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A Small-Change Approach to Weight Loss In Obese Adult Patients: A Research Translation Project

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A Small-Change Approach to Weight Loss

In Obese Adult Patients:

A Research Translation Project

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Abstract

Obesity is a major health threat in the United States. Excess weight can have devastating effects on an individual's overall health and well-being. This research translation project utilized the 12-week small-change approach to weight loss as an intervention, which is shown to be feasible and beneficial for weight loss. This intervention has been successful in the ASPIRE-VA pilot study with 14 sedentary, obese middle-aged male and female veterans (Damschroder, Lutes, Goodrich, Gillon, & Lowry, 2009). For this project the intervention was implemented in a family practice office in Gardner, Massachusetts. Ten female, predominantly Caucasian, participants volunteered to participate in this project in response to mailings and office flyers that were used to recruit eligible participants. The results included a significant weight loss in pounds, decrease in BMI, decreased waist circumference (in inches), and a decrease in systolic blood pressure readings. There was also a significant decrease in consumption of fast food at 12 weeks compared to baseline. Satisfaction with life scores increased post-intervention compared to pre-intervention. There was no significant change in fruit and vegetable consumption from baseline to 12 weeks. Although there was not a significant change observed in consumption of sugary sweetened beverages, most participants did not drink these beverages at baseline. There was no significant change in SF-12 health survey results pre-and post-intervention. There was no significant change in number of days per week an individual ate breakfast or exercised. Further studies are needed on weight loss interventions that are feasible in primary care patient settings.

Keywords: Obesity, Weight loss, BMI, healthy living, small changes

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Introduction

The problem being addressed in this research translation project is adult obesity in the United States. Obesity is a growing problem in the United States, which leads to many devastating adverse effects on an individual's health. The incidence of obesity continues to rise and contributes to a large portion of annual health care costs. Since this condition is largely preventable through diet and exercise, it is important to make increasing efforts to promote weight loss in primary care. The purpose of this research translation project was to promote weight loss among obese adult patients in a local community primary care practice. This was done by translating research from the ASPIRE-VA pilot study, which is a 12-week intervention using a small-change approach to weight loss (Damschroder, Lutes, Goodrich, Gillon, & Lowry, 2009).

Background and Significance

Obesity is an epidemic in the United States. According to the CDC (2013), data from 2009-2010 shows that the percent of adults ages 20 and older who are overweight or obese in the United States is 69.2%. Sharp (2013) claims "the adult obesity rate so far in 2013 is 27.2%, up from 26.2% in 2012, and is on pace to surpass all annual average obesity rates since Gallup-Healthways began tracking in 2008" (para. 1). Sharp further explains that obesity is increasing among all demographic groups. An individual is considered overweight if their BMI is between 25 and 29.9 and obese if their BMI is 30 or above (CDC, 2012).

Excess weight can lead to many adverse health outcomes. The Surgeon General (2001) discusses that overweight and obesity should be viewed differently by individuals as an issue related to health consequences and not outward appearance. The Surgeon General further lists some of the devastating health effects from excess weight, such as premature death, heart

disease, diabetes, cancer, breathing problems, arthritis, and reproductive complications. The Surgeon General claims “randomized controlled trials have shown that weight loss (as modest as 5 to 15% of excess total body weight) in a person who is overweight or obese, reduces the risk factors for some diseases, particularly cardiovascular disease, in the short term” (U.S. Department of Health & Human Services, 2001, p. 14).

In addition to adverse health outcomes, obesity contributes to a large percentage of health care costs each year. According to the American Heart Association (2013) “If current trends in the growth of obesity continue, total healthcare costs attributable to obesity could reach \$861 to \$957 billion by 2030, which would account for 16% to 18% of US health expenditures” (p. 2). These statistics may even be underestimated since obesity is known to be a contributing factor to many health problems.

Literature Review

Causes of Obesity

In order to effectively promote weight loss, it is important to first understand the causes of obesity. The major categories of causal factors for obesity are genetics, metabolism, environment, behavior, and culture. These factors are often interrelated so it is important to take these factors into consideration when implementing interventions for weight loss. This research translation project mainly focused on motivation to change the behavioral aspects of obesity.

A literature search was conducted using the CINAHL and PubMed databases. CINAHL was searched using the key terms *obesity and genetics, obesity and energy metabolism, obesity and environment, obesity/etiology and behavior, and obesity and culture*. Inclusion criteria included full text research articles between the years 2009 to 2014. The PubMed database was searched using the same inclusion criteria of full text research articles between the years of 2009-

2014. PubMed was searched using the MeSh terms *Genetics, Environment and Social Environment, Behavior and Health behavior, and Culture*. Each MeSh term was searched with the addition of the words *obesity* or *cause of obesity*. After reviewing each article for relevancy, 24 articles were included in this review.

Genetics. Specific genes associated with obesity have been identified through genotyping, such as the fat mass and obesity-associated gene (FTO), which is the most common obesity-related gene identified in recent literature. This susceptibility to obesity may even begin at infancy for individuals with the FTO gene (Kipelainen et al., 2011) and be present in adolescence (Liem et al., 2010). Other studies have continued to show an association between the FTO gene and obesity (Day & Loos, 2011; Hagberg et al., 2011; Hassanein et al., 2010). Although an individual may have this gene, diet and exercise is shown to help counteract this genetic component (Day & Loos, 2011; Hagberg et al., 2011; Silventoinen et al., 2009; Vimalaewaren et al., 2009).

Metabolism. Metabolism is another causal factor for obesity. Resting metabolic rate (RMR) is the amount of energy an individual utilizes at rest. This rate is different for each individual and is largely determined by fat-free mass. Cauldwell et al. (2013) show an association between RMR and energy intake, claiming it could represent a physiologic sign for hunger. Therefore, those with a higher RMR will eat larger portions and be hungrier than those with low RMR.

