighted as a tool to promote long-term behavior change. The measurement in which the self-determination theory utilizes self-efficacy is through perceived competence or the feeling of being capable [85]. SCT describes how cognitive, environmental, and behavioral factors all influence each other in the realm of behavior [88]. Within the SCT, self-efficacy plays a large role in the “behavioral factors” construct. High self-efficacy has been identified as a strong indicator of change. Both the

self-determination theory and social cognitive theory have been utilized as a framework to purse various behavioral interventions [88, 89] and identify self-efficacy as a prime indicator of health behavior change and sustainability.

Therefore, an aim of the study was to assess self-efficacy of bariatric surgery patients to perform healthy lifestyle behaviors, related to post-surgery living, after the intervention. Self-efficacy questions were asked on the baseline and concluding survey to assess changes in self-efficacy from before the intervention to after. Self-efficacy questions were asked on a Likert scale (1=strongly disagree to 7 strongly agree) to understand a participants perceived confidence to pursue healthy lifestyle behaviors. The changes in self-efficacy analyzed from pre-to post-intervention was not significantly different. However, due to this study being a small, 6-session pilot study the results were not surprising. Although the data lacked significance, the content of the results may inspire further areas of research. To specify, the data showed that participants slightly increased their confidence in diet compliance, success with weight loss after surgery, confidence in ability to exercise, and in their ability to be healthy. Although, there is a lack of research relating specifically to perceived self-efficacy of participants after nutrition and support intervention tailored for post-bariatric and metabolic patients, there are similar interventions that target other populations that have found similar results. For example, a study by Gothe et al., utilized the social cognitive theory to examine behavior change among urban African American adults in regard to physical activity [89]. Gothe et al., found that participants who obtain higher levels of self-efficacy resulted in higher levels of physical activity engagement [89]. This study's findings continued to support

the literature on the social cognitive theory, that higher self-efficacy a person perceives then increased benefit [89].

Regarding participants belief in their ability to eat healthy and have success with choosing healthy foods, participant responses remained relatively consistent after the 6-session in-person intervention. Confidence-related measures that could have been negatively impacted could be that lifestyle behavior changes can require more attention and practice then what a 6-session program could provide which therefore posed as a limitation to the study. Establishing an adequate duration for behavior change interventions is historically difficult [85, 90, 91]. The difficulty lies within the variety of factors that can influence behavior change among duration of intervention. Some of the established factors include lack motivation, self-efficacy, and fear of change [85, 91].

Lastly, when measuring success with physical activity after surgery the responses remained the same from pre-to post-intervention. This result could be an outcome of conducting a short intervention, lack of attendance on the session where physical activity was involved, and environmental factors that went beyond the intervention. Recent literature explains that lack of accessibility to exercise facilities and time are two main barriers to physical activity among post-metabolic and bariatric surgery patients [78, 92].

5.3 Weight Loss

Patients who undergo metabolic and bariatric surgery typically endure inadequate weight loss or weight regain following the procedure [23, 93, 94]. Therefore, an aim of the study was to determine if a six-session support and nutrition-based program created for post-operative metabolic and bariatric surgery patients influences weight loss. It was hypothesized that there would be a 1% decrease in total body weight by the conclusion of

the program. Although the data collected and analyzed from the study produced non-significant results, the data supported the hypothesis that following a six-session support and nutrition-based intervention, post-metabolic and bariatric surgery patients would attain a weight loss of 1%. Specifically, the data demonstrated approximately a 3.75lb (SD: ± 6.04) weight loss in the intervention participants and an approximately a 2.7lb (SD: ± 3.71) weight loss in the control participants. Differences in weight loss between the intervention and control was not statistically significant. Not finding statistically significant differences in regards to weight loss between the control and intervention participants among a post-metabolic and bariatric population is consistent with previous research [95].

Current research is not consistent on the most accurate measure to determine success with weight loss [94]. However, the measures utilized in this study are percent total weight loss (%TWL) and percent excess weight loss (%EWL). The American Society for Metabolic and Bariatric Surgery (ASMB) recognize both of these predictors of success in weight loss for post-metabolic and bariatric patients [96]. Clinically significant weight loss determined by %EWL is established as excess weight loss of 50% or greater and %TWL is established as 20% or greater [53, 97]. Data from the study found that both the intervention and control groups were “successful” with post-surgery weight loss based off %EWL and %TWL both before and after the intervention. Consequently, after the intervention there was no statistically significant difference between the intervention and control group. Similar programs are scarce, however, a retrospective study with the objective to determine if MBS- patients who obtained less weight loss would request to attend a post-operative support group compared to a patient

who achieved successful weight following metabolic and bariatric surgery [98]. Researchers found weight loss is not an independent predictor of deciding whether to attend a post-metabolic and bariatric surgery support program [98]. To continue, it was found that there was not a statistically significant difference in percent total weight loss between the participants with successful weight loss and the participants with unsuccessful weight loss [98].

5.4 Strengths and Limitations

Strengths of the study included having a registered dietitian specialized in metabolic and bariatric surgery on the research team to spearhead development of nutrition education material. Recent findings support that having a registered dietitian specialized in metabolic and bariatric surgery is the most beneficial healthcare provider in supporting patients to sustain optimal nutrient status after metabolic and bariatric surgery [13]. To continue, the setting of the intervention served as another strength in the pilot study. Utilizing a familiar location to the participants, such as their chosen surgical clinic, could have contributed to adherence and participation in the study [98].

However, this study is not without limitations. The pilot study was 6-sessions and designed to determine an appropriate and effective way to intervene after post-metabolic surgery to yield beneficial health outcomes for this population. However, the duration of this study serves as a limitation. Current literature supports that a longer and/or on-going program could contribute to statistically significant results and improved patient outcomes [84, 98]. Another limitation of the pilot study is a lack of multidisciplinary weigh-in such as an exercise specialist and mental health care provider specialized in metabolic and bariatric surgery. An exercise specialist and mental health professional

specialized in metabolic and bariatric surgery could contribute beneficial perspectives to create a well-rounded lifestyle program for post-metabolic and bariatric surgery patients and provide helpful education materials for participants, enhancing the holistic nature of the program [99]. It has been established that following-up with a multidisciplinary team that works toward a common goal, actively promotes “adherence and success” [99]. Another limitation of the study was the small sample size. Participation was voluntary and recruitment was over a short period of time. These factors could have contributed to the small sample size found in this study. Another notable limitation was restricted access to validated evaluation tools. Among the literature, very few post-metabolic and bariatric surgery lifestyle programs utilize validated evaluation tools [100]. The lack of proper evaluation tools for this population is barrier among this field of research. More research should be done to improve and create validated assessment tools for post-metabolic and bariatric surgery patients [100].

