Increasing Physical Activity in Women with Obesity to Promote Weight Loss

Ashley N. Kohler

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INCREASING PHYSICAL ACTIVITY IN WOMEN WITH OBESITY TO PROMOTE WEIGHT LOSS

by

ASHLEY KOHLER MSN, WHNP-BC

EVIDENCE-BASED PRACTICE PROJECT REPORT

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Ashley N Kohler
Student 4/28/2022
Date

Frances Clark DNP
Advisor 4/28/2022
Date
DEDICATION

This project is dedicated to my husband, Kevin. Thank you for your constant support, love, and encouragement while pursuing my graduate degree. Especially, thank you for your statistical expertise throughout the analysis of my project. I could not have completed this program without you.
ACKNOWLEDGMENTS

I would like to acknowledge my project advisor, Dr. Frances Clark. Your guidance throughout my project and paper writing was essential for my success and completion of the program.

I would also like to thank and acknowledge the providers and staff at my clinical practice site. Without your contributions and support, this project would not have been accomplished.
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ABSTRACT

INCREASING PHYSICAL ACTIVITY IN WOMEN WITH OBESITY TO PROMOTE WEIGHT LOSS

Ashley N. Kohler MSN, WHNP-BC

Obesity is a chronic disease associated with a multitude of lifelong chronic illnesses. Obesity impacts more than 42% of the United States population (CDC, 2021b). Physical inactivity is a major determinant of obesity (Muerer et al., 2019). The purpose of this evidence-based practice (EBP) project was to promote a greater reduction in body mass index (BMI) of the participants enrolled in an existing wellness program at the EBP practice site by increasing the physical activity level of the participants compared to standard protocol. The existing wellness program’s standard protocol included diet modifications, physical activity encouragement, and medication management. The EBP project aimed to increase physical activity using goal setting, self-monitoring, and continuous feedback. The sample included twenty participants newly enrolled in the existing wellness program in 2021 with a BMI greater than or equal to 25 kg/m². The participants were followed for a twelve-week period, and the BMI reduction of the group was compared to the BMI reduction of participants from the previous year who followed the standard protocol of the wellness program. Each participant’s BMI was calculated at the initial visit, at the six-week visit, and at the twelve-week visit. Data between the groups were analyzed using a paired t-test to compare the percent change in BMI at six and twelve weeks between both groups. It was found that the participants using standard protocol decreased BMI by 2.78%. Participants in the EBP project decreased BMI by 3.42%. However, the results were not found to be statistically significant. When comparing the ratio of attrition of both groups, 55% of participants in the comparison group failed to complete the program. In comparison, 30% of participants in the intervention group failed to complete the program. These findings indicated that although the EBP project did not result in a statistically significant decrease in BMI, the EBP project increased participant involvement in the program.
CHAPTER 1

INTRODUCTION

Background

Obesity is chronic disease that impacts 42.8% of United States adults (CDC, 2021b). Individuals who are overweight or obese are placed into these classifications by body mass index (BMI). BMI is calculated by weight in kilograms divided by height in meters squared (CDC, 2021b). Individuals with a BMI from 25.0-29.9 kg/m² are considered overweight (Lowe-Payne, 2020). Individuals with a BMI of greater than 30.0 kg/m² are considered obese. Obesity is further classified into classes. Class I obesity includes individuals with a BMI from 30.0-34.9 kg/m². Class II obesity includes individuals with a BMI from 35.0-39.9 kg/m². Finally, class III obesity includes individuals with a BMI greater than 40.0 kg/m² (Lowe-Payne, 2020). Obesity has been linked to a reduced quality of life and increased mortality (Eaton, et al., 2016). Obesity is associated with a multitude of lifelong chronic illnesses including type 2 diabetes mellitus, cardiovascular disease, postmenopausal breast cancer, colon cancer, and pancreatic cancer (Khanh-Dao Le, 2021). As a result, healthcare costs associated with obesity have increased exponentially. By the year 2030, it is estimated that the economic burden of obesity in the United States will hit between $48-$66 billion per year (Eaton, et al., 2016). It is imperative that healthcare providers in the United States take action to combat this chronic disease.

Sedentary behavior and unhealthy dietary habits are a major determinant of many noncommunicable diseases including obesity (Meurer, et al., 2019). Sedentary behavior is defined as behavior characterized by less than 1.5 metabolic equivalents for the majority of the day (Katzmarzyk, et al., 2019). A metabolic equivalent (MET) is the amount of oxygen consumed while sitting at rest. It is a common method to measure the level of exercise. The CDC (2021a) defined low physical activity as individuals who self-report engaging in no leisure time physical activity in the past month. Physical activity alone does not induce long-term weight loss success; however, there is strong evidence that indicates physical activity reduces weight gain.
Evidence indicates that both a dietary and physical activity component is essential for promoting long-term weight loss and reduced weight regain (Khanh-Dao Le, 2021). Physical activity is not only essential for weight loss, but it is also important for a multitude of health benefits not associated with weight loss. Physical activity makes adipocyte tissue more metabolically activity (Burridge, 2019). As a result, some of the benefits of physical activity include improved lipid profile, decrease in systolic blood pressure, improved insulin sensitivity, and improved psychological well-being (Khanh-Dao Le, 2021). Physical activity is also associated with improved self-efficacy, increase in physical function, improved quality of life, and improvement in chronic pain syndromes (DOD, 2020). Increasing physical activity in sedentary adults is a key component of increasing weight loss in adults who are overweight and obese.