Some research shows different metabolic responses to certain diets. Following the introduction of a high fat diet, Jackman, MacLean, & Bessessen (2010) show that some rats have the ability to increase total energy expenditure (TEE), while other rats do not. Nadkarni et al. (2013) further investigates this phenomenon and determines that some rats are sensitive or

resistant to high carb diets as well. Low fat, high carb diets show greater visceral fat accumulation compared to high fat diets.

A number of studies exist on physical activity and its effects on energy expenditure. Swartz, Squires, & Strath (2011) report that making small changes, even as little as taking a 5-minute walking break for every hour of sedentary activity can be beneficial for long-term weight loss. A secondary analysis of an 18 month RCT claims that variety of physical activity is related to greater long-term energy expenditure for moderate-to-vigorous physical activity (Raynor, Bond, Steeves, & Thompson, 2014).

Each individual may respond to diet and physical activity differently due to differences in metabolism. Those that experience more hunger may actually have an increased RMR. Some individuals may experience weight loss on a particular diet while another does not. Therefore, weight loss interventions should be tailored to the individual client. In regards to physical activity, small changes in physical activity and encouraging a variety of activities is beneficial to weight loss.

Behavior. An individual's dietary choices and intake is a behavior that can have a major effect on weight status. As it is commonly known, weight gain occurs when the energy intake exceeds energy expenditure. One dietary behavior that is presented in recent literature is drinking sweet, sugary beverages (SSB). One study analyzed data from an 18 month RCT with 810 adult participants to determine the association between liquid calories and obesity (Chen et al., 2009). A reduction in liquid calories was significantly associated with weight loss at 6 months and 18 months. The weight loss effect was stronger with a reduction in liquid calories vs. calories from solid food (Chen et al., 2009). For individuals who consume a large amount of liquid calories,

health care practitioners may tailor their weight loss plan to include reduction of SSB and increase in low or no-calorie beverages.

Other behavioral factors that may influence the development of obesity include internal stress. Internal distress, especially during childhood, may lead to obesity later in life. The Adverse Childhood Experiences (ACE) study is a study that emerged following a high dropout rate from an obesity program in the 1980's (Felitti, 2002). Most of the individuals that dropped out were successfully losing weight. A theme emerged from interviewing these individuals that adverse life events in early childhood was a major causal factor in their development of obesity. Emotional eating and obesity is actually a protective, coping mechanism for these individuals (Felitti, Jakstis, Pepper, & Ray, 2010). Therefore, it may be beneficial to discuss the client's history of obesity and identify the root cause in order to effectively promote weight loss.

Environment. An individual's physical and social environment may have an influence on weight. An individual's neighborhood can affect whether or not the individual is physically active due to factors such as neighborhood walkability and favorable social environments. Even the composition of stores and restaurants within a neighborhood can affect an individual's weight.

The physical layout of a neighborhood may determine the likelihood of an individual to be physically active outside of the home. An Australian cross-sectional study found the likelihood of meeting or exceeding activity recommendations on walking were higher in neighborhoods with greater street connectivity and residential density, more street lights and bikeways, less tree coverage and close to waterways (Wilson et al., 2011). Even an individual's perception of their neighborhood environment can affect physical activity levels and subsequent

obesity. A multi-ethnic study found that unfavorable perceptions of environment physical conditions are related to increased obesity (Powell-Wiley et al. 2013).

Access to various food sources can also have an effect on an individual's weight through dietary intake. Research shows that fast food restaurants and small grocery or convenience stores have a positive association with obesity while supermarkets are not associated with obesity. One study of residents from 120 neighborhoods in Oregon found that neighborhoods with a higher fast food density have a strong association with obesity, increased fast food intake, and not meeting physical activity recommendations (Li, Harmer, Cardinal, Bosworth, & Johnson-Shelton, 2009). Fast food restaurants and convenience stores are significantly associated with obesity in older adults in a large sample of adults in New Jersey, while supermarkets do not have an association with obesity (Pruchno, Wilson, Genderson, & Gupta, 2014). Small grocery stores are significantly and positively associated with obesity and BMI in a secondary analysis of a longitudinal study (Gibson, 2011). Having access to BMI-healthy food stores is associated with lower BMI and lower prevalence of obesity in a large study of adults in New York City (Rundle et al., 2009).

An individual's surroundings play an important role in weight management. Individuals with a favorable social environment, safe physical surroundings conducive to physical activity, and more supermarkets as opposed to small convenience stores and fast food restaurants are more likely to engage in physical activity and maintain a healthy weight. When implementing weight loss interventions, it may be beneficial to assess an individual's environmental surroundings and its potential effect on dietary habits and physical activity. For example, an individual who lives in a neighborhood that is not conducive for outside walking, may be encouraged to exercise in the home via exercise videos, a home treadmill, or to join a local gym.

Culture. An individual's health status is greatly influenced by cultural beliefs and practices. Data from a large sample of multi-cultural individuals from the US shows that a person is more likely to comply with doctor's recommendations when the individual feels the provider is more attentive to their patients (Basanez, Blanco, Collazo, Berger, & Crano, 2013). Hispanic and African Americans perceived doctors as less attentive than Caucasians, but this study does not have any objective measures for how physicians convey respect. Individuals are more likely to be motivated to change health behaviors when their health care provider shows respect and attentiveness, which includes taking into consideration their cultural needs.