5.5 Future Research

The purpose of this 6-session pilot study was to find a feasible and effective way for healthcare providers to positively intervene in the progress of individuals who are 1-4 years post-metabolic and bariatric surgery. This thesis serves as a tool to inspire future research for programs designed to provide nutrition education and support for patients 1-4 years post-metabolic and bariatric surgery. Throughout the study it was indicated that more research can and should be done to establish the best way for healthcare providers to supply adequate nutrition education and support for this population. One potential advancement would be a longer program. Data collected from a retrospective study found that when surveying post-metabolic and bariatric surgery patients in regard to frequency

and duration of support group, the majority requested meeting once a month and the others preferred meeting once every 3 months, both favoring continuous support after surgery for longer durations [98]. Comparing relevant data of post-metabolic and bariatric surgery programs, many that have a defined end point do not produce significant results in relation to weight loss therefore increasing the need to form ongoing, long-term program [94, 95]

To continue, this 6-session pilot study was limited in modalities. The expansion of modality offerings in addition to group programs include individual and virtual options. Data demonstrating different options for support found that the majority of patients who wish to attend a group program would prefer to meet at the hospital in which their procedure was performed [98]. Findings from a retrospective study indicated that participants were interested in an email bulletin that coincided with the group educational sessions [98]. Remaining sample preferred a private social media group [98]. Other modalities that could be utilized in future research include telehealth, virtual options, and individual motivational interviewing [18, 88, 92].

Another area of expansion could be exploring factors to promote sustainable weight loss in post-metabolic and bariatric surgery patients. This research can include programs that promote weight loss as well as interventions that establish factors of weight loss. To create an adequate program to promote weight loss and prevent weight regain, it is important to understand that their multiple factors influencing weight regulation. As found in recent literature, weight regain can be influenced by “hormonal mechanisms, nutritional non-adherence, physical inactivity, mental health causes, maladaptive eating, and surgical mechanisms” [97, 101]. Health of the person pre-and

post-metabolic and bariatric surgery is another established factor and possible predictor of weight loss and weight regain post-procedure [94, 101]. When analyzing the data in this thesis it was found that an exclusion criterion of participants who are not classified as successful (i.e., excess weight loss less than 50%) based on weight loss success standards, including %EWL and %TWL before the intervention would be further area of research.

In future studies, utilizing a multidisciplinary team may influence beneficial health outcomes for the participants. Negi et al., explains the roles of each healthcare provider in supporting a metabolic and bariatric surgery patient. Negi et al., includes a registered dietitian explains dietary changes and promote weight loss, a mental health professional identifies barriers and sets goals, and a physical therapist or exercise specialist has a role in weight loss and physical condition of patient [99]. These three healthcare providers have mandatory and vital jobs before the procedure; however, their requirements fade after the procedure despite the benefits [99]. Continued research utilizing a multidisciplinary team including a registered dietitian, exercise specialist, and mental health professional specialized in bariatrics in a post-metabolic and bariatric lifestyle and support program could positively influence patients and produce favorable outcomes.

Lastly, in the program success and acceptability survey, rewording or voiding, the question, “I haven't made any changes yet, but plan to make dietary changes following this program.” This question inspired conflicting responses and could be deemed as confusing or easily misinterpreted. However, from including this question we were able to acquire further insight on optimum wording to collect accurate patient-feedback.

Continued used of acceptability survey items should be tested with the target population to ensure the questions items are perceived correctly prior to utilization.

CHAPTER 6. CONCLUSION AND IMPLICATIONS

This 6-session pilot study aimed to explore an effective way for health care professionals to intervene in the promotion of a healthy lifestyle through a support and nutrition-based program for participants who are 1-4 years post-metabolic and bariatric surgery. Although the findings in the study were not statistically significant, this study is a substantial contribution to research in developing programing for post-metabolic and bariatric surgery patients.

Previous interventions utilize various approaches when designing post-metabolic and bariatric surgery programs [18, 78, 80, 95, 102]. However, this program incorporated social support, nutrition education led by a registered dietitian in metabolic and bariatric surgery, and physical activity within an in-person group curriculum. The current pilot study was successful in providing support and nutrition-based education for post-metabolic and bariatric surgery patients based on patients' feedback, steady attendance rates, and participant indication that they would recommend this program. In addition, through data collection it was found that weight status and reported self-efficacy was maintained throughout the study.

Metabolic and bariatric surgery is a growing treatment for weight loss. Although effective, this treatment can be restrictive and/or malabsorptive and if not properly advised, a patient can develop health conditions worse than before the procedure. Currently, there is not a requirement for patients to seek care after the procedure despite the potential health implications. The pilot program described in this thesis can be utilized and adapted to produce future interventions to establish an acceptable and

successful way for healthcare providers to adequately support patients post-metabolic and bariatric surgery.

APPENDIX

INTERNATIONAL REVIEW BOARD APPROVAL LETTER

University of Kentucky. | Office of Research Integrity
IRB, RDRC

Modification Review

Approval Ends:	IRB Number:
7/6/2023	77600

TO: Makenzie Barr, PhD
Dietetics and Human Nutrition
PI phone #: 8592571573

PI email: Makenzie.Barr@uky.edu

FROM: Chairperson/Vice Chairperson
Nonmedical Institutional Review Board (IRB)
SUBJECT: Approval of Modification Request
DATE: 10/10/2022

On 10/8/2022, the Nonmedical Institutional Review Board approved your request for modifications in your protocol entitled:

COVID19: Nutrition and Support Post-Bariatric Surgery Intervention for Weight Maintenance

If your modification request necessitated a change in your approved informed consent/assent form(s), the new IRB approved consent/assent form(s) to be used when enrolling subjects can be found on the approved application's landing page in E-IRB. [Note, subjects can only be enrolled using consent/assent forms which have a valid "IRB Approval" stamp unless special waiver has been obtained from the IRB.]

Note that at Continuation Review, you will be asked to submit a brief summary of any modifications approved by the IRB since initial review or the last continuation review, which may impact subject safety or welfare. Please take this approved modification into consideration when preparing your summary.

For information describing investigator responsibilities after obtaining IRB approval, download and read the document "PI Guidance to Responsibilities, Qualifications, Records and Documentation of Human Subjects Research" available in the online Office of Research Integrity's IRB Survival Handbook. Additional information regarding IRB review, federal regulations, and institutional policies may be found through ORI's web site. If you have questions, need additional information, or would like a paper copy of the above mentioned document, contact the Office of Research Integrity at 859-257-9428.

seeblue.

405 Kinkead Hall | Lexington, KY 40506-0057 | P: 859-257-9428 | F: 859-257-8995 | www.research.uky.edu/ori/

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Section 1 Page 1 of 1

CONSENT STATEMENT COVER LETTER

IRB Approval
9/14/2022
IRB # 77600
NMED

Hello:

I am contacting you, as you have been identified as an individual who may be eligible for a research study through the University of Kentucky.

Researchers at the University of Kentucky are inviting you to take part in an online survey as a component of this study. Information collected in this portion of the study will include outcomes after surgery, lifestyle changes since surgery, a dietary assessment, and weight status.

The process of this study includes (all optional):

1. Eligibility Screener (online survey)
    a. If eligible you will be asked to continue to the full baseline survey
    b. If ineligible, the survey will end and we appreciate your time
2. Baseline survey (online survey)
3. If completing the baseline survey, an opportunity to participate in an in-person group support program that includes:
    a. Two dietary recalls over phone
    b. A 6-week in-person nutrition and support program at Georgetown Bariatric Clinic (one group session per week with weekly data collection of weight and diet habits)
4. Post-survey (online sent via email)

Although you may not get personal benefit from taking part in this research study, your responses may help us understand more about personal experiences of patients after surgery and what support you could have benefitted from yourself. Some volunteers experience satisfaction from knowing they have contributed to research that may possibly benefit others in the future.