Data Supporting Need for the Project

National Data

Obesity is the most common chronic disease affecting more than one-third of the United States population (Eaton, et al., 2016). From 2000 to 2018, the prevalence of obesity has increased from 30.5% to 42.4% (CDC, 2021b). Obesity is more prevalent in non-Hispanic black adults than any other races (Lowe-Payne, 2020). There is no significant difference in the prevalence of men and women by age group (CDC, 2021b).

According to the CDC (2021a), more than 15% of adults in the United States were self-reported as physically inactive. All states reported at least 15% of adults in the United States were inactive, but many states reported more than 15%. Hispanic adults have the highest prevalence of physical inactivity compared to other races at 31.7%, followed by non-Hispanic Black adults at 30.3% and non-Hispanic White adults at 23.4% (CDC, 2021a).

State and Regional Data

The most current data available on the Indiana State Department of Health website regarding physical activity and obesity website was published in 2012. According to the report, 65.9% of adults in the state of Indiana are overweight or obese with a BMI greater than or equal
to 25 kg/m² (CDC, 2012). Out of the adults in Indiana, 29.6% have a BMI greater than 30 kg/m² and are classified as obese.

In the Midwest, 25.0% of adults are self-reported as physically inactive in the past month (CDC, 2021a). This is consistent with the data in the state of Indiana. In Indiana, 25-30% of adults are self-reported as physically inactive (CDC, 2021a). The 2018 Physical Activity Guideline for Americans recommends 300 minutes of moderate intensity activity per week or 150 minutes of 150 vigorous intensity physical activity per week (USDHHS, 2018). Only 43.3% of adults in Indiana self-reported an achievement of the above recommendations (CDC, 2012). The guidelines also recommend two or more days a week of muscle-strengthening activities (USDHHS, 2018). The CDC data did not report on the prevalence of muscle strengthening activities.

Clinical Agency Data

The clinical site for the evidence-based practice (EBP) project is a private obstetrics and gynecology practice located in Northwest Indiana. This clinical site has a comprehensive wellness program that provides dietary, physical activity, behavioral, and medication interventions to promote weight loss in women who are overweight and obese. The wellness program provided specific nutritional recommendations using a phone application and a continuous encouragement of an increase of physical activity (B. Rutherford, personal communication, May 25, 2021). The current wellness program did not have a specific intervention tailored towards increasing physical activity. Thus, a need was identified to provide more specific recommendations to promote physical activity in the participants of the existing wellness program.

A report utilizing the electronic health record was run from September 1, 2020 to October 31, 2020. The report was run by searching for participants by the appointment type. The appointment type searched was the “Wellness 60.” All participants enrolling in the wellness program started the program with a “Wellness 60” appointment. This report identified that 20
participants were enrolled from September 1 to October 31, 2020. The 19 participants were each followed for three months from her start date into the program. Of those 20 participants, 11 did not stay in the program for at least three months. It is important to note that the COVID-19 pandemic may have affected the retention rate of participants. A three-month chart audit was conducted of the nine participants. Of the nine participants that stayed in the program, all of them had some reduction in body mass index. Additionally, the chart audit identified that at three months, physical activity goals were documented; however, the goals were not continuously increased. Patients did not participate in self-monitoring, and no supplemental resources or reminders were provided to the patient. The data collected from the 2020 chart review was utilized to compare to the data collected from the participants in this EBP project in 2021.

Purpose of the Evidence-Based Practice Project

Purpose Statement and PICOT Question

The purpose of this evidence-based project was to promote a greater reduction in body mass index of patients participating at the EBP practice site. The goal was to increase physical activity using goal setting, self-monitoring, and continuous feedback. By increasing physical activity, the project aimed to increase weight loss in the participants. Specifically, this project addressed the following PICOT question: in women with a BMI greater than or equal to 25.0 kg/m² newly enrolled in the existing wellness program at a private obstetrics and gynecology practice in Northwest Indiana, will implementing a structured physical activity intervention that includes goal setting, self-monitoring, feedback, and supplemental materials compared to standard office protocol result in a greater decrease in body mass index over a twelve-week period?

EBP Project Description

This evidence-based project was implemented in a private obstetrics and gynecology practice located in Northwest Indiana. The wellness program included office visits with a physician or nurse practitioner that occurred in weekly to bi-weekly to monthly manner. Typically,
during the first month participants were seen weekly. In the second and third months, participants were seen every two to three weeks. During these visits, participants were provided nutrition education, medication management, and were encouraged to increase physical activity. No specific recommendations were discussed regarding physical activity.

