Implementing a Weight Loss Follow up Protocol

Catherine Nitafan-Young

Touro University, Nevada

In partial fulfillment of the requirements for the Doctor of Nursing Practice

DNP Project Chair: Heidi Johnston, DNP, RN, CNE

DNP Project Member: Judith Carrion, EdD, MSN/Ed, MSHS, RN-BC

Date of Submission: May 27, 2020

Table of Contents

Abstract

Weight loss programs can significantly reduce obesity and associated chronic diseases. Few interventions focus on patients' ability to maintain weight loss after intensive weight loss program completion. In this quality improvement (QI) project, patients' maintenance of long-term weight loss was examined in individuals who successfully completed an intensive weight loss program. A Weight Loss Follow-Up protocol was developed in order to improve follow-up by primary care providers (PCPs) in order to increase patients' self-efficacy, measured by perceived autonomy support from PCPs and confidence in maintaining weight loss. Results: The correlation between Follow-Up and autonomous support was not statistically significant, but the effect size was moderate in size, $t(19) = -1.22$, $p = .24$, Cohen's $d = -0.54$ (95% confidence interval = -1.420, -0.340); concluding that patients who received follow-up from PCPs perceived increased support from their PCPs in their ability to maintain weight loss. The results for confidence were statistically and practically significant between patients who were in the Follow-Up group compared to those in the No Follow-Up group, $t(20) = -3.84$, $p = .001$, Cohen's $d = -1.650$ (95% confidence interval = -2.650, -0.650). Hence, patients' who received follow-up from their PCPs felt more confident in their ability to maintain weight loss. Conclusion: Clinically significant finding show that patients' reported higher perceived support from their primary care providers (PCPs) and confidence in maintaining their weight after receiving follow-up from their PCPs.

Keywords: obesity medicine, weight loss maintenance, weight reduction, perceived confidence, medical and obesity management, long term, physicians and obesity, clinical decision making and obesity, follow-up, intervention development.

Implementing a Weight Loss Follow up Protocol

The future health of Americans depends in part on the management of the current obesity crisis. Obesity is defined as having a high adipose tissue to lean tissue ratio, measured by the Body Mass Index (BMI) equal to or over 30 (Levi, Segal, Laurent, Lang, & Rayburn, 2012). Adults are designated as overweight with a BMI between 25 and 29.9 (Levi et al., 2012). Assessing the BMI in adults is a priority in most healthcare systems across the country as a valuable quality measure to monitor to identify patients at risk for developing chronic diseases associated with obesity. The National Committee for Quality Assurance (NCQA) has even identified assessing adult BMI as a HEDIS measure (NCQA, 2019).

Obesity is prevalent in the United States (US) with a high mortality rate. More than one-third of the US adult population (39.8%) is diagnosed with the disease according to the Centers for Disease Control and Prevention (Hales, Carroll, Fryar, & Ogden, 2017). This exceeds the national proposed goal (< 30.5%) set out by Healthy People 2020 (2017). Most notably, the younger generations are being diagnosed with earlier onset of obesity due to early exposure to obesogenic environments; thus, prevalence is higher than in other generations (Masters, Reither, Powers, Yang, Burger, & Link, 2013). Furthermore, Americans with obesity have a high mortality rate, “about 18% of all deaths between ages 40 and 85 years during the time period 1986 to 2006” (Masters et al., 2013). This is not surprising since obesity is a condition associated with several chronic diseases, such as diabetes, hypertension, hyperlipidemia and sleep apnea (Jameson, Fauci, Kasper, Hauser, Longo, & Loscalzo, 2018). The prevalence and mortality rate of obesity has increased significantly over the past 20 years and it will continue to do so over the next 20 years unless there is tremendous effort to address the issue from all

aspects as recommended by the Trust For America's Health and Robert Wood Johnson Foundation (Levi et al., 2012).

Associated with the prevalence and mortality rates of patients with obesity is the cost of providing health care to these patients. In 2008, the cost was about $147 billion and is projected to total about $550 billion between 2012 and 2030 (Levi et al., 2012; NIH, 2013). In a systems view of the obesity crisis, the economic burden must be considered as well as the physiologic and psychosocial consequences. All of these factors have substantial implications for the health and well-being of Americans.

Overall, improved health in patients decreases physiologic and financial costs, related to managing medical complications of obesity (Masters et al., 2013). This is the motivation to ensure that patients maintain weight loss after treatment of obesity. Maintaining weight loss over the long-term is mutually beneficial for patients and health care systems. Factors found for successful weight loss maintenance were individuals who lost substantial weight during their initial treatments and met their weight loss goal, continue active lifestyles, continue monitoring of weight and eating behavior, correct weight regain quickly, suffer less from psychological conditions, binge eating and weight cycling, continue to receive support from a social context (Varkevisser, van Stralen, Kroeze, Ket, & Steenhuis, 2019). Varkevisser et al. (2019) concluded that self-efficacy for exercise and weight management were important psychological factors in weight loss maintenance. Thus, having a social context that supports self-efficacy of individuals could include the therapeutic alliance between individuals and their primary care providers (Montesi, El Ghoch, Brodosi, Calugi, Marchesini, & Dalle Grave, 2016).

In this project, maintenance of long-term weight loss will be examined in individuals who have successfully completed or near completion of a medically-monitored weight management

program (MWM) or Lifestyle Medicine weight management (LWM) programs. Individuals' self-efficacy will be measured by assessing perceived autonomy support and confidence after re-establishing care with their primary care providers. Implementing this project will increase the likelihood of maintaining initial weight loss in patients over their lifetime, thus improving their overall health.

Background

Impeding the obesity crisis requires prevention of further weight gain. Recommendations to address the crisis are multifactorial, requiring interventions from individuals, families, healthcare systems and local, state and federal community systems (Dietz et al., 2017; Levi et al., 2012). Obesity prevention strategies to help slow the increasing national rate of obesity are prevalent and target individuals of all generations and BMIs - obese, overweight and healthy weight patients. Treatment of obesity targets lifestyle management, which may or may not be augmented with medications or surgery (Kushner, 2007). The realm of lifestyle management includes dietary interventions, physical activity and behavioral change (Kushner, 2007). Weight loss interventions can significantly reduce obesity and the associated chronic diseases. The loss of 5-10% of body weight is associated with improvement in many of the 40 conditions affected by obesity (Kushner, 2007). For example, in patients with hypertension, weight loss of at least 5% of initial weight can lead to a reduction in blood pressure or prevention of hypertension (Arnett et al., 2019). Dietary eating plans, such as Dietary Approaches to Stop Hypertension (DASH) and the Mediterranean diet, as well as exercising at least 150 minutes/week can prevent or decrease obesity (Locke, Schneiderhan, & Zick, 2018; U.S. Department of Health and Human Services, 2018).

Long-term weight loss maintenance is a lifelong challenge for most Americans. It requires continued behavior change (Thomas, Bond, Phelan, Hill, & Wing, 2014). Wing and Phelan (2005) found that 20% of overweight individuals were able to sustain long-term weight loss. Alternately, several researchers found promising results. Dombrowski, Knittle, Avenell, Araujo-Soares, & Sniehotta (2014) showed that psychological/behavior interventions were strongly effective in maintaining weight loss for at least 24 months. The National Weight Control Registry (NWCR) collected information over a 10-year period and found that sustained weight loss can be done. NWCR recruited individuals that had initial weight loss of equal to or more than 30 pounds and determined that weight loss and behavior change was maintained by more than 87% of them (Thomas et al., 2014). Individuals who gained weight showed less dietary restraint, conducted less self-weighing assessments, participated in less extracurricular activities that involved physical activity and increased fat intake. These finding are consistent with research done almost 20 years prior, wherein study participants gained weight for the same reasons at the one-year follow-up assessment (McGuire, Wing, Klem, Lang, & Hill, 1999). The behaviors and psychosocial factors that lead to maintenance of weight loss has remained the same over time.

Involvement of the primary care providers from the healthcare system is crucial in the management of obesity prevention and maintenance of weight loss (Dietz et al., 2017; Levi, et al., 2012). Fundamentally, a collaborative multidisciplinary team should be formed and trained in the care of patients with obesity and lifestyle medicine (Dietz et al., 2017). Recruiting primary care providers to engage with patients who are obese and overweight regarding treatment options has been problematic. First of all, patients are not likely to have the diagnosis of obesity or overweight on their list of chronic problems despite the high prevalence of the

disease (Ciciurkaite, Moloney, & Brown, 2019). Also, physicians may be hesitant to approach the subject of obesity with patients for several reasons such as: (1) inadequate education on how best to address the disease which is associated with stigma and psychosocial issues, including noncompliance and perceptions of ineffective treatment, (2) fear or causing offense, (3) inadequate diversity of options to offer for treatment, (4) time constraint of office visits, and (5) minimal reimbursement for weight-related counseling and care (Blane, MacDonald, Morrison & O'Donnell, 2017; Circiukaite et al., 2019). Despite these factors, the weight loss efforts of patients can improve with the strength of a therapeutic relationship between the provider and patient (Levi, et al., 2012). Patients require physicians and primary care providers to assess readiness for change and provide empathetic support and long-term follow-up (Circiukaite et al., 2019).

From the patients' perspective, a dialogue with their primary care providers (PCPs) about weight management is valued. Patients can feel empowered to autonomously manage their health with support of their PCPs. Therefore, obesity and lifestyle medicine programs and departments should develop a collaborative relationship with PCPs since they are referring patients to weight loss programs.

Problem Statement

The maintenance of weight loss over the long-term has been challenging (Curioni & Lourenco 2005; Wing & Phelan, 2005). In 2002, a large health maintenance organization launched a medically-monitored weight management program (MWM), which is a behaviorally-focused, non-pharmacological, non-surgical, 82-week program (Krishnaswami et al., 2018). In a retrospective study evaluating this program, there were 11,970 patients initially enrolled and ended with 2,777 patients after five years (Krishnaswami et al., 2018). They found that patients

had lost 17.3 kg (15.3%) of their weight from baseline after four months and 14.2 kg (12.5%) after one year (Krishnaswami et al., 2018). At the end of five years, half of the patients weighed 5% less than their baseline prior to the program, significantly less that the initial difference of 12.5% after one year. This same organization implemented a Lifestyle Medicine weight management program (LWM), wherein a strict diet helped reverse the use of medications to manage chronic disease such as diabetes mellitus and hypertension (Misquitta, Kitazono, & Edwards, 2017). Patients in the first cohort lost an average of 16 lbs. after six months and 24 lbs after one year from starting the LWM (Misquitta et al., 2017). It has been shown that patients who are able to maintain weight loss for the first year in a program are more successful in maintaining the lower weight over five to ten years (Williams, Collins, Morgan, & Hollis, 2019; Thomas et al., 2014).

To improve overall health, this DNP quality improvement (QI) project will address the challenge of maintaining long-term weight loss after MWM and LWM. The intervention will target PCPs who care for patients to help improve their therapeutic relationship with patients regarding maintenance of weight loss. The outcome will be that patients feel more able to autonomously and confidently manage their weight with the support of their PCPs and maintain or lose more weight after completion of the MWM or LWM program. Over a four-week span, the intervention will be provided to PCPs. The protocol adherence of PCPs will be evaluated. Also, patients' autonomy support and confidence will be assessed at the end of four weeks.

Purpose Statement

The purpose of this Quality Improvement (QI) project is to develop a protocol based on evidence-based practice, which will improve adherence of follow-up by the primary care providers (PCPs) in order to increase patients' perceived autonomy support and confidence. The

QI project's aim is to maintain long-term weight loss, decrease obesity and promote health overall.

Project Question

Will a weight loss follow-up protocol used by PCPs increase perceived autonomy support such that patients report more perceived confidence to maintain their weight loss after completion or near completion of a medically supervised weight loss program and lead to long-term maintenance of weight loss?

Project Objectives

The objectives of this project are as follows:

1. Develop an evidence-based protocol for PCPs to increase patients' perceived autonomy support from them and perceived confidence in sustained weight loss.
2. Educate PCPs about Social Cognitive Theory (SCT) and the protocol.
3. Implement the protocol over a four-week period.
4. Evaluate protocol adherence of PCPs following up with patients regarding their completion or near completion of weight loss program.
5. Evaluate the success of the protocol by assessing the perceived autonomy support and perceived confidence of patients.

A long-term objective would be to measure weight. The goal is to maintain or decrease weight to within 10% weight loss from baseline weight at program initiation. Weight should be re-evaluated three months after PCP follow-up.