This survey/questionnaire will take about 20 minutes to complete. The survey will begin with a screener to determine participant eligibility. Eligibility criteria include: bariatric surgery patients who can read, speak, and understand English, are 1-4 years post operation, at least 18 years of age, not currently pregnant, and able to travel to the program clinic location.

Eligible participants will be granted access to continue with the survey. Participants will receive a $25 Walmart, Kroger, or Amazon (your choice) e-gift card via email after completing the survey.

Following the survey you have the opportunity to take part in the in-person group program (will include a 24-hour dietary recall over the phone with a research staff and a 6-week in-person post-operative nutrition and support program). The 24-hour dietary recall will consist of a researcher scheduling a call with you to collect information on your last 24 hours of food and drink intake. The in-person program will take place once per week for 6 weeks and will cover topics and activities of nutrition and support. More information to follow if interested in participating.

There are no known risks to participating in this portion of the study.

Although we have tried to minimize this, some questions may make you upset or feel uncomfortable and you may choose not to answer them. If some questions do upset you, we can have resources to who would be able to help you with these feelings.

Your information collected for this study will NOT be used or shared for future research studies.

We hope to receive completed questionnaires from approximately 100 people, so your answers are important to us. Of course, you have a choice about whether to complete the survey/questionnaire, but if you do

participate, you are free to skip any questions, opt out, or discontinue at any time. You will not be penalized in any way for skipping or discontinuing the survey. You will still receive full compensation.

Please be aware, while we make every effort to safeguard your data once received on our servers via REDCap, given the nature of online surveys, as with anything involving the Internet, we can never guarantee the confidentiality of the data while still en route to us. All data will be assigned to your study ID and none of your identifiable information will be used when reporting.

If you have questions about the study, please feel free to ask the PI, whose contact information is given below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff in the University of Kentucky Office of Research Integrity at 859-257-9428 or toll-free at 1-866-400-9428.

Thank you in advance for your assistance with this important project. To ensure your responses/opinions will be included, please complete the survey within one weeks.

PI CONTACT INFO

Continue below if you agree to participate.

IRB Approval
9/14/2022
IRB # 77600
NMED

Consent to Participate in a Research Study

KEY INFORMATION FOR NUTRITION AND SUPPORT PROGRAM FOR POST-BARIATRIC SURGERY PATIENTS IN KENTUCKY

We are asking you to choose whether or not to volunteer for a research study about helping support post-bariatric surgery patients through a post-operative nutrition and support program. We are asking you because record indicate that you may have had a bariatric surgery procedure in the last 1-4 years and have completed the baseline survey and 24-hour recall. This page is to give you key information to help you decide whether to participate in this in-person portion of the study. We have included detailed information after this page. Ask the research team questions. If you have questions later, the contact information for the research investigator in charge of the study is below.

WHAT IS THE STUDY ABOUT AND HOW LONG WILL IT LAST?

By doing this study, we hope to learn more about if a program targeting nutrition and support, post-bariatric surgery, can help with improving or maintaining success. Your participation in this research will last 6 weeks, with a total of 6 interactions. Throughout the six weeks you will participate in 6 group sessions focused on nutrition and support post-surgery.

Other than providing educational information at the group sessions, we will collect height, weight, and dietary adherence weekly. Your information will be kept on file with your associated study ID.

WHAT ARE KEY REASONS YOU MIGHT CHOOSE TO VOLUNTEER FOR THIS STUDY?

For participating in this study, you have a chance to win six raffle gift baskets (one raffle per week). You'll also receive nutrition and support information and resources to improve or maintain your progress post-surgery. For a complete description of benefits and/or rewards, refer to the Detailed Consent.

WHAT ARE KEY REASONS YOU MIGHT CHOOSE NOT TO VOLUNTEER FOR THIS STUDY?

Discomforts associated with the study will include sensitive questions regarding weight and support. This program will take place in a group setting in which discussing may be uncomfortable. We aim to make the program a safe space for learning and sharing but if at any time, you feel uncomfortable, you are able to discontinue any study procedure. For a complete description of risks, refer to the Detailed Consent.

DO YOU HAVE TO TAKE PART IN THE STUDY?

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any services, benefits, or rights you would normally have if you ~~choose~~ not to volunteer.

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS OR CONCERNS?

If you have questions, suggestions, or concerns regarding this study or you want to withdraw from the study contact Makenzie Barr, PI of the University of Kentucky, Department of Dietetics and Human Nutrition at makenzie.barr@ukv.edu or 859-257-1573.

If you have any concerns or questions about your rights as a volunteer in this research, contact staff in the University of Kentucky (UK) Office of Research Integrity (ORI) between the business hours of 8am and 5pm EST, Monday-Friday at 859-257-9428 or toll free at 1-866-400-9428.

This research is funded through the University of Kentucky College of Agriculture, Food and Environment's Department of Dietetics and Human Nutrition Start-up funding.

Page **1** of **4**

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. We will keep all data anonymous with your study ID and it will be kept on the PIs password protected computer.

You should know that there are some circumstances in which we may have to show your information to other people because of data analysis or in case of responses indicating suicidal tendencies. For example, the law may require us to share your information with:

- authorities, if you have a reportable disease; if you report information about a child being abused, if you pose a danger to yourself or someone else; and/or
- To ensure the study is conducted properly, and officials at the University of Kentucky may look at or copy pertinent portions of records that identify you.

Likewise, as you will be in group sessions with other participants, confidentiality cannot be guaranteed. However, we will do our best to safeguard the data by utilizing a study ID for your data instead of names or identifying information. We will also keep the data inside the PIs locked office and password-protected computer.

CAN YOU CHOOSE TO WITHDRAW FROM THE STUDY EARLY?

You can choose to leave the study at any time. You will not be treated differently if you decide to stop taking part in the study.

If you choose to leave the study early, data collected until that point will remain in the study database and may not be removed.

The investigators conducting the study may need to remove you from the study. This may occur for a number of reasons. You may be removed from the study if:

- you are not able to follow the directions,
- they find that your participation in the study is more risk than benefit to you, or
- if you do not consent to participate, we will not record your data

WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?
You will have the opportunity to win a weekly raffle at the in-person sessions (value of approximately $50)

With a few exceptions, study payments are considered taxable income reportable to the Internal Review Service (IRS). A form 1099 will be sent to you if your total payments for research participation are $600 or more in a calendar year.

WILL YOU BE GIVEN INDIVIDUAL RESULTS FROM THE RESEARCH TESTS/SURVEYS?
Generally, tests/surveys done for research purposes are not meant to provide results that apply to you alone.

WILL WE CONTACT YOU WITH INFORMATION ABOUT PARTICIPATING IN FUTURE STUDIES?
The research staff would like to contact you with information about participating in future studies. If so, it will be limited to 1-2 times per year.

Do you give your permission for the investigator or staff to contact you regarding your willingness to participate in future research studies? ☐ **Yes** ☐ **No** **Initials**_____

WHAT ELSE DO YOU NEED TO KNOW?
If you volunteer to take part in this study, you will be one of about 25 people to do so.
The University of Kentucky Department of Dietetics and Human Nutrition is providing financial support and/or material for this study.