This EBP project was aimed at increasing physical activity of the participants newly enrolled in the wellness program in September of 2021. The project participants were followed throughout a twelve-week period and compared to the participants enrolled in the project in 2020. All healthcare providers were trained in the SMART goal format as well as the current exercise recommendations via a detailed e-mail and PowerPoint presentation. Goals utilizing the SMART format are specific, measurable, attainable, relevant, and timely (DOD, 2020).

Participants were encouraged to set an exercise goal with the provider. At each subsequent visit, the goal was reviewed and built upon if applicable. Individuals were encouraged to meet the recommended physical activity minute goal established by the 2018 Physical Activity Guidelines of 150 to 300 minutes of moderate-to-vigorous intensity activity per week (USDHHS, 2018). In addition, participants were encouraged to log exercise minutes utilizing the same phone application recommended for dietary intake logging. The application used was titled “My Fitness Pal.”

Participants were provided supplemental materials through e-mail. The e-mail hand-outs included information regarding the benefits of physical activity, local gyms, and at-home work-out options. The healthcare provider completing the patient visit was responsible for assisting in goal setting and feedback. Monthly email reminders were sent to participants newly enrolled in the program. The hand-outs emailed to the participants in a monthly manner can be found in Appendix C. In addition, Appendix E includes the copyright permissions for a few of the hand-outs.
CHAPTER 2
EBP MODEL AND REVIEW OF LITERATURE

Evidence-based Practice Model

Overview of EBP Model

The evidence-based practice project was developed according to the Iowa Model of evidence-based practice. The Iowa Model was developed by a group of nurses from the University of Iowa (Buckwalter, et al., 2017). This model serves as guide for clinicians to incorporate research and evidence-based practice into patient care. The model has multiple steps with several decision points to allow for re-evaluation of the project. The model starts with identifying triggering issues. The model then progresses to the first decision point, “Is this topic a priority?” If the answer is yes, the model proceeds to the following step. If the answer is no, it allows the user to re-evaluate the topic chosen. The model proceeds with assembling a team to implement the project. This team includes all the key stakeholders of the project. The team assembles and appraises the evidence by conducting a comprehensive literature search. After the literature search, the user is brought to decision point two “Is there enough evidence?” If the answer is no, the user is once again provided the opportunity to conduct an additional literature review. If the answer is yes, the user progresses to designing the practice change with the team. Then, the team is brought to decision point three “is the change appropriate for adoption?” If the answer is yes, the team is responsible for integrating and sustaining the change. If the answer is no, once again the user is allowed the opportunity to re-evaluate the practice change. Finally, the user disseminates the findings of the evidence-based practice project.

The Iowa model was used for this evidence-based practice project because it is a thorough model that has been shown to be user friendly. It is easy to interpret and implement, and it has been utilized by clinicians all over the world (Buckwalter, et al., 2017). The step-by-step process with the three opportunities for re-evaluation allowed for the smooth implementation of this evidence-based practice project.
The steps of the Iowa Model were applied to the project. In the initial step, obesity was a chosen as the topic of priority. The site for project implementation had an existing wellness program within the private obstetric and gynecologic practice. The existing wellness program focused on weight loss through the implementation of structured diet recommendations, medication management, and an encouragement of an increase in physical activity. The program utilized a phone application to track caloric intake. The participants of the program returned for office visits on a weekly, bi-weekly, or monthly manner. During the visits with the healthcare provider, the nutrition diary was reviewed, medications were modified, and physical activity was encouraged. The current wellness program did not have a structured physical activity intervention. After determining this intervention was a priority to increase weight loss in the existing wellness program, a team was developed. The team included the key stakeholders of the project. The key stakeholders included the clinicians of the practice, the patients, the administrative staff, and the medical assistants. A thorough and comprehensive literature review was conducted to identify the intervention that was implemented in the evidence-based practice project. After determining enough evidence was evaluated, the intervention that would change the practice was implemented at the project site. Providers were educated on goal setting methods. In addition, patient hand-outs and educational materials were chosen to provide to the patients during the scheduled wellness visits. After determining this intervention was appropriate for implementation, new goals were created with the patient at every visit with a goal to gradually increase a patient’s physical activity level. The results were disseminated through the presentation of this paper.

**Literature Search**

**Sources Examined for Relevant Evidence**

A comprehensive literature search was conducted using five databases (see Appendix A). This literature search flow is illustrated in Figure 2.1 below. The first two databases searched were the Joanna Briggs Institute (JBI) and Cochrane. Key terms that were used for both
searches included: BMI, “body mass index,” intervention, obese, obesity, overweight, intervention, weight loss, weight reduction, and lose weight. The Boolean operator “OR” was used between synonyms and the Boolean operator “AND” was used between different key terms. Key phrases were separated using parentheses. JBI and Cochrane searches were both limited to evidence from the last five years. The JBI search yielded a total of 72 pieces of evidence. The titles and abstracts were reviewed of all 72 pieces of evidence. A total of three pieces of evidence were more thoroughly reviewed. One evidence summary was chosen for inclusion in this article. The Cochrane search yielded a total of 12 Cochrane reviews. Two pieces of evidence were selected but none of the evidence met the inclusion criteria, and they were excluded from the literature review.