Significance

Health care providers can assist in long term weight maintenance just as they can assist in weight loss regimens. They have the ability to obtain training and increase knowledge in order

to assess and motivate patients to change based on each patients' goals and then formulate behavior plans to meet those goals (Silveira, La Voy, & Johnston, 2016). Participants in a meal replacement program, with health coaches, who maintained weight cited that physical activity, nutrition and knowledge and support of health coaches were among the top five factors which led to their success (Kleine, McCormack, Drooger, & Meendering, 2019). The support that participants received from their health coach motivated them to sustain their behavior changes. Therefore, health care providers and coaches can create "catalytic interaction" which has been shown to result in maintained weight loss (Bertz, Sparud-Lundin, & Winkvist, 2013).

Review of Literature

Search Terms

A review of the literature was limited to articles found in the PubMed, Clinical Key and CINHAL databases conducted within the last 10 years. Search terms used were obesity medicine, weight loss maintenance, weight reduction, perceived confidence, medical and obesity management, long term, physicians and obesity, clinical decision making and obesity, follow-up, intervention development. There were 323 studies found with these search terms. Of these studies, 14 articles are included in this review due to the inclusion and exclusion criteria. Studies that were conducted within the last 10 years, published in English and involved a behavioral intervention and measurement of weight were included in this review of literature. Exclusion criteria included studies conducted on patients that underwent surgical procedures for weight loss and studies that did not have a treatment evaluation period of at least 6 months.

Impact of the problem

Maintenance of weight loss after reaching a weight loss goal is challenging. In most studies, patients return to their baseline weight prior to their weight loss program within five

years (Butryn, Webb, & Wadden, 2011). Conversely, other studies show that weight loss maintenance four to five years after weight loss program completion is possible (Thomas et al., 2014; Krishnaswami et al., 2018; Stenius-Aarniala, Poussa, Kvarnstrom, Gronlund, Ylikahri, & Mustajoli, 2000; Wing et al., 2016). A five-year study done by Krishnaswami et al. (2018) found that over 2,700 patients who were in an 82-week medically-monitored weight management program (MWM) had an average weight loss of 5.8% from baseline. Unfortunately, a drop in baseline weight by 5.8% after five years is much less than the 15.3% weight loss from baseline in the same study population after 4 months in the program (Krishnaswami et al., 2018). Although, any weight loss of 5% or more from baseline benefits patients and decreases their risk of chronic disease (Dittus et al., 2018). In addition, most weight loss maintenance studies focus on patients who are one year or more post-weight loss program completion despite the reports that weight regain occurs with the first year after program completion (Evans et al., 2019; NIH, 2013; Varkevisser et al., 2019).

Addressing the Problem with Current Evidence

Long-term maintenance of weight loss is multifactorial. Factors associated with successful maintenance of weight loss include issues around weight, physical activity, dietary strategies and self-care behaviors. In regards to weight while actively in a weight loss program, participants who had lower baseline weight, a greater amount of weight loss, a faster rate of loss and consistent loss of weight throughout the program were more successful in maintaining the lower weight (Evans et al., 2019; Kleine et al., 2019). Participants who had dietary strategies that didn't include binge eating maintained the lower weight as well (Kleine et al, 2019). Furthermore, several self-care behaviors propelled by cognitive and psychological strategies such as self-efficacy and motivation influenced weight loss maintenance (Asbiornsen et al.,

2019; Varkevisser et al., 2018). Several studies highlight various interventions to help patient maintain weight loss (Kleine et al., 2019; NIH, 2013; Varkevisser et al., 2018).

Exercise and dietary strategies. Long-term non-surgical interventions that include exercise, nutritional advice and use of low-energy products has been shown to be highly successful in weight loss and long-term maintenance of weight loss (Christensen et al., 2017; Prentice et al., 2019; Wing et al., 2016). Regular physical activity regulated weight loss and weight loss maintenance wherein the more active the participants were, the more driven they were to continue to lose weight (Kleine et al., 2019). Maintaining a regimen of physical exercise helped to contribute to successful weight maintenance (Kleine et al., 2019).

Weight loss programs that improve participant knowledge about nutrition and nutrition-based habits empowered participants to try new foods and incorporate them into their meals (Christensen et al., 2017; Kleine et al, 2019). Christensen et al. (2017) showed the possibility to support patients in long-term maintenance of a 10% weight loss for three years with intense follow-up after completion of an initial weight-loss program and continued low-energy diet.

Self-care behaviors. Self-care behaviors have been shown to improve with personal and environmental factors (Chen, Wang, & Hung, 2015; Rackow, Scholz, & Hornung, 2015). Personal factors include self-efficacy, motivation, mental health and health knowledge and environmental factors incorporate empowerment and social support (Brantley et al., 2014; Chen et al., 2015; Rackow et al., 2015). "Self-efficacy theory states that: (a) the strength of belief in one's capacity is a good predictor of motivation and behavior; (b) in addition, one's self-efficacy beliefs can be enhanced through performance mastery, modeling, reinterpretation of physiological symptoms, and social persuasion; [and] (c) finally, enhanced self-efficacy leads to improved behaviors, motivation, thinking patterns, and emotional well-being. One characteristic

of self-efficacy is that it is task-specific (Ritter & Long, 2014)." Patients, with high self-efficacy, have perceived confidence in their ability to incorporate healthy new behaviors into their lives as demonstrated by Bandura social learning theory (Bandura, 1977). Healthcare providers interested in targeting behavior change should consider incorporating personal and environmental factors in their interventions (Chen et al., 2015).

Behavior treatment programs. Successful weight loss treatment programs that focus on behavior change in participants have three main components in common – goal setting, self-monitoring and stimulus control (Butryn et al., 2011). Goals are measurable and may include daily calorie intake, weekly minutes of physical activity and number of days a week that a food diary is maintained (Butryn et al, 2011). Self-monitoring helps individuals track their progress in meeting their goals and is strongly associated with successful loss in weight (Butryn et al, 2011). Finally, stimulus control of internal and external cues (such as changing their immediate environment in the home and workplace) has been associated with meeting daily caloric intake and activity goals (Butryn et al., 2011).

Involvement of Primary Care Providers. Having support of a health coach and personal belief of goal attainment contributed to successful weight maintenance (Kleine et al., 2019). Primary care providers only perform weight loss counseling about 42% of the time despite the recommendations of the US Preventive Services Task Force (LeBlanc, O'Connor, Whitlock, Patnode, & Kapka, 2011). If individuals do not partake in shared decision making of their care, they are less likely to be successful in following advice dictated by the primary care provider. Patient and providers have differing perspectives of the barriers and benefits gained from their relationship and that with the healthcare system (Nemeth, Rice, Potts, Melvin, Jefferson, & Hughes-Halbert, 2017). Primary care providers may not feel competent in their

skills to counsel patients on weight management (LeBlanc et al., 2011; Nemeth et al., 2017).

Current Management

At present, in a large health care maintenance organization in northern California, an 82-week medically-monitored weight management program (MWM) and 20-week Lifestyle Medicine Weight Management Program (LWM) discharges their patients without further accountability. The MWM and LWM does not conduct ongoing assessment of their patients after discharge back to their primary care providers.

Current Recommendations

Primary care providers should be informed when their patients have completed a weight loss program. As part of patients' primary care team, physicians and nurse practitioners have a vital role in affecting continued weight loss maintenance in patients (Ciciurkaite et al., 2019; Dietz et al., 2019). By acting as health coaches, primary care providers can improve perceived confidence in patients which would enhance their self-efficacy and motivate them to continue their weight loss journey.

Theoretical Framework

Social cognitive theory (SCT) is the foundation for strategies which supports a change of behavior in the primary care clinic for both prevention and treatment of chronic disease (Coleman & Pasternak, 2012). The SCT addresses processes between the patient and their primary social support that provides social identity, support and role definition (Coleman & Pasternak, 2012). It explores the reciprocal interactions of people and their environments and the psychosocial determinants, including self-efficacy, of health behavior (Muniraj, 2014). Behavior is explained by dynamic interaction among personal factors, environmental influences and behavior (Coleman & Pasternak, 2012). The acquisition and maintenance of behavior takes into

consideration a person's past experiences which contributes to the execution of a behavior (LaMorte, 2019). Past experiences influence reinforcements and expectations which help shape whether or not a behavior will be performed (LaMorte, 2019). (Appendix A)

Historical Development of the Theory

The SCT, developed by Albert Bandura, a renowned Stanford University psychologist, is one of the most frequently used and robust health behavior theories (Muniraj, 2014; Vinney, 2019; Young, Plotnikoff, Collins, Callister & Morgan, 2014). The development of the theory began in the 1960's when Bandura and his colleagues began the Bobo Doll experiments, a series of observational learning studies (Vinney, 2019). In the first experiment, as described by Vinney (2019), children of preschool age were observed to determine if they would imitate the behavior of an aggressive or nonaggressive adult model after witnessing the behavior. Both genders were used as models. In the experimental scenarios, adult models would be physically and verbally aggressive or nonaggressive towards a Bobo doll in the presence of the child. The Bobo doll is a child-size inflatable doll with a weighted bottom allowing it to pop back to an upright position after being knocked down (Tanvir, 2014). After witnessing the model, a child would be placed in a different room and given an opportunity to play a selection of highly attractive toys. In order to frustrate the child, she or he would be stopped after 2 minutes and then taken to another room filled with a Bobo doll and other toys and allowed to play there for 20 minutes. The researchers observed that the children who witnessed the aggressive scenario were more verbally and physically aggressive in their play, including aggression towards the Bobo doll. The boys were found to be more aggressive than girls, especially if they witnessed a male adult model.

To expand on the original findings, Bandura and colleagues conducted another experiment with a similar protocol but exposed three groups of children to three different

scenarios, watching an aggressive interaction in-person, in a film and in a cartoon (Vinney, 2019). The researchers found again that children who observed the aggressive behavior were more aggressive in their play with toys and boys were more aggressive than girls.

These experiments demonstrated observational learning and modeling and were the foundation for Bandura's Social Learning Theory in 1977 (Vinney, 2019). Bandura went on to refine his theory in 1986 by adding self-efficacy and emphasizing the cognitive components of observational learning and the interplay between behavior, cognition, and the environment (LaMorte, 2019).

Applicability of SCT on Interventions in Current Practice

Based on SCT, there is a complex interplay between the environment, a person's internal factors (i.e., beliefs, knowledge and cognition, including self-efficacy) and a person's external factors (i.e., social support and physical environment); the environment, people and their behavior constantly influence each other, described as the concept of reciprocal determinism (Coleman & Pasternak, 2012; Joseph, Daniel, Thind, Benitez, & Pekmezi, 2014; Katz, Elmore, Wild, & Lucan, 2014). In SCT, motivation to make behavioral change involves two main factors (a) the expectation that outcomes of the behavior change would be an important new norm based on observational learning and (b) self-efficacy or one's confidence in the ability to carry out the change (Coleman & Pasternak, 2012; Muniraj, 2014).

In current practice, SCT is used as a basis for behavior change in clinic interventions since it is an advantageous framework to promote management of multiple health behaviors (Joseph et al., 2014). In a review by Strychar, Elisha and Schmitz (2012), all but one of the studies showed an association between self-efficacy and self-care behaviors. In studies regarding nutrition, SCT was associated with improved dietary self-care behaviors, lowered

consumption of fat and better glycemic control (Strychar et al., 2012). Joseph et al. (2014) reviewed 15 articles that support SCT as a foundation for promoting maintenance of health behaviors, specifically physical activity, weight loss and smoking cessation. Of those articles, eight out of nine studies showed SCT was associated with positive weight loss or weight loss maintenance (Joseph et al., 2014).

Major Tenets of the Theory

The major tenets of this theory are as follows (LaMorte, 2019; Tanvir, 2014; Young et al., 2014):

- Observational learning or modeling: This is learning by observing a behavior, gaining information from the observation and making a decision about that behavior either to change behavior or not. Information can be learned without performing new behaviors.
- Reciprocal determinism: This pertains to the connection between cognition, environment and internal behaviors, wherein each is mutually influenced by each other.
- Outcome expectancy: This is one's prediction about the consequences that are most likely to occur due to performing or not performing a particular behavior.
- Behavior capacity: This pertains to having the knowledge and skills to be able to perform a behavior.
- Reinforcement: This is learning by observing a behavior and its consequences.
- Self-efficacy: This is the confidence one has to execute control over one's health habits.

Theory Application to the DNP Project

The tenets of the SCT can be applied to various aspects of this project. Since patients are participating in intensive, structured weight loss programs, they are involved in observational learning of new information about nutrition, physical activity and weight loss. The health educators who teach in the weight loss programs are modeling behavior as they teach as well.