WILL YOUR INFORMATION BE USED FOR FUTURE RESEARCH?
Your information collected for this study will NOT be used or shared for future research studies.

INFORMED CONSENT SIGNATURES

This consent includes the following:

- **Key Information Page**
- **Detailed Consent**

You are the subject or are authorized to act on behalf of the subject. You will receive a copy of this consent form after it has been signed.

_____ **Signature of research subject**	_____ **Date**
_____ **Printed name of research subject**	
_____ Printed name of [authorized] person obtaining informed consent	_____ Date

DETAILED CONSENT:

ARE THERE REASONS WHY YOU WOULD NOT QUALIFY FOR THIS STUDY?

For the in-person program: ~~Persons~~ ineligible to participate in the study would be those under a year post-bariatric surgery, or over 4 years post-bariatric surgery, under the age of 18, non-English reading, currently pregnant (would influence weight status), or are unable to meet transportation requirements of coming to the program site.

WHERE WILL THE STUDY TAKE PLACE AND WHAT IS THE TOTAL AMOUNT OF TIME INVOLVED?

The research procedures will be conducted through in-person group sessions at Georgetown Bariatric Surgery Clinic. You will need to come to the clinic six times during the study. Each visit will take approximately 1 hours in total. The total amount of time you will be asked to volunteer for this study is approximately 6 hours over the next 6 weeks.

WHAT WILL YOU BE ASKED TO DO?

- You will be invited to come to Georgetown Bariatric Clinic to participate in group nutrition and support sessions over the next 6 weeks.
    - We will discuss your experience with your surgical journey, changes in your post-operative lifestyle, nutrition, and recommendations for ~~improvement~~
    - Some activities in the program will include:
        - Chair yoga, partner discussions, group walks, mindfulness exercises, and general PowerPoint discussions of nutrition and support
    - Your height, weight, and dietary adherence will be collected weekly by a body weight scale and through a small ~~survey~~
        - Weight will be taken in a separate room away from other participants for ~~privacy~~

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

As part of this study, discomforts that may arise include survey questions regarding support status, weight, and health related indicators. If at any time during the in-person sessions, you feel uncomfortable discussing or hearing about a topic, you are free to remove yourself.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?

We do not know if you will get any benefit from taking part in this study. However, some people have experienced a sense of community through being able to discuss your experiences when partaking in program. However, if you take part in this study, information learned may help others, so your full disclosure of information is appreciated.

IF YOU DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

If you do not want to be in the study, there are no other choices except not to take part in the study.

WHAT WILL IT COST YOU TO PARTICIPATE?

You may have to pay for the cost of getting to the study site.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?

When we write about or share the results from the study, we will write about the combined information. We will keep your name and other identifying information private.

PROMOTIONAL FLYER

Post-Bariatric Surgery Lifestyle

Facilitator's Guide

Overview:

This study will carry out a 6-week in-person course designed to provide support to post-bariatric surgery patients. Our group of researchers and participants will meet weekly for six weeks, completing six classes. During each 60–90-minute class, participants will learn about a new health-related topic and hopefully experience social support with the group setting.

Week 1: Introduction day

Week 2: General Post-Op Diet

Week 3: Support, Mindfulness

Week 4: Micronutrients

Week 5: social Support & Accountability

Week 6: Sustainability & Wrap-up

Week 1:

Introduction Day

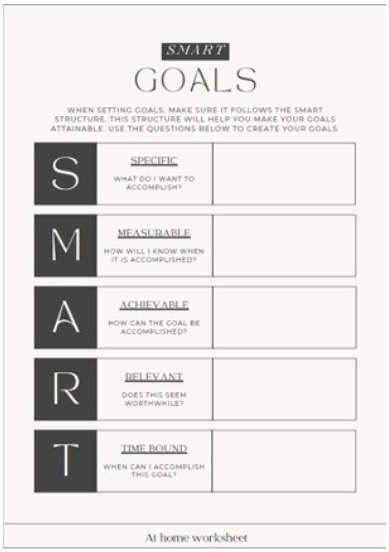
- When participants arrive, gather their name and 4 digits of phone number, mark attendance and give folder. Allow them to fill out data sheet and tell them to let you know when they are finished to get their height and weight.

a. Collect Measurements
    a. ID number
    b. Height (only needed once)
    c. Weight using Tanita scale
    d. Dietary adherence survey
b. Introduction (8 mins)
    - All members of the research team introduce themselves to the participants.
    - Thank the participants for coming and expressing your excitement for their participation in person.
    - Explain the importance of the study and its goals. The aim of this study is to improve clinical support for post bariatric surgery patients. In this study we aim to learn the needs of these patients to increase success after surgery.

This clinic will highlight post bariatric surgery guidelines, diet education, social support, mindfulness, and physical activity.

- Statistics: “In 2019, the American Society of Metabolic and Bariatric Surgeries estimated that about 278,000 weight loss surgeries were performed (5). Despite bariatric surgery being a common and often effective treatment for obesity, about 20-30% of patients do not have optimal post-surgical outcomes. Unfortunately, many patients struggle to maintain their weight loss or even fail to lose a significant amount of weight (5).”

c. Overview of the Course (10 mins)
   - Throughout the next six weeks, we will be meeting once a week to equal a total of six classes. Only attending class will not lead to remarkable results. However, applying the knowledge from class to everyday life will be the most beneficial approach to not only losing weight and sustaining weight loss but also leading a healthier and happier life.
   - Every class we will be taking measurements including weight, height, and dietary adherence surveys. We will conduct 24-hour recalls over the phone unless we have extra time during class.
   - Explain what a 24-hour recall is and how it will be collected during each session
   - We suggest wearing comfortable athletic clothing to class and supportive shoes because in some classes we will be walking/and or on your feet.
d. Guest Speaker (20 mins)
   - Open floor to each to talk about their surgery experience and post-op progress
   - Surgery type, how long since, how progress went (first 3-6 months, 1 year, beyond)
   - Anything you’d tell current patients – words of wisdom?
   - Items you wish would be talked about
   - We’ll be talking about nutrition and support these next few weeks – as a portion of the project, we’d like you all to set a SMART goal to work to reach throughout our time together.
e. Goal Setting (15 mins)
   - Explain the importance of goal setting
   - Pass out SMART goals worksheet
   - Have participants complete the worksheet at home & instruct them to keep it until the end of this course



f. Questions & Concerns (0-10 mins)
   - Open floor for any questions & concerns, be willing to speak to participants individually if necessary
   - **Additional topic areas of interest for the upcoming program**

g. Gift Basket Raffle: Hydration Kit: sugar free hydration Packets, HydroMate, and a basket/bag

h. Snack: Peanut butter Cacao protein balls

Week 2:

General Post-op Diet Education

a. Introduction (5 mins)
   i) For our first class we thought it would be most beneficial to lay the groundwork for the rest of the clinic. This class we are going over nutrition basics. We will start with a PowerPoint explaining the information. Then we will apply the knowledge. Let's begin!