Cultural beliefs and practices may also affect an individual's weight and BMI due to cultural beliefs or preferences' regarding what is considered "normal" weight. Some cultures even view excess weight as "normal" or "ideal". Hispanic/Latinos view greater body sizes as ideal vs European Americans in a study of adolescents (Ceballos & Czyzewska, 2010). The concept of BMI is not widely accepted by African Americans. When African Americans are overweight or obese, they are less likely to know what their normal weight recommendations are and many reported not getting any medical advice regarding their weight (Lopez et al., 2014). A family food decision-making survey of Canadian Families found that most women are aware of the risks of obesity. However, black women are more likely to feel ideal weight portrayed in the US is too thin and unhealthy (Ristovski-Slijepcevic, Bell, Chapman, & Beagan, 2010). It is important for healthcare providers to consider cultural preferences when caring for clients. Given this information, it may be beneficial to discuss personal perceptions of their "ideal weight" and involve the client in setting their own weight loss goals that are suitable to their beliefs.

Small Changes

Sometimes it only takes small changes in physical activity level and/or dietary changes for an individual to experience weight loss that will be long-lasting. Small changes tend to lead to long-lasting lifestyle changes. The ASPIRE-VA pilot study used a small-change approach to weight loss. Damschroder et al. (2009) conducted a 12-week weight loss intervention that consisted of three in-person sessions and nine telephone sessions. Each participant was given a pedometer and food logs and assisted by a weight loss coach to determine small changes in dietary and/or physical activity each week. Each coaching session lasted less than eight minutes. The individual who conducted each session was trained to use a non-judgmental, patient-centered form of counseling to assist each participant in goal setting. This training is consistent with a motivational interviewing (MI) style since the coaches were encouraged to use “open-ended questions, reflective listening, and positive affirmations” (Damschroder et al., 2009, p. 263).

MI is an evidence-based intervention that is used in healthcare to motivate lifestyle behavioral changes. MI focuses on patient autonomy and collaboration between the provider and patient to enhance intrinsic motivation for a specific behavior change. It was originally developed for use as an intervention for substance abuse therapy, but has recently shown effectiveness in primary care settings for promotion of weight loss (Armstrong et al., 2011; Hardcastle, Taylor, Bailey, Harley, & Hagger, 2013, Pollack et al., 2010; Thompson et al., 2011). The American Heart Association (AHA) recommends the use of MI to assess readiness to change and to promote weight loss in overweight and obese adults in ambulatory settings (Rao et al., 2011).

Telephone Interventions

Since the ASPIRE-VA pilot study is a weight loss intervention with the majority of the intervention implemented via telephone, a literature search was conducted to determine the effectiveness of telephone interventions for weight loss. The CINAHL and PubMed databases were searched for full text articles between 2009 to 2014 using the search terms *telephone* and *weight loss*. The CINAHL and PubMed database searches yielded a total of 261 articles. After reviewing articles for relevancy, seven articles were included in this review.

Telephone counseling sessions are shown to be beneficial for weight loss. Damschroder et al. (2014) conducted a three-arm 12-month RCT with 481 overweight/obese individuals from two mid-western Veteran's Affairs (VA) medical centers. Participants in all three arms lost significant weight at 12 months. However, the in-person group intervention resulted in more overall weight loss than the telephone intervention. In contrast, Pellegrini et al. (2011) implemented a six month RCT with 51 overweight/obese adults randomly assigned to one of three groups (one technology-based intervention, one in-person weight loss intervention, and one combination group). Those who participated in the technology-based intervention with monthly telephone calls produced similar, if not greater, overall weight loss than the standard in-person intervention. The telephone intervention has lower cost, but similar outcomes compared to face-to-face format. Another telephone wellness coaching intervention showed small, but consistent weight loss results for 1, 050 obese individuals (Tao et al., 2014). Although in-person sessions may result in more significant overall weight loss, telephone coaching sessions do result in some weight loss and are more cost-effective.

Promoting weight loss through an intervention primarily via telephone is cost-effective compared to face-to-face sessions. Radcliff et al. (2012) conducted a 12-month RCT with 215 female participants over the age of 50 who recently completed an initial 6-month lifestyle

program for weight loss. Participants were randomized to a telephone intervention vs. face-to-face intervention. The results found that both interventions produced similar results, but the telephone intervention cost less.

Some studies have shown significant weight loss through telephone counseling. Sherwood, Jeffrey, Welsh, VanWormer, & Hotop (2010) conducted the Drop it at Last (DIAL) study which is a 6-month RCT randomizing participants to either self-directed treatment, 10 coaching sessions, or 20 coaching sessions. Those who completed 10 or more sessions lost more weight than those who completed four or fewer sessions. This study concluded that telephone programs are associated with modest overall weight loss. Lutes et al. (2012) implemented a 3-month small change telephone intervention for 25 obese adult women in a medium-sized Southwestern University. As a result of the small change intervention, participants achieved clinically significant overall weight loss.

Telephone coaching may be beneficial for maintenance of weight loss as well as for initial weight loss efforts. Sherwood et al. (2011) conducted a larger scale study in which 419 adults who had intentionally lost at least 10% of their body weight during the previous year were eligible and randomized to either a self-directed intervention (two phone sessions and a weight loss book) vs a guided intervention (10 coaching sessions). The study suggests that telephone-based counseling may be suitable for a maintenance-focused intervention due to its flexibility and relatively low intensity.

This literature review shows that a telephone-based weight loss intervention is cost-effective and feasible to promote small to moderate weight loss in obese adults. Although face-to-face coaching sessions may result in greater weight loss, some studies have shown that the

weight loss is comparable to results in telephone interventions where there are 10 or more sessions. Telephone counseling is also shown to be effective for maintenance of weight loss.

Theoretical Framework

A theoretical foundation for weight loss in obese adult patients correlates well with the theory of self-efficacy. Self-Efficacy is when a person's confidence in their ability determines whether coping mechanisms will be used, how much effort they will put forth, and how long it will be sustained in the face of obstacles and unpleasant experiences (Bandura, 1977).