Reciprocal determination, or the environmental construct (Safdie, Cargo, Richard, & Levesque, 2014) that is conducive to weight loss is taught in the weight loss programs. Patients learn how to build an environment, physically, socially and psychologically, that supports them in their decision to focus on their health and weight loss goals. Additionally, this project develops and strengthens the therapeutic relationship between the primary care provider, healthcare providers and patients; thus, a supportive healthcare environment for patients to obtain assistance and motivation for change.

The tenets of outcome expectancy and reinforcement in this project are encompassed in the therapeutic relationship between the patients and the healthcare team and organization. Although patients may have the self-motivation for change, when asked to be accountable to their healthcare team in follow-up phone calls or visits, patients have an additional expectation to fulfill. This can inherently reinforce the patients' desire for weight loss maintenance to meet the expectations of their healthcare team.

Self-efficacy has been shown to be highly associated with behavior change (Joseph et al., 2014). The basis of self-efficacy is the tenet of behavioral capacity (Safdie et al., 2014). Patients obtain the knowledge and skills to be successful in weight loss and weight loss maintenance by participating in their programs. In a study by Annesi and Vaughn (2017), it was found that self-efficacy predicted weight loss behaviors. They reported that the self-regulatory skills of self-monitoring, goal setting, time management and building social support strongly

predicted self-efficacy (Annesi & Vaughn, 2017). In this project, self-efficacy will be evaluated by measuring participants' self-monitoring behaviors and self-confidence in weight loss and/or maintenance.

Project Design

The overall purpose of this quality improvement (QI) project is to maintain long-term weight loss and decrease obesity in patients after completion or near completion of a non-surgical, medically supervised weight loss program with the social cognitive theory (SCT) as the foundation. This will be completed through the development of an evidence-based practice protocol, the Weight Loss Follow-up (WLFU) Protocol, to improve adherence of follow-up by PCPs in order to increase perceived autonomy support and confidence in patients related to weight loss maintenance. The target population will be PCPs working in a satellite facility of a large medical center located in South Sacramento, California. The PCPs will be educated about the protocol and asked to follow-up with their patients who have completed or nearly completed MWM and LWM programs, in order to assess and encourage weight maintenance.

Objectives

The project design will meet the objectives by (a) developing an evidence-based protocol, the Weight Loss Follow-Up (WLFU) Protocol, for PCPs to increase patients' perceived autonomy support and perceived confidence in sustained weight loss, (b) providing an educational presentation about the WLFU Protocol for PCPs and evaluating their knowledge by administering pre- and post-tests; (c) assessing WLFU Protocol adherence using a manual data collection sheet; and (d) assessing patients perceived autonomy support from PCPs and perceived confidence in weight loss maintenance using the Weight Loss Follow-Up Questionnaire.

Protocol Development and Implementation

The WLFU Protocol was developed based on best practice evidence found in the literature (Appendix B). Primary Care Providers (PCPs) have reported a lack of knowledge in counseling patients about obesity and weight management (LeBlanc et al., 2011; Nemeth et al., 2017). The educational presentation conducted about the WLFU Protocol aims to improve the knowledge of PCPs in relation to weight management regarding their influence on patients' perceived autonomy, behavior change and patients' perceived confidence in maintaining weight loss.

The Social Cognitive Theory (SCT) states that behavior can be modified by reciprocal determination, or the environmental construct (Safdie, Cargo, Richard, & Levesque, 2014). Therefore, the therapeutic relationship between patients and PCPs can motivate patients to change and manage maintenance of weight loss more successfully.

The implementation of the WLFU Protocol begins with an educational presentation to all the PCPs at the target facility (Appendix C). The presentation will include information about SCT and the WLFU protocol. Pre- and post-test knowledge assessment will be conducted before and after the educational training (Appendix D). The content validity and reliability of the knowledge assessment was determined using a Construct Validity Index after ratings from the course instructor, academic mentor, and project mentor.

After the presentation, PCPs who have patients that have completed or nearly completed a medically-monitored weight management program will receive an email with patient information and will be asked to reach out to patients by email (or phone for participants without

email access) to congratulate the patients on their accomplishment of improved health via weight loss and assess current status of weight maintenance. Patients who report weight regain since program completion will be sent a follow-up email with options to re-engage with their MWM or LWM programs. A sample of an initial email and follow-up email to send out to patients will be provided to PCPs (Appendix E).

Protocol adherence. Data will be collected on protocol adherence to determine if PCPs followed up with patients by email, phone call, office or video visit or other using a manual data collection sheet, the Protocol Adherence Data (Appendix F). A target of 30 charts will be reviewed to determine if outreach was conducted.

Variables

There will be manipulation of two independent variables with corresponding dependent variables in this project. The first independent variable is the educational training of the protocol for PCPs. The knowledge level of PCPs is the dependent variable. By improving knowledge of PCPs with an educational presentation, it is expected that post-test scores will be higher compared to pre-test scores. For the second independent variable, autonomy support or the follow-up support that PCPs provide to patients who have completed or nearly completed a medically-monitored weight loss program will be examined. The dependent variables are the patients' perceived autonomy support from PCPs and perceived confidence of weight loss maintenance.

The data collected from these tools will be analyzed using the organization's survey collection program, Jotform. For the knowledge assessment of PCPs, paired t-tests will be used to evaluate knowledge gained by PCPs after project intervention. For autonomy support, perceived support by PCPs of patients' autonomy to maintain weight loss will be evaluated for

correlation with patients' perceived confidence in maintaining weight loss using the Pearson's product-moment correlation coefficient. Finally, to measure protocol adherence, a percentage of adherence will be calculated.

Population of Interest

The target population will be PCPs, 28 Internal Medicine and Family Medicine physicians, working in the Adult and Family Medicine department in a satellite facility of a large medical center located in South Sacramento, California. Each PCP has 1,500 - 2,000 patients in their direct care. The inclusion criteria for PCP involvement in this QI project is the signing of an agreement to partner with the Lifestyle Medicine department to treat and manage obesity as an etiology of chronic diseases. Physicians must be trained in Adult Medicine, Internal Medicine and/or Family Medicine. Other specialty physicians are excluded**.**

Setting

The setting of this DNP project is a satellite medical clinic, which is part of a large regional medical center. The medical center is one center in a network of 21 centers of a Northern California health maintenance organization (HMO). The race/ethnicity demographics of the local community served by the satellite clinic and its medical center consists of 45% White/Caucasian, 26% Hispanic/Latino, 23% Asian, 12% Black/African American, 8% Other race, 7.7% multiple races, 1.7% Pacific Islander/Native Hawaiian and 0.8% Native American. This setting hosts the MWM and LWM programs. These are intensive, non-surgical weight loss programs. There are about 500 patients who participate in these weight loss programs per year.

The MWM is a fee-for-service program which offers 6 months of intensive medically supervised weight loss treatment with an associated fee. In contrast, the LWM is a disease-reversal focused program for weight loss that is included as a benefit for patients with the HMO

insurance. Depending on a patient's insurance coverage, there may be a fee associated with the LWM program.

Stakeholders

The stakeholders include the Medical Group Administrator, Lifestyle Medicine and Adult and Family Medicine department directors, department managers, physician leads, physician chiefs, clinical health educators and medical assistants. The PCPs are also stakeholders since the overall goal of the project is to maintain weight loss to decrease the risk of their patients' developing or worsening chronic diseases, such as diabetes and hypertension. The Lifestyle Medicine Director granted approval to conduct this project (Appendix H). To maintain rapport with the stakeholders, the project lead will involve staff early in the QI process. Ongoing communication and collaboration with all stakeholders will ensure the educational needs of medical staff and patients are met.

Recruitment Methods

All PCPs in Adult and Family Medicine at the target facility will be recruited to partner with the Lifestyle Medicine department. These PCPs are also expected to attend a monthly department meeting which is where the educational presentation will be conducted. Attendees of this meeting will be given the pre- and post-tests. Patients in the MWM and LWM programs who are assigned to PCPs at the target facility will be sent emails by the lead Physician or Clinical Educator to complete the survey assessing perceived autonomy support and confidence. Recruitment methods will align with procedures to protect privacy and confidentiality of PCPs and patients. PCPs' and patients' personal information will be de-identified. No advertisements will be distributed nor will incentives be offered for participation.

Instrumentation

The knowledge of PCPs will be assessed with the same test prior to and after the presentation to PCPs. The content validity and reliability of the knowledge assessment was determined by ratings from the course instructor, academic mentor, and project mentor and the Construct Validity Index was found to be 1.0.

The assessment of perceived autonomy support from PCPs and perceived confidence in weight loss maintenance will be conducted by surveying participants. The project will be using a validated survey tool, the Weight Loss Follow-up Questionnaire, to assess the perceived autonomy support and confidence of patients (Appendix G). The Weight Loss Follow-up Questionnaire contains questions which include (a) non-identifying patient information; (b) assessment of perceived autonomy support from their PCPs, using the Health Care Climate Questionnaire (HCCQ); and (c) assessment of perceived confidence in maintaining weight loss, Perceived Confidence Scale (PCS).

The HCCQ and PCS are validated tools available to members of the Center for Self-Determination Theory (Center for Self-Determination Theory, 2019). These instruments are copyrighted and available for use for academic research projects. The HCCQ was first validated in a study by Williams, Grow, Freedman, Ryan and Deci (1996) that researched obese patients involved in a weight-loss program, visiting their primary care providers. The instrument was also tested in patients with diabetes and evaluated their perceived autonomy support to motivate control of their blood sugars (Williams, Freedman, & Deci, 1998). The original Perceived Competence Scale was validated by Williams, Freedman and Deci (1998) as well. It has been used and adapted as recommended by the developers as the Perceived Confidence Scale in a study by Stamp et al. (2016).

Both the HCCQ and PCS collect responses on a seven-point Likert-type scale, ranging

from one to seven. Higher total scores predict higher autonomy support from primary care providers and higher confidence in sustaining weight loss, respectively.

Data Collection Procedures

The pre- and post-testing of PCPs will be conducted at the start and end of the educational presentation, respectively. This knowledge assessment testing will be performed on-site with a captive audience at a department meeting for Adult and Family Medicine department PCPs.

Shortly after this presentation, PCPs will be given patient information of those who have completed or are near completion of the MWM and LWM programs and will be asked to follow-up with patients. PCPs will be reminded every two days to message or call patient to discuss weight loss management. The patients that have been identified as patients of the PCPs at the target facility will be surveyed two weeks after the educational session with PCPs. The online link to the survey will be emailed (or mailed to patients without emails). The lead Physician or Clinical Health Educator for the MWM program will be responsible for distributing the questionnaires. Patients will be reminded to complete the survey every two days until the end of the intervention period.

In order to evaluate the percentage of PCPs that adhered to the WLFU Protocol, chart review of patients will be conducted. Data will be collected on protocol adherence to determine if PCPs followed up with patients by email, phone call, office or video visit or other using a manual data collection sheet, the Protocol Adherence Data (Appendix F). The manual data sheet will tally if contact was made and if so, by what means. Protocol adherence percentages will be further categorized by the method by which contact was made.

Intervention

Project Timeline

Approval for implementation of the WLFU Protocol was obtained from the Director of Lifestyle Medicine (Appendix H). Participants in this protocol are the PCPs in the Adult and Family Medicine department and are required to attend these pre-scheduled monthly meetings. The implementation of this intervention will be over a four-week span of time as outlined in Table 1.

Table 1

Timeline for intervention

Week One	Conduct educational session for PCPs at their monthly meeting. Conduct pre- and post-test knowledge assessment. Initiate emails to PCPs regarding patients who have completed or nearly completed weight loss programs.
Week Two	Determine which PCPs have conducted patient follow-up. Follow-up with PCPs to encourage follow-up with patients if not completed.
Week Three	Initiate distribution and collection of Weight Loss Follow-Up Questionnaire to patients in classes and by mail. Follow-up with patients who have not answered questionnaires by the end of the week.
Week Four	Complete collection of Weight Loss Follow-Up Questionnaires Complete chart review for Protocol Adherence Data form.

During the first week of implementation, the WLFU Protocol will be initiated with an educational session to the PCPs in the Adult and Family Medicine department at the satellite clinic. Pre- and post-test knowledge assessment will be conducted before and after the

educational training (Appendix C). After the presentation, PCPs who have patients that have completed or nearly completed a medically-monitored weight management program will receive an email from the lead Physician or Clinical Health Educator with patient information. The PCPs will be asked to follow-up with their patients by email, preferably (or phone call, office visit or video visit), to congratulate them on their accomplishment of improved health via weight loss and to assess current status of weight maintenance. Patients who report weight regain since program completion will be given follow-up information and encouraged to re-engage with their MWM or LWM programs.