The Trip Medical Database was also searched for this study. Key terms that were searched included obesity, interventions, strategies, best practices, weight loss, weight reduction, and lose weight. The Boolean operator “OR” was used between synonyms. The Boolean operator “AND” was used between key terms and phrases that were different. The key term obesity was searched with the title limiter. The search was also limited to clinical practice guidelines in the USA from the last five years. The search yielded 13 results. Two of the results were reviewed, and one guideline was selected for the literature review. The clinical practice guideline published by the Department of Veterans Affairs Department of Defense (DOD) (2020) was utilized to citation chase an additional clinical practice guideline.

CINAHL and PubMed were the last two databases searched for this literature review. The key terms included obesity, overweight, obese, BMI, body mass index, weight loss, weight reduction, lose weight, family medicine, primary care, primary health care, and adult. Once again, the Boolean operator “OR” was utilized for synonyms. In addition, an asterisk was applied after the key term adult to broaden the search to include all forms of this word. The key term adult* was only utilized in the PubMed search. The PubMed search was limited to articles published in the last five years, abstract, full text, English language, adult age, and female sex.
The articles were limited to clinical trials, meta-analysis, randomized control trial, and systematic review. The search yielded a total of 156 results. Three pieces of evidence were removed due to duplication from other database searches. A total of twelve pieces of evidence were selected to review. After an extensive attempt to retrieve one piece of evidence through several databases and the interlibrary loan service, this piece of evidence was excluded due to inability to collect the full text article. Four of the ten articles reviewed were included in the literature review. The CINAHL search included the same key terms as the PubMed search except for the adult* key term. The limiters applied included articles published in the last five years, full text, in the English language, and the adult age group. The CINAHL search yielded 87 pieces of evidence. Eight pieces of evidence were reviewed, and two pieces of evidence were selected to include in the literature review.
In conclusion, a total of 337 pieces of evidence were screened for inclusion in the literature review. Twenty-four pieces of evidence were more thoroughly reviewed based on specific inclusion and exclusion criteria. The inclusion criteria included studies with interventions that addressed weight loss utilizing physical activity as a primary intervention. The literature also had to be published within the last five years. Studies were excluded if weight loss was not a primary outcome, and if the study did not address female participants. Studies were also excluded if the
study participants were not overweight or obese. Studies were excluded if the studies were not a level I or level II piece of evidence according to the Melnyk and Fineout-Overholt (2019) hierarchy of evidence published. As a result, a total of nine pieces of evidence were selected to be included in this literature review.

Levels of Evidence

The hierarchy of evidence was evaluated utilizing the levels of evidence pyramid established by Melnyk and Fineout-Overholt (2019). Because this evidence-based project was intervention based, it was important to utilize this hierarchy with quantitative studies ranking higher than qualitative or descriptive studies. A large base of evidence was available regarding individuals with obesity. Thus, it was important that high levels of evidence were chosen when evaluating the literature. The higher the level of evidence, the lower the risk for bias. As a result, higher levels of evidence are more generalizable. The highest level of evidence includes systematic reviews, meta-analyses, and evidence summaries. Systematic reviews, meta-analyses, and evidence summaries evaluate multiple pieces of evidence. The second level of evidence includes randomized controlled trials (RCTs). The next level of evidence includes nonrandomized controlled studies, controlled cohort studies, uncontrolled cohort studies, case studies, and expert opinions in descending order. By utilizing research found in levels I and II of the hierarchy of evidence, the strength of the evidence-based practice project was validated.

These levels of evidence are depicted in Table 2.1 below. This literature review includes three pieces of level I evidence. One is an evidence summary, and the other two are clinical practice guidelines. There were six pieces of level II evidence. All six of these studies were randomized controlled trials. By utilizing evidence from high levels, the findings from the studies were more generalizable and able to assist in identifying an intervention.

Analysis and Appraisal of Relevant Evidence

The critical appraisal skills programme (CASP) tool was utilized for appraising the quality of evidence used in the literature review for this evidence-based practice project. The CASP tool
was selected due to its straightforward nature and ease of use. The CASP tools provide separate appraisal tools for evaluating the various types of literature. The CASP checklist covers study validity, results, and clinical relevance. The CASP tool utilizes checkboxes to establish if the piece of literature meets the criteria for each subsection. The subsections include validity of design, whether the study is methodologically sound, and whether the study produces statistically significant, generalizable results (CASP Knowledge hub, 2021). The quality of evidence utilizing the CASP appraisal tool is listed below in Table 2.1.