b. Post-op PowerPoint (25-30 mins)

   i) Read through PowerPoint efficiently, give concrete examples when necessary

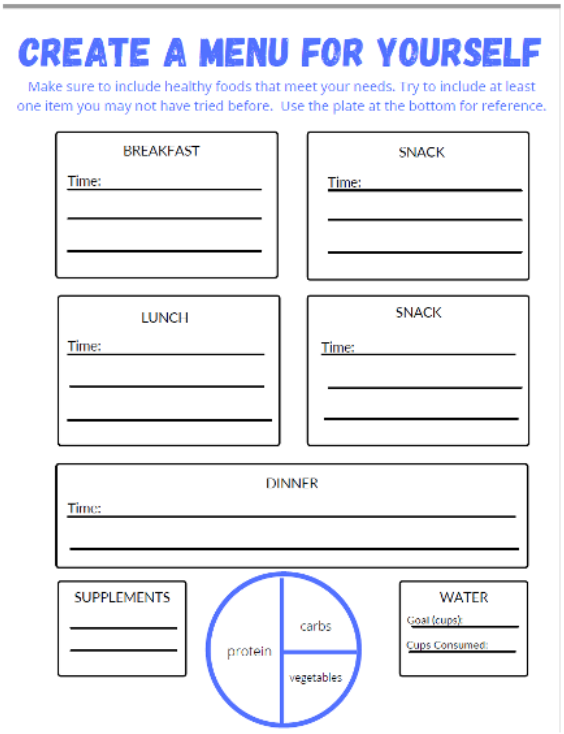
   --Importance of protein (30g protein water)

   ii) Answer questions as they come up

c. Activity (15-20 mins)

   i) Pass out "Create a Menu" worksheet

ii) Explain the worksheet. Participants will create a one-day sample menu for themselves based on the information they learned. These foods should be healthy and meet post-surgery needs. Try to include healthy foods you would enjoy. Challenge yourself to add at least one item you have never tried before.



d. Short Walk (15 mins)

i) Walk around the building

ii) Instruct participants to partner up and walk around the building together. Encourage them to talk about their experiences to develop social support while they are on their walk.

e. Collect Measurements

i) ID number

ii) Weight using Tanita scale

iii) dietary adherence survey

f. Gift Basket: Protein Basket: Protein infused water 12 pack and protein cookies/snacks, basket/bag

g. Snacks: Isopure sample

Week 3:

(add: rebuilding healthier relationship with food)

Support Day Mindfulness

a. Introduction (5 mins)

i) Today we are focusing on lifestyle. You cannot take care of your body if your lifestyle is not feeding into your happiness.
ii) Conclude introduction by saying they are not alone and introduce the guest speaker.

b. Guest Speaker (25 mins)

i) Speak about struggles with unhealthy thinking and poor body image

ii) Speaker should be empathetic and relatable

c. Breathing/Chair Yoga (15-20 mins)

i) Teach mindfulness using short PowerPoint

ii) Teach deep breathing technique, then practice deep breathing exercise (3-minute video)

- https://www.youtube.com/watch?v=aNXKjGFUlMs
- This video is from the app, "Calm" which helps with learning deep breathing techniques.

iii) Show the interactive video of chair yoga (18-minute video)

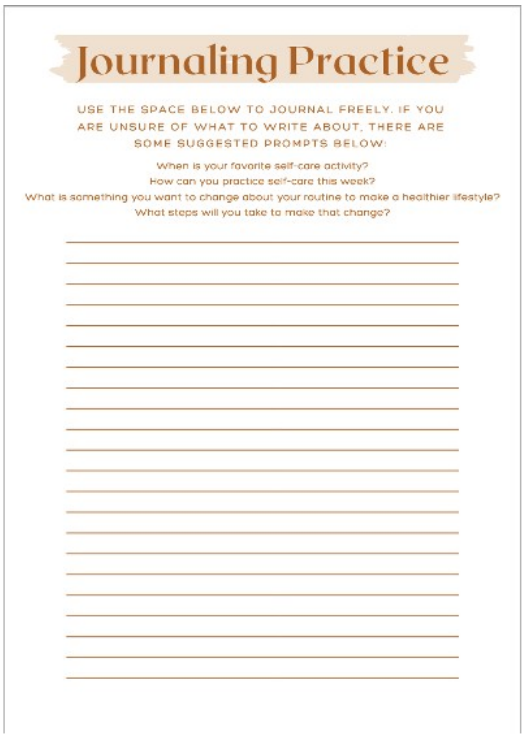
- https://www.youtube.com/watch?v=1DYH5ud3zHo&t=488s

d. Journaling Activity (15 minutes)

i) pass out journaling worksheet

ii) explain significance of journaling for self-care, relate to mindfulness

iii) read instructions/prompts on worksheet and allow about 8 minutes for journaling



Journaling Practice

USE THE SPACE BELOW TO JOURNAL FREELY. IF YOU ARE UNSURE OF WHAT TO WRITE ABOUT, THERE ARE SOME SUGGESTED PROMPTS BELOW:

When is your favorite self-care activity?
How can you practice self-care this week?
What is something you want to change about your routine to make a healthier lifestyle?
What steps will you take to make that change?

e. Collect Measurements

i) ID number

ii) weight using Tanita scale

ii) diet adherence survey

f. Gift Basket: Mindfulness Basket: journal, colored pens, lavender spray, and a basket/bag
g. Snack: edamame and orange

Week 4:

(add smoothie recipes)

Diet Education Micronutrients

a. Introduction (5 mins)

i) Today we will be diving deeper into diet education, specifically post bariatric surgery nutrition. The objective of this class is to provide attention-grabbing information that will help the participants understand the importance of maintaining a healthy lifestyle.

b. Importance of Vitamins PowerPoint (20 mins)

i) We talked about vitamins in our first class, but today we are going to dive deeper and explain how you can get the ones you need, specifically after surgery.

ii) Explain vitamins they may be lacking after surgery and how they can avoid deficiencies

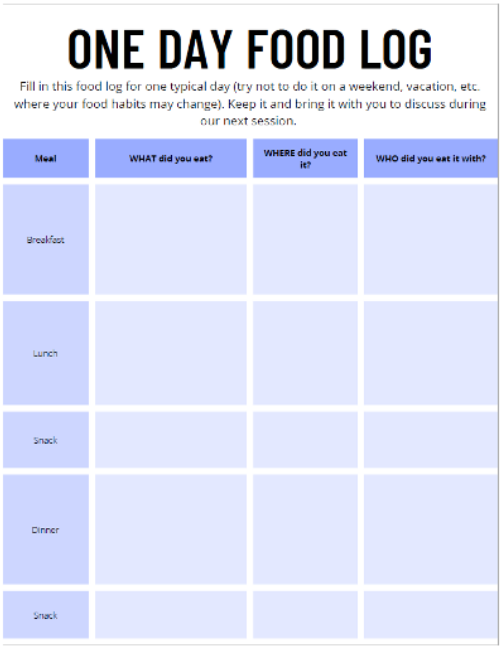
---Add information about bariatric specific vitamins and supplements (multivitamins)

iii) Provide examples of good multivitamins they should buy, show prices

c. Take Home Food Log (5 mins)

i) pass out take home food log worksheet

ii) instruct participants to do it at home and bring it back for the next class for discussion



ONE DAY FOOD LOG

Fill in this food log for one typical day (try not to do it on a weekend, vacation, etc. where your food habits may change). Keep it and bring it with you to discuss during our next session.