Two weeks after the educational session, the Weight Loss Follow-Up questionnaire (Appendix G), assessing perceived autonomy support and perceived confidence in weight loss maintenance, will be given to patients in class or sent by mail. Survey results will be collected and analyzed. The percentage of protocol adherence will be measured. After all the data has been collected, statistical analysis will begin.

Human Subjects Protection

The DNP project is a quality improvement (QI) project. This QI project will be submitted to the Touro University Nevada Institutional Review Board (IRB) per policy and the practice site IRB. Although, it is anticipated that this QI project will not require an IRB review as the risks to participants are minimal and not beyond that of the activities of everyday living. The participants will be the PCPs. Participation will be mandatory. No compensation for participating in this project will be provided.

Protecting anonymity and confidentiality will be maintained in this evidenced-based QI project. In order to protect personal information of PCPs and any data collected on the Weight Loss Follow-Up Questionnaire, all information will be deidentified and linking codes will be

devised for PCPs and each completed questionnaire. All tests and questionnaires will be kept locked in the Lifestyle Medicine department at the practice site. The completed questionnaires include individual patient results and will be collected for data analysis based on survey responses; the patient is not a participant.

Both the PCPs and the patients may benefit from participation in this WLFU Protocol. PCPs can gain knowledge related to weight loss maintenance and behavior change, realize their potential to influence the actions of their patients and develop more therapeutic relationships with their patients. Patients can gain autonomy support and confidence in self-care management of weight loss by perceiving increased PCP support and a stronger relationship with their PCPs.

Analysis of Results

Analysis of the QI project was completed by the project lead after data collection. Recommendations at the practice site will be derived from this data. Analysis of data includes (a) PCPs' knowledge assessment, (b) adherence of the Weight Loss Follow-up Protocol by PCPs, and (c) patients' perceived autonomy support from PCPs and perceived confidence in weight loss maintenance. Implementation of this QI project recruited PCPs who are licensed as nurse practitioners and clinical health educators. They work in partnership with the Primary Care Physicians described as the target population. Physicians were unavailable to participate as discussed further in the Limitations section below. Since these nurse practitioners and clinical health educators work closely with Primary Care Physicians in teams to deliver healthcare to the same group of patients, the results obtained are equally valuable.

Prior to data analysis, data were evaluated on requisite statistical assumptions (e.g., sphericity, normality) and for the detection of any potential outliers that would otherwise undermine the trustworthiness of the results via box-and-whisker plots. The data met all

statistical assumptions and no outliers were detected in the data, and thus, data analysis proceeded with all complete cases without making any statistical modifications to the data.

Descriptive statistics and bivariate, zero-order correlations were requested for relevant variables. Demographic characteristics of the sample of weight loss patients are listed in Table 2. These patients had a mean weight of 198.5 lbs. (*SD* = 46.63) and an average of 40.26 weeks of being in the program (*SD* = 12.28). Descriptive statistics for pretest and posttest scores of protocol knowledge assessment of PCPs regarding follow-up with patients after completion of the medically-monitored phase of their weight loss management program are displayed in Table 3. Table 4 displays descriptive statistics by group for autonomy support and confidence as well as internal consistency reliability coefficients, Cronbach's alphas for the two scales.

Table 2

Demographic Characteristics of the Sample of Weight Loss Patients

Variable	Frequency	%
Age		
18-25	1	4.5
26-35	1	4.5
36-45	2	9.1
46-55	2	9.1
56-65	10	45.5
66 or older	6	27.3
Gender		
Male	5	22.7
Female	17	77.3
Ethnicity		
White	17	77.3
Asian	4	18.2
Other	1	4.5

N = 22

Statistical Tests

A series of paired/dependent samples *t*-tests were conducted to compare mean differences on pretest and posttest protocol knowledge assessment of PCPs regarding follow-up with patients

after completion of the medically-monitored phase of their weight loss management program; one was done on the same pretest and posttest items and the other was done on the pretest/posttest items and the new items, while taking into account the fact that there were more items on the posttest. In addition, a series of independent samples *t*-tests were conducted, with group (Follow-Up, No Follow-Up) serving as the independent variable and autonomy support and confidence serving as the dependent variable in each of the analyses, respectively. The Follow-Up group comprised of patients who reported they received follow-up communication from their PCPs and the No Follow-Up group did not. The Bonferroni adjustment to statistical significance was employed to control for familywise Type I error rate inflation, and thus, the actual, more conservative *p*-value for establishing statistical significance was .025 (.05/2). The effect size to evaluate the practical significance of the *t*-test findings was Cohen's *d* and the lower bound and upper bound values of its 95% confidence interval ($CI_{95\%}$). Cohen (1988) provided the following interpretive guidelines for *d*: .010-.499 as small; .500-.799 as medium; and >.800 as large. Cohen's *d* is interpreted as a standardized mean difference between pretest and posttest knowledge percentile scores, and thus, they are interpreted as standard deviations in a *z*-score distribution.

Weight Loss Follow-Up Protocol Knowledge Assessment of PCPs

The paired samples *t*-test comparing only the same items at pretest and posttest was not statistically significant, $t(3) = -2.45$, $p = .30$, albeit the effect size was large in size, Cohen's $d = -1.225$ (95% confidence interval = -2.735, -0.285). The results comparing the pretest only items and the pretest and new items at posttest while taking into account the additional items at posttest was statistically and practically significant, $t(3) = -7.98$, $p = .004$, Cohen's $d = -3.991$ (95% confidence interval = -8.393, -2.415). The effect size, Cohen's *d*, represents a standardized mean

difference, and hence, for the former analysis it indicates that the mean at posttest was 1.22 standard deviations higher compared to the pretest mean, which is large. For the latter analysis, it suggests that the posttest mean was almost four standard deviations higher (3.991) than the pretest mean, which is very large.

Table 3

Descriptive Statistics of Relevant Variables by Type of Test

Variable	Pretest		Posttest		Posttest Only Items		Posttest All Items	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
PCP Knowledge	7.00	0.71	8.25	0.50	3.75	0.50	11.07	0.82

N = 4

Perceived Autonomy Support from PCPs and Perceived Confidence in Maintaining Weight

The total number of patients who received follow-up outreach from PCPs was 60 out of 111 (54% of patients), thus PCP adherence to the protocol was 54%. In sum, there were 110 patients surveyed (since one patient had an inaccurate email address). Surveys were sent via email and patients were given one week to reply. One reminder email was sent 2 days prior to the due date. Of the 110 patients surveyed, 22 patients completed and submitted a response. This was a response rate of 20% and a nonresponse bias of 80%. Of the 22 patients who submitted surveys, 13 patients (59%) reported follow-up by PCPs.

Regarding autonomy support and confidence, bivariate, zero-order correlations between the two measures was: r = .38 for the sample (weak); r = .60 for the No Follow-Up group (moderate); and r = -.11 for the Follow-Up group (weak-to-no relation). Results of the independent samples t-test for perceived autonomy support was not statistically significant, $t(19) = -1.22$, p = .24, albeit the effect size was moderate in size, Cohen's d = -0.54 (95% confidence interval = -1.420, -0.340). Results for confidence was statistically and practically significant between groups, $t(20) = -3.84$, p = .001, Cohen's d = -1.650 (95% confidence interval = -2.650, -

0.650). For autonomy support, the standardized mean difference between groups was over half of one standard deviation (0.54) higher for the Follow-Up group, and for confidence the standardized mean difference between groups was 1.65 standard deviations higher for the Follow-Up group (see Table 4 for descriptive statistics by group).

Table 4

Descriptive Statistics for the Follow-Up and No Follow-Up Groups for Autonomy Support and Confidence

Variable	Follow-Up (n = 13)		No Follow-Up (n = 9)	
	M	*SD*	*M*	*SD*
Autonomy Support	5.38	1.17	4.19	2.29
Confidence	5.58	1.10	3.19	1.81

N = 22

Effect of Demographic Characteristics

Additional ad hoc analyses were conducted to evaluate the influence of demographic characteristics on autonomy support and confidence. Table 5 presents the difference between genders. There were no statistically significant differences regarding autonomy support, $t(20) = -0.31$, $p = .97$. As for confidence, although the difference was not statistically significant, the standardized mean difference (effect size) between males and females was moderate, $t(20) = 1.18$, $p = .25$, Cohen's $d = 0.65$, with males reporting a higher confidence than females.

Table 5

Descriptive Statistics for Male and Female Weight Loss Patients for Autonomy Support and Confidence

Variable	Male (n = 5)		Female (n = 17)	
	M	*SD*	*M*	*SD*
Autonomy Support	4.83	1.79	4.87	1.19
Confidence	5.45	1.46	4.35	1.90

N = 22

Table 6 presents the results of autonomy support and confidence by age bands. For the purposes of the study, the age bands were dichotomized into 55 years of age or younger and 56 years of age or older. Results revealed a statistically significant difference for autonomy support, $t(20) = -2.79$, $p = .01$, Cohen's $d = -1.09$, with those 55 years of age or younger reporting significantly higher autonomy support than those 56 years of age or older. The same pattern was true for confidence, albeit the results were not statistically significant, $t(20) = -1.74$, $p = .10$, Cohen's $d = -0.88$ (a large effect size).

Table 6

Descriptive Statistics for Weight Loss Patients for Autonomy Support and Confidence by Age

Variable	55 years or younger (n = 6)		56 years or older (n = 16)	
	M	*SD*	*M*	*SD*
Autonomy Support	6.28	0.93	4.30	2.38
Confidence	5.67	1.48	4.20	1.84

$N = 22$

Differences between participants who identified as White and Non-White/Minority were also analyzed. Table 7 displays descriptive statistics for these two groups. For both autonomy support and confidence, those who identified as Non-White Minority reported higher mean scores than those who identified as White, albeit the effect size was only meaningful for autonomy support, $t(20) = 1.91$, $p = .07$, Cohen's $d = 0.76$ (moderate effect size).

Table 7

Descriptive Statistics for Weight Loss Patients for Autonomy Support and Confidence by Ethnicity

Variable	White (n = 17)		Non=White/Minority (n = 5)	
	M	*SD*	*M*	*SD*
Autonomy Support	4.53	2.45	5.93	0.90
Confidence	4.52	1.99	4.85	1.31

$N = 22$

Finally, the influence of number of weeks in the program was not significant for either autonomy support or confidence (all p-values $\geq .23$), albeit the effect was trending upward for autonomy support insofar as more time in the program tended to yield higher autonomy support.

Discussion of Findings

The purpose of this QI project was to examine if increased PCP follow-up after completion of a medically-monitored weight loss program correlated with increased patients' perceived autonomy support from PCPs, or support from PCPs that they can independently manage their weight, and patients' confidence in their ability to maintain weight loss. First, PCPs were presented with (a) education regarding social cognitive theory and the role that they play in influencing behavior change in their patients and (b) education about the Weight Loss Follow-Up Protocol. The difference in pretest and posttest scores were not statistically significant due in large part to the small sample size (n=4). Despite this finding, the clinical significance was found to be large due to the effect size of 1.22 and 3.99 standard deviations higher means on posttest scores. Therefore, providing educating to PCPs improved their competence.

After implementation of the Weight Loss Follow-Up Protocol, patients reported their perception of autonomous support from PCPs and confidence in their ability to maintain weight loss. Yet again, it was found that the correlation between Follow-Up and autonomous support was not statistically significant, but the effect size was moderate in size; concluding that patients who received follow-up from PCPs perceived increased support from their PCPs in their ability to maintain weight loss. This contributes to patients' autonomous motivation for weight loss and/or weight maintenance, essentially, behavior change (Williams, Grow, Freedman, Ryan, & Deci, 1996; Williams, McGregor, King, Nelson, & Glasgow, 2005).

The results for confidence were statistically and practically significant between patients who were in the Follow-Up group compared to those in the No Follow-Up group. Hence, patients' who received follow-up from their PCPs felt more confident in their ability to maintain weight loss. Patients who feel more confident in their abilities are more likely to sustain behavior change (Teixeira, Silva, Mata, Palmeira, & Markland, 2012).

Some of the demographic differences were interesting. Patients' 55 years of age and younger felt more autonomous support and confidence that older patients. Also, men felt more confidence after follow-up than women. Further studies would need to be conducted to determine if these effects persisted with larger sample sizes.

Significance/Implications for Nursing

Despite the recommendations of the US Preventive Services Task Force, PCPs only perform weight loss counseling about 42% of the time since they may not feel competent in their skills to counsel patients on weight management, (LeBlanc et al., 2011; Nemeth et al., 2017). The Weight Loss Follow-Up Protocol implemented in this project showed that improving the knowledge of PCPs regarding (a) social cognitive theory as a basis for behavior change in clinic interventions, (b) the influence that PCPs have on patients' self-confidence to change behavior, and (c) the Weight Loss Follow-Up Protocol increased patients' autonomous support from PCPs and confidence in their ability to maintain weight loss. By increasing knowledge and competence in PCPs, they have more self-confidence to counsel patients regarding weight loss and motivate continuation of healthy behaviors patients' learned in their weight loss programs.