Damschroder et al. (2009) uses a measure of self-efficacy prior to the weight loss intervention to establish participant's self-confidence to be physically active. This same measure of self-efficacy was used at the initial session for this capstone project. Marcus et al. (2002) found this self-efficacy measure to be highly reliable. It was hypothesized that participants who have a higher self-efficacy for physical activity will be more likely to engage in physical activity, complete the 12-week intervention, and result in greater weight loss than those with lower scores on the self-efficacy measure.

There are four fundamental elements in developing self-efficacy: successful performance, vicarious experience, verbal persuasion, and emotional arousal (Bandura, 1977). Successful accomplishments enhance self-efficacy whereas failure adversely affects and individual's self-efficacy. In order to develop self-efficacy, an individual should set goals that are attainable. This intervention used weekly small, realistic goals. This gave the opportunity for the individual to successfully accomplish goals each week, which was more likely to enhance their self-efficacy throughout the 12-week intervention. Participants were also asked about previous weight loss efforts, which correlated well with self-efficacy. Successful performance accomplishments raise an individual's mastery expectations while repeated failures lower them (Bandura, 1977).

Consequently, an individual who has had successful weight loss attempts in the past may be more likely to lose weight than those with repeated past failures.

Vicarious experience is the learning of a new skill through a model or template. In this intervention, participants were given the resources they needed to set realistic goals (pedometer, Stoplight food guide, weekly food logs). Participants were educated on how to use these resources to set and attain their goals.

Verbal persuasion is the use of encouragement and positive feedback to enhance confidence in one's ability to accomplish a goal. According to Bandura (1977) "people are led, through suggestion, into believing they can cope successfully with what has overwhelmed them in the past" (p.198). The DNP student used positive feedback and encouragement throughout the intervention to enhance self-efficacy. The small-change weekly, cumulative goals provided a great opportunity to give positive feedback and encouragement on a weekly basis. Rather than focusing on negatives, positive feedback was used to enhance motivation. For example, if a participant did not attain their current weekly goal but maintained the previous week's goal, the DNP student acknowledged the maintenance of the previous week's goal rather than focusing on the goal that was not achieved.

Another factor in developing self-efficacy is emotional arousal. Individuals rely on their emotional state when assessing their abilities. The Satisfaction with Life Scale was used to assess the individual's overall emotional well-being. Individuals with higher satisfaction with life scores were more likely to have more confidence in their abilities to attain weight loss goals. Those with lower satisfaction with life scores needed more verbal persuasion to accomplish their goals. These scores were assessed before and after the intervention to assess whether their satisfaction with life changes as they progress through this intervention.

This theoretical framework was used throughout the intervention. Successful performance, vicarious experience, verbal persuasion, and emotional arousal are the four fundamental elements in the development of self-efficacy. These elements were addressed in weekly phone sessions between the DNP student and the individual participant.

Methods

A research translation project was conducted using the Plan-Do-Study-Act (PDSA) format recommended by the Agency for Healthcare Research and Quality (AHRQ). AHRQ (2013) explains the PDSA “is a simple yet powerful tool for accelerating quality improvement” (para. 1). The planning phase of this project was completed through a review of the current evidence on the causes of obesity and telephone interventions for weight loss. The intervention used in this project was the small-change approach to promote weight loss which was conducted with 14 obese, sedentary male and female veterans (Damschroder et al., 2009).

As recommended by Damschroder et al. (2009), the intervention consisted of 12 weekly coaching sessions with three in-person sessions (weeks 1, 5, and 12) and nine telephone sessions (Appendix A). The first week consisted of verbal informed consent, anthropometric and blood pressure measures, and baseline questionnaires. During this first session, each participant was given a downloadable pedometer, food logs (Appendix B), and a copy of the Stoplight food guide (“The Stoplight Food Guide”, 2013). This first session consisted of orientation to these materials and each participant was asked to wear the pedometer daily and use food logs without changing any walking or dietary habits the first week. The participants completed three questionnaires; Marcus et al.’s (1992) measure of self-efficacy, the SF-12 Version 2 mental (MCS) and physical (PCS) component subscales (“The SF-12 Health Survey”, 2002) and a 5-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) as was done in the

ASPIRE-VA study (Damschroder, 2009). Another questionnaire was used to assess dietary and physical activity habits (Greenwood, Murtaugh, Omura, Alder, & Standford (2008). Although Damschroder et al. (2009) used a different nutritional questionnaire in their intervention, it was outdated and not easily accessible.

Weeks two through four consisted of telephone sessions using MI approach in which participants made small-change, cumulative goals in dietary intake and/or daily step count. Week five consisted of an in-person session where anthropometric and blood pressure measurements were taken to evaluate progress and to provide encouragement. Weeks 6 through 11 involved weekly phone sessions where small, cumulative goals continued to be made. Week 12 was the final session in which anthropometric measurements, blood pressure, SF-12 Version 2, the 5-item Satisfaction with Life Scale, and the nutritional questionnaire were given to evaluate the difference from pre-to-post intervention.

These coaching sessions were conducted using a MI approach. Since an MI approach was used, each small change goal was made primarily by the participant in collaboration with the DNP student. The four general principles of MI are to express empathy, develop discrepancy, roll with resistance, and support self-efficacy (Miller & Rollnick, 2002). The OARS is an acronym for four methods that are used throughout the MI process. These are asking open-ended questions, affirmations, reflective listening, and summarizing (Miller & Rollnick, 2002). The fifth method of MI is to elicit change talk, which requires some skill in MI. This DNP student has completed an online motivational interviewing (MI) course and attended two MI conferences (The Basics and Advancing the Practice) through Health Education and Training Institute (HETI) to prepare for this project.