Meal	WHAT did you eat?	WHERE did you eat it?	WHO did you eat it with?
Breakfast			
Lunch			
Snack			
Dinner			
Snack			

d. Collect Measurements

i) ID number

ii) Weight using Tanita scale

ii) dietary adherence survey

e. Gift Basket: Vitamin Basket: bariatric advantage multivitamins, vitamin case, and a basket/bag

f. Snack: Smoothie

Week 5:

(Social aspect of eating – eating with other people; helpful consumption of social media)

Support Day Social Support and Accountability

- When participants arrive, gather their name and 4 digits of phone number, mark attendance and give folder (if they have not received on previously, but at this point they should all have a folder). Allow them to fill out data sheet and tell them to let you know when they are finished to get their weight.
  - Collect Measurements
  a. ID number
  b. Weight using Tanita scale
  c. Dietary adherence survey

a. Introduction (30 mins)
   i) The objective of today's class is to express how important it is to incorporate physical activity in your daily routine as well as finding social support. Social support is not something that is helpful before and right after surgery. Social support is something you will need for the rest of your life. Finding the right group and the right people is essential. According to a study conducted on bariatric surgery patients posted by the National Institute of Health, many patients reported that whether they had support was an indicator of post-surgery weight loss success. Those who have individualized long-term support and those who belonged to support groups lost more weight and regained their identity. After our discussion on support groups through social media and how that can be a negative experience for some, we provided a packet that can help you choose the right support group or person that will help you succeed.

   ii) https://www.heretohelp.bc.ca/sites/default/files/choosing-a-support-group-thats-right-for-you-2018.pdf

   iii) Ask participants to look over templates and ask if there are any questions

d. Importance of Exercise PowerPoint (15 mins)

i) Talk about getting variation in exercise (cardio, strength & conditioning, etc.)

ii) give examples of physical activity that requires little to no equipment

e. Short Walk (15 mins)

i) Instruct participants to partner up with a different partner than last time. On their walk around the building, encourage the pairs to reflect on their physical activity habits and how they can be improved.

PASS OUT SNACK AND GIFT BASKET AT THE END/ON THE WAY OUT

e. Gift Basket: Home Workout Equipment Basket: exercise dice, yoga mat, yoga ball, 5 lb weights, resistance bands, booty bands, basket/bag.

e. Snacks: Fruit-infused water

Week 6:

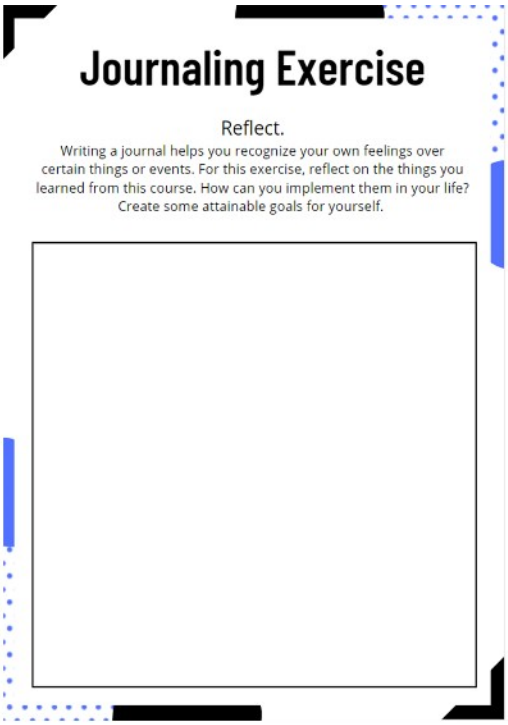
Sustainability Lesson & Course Wrap-Up

a. Introduction (5 mins)
   i) Today is the last class and we would like to thank you all for participating in this study. We hope our research helps future bariatric patients stay accountable and the post-surgery success rates increase. This last class is all about staying accountable and making permanent lifestyle changes.
   ii) Please take out your goal sheets from the 1st class if you have them. Has anyone achieved one of their goals? If not, how will you continue to work to achieve that goal?
   iii) Today we will put what we have learned throughout this course into action.

b. Journaling Activity (15-20 mins)

i) Pass out the final reflection journaling worksheet

ii) read instructions/prompts and allow time for journaling



c. Group Discussion (0-10 mins)

i) Ask if any participants would like to share what they wrote about, their goals, or anything they have taken away from the course. If no one volunteers, move on.

d. Practicing Mindfulness (15 mins)

i) We know journaling can be used to practice mindfulness and we have practiced it twice in this course. However, we have also learned other techniques such as deep breathing and chair yoga. We will do one more of each exercise to remind you of the techniques so that you can practice outside of this space.

i.) Pass out the chair yoga flyer

ii) Go through the chair yoga handout with the class

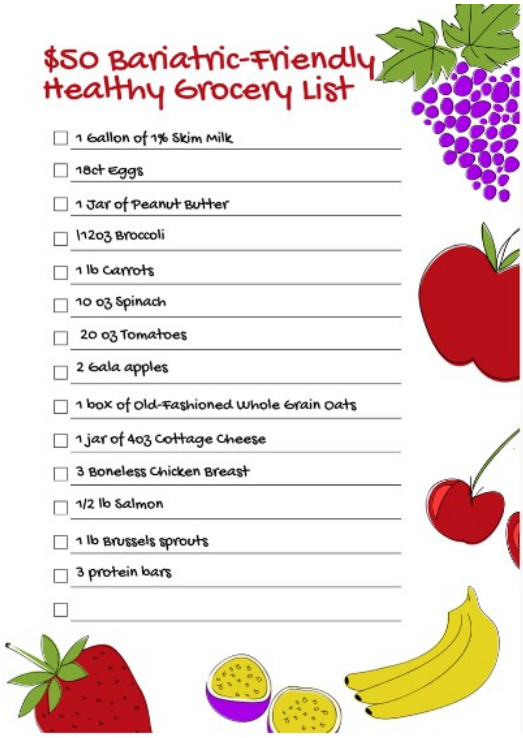
iii) Complete the 3-minute deep breathing exercise

- https://www.youtube.com/watch?v=aNXKjGFUlMs

e. Question & Concerns with a Registered Dietician (15 mins)

i) Open the floor for questions & concerns related to nutrition and physical activity that can be answered by a registered dietician.

ii) After 15 minutes or when questions subside, provide a list of resources participants can use after this course is over. We will also pass out a small grocery list that participants can use as a guide when they go to the store. The list will be affordable so that participants can use their post-study stipend gift cards to purchase the items from the list, if necessary.



f. Collect Measurements

i) ID number

ii) Weight using Tanita scale

iii) dietary adherence survey

f. Gift Basket: Kitchen Basket: bariatric cookbook, cookware set, and a basket/bag
g. Snack: Frozen banana dipped in dark chocolate (cacao)

Data Collection Sheet:

This will be completed by each participant at the beginning of each class before getting into material.

Study ID #: _____

Height (inches): _____

Weight (pounds): _____

Diet adherence:

Reflect on this past week. Circle the answer that best describes your answer to the question. Fill in the blanks when necessary.