The findings of this QI project support that improving PCPs' knowledge and follow-up procedures increased support of patients to autonomously maintain their weight and improved patients' self-efficacy, particularly self-confidence, to continue healthy behaviors in their daily

routine. The continued implementation of the Weight Loss Follow-Up protocol at this clinic site should improve patients' maintenance of weight loss over the 82 weeks of the program and beyond. The increased knowledge about behavior change and weight maintenance gained by PCPs focus attention on the management of obesity among all members of the team of healthcare workers in the clinic, including the nurses, medical assistants and receptionists; thus, improving competence of the whole team in the care of patients with obesity. Nurses, as an integral part of the health care team, can ensure that the staff is providing non-stigmatizing care of patients and address any health disparities found among the patient population (Kelley, Sbrocco, & Sbrocco, 2016).

Weight loss maintenance is multifactorial and best achieved by the incorporation of physical activity, healthy dietary choices and behavioral therapy which includes support from medical and nursing professionals (Bischoff et al, 2017; Kelley et al., 2016). The significance of maintained weight loss is the reduction in the number of uncontrolled chronic conditions which improves patients' health overall (Agborsangaya, Majumdar, Sharma, Gregg, & Padwal, 2015). This contributes to decreased medication usage and mortality. The nursing field would be able to focus more on health promotion rather than disease management.

Limitations

There were several limitations that occurred during the implementation of this QI DNP project: (a) PCPs licensed as physicians were unavailable to participate, (b) large group educational sessions were not recommended, (c) the difference in knowledge base of PCPs licensed as physicians compared to the final target population, and (d) the limited timeframe to conduct this QI project. The most prominent limitation in implementing this project was the change in target population. Due to the COVID-19 viral pandemic, physicians were unavailable

to participate in this project since they were required to transition from in-person clinic visits conducted at the medical clinic to video or telephonic visits at remote worksites. Some physicians were even recruited to perform duties outside their normal routine. The target population was comprised of Clinical Health Educators (CHEs) in the Lifestyle Medicine department partnered with Adult and Family Medicine (AFM) physicians and nurse practitioners (NPs) in the AFM clinic. Health educators and nurse practitioners are both trained in patient assessment, health promotion and education. They can act as health coaches just like physicians and work collaboratively with physicians in the facility.

In addition, due to recommendations against the gathering of large groups to help minimize the transmission of the virus, the educational presentation was cancelled. This posed a challenge for dissemination of information. Instead of a large group presentation, the implementation of this project utilized technology, an emailed PowerPoint slideshow, rather than an in-person presentation as originally planned. With this teaching modality, there was less discussion between presenter and target population and an inability to determine how much attention was given to the slideshow. Furthermore, the target population, the CHEs and NPs, may have already had the knowledge presented in the slideshow since their educational degree curriculums include some training in teaching strategies and nutrition as it relates to prevention of chronic disease. The focus of medical school curriculum is on assessment, diagnosis and management of disease more so than teaching strategies and nutrition. Finally, the short timeframe to conduct this QI project limited the time to educate a larger target population, survey more patients and determine long-term outcomes of the Weight Loss Follow-Up Protocol.

Dissemination

In collaboration with the Lifestyle Medicine Director, the results of this QI DNP project

will be presented to the Lifestyle Medicine and Adult and Family Medicine department providers. This project will also be submitted to the repository for DNP projects hosted by the Doctors of Nursing Practice organization (Doctors of Nursing Practice, 2020). Finally, the results will be submitted for podium/poster presentation at the Western Institute of Nursing Annual Research Conference on April 14-17, 2021 and the Obesity Medicine Association Spring Conference on April 22-26, 2021.

Project Sustainability

The Weight Loss Follow-Up (WLFU) Protocol will likely be incorporated in the ongoing MWM program because of the high level of patients' perceived confidence and autonomy support associated with the protocol. Since it was found that the greatest number of patients exhibited weight gain about 6 months after starting the Lifestyle Phase of MWM, the ongoing implementation of the WLFU Protocol will be with patients at that timeframe in the program. The CHE lead for the MWM program will create a sustainable plan to continue the protocol. As research continues, it will be important to update the protocol to continue to reflect best practices. New employees will receive an orientation in-service and ongoing in-services will be conducted biannually to ensure proper understanding.

Conclusion

In this small scale QI project, it was shown that PCPs, as external constructs according to the Social Cognitive Theory, play an instrumental role in the maintenance of weight of their patients by simply following up with their patients after they have participated in a weight loss program. Simply acknowledging patients' weight loss efforts and success can increase their feelings of support from their PCPs as well as their confidence in maintaining the weight. Further studies with larger PCP and patient populations are needed to determine the extent of

support PCPs need to provide and if PCPs' team members working with patients produce the same outcomes. Also, studies with a longer timeframe would be able to capture weight changes over time in comparison to perceived autonomous support and confidence. Finally, enhancing PCPs' engagement with patients after losing weight through an intensive weight loss program can help sustain patients' weight loss for years; thus, improving their overall health by lowering their risk for chronic diseases such as diabetes, hypertension and coronary artery disease.

References

2018 Physical Activity Guidelines Advisory Committee. (2018). *2018 Physical Activity Guidelines Advisory Committee Scientific Report.* Washington, DC: U.S. Department of Health and Human Services. https://health.gov/paguidelines/second-edition/report/pdf/PAG_Advisory_Committee_Report.pdf

Agborsangaya, C., Majumdar, S., Sharma, A., Gregg, E., Padwal, R. (2015). Multimorbidity in a prospective cohort: prevalence and associations with weight loss and health status in severely obese patients. *Obesity*, 23(3), 707-12. doi: 10.1002/oby.21008. Epub 2015 Feb 13.

Anderson, E., Winett, R., Wojcik, J. (2007). Self-regulation, self-efficacy, outcome expectations, and social support: social cognitive theory and nutrition behavior. *Annals of Behavior Medicine*, 34(3): 304-312.

Annesi, J., Johnson, P., Tennant, G., Porter, K., McEwen, K. (2016). Weight loss and the prevention of weight regain: evaluation of a treatment model of exercise self-regulation generalizing to controlled eating. *The Permanente Journal*, 20(3): 15-146. Retrieved from http://dx.doi.org/10.7812/TPP/15-146

Annesi, J., Tennant, G. (2012). From morbid obesity to a healthy weight using cognitive-behavioral methods: a women's three-year process with one and one-half years of weight maintenance. *The Permanente Journal*, 16(4): 54-59. Retrieved from http://dx.doi.org/10.7812/TPP/12-062

Annesi, J., Vaughn, L. (2017). Directionality in the relationship of self-regulation, self-efficacy, and mood changes in facilitating improved physical activity and nutrition behaviors:

extending behavioral theory to improve weight-loss treatment effects. *Journal of Nutrition Education and Behavior,* 49(6): 505-512. doi: 10.1016/j.jneb.2017.03.004

Asbiornsen, R., Smedsrod, M., Nes, L., Wentzel, J., Varsi, C., Hielmesaeth, J., van Gemert-Pijnen, J. (2019). Persuasive system design principles and behavior change techniques to stimulate motivation and adherence in electronic health interventions to support weight loss maintenance: scoping review, *Journal of Medical Internet Research,* 21(6):e14265. doi: 10.2196/14265: 10.2196/14265

Arnett, D., Blumenthal, R., Albert, M., Buroker, A., Goldberger, Z., Hahn, E., Himmelfarb, C., Khera, A., Lloyd-Jones, D., McEvoy, J., Michos, E., Miedema, M., Muñoz, D., Smith, Jr., S., Virani, S., Williams, Sr, K., Yeboah, J., Ziaeian, B. (2019). 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease, *Journal of the American College of Cardiology,* Retrieved from doi: https://doi.org/10.1016/j.jacc.2019.03.010.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavior change. Psychological Review, 84(2):191-215.

Bertz, F., Sparud-Lundin, C., Winkvist, A. (2015). Transformative lifestyle change: key to sustainable weight loss among women in a post-partum diet and exercise intervention. *Maternal and Child Nutrition,* 11(4):631-645.

Bischoff, S., Boirie, Y., Cederholm, T., Chourdakis, M., Cuerda, C., Delzenne, N., …, Barazzoni, R. (2017). Towards a multidisciplinary approach to understand and manage obesity and related diseases. Clinical Nutrition, 36(4), 917-938. Retrieved from https://www-clinicalkey-com.kaiserpermanente.idm.oclc.org/#!/content/journal/1-s2.0-S0261561416313231

Blane, D., MacDonald, S., Morrison, D., O'Donnell, C. (2017). The role of primary care in adult weight management: qualitative interviews with key stakeholders in weight management services. *BMC Health Services Research*, 17:764-776.

Brantley, P., Stewart, D., Myers, V., Matthews-Ewald, M., Ard, J., Coughlin, J., Jerome, G., Samuel-Hodge, C., Lien, L., Gullion, C., Hollis, J., Svetkey, L., Stevens V. (2014). Psychosocial predictors of weight regain in the weight loss maintenance trial. *Journal of Behavioral Medicine*, 37(6):1155-1168. doi: 10.1007/s10865-014-9565-6

Brunacini, K. (2019). Implementation of a virtual patient-centered weight loss maintenance behavior competency assessment in adults with obesity. *Journal of the American Association of Nurse Practitioners*, 00, 1-8. doi: 10.1097/JXX.0000000000000192

Burke, L., Ewing, L., Ye, L., Styn, M., Yaguang, Z., Music, E., …Sereika, S. (2015). The SELF trial: a self-efficacy based behavioral intervention trial for weight -loss maintenance. Obesity (Silver Springs), 23(11): 2175-2182. doi: 10.1002/oby.21238

Butryn, M., Webb, V., Wadden, T. (2011). Behavioral Treatment of Obesity. *Psychiatric Clinics of North America*, 24(4):841-859.

Center for Self-Determination Theory (2019). Metrics and methods: Questionnaires. [Website]. Retrieved from https://selfdeterminationtheory.org/questionnaires/

Ciciurkaite, G., Moloney, M., Brown, R. (2019). The incomplete medicalization of obesity: Physician office visits, diagnoses, and treatments, 1996-2017. *Public Health Reports*, 134(2):141-149.

Chen, M., Wang, R., Hung, S. (2015). Predicting health-promoting self-care behaviors in people with pre-diabetes by applying Bandura social learning theory. *Applied Nursing Research*, 28(4):299-304.

Christensen, P., Henricksen, M., Bartels, E., Leeds, A., Larsen, T., Gudbergsen, H., Riecke, B., Astrup, A., Heitmann, B., Boesen, M., Christensen, R., Bliddal, H. (2017). Long-term weight-loss maintenance in obese patients with knee osteoarthritis: a randomized trial. *American Journal of Clinical Nutrition*, 106:755-763.

Coleman, M., Pasternak, R. (2012). Effective strategies for behavior change. *Primary Care Clinics in Office Practice,* 39(2): 281-305.

Coughlin, J., Guillion, C., Brantley, P., Stevens, V., Bauck, A., Champagne, C., Dalcin, A., Funk, K., Hollis, J., Jerone, G., Lien, L., Loria, C., Myers, V., Appel, L. (2013). Behavior mediators of treatment effects in the weight loss maintenance trial. *Annals of Behavioral Medicine: a publication of the Society of Behavioral Medicine*, 46(3):369-381. doi: 10.1007/s12160-013-9517-3

Coughlin, J., Brantley, P., Champagne, C., Vollmer, W., Stevens, V., Funk, K., Dalcin, A., Jerone, G., Myers, V., Tyson, C., Batch, B., Charleston, J., Loria, C., Bauck, A., Hollis, Ja., Svetkey, L., Appel, L., the Weight Loss Maintenance Collaborative Research Group. (2016). The impact of continued intervention on weight: five-year results from the weight loss maintenance trial. *Obesity*, 24(5):1046-1053. doi: 10.1002/oby.21454

Curioni, C., Lourenco, P. (2005). Long-term weight loss after diet and exercise: a systematic review. *International Journal of Obesity*, 29:1168–74.

Dastani, H., Brown, C., O'Donnell, D. (2004). Combating the obesity epidemic: community pharmacists' counseling on obesity management. *Annuals of Pharmacotherapy,* 38(11), 1800−1804. doi:10.1345/aph.1E205

Dietz, W., Belay, B., Bradley, D., Kahan, S., Muth, N., Sanchez, E., Solomon, L. (2017). A model framework that integrates community and clinical systems for the prevention and

management of obesity and other chronic diseases. *National Academy of Medicine Perspectives.* National Academy of Medicine, Washington, DC. doi: 10.31478/201701b.