Setting

This project took place in a primary care setting. The clinical site was Cornerstone Family Medicine (CFM) in Gardner, Massachusetts. This practice consists of two family practice physicians. Gardner, Massachusetts is a city within Worcester County with a population of approximately 20,254 people in 2012. The majority of Gardner, Massachusetts is inhabited by Caucasians (87.8%). The remaining population consists of 5.4% Hispanics, 2.8% Asians, 2.5% African Americans, 0.3% American Indian, and 1.2% identify as two or more races. (City-data.com, 2014). The estimated median household income in 2011 for Gardner was \$44,247 which is less than the \$62,859 median household income for the overall State of Massachusetts. The unemployment rate for Gardner, Massachusetts was 10.3% in July 2013, which is higher than the overall unemployment rate of Massachusetts, which is 7.2% (City-data.com, 2014). For individuals 25 years and older in Gardner, 83.2% have high school degree or higher, 19.3% have a Bachelor's degree or higher, and 5.9% have a Graduate or professional degree (City-data.com, 2014).

Sample

Participants were identified by a medical record database search for patients with a BMI of 30 or higher. A letter (Appendix C) was mailed to eligible participants discussing the research translation project. In addition to the mailings, flyers (Appendix D) were posted in the family practice exam rooms for an additional method of recruitment. Flyers were not posted in the office or elsewhere since this project's intent is to recruit patients within the Cornerstone Family Medicine practice. The goal for this project was to recruit 10 to 15 participants for this intervention.

Inclusion criteria included BMI 30 or above, ages 21 and older, English-speaking, competent to provide informed consent, reliable access to a phone, able to walk 10 minutes

without sitting down to rest, and able to wear a pedometer daily. Exclusion criteria include pregnant women and individuals who are currently being treated for weight loss with weight loss medications (prescription or OTC). These criteria are consistent with criteria used by Damschroder et al. (2009). Since this is a research translation project based on evidence, a control group was not necessary.

Resources and Constraints

CFM offered many great resources that helped to facilitate this research translation project. The practice has an electronic medical record that made a database search for eligible participants more feasible. The providers were supportive of this research translation project and agreed that it will be beneficial to their practice. The physicians in this practice offered an examination room on Tuesdays to be used solely for the purposes of this research project. Other dates for use of examination rooms were arranged as needed. The providers have also agreed that participants and/or their insurance will not be charged for participation in this project.

Although there were many great resources that assisted in the implementation of this project, there were also a few barriers. One potential barrier to the implementation of this project was recruiting eligible participants since the primary care practice is small. This barrier was minimized by using two methods of recruitment (mailings and flyers). Another potential barrier was participant transportation to and from the physician's office and potential scheduling conflicts. Scheduling conflicts and transportation issues may also make it more likely to lose participants at the follow-up visit. This barrier was minimized by doing most of the sessions via telephone as was done in the research study and being flexible with dates and times of the in-person sessions.

Key Stakeholders

The stakeholders for this project include the providers at CFM, other primary care providers in the community, and the patients. The providers at CFM were already engaged in this project since they agreed to facilitate this project within their practice. To involve other stakeholders, a presentation will be given to the providers and offered to local primary care providers and the general public to relay the results of the project and to provide education on how to incorporate weight loss interventions in busy clinical settings.

Protection of Human Subjects

This was a research translation project to evaluate a program's effectiveness in a specific setting. This type of project is not subject to IRB approval in the organization involved unless there is tracking of identified personal health information. Efforts were made to minimize personal information retrieved. Office staff received calls from interested participants. The names and phone numbers of these individuals were only be used for purposes of this research translation project. All data with names and phone numbers were kept in the office where files are secure and was shredded when this information was no longer needed. The initial database search was conducted by the office manager.

The only information that was recorded as results for this project are age, gender, weight/height, BMI, blood pressure readings, and questionnaires results pre-and post-intervention. Pseudonyms were used to maintain confidentiality. Patients were given the opportunity to decline participation in this project. Based on these factors, this project was exempt from IRB approval.

Method of Evaluation

Weight and height, BMI, waist circumference (WC), and blood pressure (BP) were measured before the small-change intervention and at the 12-week follow-up. Questionnaires

were given at the first and last in-person sessions (SF-12 and Satisfaction with Life Scale).

Damschroder et al. (2009) also assessed nutritional intake through a nutrition questionnaire. This questionnaire was from 2005 and was not easily accessible. Greenwood, Murtaugh, Omura, Alder, & Stanford (2008) developed a 14-item questionnaire and tested its effectiveness in two primary care clinics in Utah. Strong associations are found between specific behaviors presented in the questionnaire and obesity (Greenwood et al., 2008). This questionnaire was used to assess dietary intake at baseline and post-intervention.

The pre-and post-intervention questionnaire data was collected on paper, and results were transferred onto a word document. The information was then transferred to SPSS software for statistical analysis. General data, such as age and gender as well as outcome measures, were entered onto the word document. This allowed for easier interpretation of the outcome measures. The characteristics of participants are presented in percentages and mean/standard deviation. Weight, BMI, WC, and blood pressure are displayed by the statistical method, repeated measures ANOVA since data were evaluated at three different points in time. The questionnaire data results were displayed using paired t-test since these were only given pre-and-post intervention.

Time Frame and Budget

This project took place from December 2014 to April 2015 (Table 4). The planning phase occurred in December in which eligible participants were determined and a letter was mailed to potential participants describing the project. Flyers for the project were also put in the examination rooms as a second recruitment method. The 12-week sessions were conducted from January 2015 through March 2015. The data was collected and analyzed in April 2015 to fulfill capstone requirements for the DNP program. In April 2015, a presentation will be offered to local providers at Heywood Hospital and, which is located in the same building as CFM, and to

the general public. The presentation will discuss the project results and education on obesity and interventions in the primary care setting. Emails will be sent out to the hospital providers and staff regarding this presentation and an article will be posted in the hospital newsletter. Flyers about the presentation will be put up in the office. This will reach multiple primary care providers and lead to future patient benefits of healthy weight loss.