**Level I Evidence**

The quality of the pieces of the evidence chosen for the literature review ranged from moderate to strong quality. Details of each piece of evidence included is available in the table found in Appendix B. The evidence summary was a strong quality of evidence utilizing the CASP appraisal tool. Khanh-Dao Le (2021) provided a comprehensive evidence summary that reviewed an extensive amount of literature including three meta-analyses, five systematic reviews, three randomized controlled trials, and one retrospective cohort study. The goal of the evidence summary was to identify the best evidence available for long-term weight loss maintenance of participants in a structured weight loss program. This evidence summary produced high level (grade A) recommendations. One of the recommendations included that a long-term intervention is needed to promote compliance. Another recommendation included that decreasing energy intake and increasing physical activity to at least 150 minutes per week is needed for healthy weight loss. The summary also identified that an intervention with a diet and exercise program provided greater long-term weight loss than a diet or exercise alone program (Khanh-Dao Le, 2021).

The clinical practice guidelines included were also ranked as strong quality. The Department of Veterans Affairs Department of Defense (2020) identified clinical practice guidelines after a systematic review of the literature. The goal of the guidelines was to provide information to assist in management of patients with obesity (DOD, 2020). The guidelines
identified a strong recommendation for a comprehensive lifestyle intervention that includes a behavioral, dietary, and physical activity component to increase weight loss. The guidelines also identified the importance of setting goals that are specific, measurable, attainable, relevant, and timely (SMART). The guidelines established a strong recommendation for an in-person intervention. There were no significant recommendations regarding the type of physical activity; however, levels of exercise greater than 300 minutes per week is associated with improved weight maintenance (DOD, 2020).

The clinical practice guidelines published by the U.S. Department of Health and Human Services (2018) was also produced after a comprehensive review of the literature by the physical activity guidelines advisory committee. These guidelines were developed to provide guidance on the type and amount of physical activity for multiple population groups. One of the population groups reviewed was individuals who were sedentary. According to the Physical Activity Guidelines for Americans (2018), all adult individuals should participate in 150 to 300 minutes of moderate to vigorous physical activity per week. These guidelines also identify that greater than 300 minutes per week of moderate to vigorous physical activity may be necessary to prevent weight regain. In addition, individuals aiming to lose more than 5% of their body weight may need to participate in more than 300 minutes of moderate to vigorous physical activity per week. Muscle strengthening is also recommended two days per week to maintain lean body mass during weight loss. These guidelines identified that increasing physical activity is instrumental in promoting weight loss in individuals who are overweight and obese.

*Level II Evidence*

Out of the six randomized controlled trials included in the study, four were of strong quality and two were of moderate quality according to the CASP appraisal tool. Eaton, et al. (2016) is a strong quality randomized controlled trial that determined that an intervention that included three face-to-face meetings with lifestyle counselors, monthly follow up phone calls, goal setting, self-monitoring and supplemental materials resulted in greater weight loss than the
A second strong quality RCT included was conducted by Meurer, et al. (2019). This study evaluated the effectiveness of an intervention that included the VAMOS strategy. The VAMOS strategy was based on the social cognitive theory by Bandura (Meurer, et al., 2019). The social cognitive theory promotes the principles of observational learning, reinforcement, self-control, and self-efficacy. Participants in the intervention group received weekly, face-to-face, group sessions that promoted self-efficacy, confidence, physical activity increase, and dietary habits. This study included participants who were not overweight or obese in the study sample (Meurer, et al., 2019). However, this study was included because it analyzed the effects of a physical activity intervention for participants who were obese or overweight separately from the normal body weight participants. Participants in the intervention group were self-monitored through diaries and pedometers. Individuals in the intervention group lost significantly more weight compared to the control group (Meurer, et al., 2019).

The third strong quality RCT was conducted by Schroder, et al. (2018). This study evaluated the effectiveness of the physical activity component of the PREDIMED-PLUS trial at one year (Schroder, et al., 2018). The physical activity intervention included individual, weekly, face-to-face sessions that included goal setting, action planning, feedback, informational materials, motivation, and self-monitoring. The intervention group had a greater decrease in BMI from 32.5 to 31.1 compared to the control group of 32.5 to 31.1 (Schroder, et al., 2018).

The fourth strong quality RCT was conducted by Villareal, et al. (2017). The purpose of the study was to compare the effects of various types of exercise including aerobic exercise, resistance exercise, and combined exercise. The study identified weekly sessions that included goal adjustments and behavior therapy as an essential component of successful weight loss
through physical activity. The study concluded all exercise results in comparable weight loss; however, combined training offers greater health benefits including reduction in frailty and improvement in physical function.

Two of the pieces of evidence were ranked as moderate quality due to a small sample size. The moderate quality levels of evidence were included because the interventions discussed physical activity as a primary intervention for weight loss (Lison, et al., 2020; Oh, et al., 2018). Lison, et al. (2020) evaluated the effectiveness of an internet-based intervention. The modules encouraged self-reinforcement, self-monitoring, problem-solving techniques, and homework (Lison, et al., 2020). At twelve months, the intervention group had a statistically significant reduction in body mass index.