Dittus, K., Harvey, J., Bunn, J., Kokinda, N., Wilson, K., Priest, J., Pratley, R., (2018). Impact of a behaviorally-based weight loss intervention on parameters of insulin resistance in breast cancer survivors. *BMC Cancer,* 18(1):351. doi: 10.1186/s12885-018-4272-2

Doctors of Nursing Practice (2020). Doctoral Project Repository. [Website]. https://www.doctorsofnursingpractice.org/project-repository/

Dombrowski, S., Knittle, K., Avenell, A., Araujo-Soares, V., Sniehotta, F. (2014). Long term maintenance of weight loss with non-surgical interventions in obese adults: systematic review and meta-analyses of randomized controlled trials. *The British Medical Journal*, 348:g2646.

Evans, E., Sainsbury, K., Marques, M., Santos, I., Pedersen, S., Lahteenmaki, L., Teixeira, P., Stubbs, R., Heitmann, B., Sniehotta, F. (2019). Prevalence and predictors of weight loss maintenance: a retrospective population-based survey of European adults with overweight and obesity. *Journal of Human Nutrition and Dietetics.* Retrieved from: http://doi.org/10.1111/jhn.12666

Faghri, P., Simon, J., Huedo-Medina, T., Gorin, A. (2017). Perceived self-efficacy and financial incentives: factors affecting health behaviors and weight loss in a workplace weight loss intervention. *Journal of Occupational and Environmental Medicine*, 59(5): 453-460. doi: 10.1097/JOM.0000000000000987

Fincham J. E. (2008). Response rates and responsiveness for surveys, standards, and the Journal. American Journal of Pharmaceutical Education, 72(2), 43. https://doi.org/10.5688/aj720243

Fitzpatrick, S., Bandeen-Roche, K., Stevens, V., Coughlin, J., Rubin, R., Brantley, P., Funk, K., Svetkey, L., Jerone, G., Dalcin, A., Charleston, J. Appel, L. (2013). Examining behavioral processes through which lifestyle interventions promote weight loss: results from PREMIER. *Obesity*, 22(4): 1002-1007. doi: 10.1002/oby.20636

Giacobbi, R. (2016). Theoretical, critical and practical reflections on the long-term maintenance of health behavior change. *American Journal of Lifestyle Medicine,* 10(6):377-380. doi: 10.1177/1559827616662435

Hales, C., Carroll, M., Fryar, C., Ogden, C. (2017). *Prevalence of obesity among adults and youth: United States, 2015–2016. NCHS data brief, no 288*. Hyattsville, MD: National Center for Health Statistics. [Website]. Retrieved from https://www.cdc.gov/nchs/products/databriefs/db288.htm

Hicks, L. (2018). CITI Program: Defining research with human subjects - SBE. [Online]. https://www.citiprogram.org/members/index.cfm?pageID=665&ce=1#view

Hill, J., Wyatt, H., Phelan, S., Wing, R. (2005). The National Weight Control Registry: is it useful in helping deal with our obesity epidemic? *Journal of Nutrition Education and Behavior,* 37(4):206 - 210.

Holdsworth, L., Zionts, D., De Sola-Smith, K., Valentine, M., Winget, M., Asch, S. (2019). Beyond satisfaction scores: exploring emotionally adverse patient experiences. *American Journal of Managed Care,* 25(5), e145-e152.

Jameson, J., Fauci, A., Kasper, D., Hauser, S., Longo, D., Loscalzo, J. (2018). Harrison's Principles of Internal Medicine, 20th Edition. McGraw-Hill Education. United States of America.

Jeffrey, D. (2016). Clarifying empathy: the first step to more humane clinical care. *British Journal of General Practice,* 66 (643), e143-e145. doi: https://doi.org/10.3399/bjgp16X683761

Joseph, R., Daniel, C., Thind, H., Benitez, T., Pekmezi, D. (2014). Applying psychological theories to promote long-term maintenance of health behaviors. *American Journal of Lifestyle Medicine,* 10(6): 356-368. doi: 10.1177/1559827614554594

Katz, D., Elmore, J., Wild, D., Lucan, S. (2014). Methods of primary prevention: health promotion. In D. Katz, J. Elmore, D. Wild, & S. Lucan (4th Ed.), *Jekel's Epidemiology, Biostatistics, Preventive Medicine, and Public Health,* (pp. 181-195). Retrieved from https://www-clinicalkey-com.kaiserpermanente.idm.oclc.org/#!/content/book/3-s2.0-B9781455706587000153?scrollTo=%23s0050

Kelley, C. P., Sbrocco, G., & Sbrocco, T. (2016). Behavioral modification for the management of obesity. *Primary Care,* 43(1), 159–x. https://doi.org/10.1016/j.pop.2015.10.004

Kleine, H., McCormack, L., Drooger, A., Meendering, J. (2019). Barriers to and facilitators of weight management in adults using a meal replacement program that includes health coaching. *Journal of Primary Care and Community Health,* 10: 1-8. doi:2150132719851643

Klem, M., Wing, R., Lang, W., McGuire, M., Hill, J. (2000). Does weight loss maintenance become easier over time? *Obesity Research,* 8:438–44.

Krishnaswami, A., Ashok, R., Sidney, S., Okimura, M., Kramer, B., Hogan, L., Sorel, M., Pruitt, S., Smith, W. (2018). Real-world effectiveness of a medically supervised weight management program in a large integrated health care delivery system: Five-year outcomes. *Permanente Journal* 22:17-82.

Kushner, R. (2007). Obesity Management. *Gastroenterology Clinics of North America*, 36(1):191-210.

LaMorte, W. (2019). Behavioral change models. The social cognitive theory. Boston University School of Public Health [Webpage]. Retrieved from http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories5.html

Latimer, L., Walker, L., Kim, S., Pasch, K., Sterling, B. (2011). Self-efficacy scale for weight loss among multi-ethnic women of lower income: a psychometric evaluation. Journal of Nutrition Education and Behavior, 43(4): 279-283.

LeBlanc, E., O'Connor, E., Whitlock, E., Patnode, C., Kapka, T (2011). Screening for and Management of Obesity and Overweight in Adults. Evidence Report No 89. Rockville, MD: Agency for Healthcare Research & Quality.

Levi, J., Segal, L., Laurent, R., Lang, A., Rayburn, J. (2012). Robert Wood Johnson Foundation: F as in fat: how obesity threatens America's future, 2012. [Website]. Retrieved from https://www.rwjf.org/en/library/research/2012/09/f-as-in-fat--how-obesity-threatens-america-s-future-2012.html

Locke, A., Schneiderhan, J., Zick, S. (2018). Diets for health: goals and guidelines. *American Family Physician*, 97(11):721-728.

Masters, R., Reither, E., Powers, D., Yang, Y., Burger, A., Link, B. (2013). The impact of obesity on U.S. mortality levels: the importance of age and cohort factors in population estimates. *American Journal of Public Health*, 103(10):1895-1901.

McGuire, M., Wing, R., Klem, M., Hill, J. (1999). Behavioral strategies of individuals who have maintained long-term weight losses. *Obesity Research*, 7:334–41.

McGuire, M., Wing, R., Klem, M, Lang, W., Hill, J. (1999). What predicts weight regain in a group of successful weight losers? *Journal of Consulting and Clinical Psychology,* 67(2):177-85.

Misquitta, R., Kitazono, R., Edwards, L. (2017). Health Achieved Through Lifestyle Transformation (HALT): the power of lifestyle to reverse chronic disease. *The Permanente Journal,* 21(4): Retrieved from https://doi.org/10.7812/TPP/17-140-01

Montesi, L., El Ghoch, M., Brodosi, L., Calugi, S., Marchesini, G., Dalle Grave, R. (2016). Long-term weight loss maintenance for obesity: a multidisciplinary approach. *Diabetes: Metabolic Syndrome and Obesity,* 9:37–46.

Muniraj, T. (2014). Public Health Practice in Communities. In D. Katz, J. Elmore, D. Wild, & S. Lucan (4th Ed.), *Jekel's Epidemiology, Biostatistics, Preventive Medicine, and Public Health,* (pp. 318-333). Retrieved from https://www-clinicalkey-com.kaiserpermanente.idm.oclc.org/#!/content/book/3-s2.0-B9781455706587000268?scrollTo=%23s0015

National Committee for Quality Assurance (2019). Adult BMI Assessment. https://www.ncqa.org/hedis/measures/adult-bmi-assessment/

National Health, Lung and Blood Institute (2013). *Managing overweight and obesity in adults. Systematic evidence reviews from the Obesity Expert Panel, 2013.* U.S. Department of Health and Human Services, National Institutes of Health. https://www.nhlbi.nih.gov/sites/default/files/media/docs/obesity-evidence-review.pdf

Nemeth, L., Rice, L., Potts, M., Melvin, C., Jefferson, M., Hughes-Halbert, C., (2017). Priorities and Preferences for weight management and cardiovascular risk reduction in primary care. Family and Community Health, 40(3):245-252. doi: 10.1097/FCH.0000000000000155.

Prentice, R., Aragaki, A., Howard, B., Chlebowski, R., Thomson, C., Van Horn, L., Tinker, L., Manson, J., Anderson, G., Kuller, L., Neuhouser, M., Johnson, K., Snetselaar, L., Rossouw, J. (2019). Low-fat dietary pattern among postmenopausal women influences long-term cancer, cardiovascular disease, and diabetes outcomes. *The Journal of Nutrition*, 149(9):1565-1574. Retrieved from https://doi-org.kaiserpermanente.idm.oclc.org/10.1093/jn/nxz107

Rackow, P., Scholz, U., Hornung, R. (2015). Received social support and exercising: an intervention study to test the enabling hypothesis. British Journal of Health Psychology, 20(4):763-776.

Rikke, A., Smedsrod, M., Nes, L., Wentzel, J., Varsi, C., Hjelmesaeth, J., van Gemert-Pijnen, J. (2019). Persuasive system design principles and behavior change techniques to stimulate motivation and adherence in electronic health interventions to support weight loss maintenance: scoping review. *Journal of Medical Internet Research,* 21(6):e14265.

Riley, W., Martin, C., Rivera, D., Hekler, E., Adams, M., Buman, M., …, King, A. (2016). Development of a dynamic computational model of social cognitive theory. Translational Behavioral Medicine, 6(4), 483–495. doi: 10.1007/s13142-015-0356-6

Ritter, P., Long, K. (2014). The English and Spanish self-efficacy to manage chronic disease scale measures were validated using multiple studies, *Journal of Clinical Epidemiology*, 67(11):1265-1273.Safdie, M., Cargo, M., Richard, L., Lévesque, L. (2014). An ecological and theoretical deconstruction of a school-based obesity prevention program in Mexico. *The International Journal of Behavioral Nutrition and Physical Activity,* 10(11), 103. doi: 10.1186/s12966-014-0103-2Silveira, S., LaVoy, E., Johnston, C. (2016). Assisting the novice in lifestyle change. *American Journal of Lifestyle Medicine,* 10(3):178-180.

Silveira, S. L., LaVoy, E. C., & Johnston, C. A. (2016). Assisting the Novice in Lifestyle Change. American journal of lifestyle medicine, 10(3), 178−180. https://doi.org/10.1177/1559827616629913

Smith, E., Bradbury, K., Scott, L., Steele, M., Little, P., Yardley, L. (2017). Providing online weight management in Primary Care: a mixed methods process evaluation of healthcare practitioners' experiences of using and supporting patients using POWeR. Implementation Science, 12(1):69. doi: 10.1186/s13012-017-0596-6.

Stamp, K., Dunbar, S., Clark, P., Reilly, C., Gary, R., Higgins, M., Ryan, R. (2015). Family partner intervention influences self-care confidence and treatment self-regulation in patients with heart failure, European Journal of Cardiovascular Nursing, 315(5), 317-327. Retrieved from https://doi-org.kaiserpermanente.idm.oclc.org/10.1177/1474515115572047

Stenius-Aarniala, B., Poussa, T., Kvarnstrom, J., Gronlund, E., Ylikahri. M., and Mustajoli, P. (2000). Immediate and long-term effects of weight reduction in obese people with asthma: randomized controlled study. *BMJ,* 320(7238): 827-832. Retrieved from https://www-ncbi-nlm-nih-gov.kaiserpermanente.idm.oclc.org/m/pubmed/10731173/?i=2&from=stenius%20aarniala%20and%20%22diet%22

Strychar, I., Elisha, B., Schmitz, N. (2012). Type 2 diabetes self-management: role of diet self-efficacy. Canadian Journal of Diabetes, 36(6): 337-344. Retrieved from https://www-clinicalkey-com.kaiserpermanente.idm.oclc.org/#!/content/journal/1-s2.0-S1499267112008106?scrollTo=%23hl0000455

Tanvir, A. (2014, December 6). Social Learning Theory. [Website] Retrieved from https://www.slideshare.net/anamtanvir5/social-learning-theory-42421469

Thomas, J., Bond, D., Phelan, S., Hill, J., Wing, R. (2014). Weight-loss maintenance for 10 years in the National Weight Control Registry. *American Journal of Preventive Medicine*, 46:17–23.