Table 4. Project Time Line

Task	December	January	February	March	April
Recruitment of eligible participants	X				
12-week coaching sessions		X	X	X	
Results presented to local providers via PowerPoint presentation and discussion					X

The time required by other providers and office staff in the practice was minimal. The office staff was asked to take telephone messages from eligible participants who called to request information regarding the project. The office manager conducted a database search of eligible participants based on inclusion criteria. One examination room was utilized on Tuesdays by the DNP student for the purpose of this project, since there is only one provider in the office on this day. Other arrangements were made for different dates as needed. The contributed the majority of the time. The resources needed for this project were paper and toner for copying questionnaires and forms. A \$10 Amazon gift card was given to each participant at each in-person session to show appreciation for their time. The DNP student completed course trainings for MI for the benefit of this project. Downloadable pedometers were given to each participant. Total costs were approximately \$965 and was paid for by the DNP student (Table 5).

Table 5. Budget

Item	Cost
Paper	\$25
Toner	\$50
Online MI Course	\$75
MI: The Basics & MI: Advancing the Practice Conference	\$215
Downloadable pedometers (\$10 x 15 participants)	\$150
Amazon gift cards (\$30 x 15 participants)	\$450
Total	\$965

Results

A total of 13 participants were initially recruited for this project. Two participants dropped out within the first few weeks due to scheduling issues. One participant dropped out at week 7 due to pregnancy. The remaining 10 participants completed the full 12 week program and are included in the results analysis. All participants were female and primarily Caucasian. Recruitment was aimed at both males and females but only female patients volunteered to be a part of this project. Most participants were healthy with an average of 1.3 chronic medical conditions and an average of 1.5 previous weight loss attempts (see table 6).

Table 6. Characteristics of participants

Number of participants	10
Mean (S.D.) age	47.2 (13.1)
% Male vs % Female	100% female
% Racial minority	10% Latino

Mean (S.D) number of chronic conditions	1.3 (0.9)
Mean (S.D) number of prior weight loss attempts	1.5 (0.8)

The outcome measures of weight in pounds, BMI, WC, and systolic (SBP) and diastolic blood pressures (DBP) were evaluated at baseline, five weeks, and 12 weeks. The means and standard deviations for the sample of participants' weights, BMI, WC, & BP at each time interval are shown in table 7. A repeated-measures analysis of variance revealed that the participants' experienced a significant weight loss over time, $F(2, 8) = 15.77, P=0.02$. The participant's lost an average of 6.55 pounds. There was also a significant decrease in BMI among participants, $F(2, 8) = 16.99, P= 0.01$. The participant's BMI decreased on average by 1.12 points. Although not as significant as weight loss and BMI, the WC also decreased and was considered statistically significant, $F(2,8) = 6.35, p=0.02$. Systolic blood pressure decreased significantly, $F(2, 8) = 19.27, P=0.001$, with an average of a 14.4 point decrease. Diastolic blood pressure did not have a significant change over time.

Table 7. Results (Weight in pounds, BMI, WC, & Blood Pressure)

Results:	Baseline Mean/S.D.	5 weeks Mean/S.D	12 weeks Mean/S.D.	Difference Mean from baseline to 12 weeks	F (df), P
Weight (lb)	196.50 (20.52)	193.90 (21.60)	189.95 (20.86)	-6.55 lb.	15.77 (2, 8), P= 0.02
BMI	33.52 (3.31)	33.08 (3.51)	32.40 (3.47)	-1.12 BMI	16.99 (2,8), p= 0.01
Waist Circumference (inches)	40.70 (3.65)	40.30 (3.77)	39.30 (3.47)	-1.4 inches	6.35 (2,8), p= 0.02
Systolic Blood Pressure	128.20 (15.96)	125.40 (18.48)	113.80 (11.37)	-14.4 points	19.27 (2,8), P=0.001

Diastolic Blood Pressure	82.00 (10.79)	78.00 (6.25)	73.60 (7.59)	-8.4 points	4.13 (2,8), P= 0.06
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The mean and standard deviations of the questionnaires at baseline and 12 weeks are listed in table 8. A paired test was performed to determine the correlation between the questionnaires at baseline and 12 weeks. The SF-12 MCS & PCS survey results did not have a significant change pre and post intervention. The satisfaction with life survey showed a significant increase from baseline (M= 21.70, SD=7.02) and 12 weeks (M=27.20, SD= 2.82), $t(9) = 2.90$, $P=0.018$. There was a significant decrease in fast food consumption weekly from baseline (M= 2.10, SD= 1.52) and at 12 weeks (M=0.50, SD= 0.71), $t(9) = 4.71$, $p= 0.001$. The consumption of non-diet soda, juice/punch, fruits, and vegetables did not have a significant change from baseline to 12 weeks. The number of days a participant ate breakfast and exercised each week did not significantly change from baseline to 12 weeks.

Table 8. Results (SF-12 MCS & PCS, Satisfaction with Life, Nutrition)

Results:	Baseline mean/S.D	12-weeks mean/S.D	Difference mean/S.D	P
SF-12 MCS	50.06 (7.39)	51.72 (4.38)	1.66 (7.79)	0.517
SF-12 PCS	42.39 (13.03)	50.57 (6.97)	8.18 (16.32)	0.147
Satisfaction with Life	21.70 (7.02)	27.20 (2.82)	5.50 (6.00)	0.018
Fast food (times/week)	2.10 (1.52)	0.50 (0.71)	-1.60 (1.07)	0.001
Non-diet soda (times/day)	0.20 (0.42)	0.10 (0.32)	-0.10 (0.32)	0.343
Juice/Punch (times/day)	0.80 (1.03)	0.50 (0.97)	-0.30 (0.82)	0.279
Vegetables (times/day)	1.90 (1.37)	2.40 (1.17)	0.50 (0.85)	0.096
Fruits (times/day)	1.30 (0.82)	1.40 (0.97)	0.10 (1.10)	0.780
Breakfast (times/week)	5.80 (1.87)	6.60 (0.84)	0.80 (1.14)	0.053
Exercise (days/week)	2.20 (1.52)	3.30 (1.57)	1.20 (1.87)	0.074

Discussion

This project was successful in recruiting ten obese female participants. Recruitment was also aimed at males, but there were no male volunteers for this program. This could be due to many different factors, including time constraints or disinterest. Males may have been more likely to volunteer for a program like this if they had a male program leader. The study by Damschroder et al. (2009) included mostly males but the recruitment was done at a Veteran's Affairs office which is a predominantly male population compared to the setting of this project. This project also recruited mostly Caucasian participants, which is reflective of the setting demographics.