1.	I stop eating when I am full.	Always	Sometimes	Never
2.	I eat slowly (1 teaspoon at a time).	Always	Sometimes	Never
3.	I avoid or limit eating out.	Always	Sometimes	Never
4.	I avoid or strictly limit fried foods.	Always	Sometimes	Never
5.	I avoid eating when I am bored.	Always	Sometimes	Never
6.	I avoid simple sugars (ex: juice, cookies, candy).	Always	Sometimes	Never
7.	I consume adequate amounts of protein daily.	Always	Sometimes	Never
8.	I include lean meats in my diet (ex: turkey, chicken, tuna)	Always	Sometimes	Never
9.	I drink non-carbonated beverages.	Always	Sometimes	Never
10.	I drink at least 8 cups of water/day.	Always	Sometimes	Never
11.	I avoid caffeine.	Always	Sometimes	Never

12. What is your caloric intake? _____
13. Do you use a food journal? If yes, plese list which one(s). _____
14. How many times a week do you exercise? _____ How long do you exercise? _____
15. What type(s) of exercise do you do, if any _____

Height in inches (5 feet is 60 inches)

- ◯ Less than 36
- ◯ 36
- ◯ 37
- ◯ 38
- ◯ 39
- ◯ 40
- ◯ 41
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- ◯ 87
- ◯ 88
- ◯ 89
- ◯ 90
- ◯ More than 90

Current Weight (pounds)

Options 100-600+

- ○ 100
- ○ 101
- ○ 102
- ○ 103
- ○ 104
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What was your "dream weight" after surgery?

- ○ 100
- ○ 101
- ○ 102
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- ○ 167
- ○ 168

Options 100-600+

What has been your lowest weight since surgery?

- ◯ 100
- ◯ 101
- ◯ 102
- ◯ 103
- ◯ 104
- ◯ 105
- ◯ 106
- ◯ 107
- ◯ 108
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- ◯ 168

Options 100-600+

Have you gained/regained any weight since surgery (in pounds)?	○ 0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○ 11 ○ 12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17 ○ 18 ○ 19 ○ 20 ○ 21 ○ 22 ○ 23 ○ 24 ○ 25 ○ 26 ○ 27 ○ 28 ○ 29 ○ 30 ○ 31 ○ 32 ○ 33 ○ 34 ○ 35 ○ 36 ○ 37 ○ 38 ○ 39 ○ 40 ○ 41 ○ 42 ○ 43 ○ 44 ○ 45 ○ 46 ○ 47 ○ 48 ○ 49 ○ 50 ○ 51 ○ 52 ○ 53 ○ 54 ○ 55 ○ 56 ○ 57 ○ 58 ○ 59 ○ 60 ○ 61 ○ 62 ○ 63 ○ 64 ○ 65 ○ 66 ○ 67 ○ 68

	◯ 69 ◯ 70 ◯ 71 ◯ 72 ◯ 73 ◯ 74 ◯ 75 ◯ 76 ◯ 77 ◯ 78 ◯ 79 ◯ 80 ◯ 81 ◯ 82 ◯ 83 ◯ 84 ◯ 85 ◯ 86 ◯ 87 ◯ 88 ◯ 89 ◯ 90 ◯ 91 ◯ 92 ◯ 93 ◯ 94 ◯ 95 ◯ 96 ◯ 97 ◯ 98 ◯ 99 ◯ 100 ◯ Over 100
When did your weight regain begin after surgery?	◯ N/A ◯ 3 months ◯ 6 months ◯ 9 months ◯ 12 months ◯ 18 months ◯ 2 years ◯ 2.5 years ◯ 3 years ◯ 3.5 years ◯ 4 years ◯ 4.5 years ◯ 5 years ◯ 5.5 years ◯ 6 years ◯ 6.5 years ◯ 7 years ◯ 7.5 years ◯ 8 years ◯ 8.5 years ◯ 9 years ◯ 9.5 years ◯ 10 years ◯ Beyond 10 years
Are you satisfied with how surgery has changed your life overall?	◯ Very unsatisfied ◯ Somewhat unsatisfied ◯ Neither satisfied or unsatisfied ◯ Somewhat satisfied ◯ Very satisfied

How often do you follow-up with your dietitian since surgery?

- ◯ More than 4 times per month
- ◯ 3 times per month
- ◯ 2 times per month
- ◯ 1 time per month
- ◯ Less than once per month

Please rank the following on a scale of 1 (lowest) to 10 (highest)

	1	2	3	4	5	6	7	8	9	10
Rate your compliance with the post-bariatric surgery diet recommendations (1 being very compliant, 10 being noncompliant)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Rate the clarity of information conveyed by the dietitian (1 being very clear, 10 being vague)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

How important do you feel it is to have a support system when going through bariatric surgery?

- ◯ Very important
- ◯ Kind of important
- ◯ Neutral
- ◯ Kind of not important
- ◯ Not very important

Rank yourself on the following questions

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I've had success with weight loss after surgery	◯	◯	◯	◯	◯	◯	◯
I've had success with physical activity after surgery	◯	◯	◯	◯	◯	◯	◯
I've had success with choosing healthy foods after surgery	◯	◯	◯	◯	◯	◯	◯
I feel confident in my ability to eat healthy	◯	◯	◯	◯	◯	◯	◯
I feel confident in my ability to exercise	◯	◯	◯	◯	◯	◯	◯
I am confident I am able to be a healthy version of myself	◯	◯	◯	◯	◯	◯	◯

These next questions are about the food eaten in your household in the last 12 months, since (current month) of last year and whether you were able to afford the food you need.	
"(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more." Was that often true, sometimes true, or never true for (you/your household) in the last 12 months?	◯ Often true ◯ Sometimes true ◯ Never true
"The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more." Was that often, sometimes, or never true for (you/your household) in the last 12 months?	◯ Often true ◯ Sometimes true ◯ Never true
"(I/we) couldn't afford to eat balanced meals." Was that often, sometimes, or never true for (you/your household) in the last 12 months?	◯ Often true ◯ Sometimes true ◯ Never true
In the last 12 months, since last month, did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?	◯ Yes ◯ No ◯ Don't Know
How often did this happen-almost every month, some months but not every month, or in only 1 or 2 months?	◯ Almost every month ◯ Some months but not every month ◯ Only 1 or 2 months ◯ Don't know
In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?	◯ Yes ◯ No ◯ Don't Know
In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?	◯ Yes ◯ No ◯ Don't Know
Are you on a limited food budget or rely on food stamps, food pantry, to similar for food?	◯ Yes ◯ No
Do you feel you personally had a strong support system in place as you went through surgery?	◯ Yes ◯ No ◯ Choose not to answer
How often do you find yourself eating in response to stress, emotions, boredom (in the last 6 months)?	◯ Never/less than once per month ◯ 1-3 times per month ◯ 1 time per week ◯ 2-4 times per week ◯ 5-7 times per week ◯ More than once per day ◯ Choose not to answer
How often do you skip meals?	◯ Rarely ◯ 2-3 times/week ◯ 4-6 times/week ◯ Daily ◯ Choose not to answer