Varkevisser, R., van Stralen, M., Kroeze, W., Ket, J., Steenhuis, I. (2018). Determinants of weight loss maintenance: a systematic review. Obesity Reviews, 20:171-211.

Vinney, C. (2019, January 20). Social cognitive theory: how we learn from the behavior of others. [Web post]. Retrieved from https://www.thoughtco.com/social-cognitive-theory-4174567

Williams, L. T., Collins, C. E., Morgan, P. J., Hollis, J. L. (2019). Maintaining the outcomes of a successful weight gain prevention intervention in mid-age women: two year results from the 40-something randomized control trial. *Nutrients*, 11(5):1100. doi:10.3390/nu11051100

Williams, G. C., Freedman, Z. R., & Deci, E. L. (1998). Supporting autonomy to motivate patients with diabetes for glucose control. Diabetes care, 21(10), 1644–1651. https://doi-org.kaiserpermanente.idm.oclc.org/10.2337/diacare.21.10.1644

Williams, G. C., Grow, V. M., Freedman, Z. R., Ryan, R. M., & Deci, E. L. (1996). Motivational predictors of weight loss and weight-loss maintenance. Journal of personality and social psychology, 70(1), 115−126. https://doi-org.kaiserpermanente.idm.oclc.org/10.1037//0022-3514.70.1.115

Williams, G. C., McGregor, H. A., King, D., Nelson, C. C., & Glasgow, R. E. (2005). Variation in perceived competence, glycemic control, and patient satisfaction: relationship to autonomy support from physicians. Patient education and counseling, 57(1), 39−45. https://doi-org.kaiserpermanente.idm.oclc.org/10.1016/j.pec.2004.04.001

Wing, R., Espeland, M., Clark, J., Hazuda, H., Knowler, W., Pownall, H., Unick, J., Wadden, T., Wagenknecht, L., Action for Health in Diabetes (Look AHEAD) Study Group (2016). Association of weight loss maintenance and weight regain on 4-year changes in CVD risk factors: the action for health in diabetes (Look AHEAD) clinical trial. *Diabetes Care*, 39:1345-1355. Retrieved from https://care-diabetesjournals-org.kaiserpermanente.idm.oclc.org/content/39/8/1345.long

Wing, R., Hill, J. (2001). Successful weight loss maintenance. *Annual Review of Nutrition,* 21:323–41.

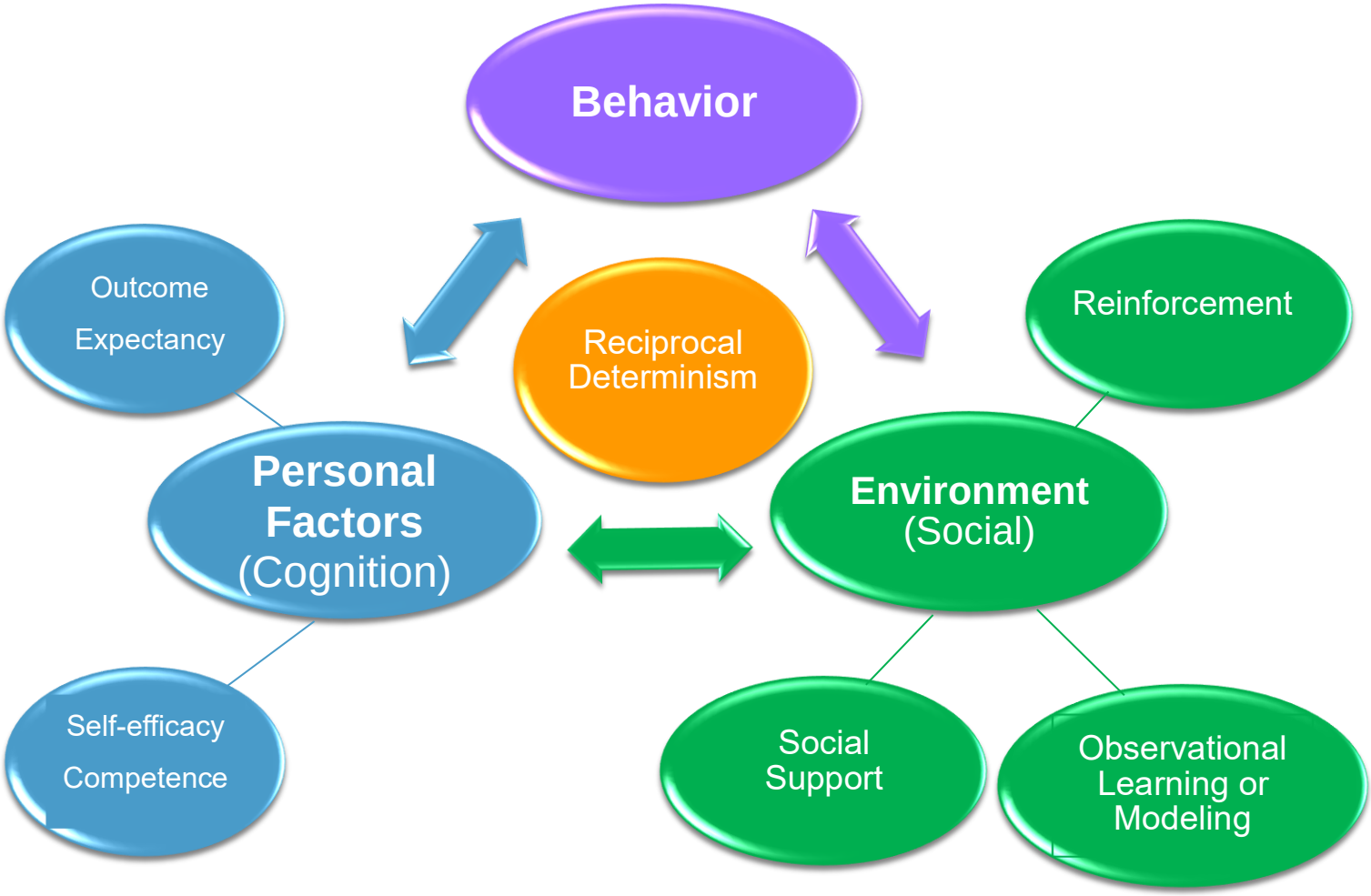
Wing, R., Phelan, S. (2005). Long-term weight loss maintenance. *American Journal of Clinical Nutrition,* 82(1 Suppl):222–5.

Young, M., Plotnikoff, R., Collins, C., Callister, R. & Morgan, P. (2014). Social cognitive theory and physical activity: a systematic review and meta-analysis. Obesity Reviews, 15:983-995. doi: 10.1111/obr.12225

Appendix A

Theoretical Framework

Bandura's Social Cognitive Theory



Appendix B

Weight Loss Follow-Up Protocol

	Lifestyle Medicine Department	**Protocol #**	LM SSC
	South Sacramento	**Revision #**	N/A
	TITLE: Weight Loss Follow-Up Protocol	**Implementation Date**	March 2020
Page 1	1 of 2	**Last Reviewed/Update Date**	March 2020
Author	Catherine Nitafan-Young, FNP	**Approval**	

1. Purpose

The purpose of this Weight Loss Follow-up Protocol at the South Sacramento Medical Office Building (MOB) is to describe the procedures to be followed when patients who have completed or nearly completed an intensive weight loss program (e.g., Medical Weight Management [MWM] program) are referred back to their primary care providers (PCPs) and/or clinical health educators (CHEs).

Describe relevant background information.

2. Scope

This protocol is targeted for primary care providers in the Adult and Family Medicine Department and the CHEs in the Lifestyle Medicine Department at the South Sacramento MOB. Staff who assist these PCPs should be familiar with this as well.

3. Prerequisites

Primary care providers (PCPs) and CHEs who have patients who have completed an intensive weight loss program can participate in this protocol.

4. Responsibilities

The lead physicians from intensive weight loss programs involved with the Lifestyle Medicine Department will be responsible for informing the primary care providers and CHEs at South Sacramento MOB when their patients have completed the programs. PCPs or CHEs will follow-up with patients after receiving the information. The lead Clinical Health Educator (CHE) for each intensive weight loss program will the liaison between the physicians in the intensive weight loss programs and the PCPs. The CHEs are members of the Lifestyle Medicine Department.

5. Procedure

The steps involved in this protocol are as follows:

A. Obtain information from Lifestyle Medicine physician regarding a patient who has completed an intensive weight loss program.

B. Follow-up with patient by email, phone, video or clinic appointment to acknowledge patients' accomplishment and their improved health and to provide support to maintain the current weight.

1) Sample:

a) Initial email to patient: Congratulations, (Patient name)! I was informed that you successfully reduced your weight from XXX (baseline) pounds to XXX (program completion) pounds after participating in Kaiser's program. I was also thrilled to learn that you have been able to reduce or stop taking medication for high blood pressure and/or diabetes because of your hard work!

Appendix B (continued)

Weight Loss Follow-Up Protocol

	Lifestyle Medicine Department	**Protocol #**	LM SSC
	South Sacramento	**Revision #**	N/A
	TITLE: Weight Loss Follow-Up Protocol	**Implementation Date**	March 2020
Page 1	2 of 2	**Last Reviewed/Update Date**	March 2020
Author	Catherine Nitafan-Young, FNP	**Approval**	

Now, you have the tools to maintain your weight. Keep up the great work! Let me know if there is anything I can do to assist you in maintaining your goal weight.

2) If a patient has gained weight since completion of their program and the follow-up, send an email to provide support for maintaining their weight.
   a) Follow-up email to patient: It sounds like it has been a challenge to maintain your weight. I know you can get back on track and reach your goals! Please reconnect with your weight loss program. I have partnered with Lifestyle Medicine and the health educators to help you reach your goals.

C. Any patient who has gained more than 5 lbs. over their lowest weight should receive follow-up contact (by email, phone, video or clinic visit) and advised to follow-up with their Lifestyle Medicine program.

6. References

Annesi, J., Johnson, P., Tennant, G., Porter, K., McEwen, K. (2016). Weight loss and the prevention of weight regain: evaluation of a treatment model of exercise self-regulation generalizing to controlled eating. The Permanente Journal, 20(3): 15-146. Retrieved from http://dx.doi.org/10.7812/TPP/15-146

7. Definitions

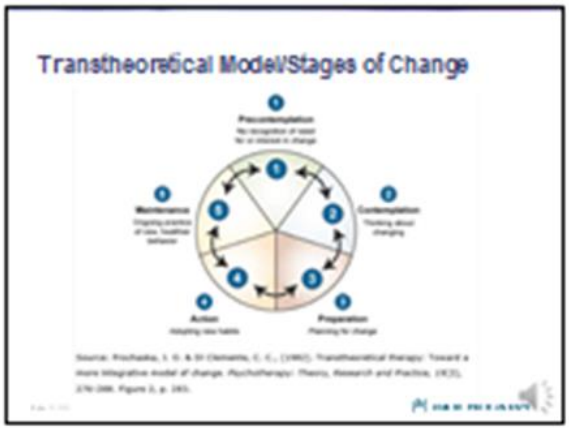
Lifestyle Medicine: department in South Sacramento Medical Facility

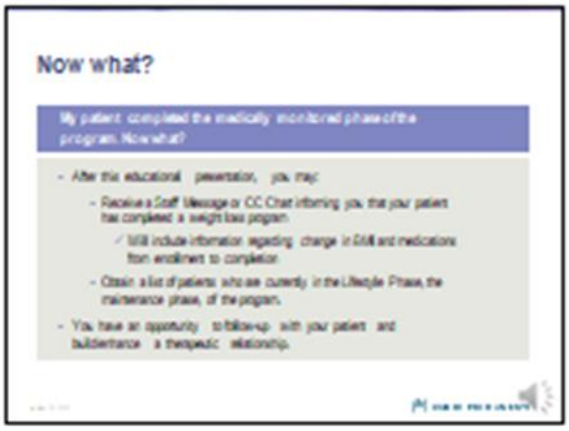
Intensive weight loss programs: programs hosted by the Lifestyle Medicine Department, such as Medical Weight Management and Health Achieved through Lifestyle Transformation (HALT).