The program participants were successful in losing weight with an average weight loss of 6.55 pounds. Through making small weekly change goals, such as increasing water intake, increasing daily step goals, and decreasing sugar intake, these participants were able to lose weight. As a result of the weight loss, they also decreased BMI by an average of 1.12 points and lost an average of 1.4 inches from their waist. Although DBP did not change significantly, SBP decreased significantly from baseline to 12 weeks. Although these results show a statistically significant decrease in weight loss, BMI, and SBP, future interventions may need to be longer to achieve meaningful weight loss in terms of health. Although these participants achieved weight loss, it was less than 5% of their body weight which is not likely to make a difference in terms of health status.

One participant had a high blood pressure reading at baseline and was joining this project in hopes to decrease blood pressure so she would not have to go on blood pressure medications. Her first few small weekly goals were to decrease sodium intake and increase water intake.

Along with exercise and weekly step goals, she was able to normalize her blood pressure and lose weight.

On average, the scores of the satisfaction with life scale increased from baseline to 12 weeks and participants reported feeling better in general and about life. There was not a significant change in health survey scores, but these participants were relatively healthy at baseline. There was not a significant increase in fruit and vegetable intake on average. Some participants routinely ate fruits and vegetables at baseline, while others reported not liking fruits or vegetables at all. Those that reported not liking fruits or vegetables did make goals to increase intake of fruits and vegetables and were successful in meeting these goals. Fast food intake was significantly decreased on average, which may be a result of healthier eating patterns and more home-made meals which is consistent with this project's goal of healthy living. Although exercise was not found to change significantly by number of times per week, participants did report increased daily step counts and increase amount of time of exercising per day.

There was not a significant change in consumption of non-diet soda and fruit/punch on average, but most participants did not routinely drink these beverages at baseline and continued to avoid these beverages at 12 weeks. It would be expected that participants who routinely drank sugary sweetened beverages would decrease intake with this small changes intervention. As discussed in the literature review, Chen et al. (2009) showed a correlation between consumption of sugary sweetened beverages and obesity. This study was an RCT that showed participants lost more weight from a reduction in liquid calories vs. reduction in calories from solid food. Since participants in this current study did not drink a large amount of liquid calories at baseline, this correlation between liquid calories and weight was not able to be observed.

There are strengths and limitations to this project. One advantage of this project is having

one individual perform all measurements and telephone sessions, which allowed for consistency. The DNP student was trained in MI, which was beneficial to the study. The OARS techniques of MI were used throughout the in-person and telephone sessions. These techniques include open-ended questions, affirmations, reflections, and summary. Open-ended questions are used throughout the sessions, rather than closed questions, which allowed participants to focus more on their intrinsic motivations. Affirmations were used to encourage participants and to acknowledge their successes. Reflections were useful for eliciting change talk in the participants. Summaries were used to wrap up each session and clarify understanding of all that had been discussed. The DNP student used these techniques to elicit change talk in participants, which led to the participants choosing small weekly goals that would be realistic for them to achieve.

The self-efficacy theoretical framework was another strongpoint to this intervention. The self-efficacy questionnaire used in this intervention was found to be highly reliable by Marcus et al. (2002). It was hypothesized that participants with higher self-efficacy scores would be more likely to engage in physical activity, complete the 12-week intervention, and result in greater weight loss than those with lower scores. This was true for the current intervention. Participants with higher self-efficacy scores were more self-motivated from the beginning, exercised more, and had greater weight loss results than those with lower scores on the self-efficacy measure. Those with lower self-efficacy scores required more encouragement by the DNP student, but the use of MI helped to improve motivation in these participants to produce behavior changes.

Another advantage is the 12-week length of the intervention. This allowed for small change goals to be evaluated over time. Questionnaires and measurements taken pre- and post-intervention help to show a correlation between results of the project compared to baseline. However, a greater length of intervention would be more likely to show meaningful weight loss

in terms of health.

A limitation to this study is the small sample size (n=10) and the homogeneity of the sample (100% female). However, Damschroder et al. (2009) also had a small sample size of 14 participants, which seemed to be more feasible for a study involving weekly sessions. Another limitation to this study was the timing of the project. The project occurred in the winter time in New England. There was a great amount of snow accumulation during this project which made increasing daily step count and exercise more difficult. A project done during improved weather conditions may result in more weight loss due to increased physical activity and motivation. Gift cards given at each in-person session provided incentive for the participants to continue with the intervention, but may have given participants additional motivation that was unrelated to the MI sessions.

One participant became pregnant while in this project. She had been trying for a while, but had stopped trying due to advanced age. Her diet consisted of a lot of “junk food” and sugary sweetened beverages. Small goals were made for healthier dietary changes and physical activity. Although this project may not have played a role in this pregnancy, certain dietary changes are shown to increase fertility. According to the Institute for Reproductive Health (2015), “it is well established that diet, exercise, and body weight affect your fertility”. A diet to enhance fertility is described, such as a diet rich in whole grains, good fats, and protein. Exercise and weight loss are also shown to play a role in fertility. It is possible that women that participate in a weight loss program could become pregnant if they are not taking efforts to prevent pregnancy. Although this was not an outcome measure for this project, it may be beneficial to counsel women on this possibility prior to entering a weight loss program. More studies are warranted on the relation between diet, exercise, and fertility.