Oh, et al. (2018) was an additional moderate quality study included in the literature review. This study investigated the effects of a combination diet and exercise program that included diet and exercise logs, text message reminders. The combination group was compared to diet alone and exercise alone groups. Participants were supervised during physical activity sessions throughout the first week of training (Oh, et al., 2018). However, diet and exercise logs were monitored weekly. The combination group had the greatest decrease in body mass index compared to the exercise and diet alone groups (Oh, et al., 2018). This study identified the importance of self-monitoring through a log of physical activity minutes. The participants from this study who kept the log after attending a private session with an exercise specialist had a decrease in body mass index of 1.3 versus 0.9 in the control group. The high quality of evidence chosen for this literature review ensured the applicability to this evidence-based practice project.
### Table 2.1.

**Summary of Evidence**

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<th>Quality/Tool</th>
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<td>Strong/CASP</td>
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<td>Strong/CASP</td>
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<td>CINAHL</td>
<td>II/RCT</td>
<td>Strong/CASP</td>
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#### Construction of Evidence-based Practice

**Synthesis of Critically Appraised Literature**

Physical activity is an essential component for weight loss in individuals who are overweight and obese. A comprehensive literature search identified that a combination intervention that involves a dietary, behavioral, and physical activity component is key to promote weight loss and prevent weight regain (DOD, 2020; Schroder, et al., 2018). A multi-faceted approach with both diet and physical activity produces greater long-term weight loss than diet alone (Khanh-Dao Le, 2021; USDHHS, 2018; Oh, et al., 2018).
Method to Promote Physical Activity

Goal Setting and Feedback

To encourage physical activity in adults with obesity, goal setting with feedback has been shown to promote weight loss (DOD, 2020; Eaton, et al., 2016; Meurer, et al., 2019; Schroder, et al., 2018; Villareal, et al., 2017). The frequency of the feedback varied across the studies. Monthly feedback was conducted in the studies by Eaton, et al. (2016) and Schroder, et al. (2018). Weekly feedback was provided in the studies by Meurer, et al., (2019) and Villareal, et al. (2017). The DOD (2020) identified that goals should utilize SMART principles and be tailored to the individual. Meurer, et al (2019), Schroder, et al. (2018), Eaton, et al. (2016), and Villareal, et al. (2017) all identified the Importance of providing individually tailored feedback with goal adjustments for successful weight loss through physical activity.

Self-Monitoring

Self-monitoring is a key component to promote physical activity and encourage weight loss in individuals who are overweight and obese (Khanh-Dao Le, 2021; Eaton, et al., 2016; Meurer, et al., 2019; Schroder, et al., 2018; Lison, et al., 2020; Oh, et al., 2018). Diaries were often utilized to report dietary intake and physical activity (Eaton, et al., 2016; Meurer, et al., 2019; Oh, et al., 2018). Some studies utilized devices including accelerometers and pedometers to track physical activity (Schroder, et al., 2018; Meurer, et al., 2019). Only one study was an internet-based module that promoted self-monitoring, self-reinforcement, and problem-solving techniques (Lison, et al., 2020).

Face-to-Face Intervention

The guidelines published by the Department of Defense (2020) identified a strong recommendation for a face-to-face intervention. This type of intervention was emphasized in multiple studies (Eaton, et al., 2016; Meurer, et al., 2019; Schroder, et al., 2018; Villareal, et al., 2017). Oftentimes, the face-to-face intervention was individualized and conducted via trained intervention providers, including dieticians and lifestyle counselors (Eaton, et al., 2016; Schroder,
et al., 2018). These interventions lasted 60 minutes and occurred at varying frequencies depending on the length of the intervention. The intervention conducted by Eaton, et al. (2016) was implemented over a twelve month period and included one face-to-face session every three months. The face-to-face component included in the intervention in the VAMOS study occurred monthly (Schroder, et al., 2018). The intervention conducted by Villareal, et al. (2017) occurred over 26 weeks and included weekly sessions for goal adjustments and behavioral therapy. Less often, the face-to-face intervention was conducted in the group setting that involved establishing a social support system (Meurer, et al., 2019). These session conducted by Muerer, et al. (2019) occurred weekly for twelve consecutive weeks. Only one study was conducted entirely online without any face-to-face intervention (Lison, et al., 2020). The intervention included a multimedia, interactive, self-administered online program. However, this study was limited due to a small sample size and lack of a control group.

**Supplemental Materials**

Many of the studies provided supplemental materials to the participants (Meurer, et al., 2019; Lison, et al., 2020; Schroder, et al., 2018). Supplemental materials included print materials and DVDs that focuses on motivation, weight loss, calorie and exercise goals, journal compliance, food issues, comorbid conditions, and nutrition (Eaton, et al., 2016). Lison, et al. (2020) was an entirely online self-administered module that included modules that included downloadable documents and videos that supported problem-solving techniques, self-monitoring, and self-reinforcement. Informational materials were also provided throughout the PREDIMED-Plus trial (Schroder, et al., 2018).