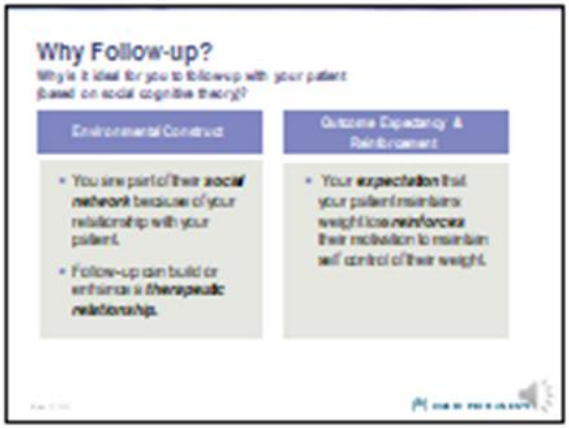
Medical Weight Management program: medically managed weight loss program incorporating an active weight loss phase of 16 weeks of meal replacements with transition to regular food and a maintenance phase of at least 66 weeks afterwards.

Appendix C

Educational Presentation to PCPs

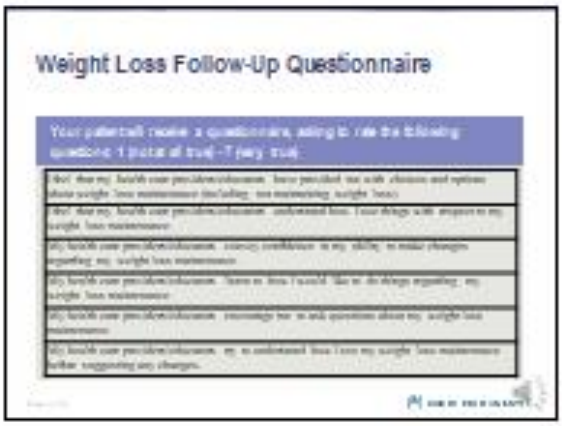






Appendix C (continued)

Educational Presentation to PCPs



Appendix D

Weight Loss Follow-Up Knowledge Assessment (Post-test for PCPs/CHEs)

Name: _____ Date: _____

Weight Loss Follow-Up Knowledge Assessment Post-Test: Please circle the correct answer (Questions 2-10).

_____ **1**. Rank the following stages of change in order of occurrence (starting with 1 to 5):

_____a. Contemplation
_____b. Preparation
_____c. Precontemplation
_____d. Maintenance
_____e. Action

_____ 2. Which theory best describes the role primary care providers (PCPs) and clinical health educators (CHEs) play in the process of behavior change in individual patients?

a. The Transtheoretical Model
b. The Health Belief Model
c. Social Cognitive Theory
d. The Social Ecological Model

_____ 3. Which tenet of the theory relates to social networks?

a. Outcome Expectancy and Reinforcement
b. Environmental Construct
c. Reciprocal Determinism
d. Personal factors

_____ 4. What is believed to improve with increasing engagement by PCPs and CHEs with patients and conducting follow-up with patients regarding their recent weight loss?

a. confidence in maintaining weight loss
b. physical characteristics
c. confidence in PCP/CHE ability overall
d. decrease financial obligations to healthcare organization

_____ 5. A patient replies that he or she feels like a failure because he or she began gaining weight again after completion of his/her weight loss program. What is the *best* response?

a. Let's discuss what triggered you to start gaining weight again so we can develop a plan to avoid it in the future.
b. You understand that obesity contributes to the most common causes of death in the United States, correct?
c. Did you know that your insurance premiums will increase if you continue to gain weight?
d. My mother died last year of a heart attack due to her obesity.

_____ 6. What is the first step in the Weight Loss Follow-Up protocol?

a. Set-up a follow-up visit (telephone, office or video visit)
b. Refer the patient back to the Clinical Health Educator/Facilitator at their weight loss program.
c. Send a congratulatory email (or telephone call) to patient
d. Participate in an educational session about the protocol

_____ 7. You will need to provide intensive weight management education to patients regarding weight loss maintenance?

a. True
b. False

_____ 8. Based on the Weight Loss Follow-Up protocol, you will be required to follow-up with patients by scheduling an Office Visit with them.

a. True
b. False

_____ 9. Patients who have completed or nearly completed an intensive weight loss program will be given a questionnaire. What will the questions regarding PCPs/CHEs be assessing?

a. educational level reached in school
b. support from PCPs/CHEs in maintaining weight loss
c. competence in weight loss program curriculum
d. likeability of person

_____ 10. Patients will be asked, "My health-care providers/educators try to understand how I see my weight loss maintenance before suggesting any changes."

a. True
b. False

Appendix D (continued)

Weight Loss Follow-Up Knowledge Assessment (Answer Key for PCPs/CHEs)

1. Rank the following stages of change in order of occurrence (starting with 1 to 5):

_____a. Contemplation
_____b. Preparation
_____c. Precontemplation
_____d. Maintenance
_____e. Action

Answer: 2, 3, 1, 5, 4

_____ 2. Which theory best describes the role primary care providers (PCPs) and clinical health educators (CHEs) play in the process of behavior change in individual patients?

Answer: C

_____ 3. Which tenet of the theory relates to social networks?

Answer: B

_____ 4. What is believed to improve with increasing engagement by PCPs and CHEs with patients and conducting follow-up with patients regarding their recent weight loss?

Answer: A

_____ 5. A patient replies that he or she feels like a failure because he or she began gaining weight again after completion of his/her weight loss program. What is the *best* response?

Answer: A

_____ 6. What is the first step in the Weight Loss Follow-Up protocol?

Answer: D

_____ 7. You will need to provide intensive weight management education to patients regarding weight loss maintenance.

Answer: B

_____ 8. Based on the Weight Loss Follow-Up protocol, you will be required to follow-up with patients by scheduling an Office Visit with them.

Answer: B

_____ 9. Patients who have completed or nearly completed an intensive weight loss program will be given a questionnaire. What will the questions regarding PCPs/CHEs be assessing?

Answer: B

_____ 10. Patients will be asked, "My health-care providers/educators try to understand how I see my weight loss maintenance before suggesting any changes."

Answer: A

Appendix D (continued)

Weight Loss Follow-Up Knowledge Assessment (Pre-test for PCPs)

Name: _____ Date: _____

Weight Loss Follow-Up Pre-Test: Please circle the correct answer (Questions 2-5).

1. Rank the following stages of change in order of occurrence (starting with 1 to 5):
   _____a. Contemplation
   _____b. Preparation
   _____c. Precontemplation
   _____d. Maintenance
   _____e. Action

2. Which theory best describes the role primary care providers (PCPs) play in the process of behavior change in individual patients?
   a.The Transtheoretical Model
   b. The Health Belief Model
   c. Social Cognitive Theory
   d. The Social Ecological Model

3. Which tenet of the theory relates to social networks?
   a. Outcome Expectancy and Reinforcement
   b. Environmental Construct
   c. Reciprocal Determinism
   d. Personal factors

4. What is believed to improve with increasing engagement by PCPs with patients and conducting
   follow-up with patients regarding their recent weight loss?
   a. confidence in maintaining weight loss
   b. physical characteristics
   c. confidence in PCP ability overall
   d. decrease financial obligations to healthcare organization

5. A patient replies that he or she feels like a failure because he or she began gaining weight again, after completion of his/her weight loss program. What is the *best* response?
   a. Let's discuss what triggered you to start gaining weight again so we can develop a plan to avoid it in the future.
   b. You understand that obesity contributes to the most common causes of death in the United States, correct?
   c. Did you know that your insurance premiums will increase if you continue to gain weight?
   d. My mother died last year of a heart attack due to her obesity

Appendix E

Email samples for PCPs

ELGMWMFUGAIN (for patients who have gained weight since completing first 20 weeks)	Hi ***, I work with Dr. *** and the Medical Weight Management team. First of all, I'd like to congratulate you on your success during the Active Phase of the program! What a great accomplishment! How are you doing since starting the Lifestyle Phase? I'm sure it's been challenging to be sheltered in place. We are here to support your success. If you have any questions or concerns, please reply to this message. Also, we can schedule a phone appointment if you'd like to talk further. Stay well! ***
ELGMWMFULOSS (for patients who have lost weight since completing first 20 weeks)	Hi ***, I work with Dr. *** and the Medical Weight Management team. I'm writing to congratulate you on your weight loss since starting the Lifestyle Phase! What a great accomplishment! We are here to support your success. If you have any questions or concerns, please reply to this message. Also, we can schedule a phone appointment if you'd like to talk further. Keep up the great work! Stay well! ***
ELGMWMFULOSSUNKCURRENT (for patients who initialed lost weight after completing first 20 weeks and have no recent weights in the last 2 months)	Hi ***, I work with Dr. *** and the Medical Weight Management team. I'm writing to congratulate you on your documented weight loss since starting the Lifestyle Phase! What a great accomplishment!

	How are you doing now? Are you meeting your goal? We are here to support your success. We can schedule a phone appointment if you'd like to talk further. Keep up the great work! Stay well! ***
ELGMWMFUMAINTAIN (for patients who have maintained weight since completing first 20 weeks [may have about 5-6# cycling of weight])	Hi ***, I work with Dr. Ishihara and the Medical Weight Management team. I'm writing to congratulate you on maintaining your weight in the Lifestyle Phase! You're doing great! Is this meeting your goal? We are here to support your success. If you have any questions or concerns, please reply to this message. Also, we can schedule a phone appointment if you'd like to talk further. Keep up the great work! Stay well! ***
ELGMWMFUUNKNOWN (for patients who completed first 20 weeks but have no current weights afterwards or none in the last 2 months)	Hi ***, I work with Dr. Ishihara and the Medical Weight Management team. I'm writing to congratulate you on your weight loss through the program! What a great accomplishment! How are you doing since starting the Lifestyle Phase? Are you meeting your goal? We are here to support your success. If you have any questions or concerns, please reply to this message. Also, we can schedule a phone appointment if you'd like to talk further. Stay well! ***

Appendix F

Protocol Adherence Data (Data Collection Sheet)

Primary Care Provider's ID	Patient ID	Follow-up Done (Yes/No)		Method of Contact (Email, Phone Call, Office/Video Visit or Other)				
		Yes	No	Email	Phone	Office	Video	Other

Appendix G

Weight Loss Follow-Up Questionnaire (Patient Survey)

1. What is your gender?
   - Female
   - Male

2. What is your age?
   - 18-25
   - 26-35
   - 36-45
   - 46-55
   - 56-65
   - 66+

3. What is your ethnicity?
   - Caucasian/White
   - African American/Black
   - Hispanic
   - Asian
   - Pacific Islander/Native Hawaiian
   - Other

4. What is your current weight?

   _____ pounds

5. What is the name of your Lifestyle Medicine program?
   - Medical Weight Management
   - HALT (Health Achieved Through Lifestyle Transformation)
   - Other

6. How many weeks have you completed in your program?

   _____ weeks

7. When did you finish the active weight loss phase of your program?

   Date: _____

8. Have you heard from your Primary Care Physician/Provider regarding your Lifestyle Medicine Program?
   - Yes
   - No

9. If yes, how did you communicate?
   - By phone
   - By Video Visit
   - By Message in kp.org
   - In person
   - Other

Appendix G (continued)

10. In the following table, please rate the following questions:
(1 = Not at all true, 4 = Somewhat true, and 7 = Very true)

Question	1	2	3	4	5	6	7
I feel that my health-care practitioners have provided me with choices and options about weight loss maintenance (including not maintaining weight loss).							
I feel my health-care providers understand how I see things with respect to my weight loss maintenance.							
My health-care providers convey confidence in my ability to make changes regarding my weight loss maintenance.							
My health-care practitioners listen to how I would like to do things regarding my weight loss maintenance .							
My health-care practitioners encourage me to ask questions about my weight loss maintenance .							
My health-care practitioners try to understand how I see my weight loss maintenance before suggesting any changes.							

11. In the following table, please rate the following questions:
(1 = Not confident at all, 4 = Somewhat confident, and 7 = Extremely Confident)

Question	1	2	3	4	5	6	7
I feel confident in my ability to maintain weight loss.							
I now feel capable of maintaining weight loss.							
I am able to maintain weight loss over the long term.							
I am able to meet the challenge of maintaining weight loss.							

Appendix H

Project Approval by Director of Lifestyle Medicine

Catherine Nitafan-Young, DNP candidate, has approval to conduct the Weight Loss Follow-up Protocol at Kaiser South Sacramento, Department of Lifestyle Medicine.	
DATE	LISA EDWARDS, MBA, Program Director, Lifestyle Medicine
2-10-20	Lisa Edwards