Conclusion

For the obese patient, weight loss is essential in improving overall health and well-being. Weight management is a lifelong process that begins with making small, cumulative changes that an individual can fit into their lifestyle. A literature review has demonstrated that a primarily telephone-based weight loss intervention is feasible and can produce weight loss results. Although the current intervention consisted of a small sample size, some studies with larger sample sizes have shown similar weight loss results. Tao et al. (2014) showed small but consistent weight loss results in a large sample of obese individuals. In a primary care setting, interventions that are cost-effective and can be done in a short amount of time are best. Radcliff et al. (2012) showed cost-effectiveness of a telephone intervention in comparison with a face to face intervention with similar weight loss results in both groups. Damschroder et al. (2009) showed effectiveness in a primarily telephone-based intervention with each session lasting less than ten minutes. Telephone sessions for the current intervention also showed statistically significant weight loss results with sessions lasting less than ten minutes each.

The aim of this project was to increase motivation in participants and to assist them in making long-term healthy lifestyle choices to benefit their overall health and well-being. Educating other providers and the general public regarding the project results and weight loss interventions that are feasible in a busy clinical setting will hopefully lead to healthier weights and promote well-being to others in this setting. It is important for primary care providers to counsel obese patients on the importance of diet, exercise, and weight loss. With limited time and increased patient acuity, it is difficult to counsel patients effectively in the primary care setting. This small changes project, however, demonstrated that a 12-week program with three in-person and nine telephone sessions using a self-efficacy framework and MI can initiate

significant changes in weight loss and improvement in healthy eating behaviors.

More research would be beneficial on feasible interventions for weight loss in busy primary care patient settings. A longer intervention may be more likely to produce weight loss results that are meaningful in terms of improved health status. Future studies on the use of weight loss interventions through technology, such as email or text messaging, may be beneficial as this would decrease scheduling conflicts and may improve time management. The use of smartphone apps and higher technology pedometers may also be beneficial for future studies on weight loss for obese patients in the primary care setting due to increased convenience for participants with busy lifestyles. This intervention shows the benefits of a weight loss intervention for obese patients in a primary care setting and will hopefully lead to improved weight loss efforts from health care practitioners for obese patients in primary care settings.

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Appendix A

Small Change Intervention Timeline

Week 1: Face-to-face session

- Obtain measurements (Weight in kg, BMI, waist circumference (WC) in inches, and blood pressure)
- Baseline questionnaires (SF-12 version 2 MCS, SF-12 PCS, Diener's 5-item life satisfaction, & Greenwood et al.'s nutrition questionnaire)
- Marcus et al.'s self-efficacy measure
- Pedometers and food logs will be given to each participant
- A copy of the Stoplight food guide will be given
- Participants will be asked to wear the pedometer daily and do daily food logs this first week without making any changes
- \$10 gift card

Weeks 2-4: Telephone sessions using MI approach in which participants will make small-change, cumulative goals in dietary intake and/or daily step count

Week 5: In-person session (obtains weight, BMI, WC, and blood pressure measurements to evaluate progress)

- \$10 gift card

Weeks 6-11: Weekly telephone sessions (same as sessions 2-4)

Week 12: Face-to-face session

- Final measurements (weight, BMI, WC, and blood pressure).
- Final questionnaires (SF-12 MCS, SF-12 PCS, life satisfaction, and Greenwood et al.'s nutrition questionnaire)
- \$10 gift card

**Appendix B
Weekly Food Log**

Meal Type	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Breakfast							
Lunch							
Dinner							
Snacks							
Beverages							

Appendix C

Letter of Intent

Spring 2015

Dear Patient,

You are receiving this letter because I am a student with Dr. Michele Parker. My name is Aimee Beck and I am a Family Nurse Practitioner and Doctor of Nursing Practice student through UMass Amherst. I will be implementing a project this semester. My goal of the project is to improve overall health and well-being through a 12-week weight loss intervention. This will consist of three in-person sessions and 9 weekly coaching sessions by telephone. The project will involve wearing a pedometer daily and completing daily food logs.

If you are willing to participate, please leave a message with the front desk at Cornerstone Family Medicine and I will contact you to set up an appointment. The in-person sessions will usually take place on Tuesdays between 8am to 5pm starting in January at Cornerstone Family Medicine. However, the dates and times can be flexible and adjusted to best fit your schedule, as needed. This will be no cost to you or your insurance. As a token of my appreciation for your time, each participant will receive a \$10 Amazon gift cards at each in-person assessment for a total of \$30 for all three sessions.

If you have any questions regarding this project, please do not hesitate to call Dr. Parker's office. I look forward to hearing from you.

Sincerely,

A handwritten signature in black ink that reads "Aimee Beck".

Aimee Beck

Family Nurse Practitioner/Doctor of Nursing Practice Candidate

Examination Room Flyer

Have you been thinking of losing weight? Now is the time!



- Aimee Beck is a Family Nurse Practitioner student with Dr. Michele Parker doing a small-changes weight loss intervention for her doctoral project.
- **What is it? A 12- Week weight loss intervention (3 in-person sessions & 9 weekly telephone sessions)**
- **When is it? The project will start in January and consist of 12 short coaching sessions (3 in-person and 9 telephone sessions)**
- **The project will involve wearing a pedometer daily and daily food logs.**
- **Each participant will receive a \$10 Amazon gift card at each in-person session for a total of \$30 for all three sessions.**

If you are interested in participating or have further questions about this project, please notify Dr. Michele Parker or the Cornerstone Family Medicine Staff.

Thank you!

Aimee Beck

Aimee Beck

Family Nurse Practitioner/Doctor of Nursing Practice Candidate