**Physical Activity Recommendations**

When increasing an individual's physical activity level, it is important to evaluate the current physical activity level of the individual. A gradual increase in physical activity is necessary to avoid injury (USDHHS, 2018). When increasing physical activity, it is recommended that individuals first increase minutes per session and days per week. Then, the individuals should
increase intensity of physical activity. Eaton, et al. (2016) encouraged a gradual increase of ten minutes of moderate intensity per week to work up to the goal of 300 minutes of moderate intensity activity per week. Another study also promoted the gradual increase of physical activity to at least 150 minutes per week of moderate to vigorous physical activity with an ultimate goal to walk 45 minutes, six days per week (Schroder, et al., 2018). These participants were also encouraged to perform static exercises for strength, flexibility, and balance. Individuals who completed this intervention experienced a decrease in body mass index from 32.5 to 31.1. When individuals are aiming to lose more than 5% of body weight and to keep off a significant amount of weight, more than 300 minutes of moderate to vigorous intensity activity may be needed (USDHHS, 2018).

No specific difference in type of physical activity has been identified (DOD, 2020). The current guidelines recommend 150 to 300 minutes of moderate to vigorous activity and to incorporate two days of resistance training per week (USDHHS, 2018). Some of the study interventions included incorporation of both aerobics and resistance training (Schroder, et al., 2018; Oh, et al., 2018). One study compared aerobics only training, resistance only training, and combination training (Villareal, et al., 2017). This study found that the combination group had the most healthy benefits including: greatest improvement in physical function, more weight loss, and reduced frailty. Although resistance training may not increase weight loss, it is essential to maintain muscle composition and results in added health benefits (USDHHS, 2018).

**Recommendation for Best Practice**

The comprehensive literature review identified a face-to-face intervention as imperative to encourage physical activity to promote weight loss. Individualized sessions may provide a more personalized experience to the participants offering the opportunity for individualized goal setting and feedback. The frequency of the sessions should occur in a weekly to monthly manner. If sessions are occurring less frequently, it may be beneficial to incorporate telephone call check-ins with the participants. Supplemental materials may also prove to be beneficial to provide
reference materials between the sessions. The delivery route for these materials could be via e-mail or printed materials provided during the individual sessions. These sessions should be conducted by a trained healthcare provider to ensure proper guidelines and recommendations are provided. The sessions should emphasize review of the individualized goal. The goal must be reviewed and gradually increased. The goal should be established by the participant and utilize the SMART format, specific, measurable, attainable, relevant, and timely (DOD, 2020).

The type of physical activity performed was not the most essential component. The current evidence identified that some physical activity is better than none (USDHHS, 2018). In fact, the greatest amount of health benefit was received when an individual increased from a sedentary lifestyle to sixty minutes per week. Finally, the intervention should include self-monitoring. Many of the interventions included logs to document nutrition and physical activity. The use of a pedometer or accelerometer can also assist in self-monitoring. In conclusion, a face-to-face intervention that includes goal setting, continuous feedback, and self-monitoring are essential when implementing a physical activity component of a weight loss intervention.
CHAPTER 3
IMPLEMENTATION OF PRACTICE CHANGE

The primary focus of the proposed practice change at the project site was to promote a greater reduction of weight loss through incorporation of a structured physical activity component. The physical activity component included goal setting, self-monitoring, and continuous provider feedback. The practice change was implemented into an existing wellness program at the EBP project site.

Participants and Setting

The participants were newly enrolled wellness patients who enrolled at the EBP practice site from September 1, 2021, to October 19, 2021. The participants included women, over the age of eighteen, with a body mass index greater than or equal to 25 mg/kg². Participants who were pregnant were considered ineligible for the project.

Additional stakeholders included in the project were the providers at the practice site. The providers were all women’s healthcare providers. There were four obstetric and gynecologic (OB/GYN) physicians and two advance practice nurses (APN) who assisted with the implementation of this project. All physicians had more than fifteen years of experience. One APN was a family nurse practitioner with five years of women’s health experience. The other APN was a women’s health nurse practitioner with six years of women’s health experience.

The project took place at a private OB/GYN practice. A pre-existing wellness program was already established at this practice. This wellness program included nutrition education, physical activity encouragement, and medication management. Nutrition education included caloric restriction, macronutrient counting, and self-monitoring with the My Fitness Pal application. Medication management included the use of weight loss medications such as phentermine, topiramate, injectable semaglutides, metformin, bupropion, and lisdexamfetamine. Medications were not initiated until at least three weeks into the program. There was no pre-existing structured physical activity goal setting or monitoring of physical activity in place.
Pre-Intervention Group Characteristics

Twenty participants were selected to be included in this project. The demographic information was collected from each participant via the electronic health record. The information included age by 10-year groupings, ethnicity, and insurance status. Insurance was divided into four groups private, Medicaid, Medicare, and self-pay. Nineteen participants were privately insured, and one participant had Medicaid. Two participants were in the 20–30-year age grouping, four participants were in the 31–40-year age group, seven participants were in the 41–50-year age group, five participants were in the 41–50-year age group, and two participants were in the 61 and up age group. Ethnicity was divided into five categories Caucasian, African American, Hispanic, Asian, and other. Sixteen participants self-identified as Caucasian, one participant self-identified as African American, two participants self-identified as Hispanic, and one participant self-identified as Asian.