Do you feel that you had access to the foods you were expected to eat after surgery?	◯ Always ◯ Sometimes ◯ Often ◯ Rarely ◯ Never
How many servings of fruits or vegetables combined per day are you eating?	◯ 1 serving or less ◯ 2-3 servings ◯ 4-5 servings ◯ Greater than 5 servings ◯ Choose not to answer
Do you get the recommended amount of protein per day (around 60-80 grams)?	◯ Always ◯ Often ◯ Sometimes ◯ Rarely ◯ Never
How many times per week do you eat away from home (fast food, restaurant, etc)?	◯ 1 or 2 ◯ 3 or 4 ◯ 5 or 6 ◯ 7 to 9 ◯ 10 to 12 ◯ 13 to 15 ◯ 16 to 20 ◯ More than 20
How many meals do you eat per day?	◯ 3 main meals + 4-6 snacks ◯ 3 times (breakfast, lunch, and dinner) ◯ 3 main meals + 2-3 snacks
How quickly do you consume these main meals?	◯ 10-15 minutes ◯ 15-20 minutes ◯ More than 25 minutes
How much water do you drink during the meal?	◯ More than 2 glasses ◯ 1 glass ◯ None
How many times per week do you eat sweets (excludes breakfasts)?	◯ More than 3 times per week ◯ 2 times per week ◯ 0-1 times per week
How many times per week do you drink wine or alcohol?	◯ More than 2 times per week ◯ 1 time per week ◯ Never
How many times per week do you drink sparkling beverages?	◯ More than 2 times per week ◯ 1 time per week ◯ Never
How hungry are you before meals?	◯ Elevated ◯ Medium ◯ Little
How full do you feel after meals?	◯ Elevated ◯ Medium ◯ Little

How big is the portion of vegetables you consume during the meal?	◯ Large ◯ Medium ◯ Small
How much time do you spend on physical activity?	◯ 0-1 time per week; 30-60 minutes each ◯ 2-3 times per week; 30-60 minutes each ◯ 5 times per week; 30-60 minutes each
How often do you weigh yourself?	◯ Never ◯ 1 time per month ◯ 1 time per week
Do you take your post-operative vitamins as recommended?	◯ Always ◯ Often ◯ Sometimes ◯ Rarely ◯ Never

Last section! Thank you for sticking with us. You will be able to receive a gift card for your time after this!

Please answer the following based on your current knowledge

How bariatric surgery affects weight loss:
(Mark all the correct answers)

- ☐ Reduces the amount of food eaten
- ☐ Limites the ability to eat and allows drinking only
- ☐ Manipulates gastrointestinal absorption
- ☐ Stops snacking behavior and consumption of unhealthy foods
- ☐ Reduces hunger
- ☐ Reduces cravings for sweets and snacks

What are progress diet steps following bariatric surgery
(Mark the most correct answer)

- ○ Start with solid foods immediately after the surgery
- ○ During the first several months consumption of liquids only and then gradually progress in food textures
- ○ Progress from liquid foods, to mashed foods, to soft foods, to solid foods within one to two months
- ○ Progress from liquid foods, to mashed foods, to soft foods within one to two months

Which foods are rich in protein
(Mark all the correct answers)

- ☐ Milk and yogurt
- ☐ Fish
- ☐ Avocado
- ☐ Cracker
- ☐ Banana
- ☐ Hummus peas
- ☐ Chicken/Turkey
- ☐ Bread
- ☐ Soy mlk
- ☐ Rice
- ☐ Almonds
- ☐ Cucumbers
- ☐ Yellow cheese
- ☐ Pasta
- ☐ Cabbage

Which of the following are rich in carbohydrates?
(Mark all the correct answers)

- ☐ Turkey
- ☐ Meat
- ☐ Rice
- ☐ Egg
- ☐ Bread
- ☐ Yellow cheese
- ☐ Pasta
- ☐ Avocado
- ☐ Potato
- ☐ Olive oil
- ☐ Sweet potato
- ☐ Walnuts
- ☐ Cracker
- ☐ Tahini
- ☐ Lettuce

Which of the following dietary supplements you will be required to take following bariatric surgery? (Mark all correct answers)	☐ Vitamin B12 ☐ Vitamin C ☐ Multivitamin ☐ Phosphorus ☐ Vitamin K ☐ Calcium ☐ Vitamin D ☐ Tumeric
For how long after bariatric surgery should you take dietary supplements?	◯ Only the first month after surgery ◯ For a lifetime ◯ Only the first year after the surgery ◯ Depends on your blood test results
For which of the following foods/drinks should you avoid forever after bariatric surgery? (Mark all correct answers)	☐ Bread ☐ Watermelon ☐ Meat ☐ Citrus pulp (you can eat the inside of the fruit slice) ☐ Pasta ☐ Chocolate ☐ Pear ☐ Persimmon ☐ Carbonated drinks
Which of the following diet behaviors are recommended following bariatric surgery? (Mark all correct answers)	☐ Separation between solids and liquid ☐ Eating and drinking together ☐ Eating fast ☐ Consumption of fatty foods ☐ Eating foods rich in proteins ☐ Eating regular meals every 3-4 hours ☐ Eating 1-2 meals a day ☐ Chewing food well
How many cups/day of drinks are recommended following bariatric surgery? (Mark MOST correct answer)	◯ At least 8-10 cups a day, no matter which drink ◯ 1-2 cups a day, preferably drinking water ◯ 4-5 cups a day, preferably drinking water ◯ At least 8-10 cups a day, preferably drinking water
How many dietitian sessions are recommended following bariatric surgery (Mark most correct answer)	◯ Total of 2 sessions, frequency is not important ◯ At least 6 sessions during the first year, and then at least 1-3 sessions a year ◯ Dietitian sessions after the surgery are meaningless ◯ Once a year
What are the reasons that can cause weight regain after surgery? (Mark all correct answers)	☐ Eating until feeling pain ☐ There is no possibility for weight regain after bariatric surgery ☐ Non-recommended eating behaviors ☐ Eating bread will expand stomach volume ☐ After a year, the surgery is not effective anymore ☐ Eating and drinking together may expand stomach volume

On the following scale, please rank the following statements - reading carefully

	Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
I am satisfied with the program approach used to provide nutrition and support for post-bariatric surgery.	○	○	○	○	○	○
The program length was reasonable (6 weeks, 1 hour each)	○	○	○	○	○	○
The in-person program was useful for gaining nutrition knowledge.	○	○	○	○	○	○
The in-person program provided a sense of social support.	○	○	○	○	○	○
The in-person program was helpful for accountability after bariatric surgery.	○	○	○	○	○	○
The in-person program was useful for recommendations on overall healthy living.	○	○	○	○	○	○
This program improved my confidence in living a healthy lifestyle.	○	○	○	○	○	○
I have changed my diet habits throughout the program.	○	○	○	○	○	○
I haven't made any changes yet, but plan to make dietary changes following this program.	○	○	○	○	○	○
I plan to use information from this program in my lifestyle moving forward.	○	○	○	○	○	○
I would recommend this in-person program for post-bariatric surgery individuals.	○	○	○	○	○	○

If you would to recieve gift card for completing this survey please continue to the link below. Additionally, we will be offering a 6-week in-person program for post-bariatric surgery nutrition and support if interested, please sign up at the link as well!
Gift card entry & in-person program sign-up link:

https://uky.az1.qualtrics.com/jfe/form/SV_baBZ7CPYWaxCm6W

If you have questions or concerns you can contact me at Makenzie.Barr@uky.edu or (857) 257-1573.

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VITA

Sydney Mae McIntosh:

1. Educational institutions attended and degrees already awarded: University of Kentucky, Bachelor of Science in Dietetics