Intervention

Prior to implementation of the EBP project, several hand-outs were developed to provide supplemental materials to the project participants (see Appendix C). Provider education was the first step in this project’s implementation. Each provider received a brief face to face meeting with the project facilitator regarding the topic of the project. Then, the providers were e-mailed a detailed presentation that included information regarding the project. The presentation also included education on how to properly set a SMART goal. In addition, the presentation included the hand-outs that were provided to the participants via monthly e-mails. The medical assistants were also educated individually by the project facilitator. Medical assistants were reminded to have all participants remove shoes prior to collecting the data.

The intervention began when each participant presented for her first wellness appointment. At the initial visit, each participant was asked to remove shoes and a starting height and weight was measured. The measurements were taken from the same scale and stadiometer
at every subsequent visit by the medical assistant. Utilizing the height and weight measurements, the BMI was calculated by the electronic health record (I).

At the initial visit, participants were educated on the exercise recommendations of 150 to 300 minutes of moderate to vigorous intensity physical activity per week. This education was completed by the APN who conducted the initial visit. Then, the participants worked with the APN to set a SMART goal. Participants chose a type of physical activity based on the participant’s personal preference. Participants were also instructed to download the My Fitness Pal application to utilize and log their caloric intake and physical activity minutes.

Hand-out one of three hand-outs used in the practice change was emailed to each participant after her initial wellness appointment. The first hand-out included information regarding the benefits of physical activity and an example of a seven-minute work-out (see appendix C). Throughout the first four weeks, participants returned weekly for an office visit with a health care provider. The SMART goals were re-established, and participants were encouraged to increase activity at every visit. Each participant alternated visits between the same physician and nurse practitioner to maintain consistency.

After the participants were enrolled in the project for four weeks, a second e-mail was sent out. This e-mail included options to increase physical activity. The list included websites and addresses for local gyms and online programs for at-home workouts. From week four to week eight, participants typically returned in a bi-weekly manner. At each visit, participants were reminded of the physical activity goal of 150 to 300 minutes of moderate to vigorous intensity activity per week. In addition, the SMART goal was updated and increased with the provider. Providers were also instructed to monitor the patient’s physical activity minutes via patient self-report of the My Fitness Pal application.

After eight weeks, participants were emailed the third hand-out (see Appendix C). This hand-out included information advising participants how to determine physical activity intensity. From week eight to twelve, most participants were seen monthly for office visits. The frequency
of visits was determined between the health care provider and the participant. The frequency varied by a week or two depending on the patient and providers individual schedules. SMART goals and physical activity were monitored, and feedback was continuously provided.

**Comparison**

The wellness program included caloric restriction, medication management, and physical activity encouragement. Physical activity was encouraged, but the existing program lacked a structured component to promote an increase in physical activity. This project aimed to add a more extensive physical activity component to promote a greater reduction of the participants’ BMIs. Each participant was followed for a twelve-week period. The BMI of each participant was tracked to determine the total decrease in their BMIs. This data was compared to the prior year’s data from September 2020-January 2020.

**Outcomes**

The primary outcome of this evidence-based practice project was determined by comparing body mass index pre-and-post intervention. This project aimed to decrease body mass index for the participants more than the pre-existing wellness program. By performing the height and weight with the same in-office equipment, the reliability of the data collected was ensured. Inter-rater reliability was controlled by education of the staff members on how to properly use the stadiometer and scale. The validity of the equipment did not need to be determined because height and weight are accepted constructs (Melnyk & Fineout-Overholt, 2019). However, criterion related validity identified that the BMI is valid when comparing the participant’s BMI to the accepted BMI ranges of overweight and obese participants.

In addition, participant demographics were collected from the EHR. Demographics that were collected included age, ethnicity, and insurance status. Outcomes for the project were analyzed with SPSS statistical software. An independent T-test was performed to compare the change in body mass index between pre-and-post project implementation.
The project was initiated in June of 2021. A GANTT chart was completed to establish the proper timeline of the proposed project (see Appendix D). The project began with the development of the proposed practice site change. The change was developed through a thorough literature review. The details of the change were finalized in July of 2021. After the change was finalized, Institutional Review Board (IRB) approval was requested. On July 30, 2021, it was determined that IRB approval was not needed from either Valparaiso University or the project site. The project development phase was concluded with staff and provider education. The clinic staff and providers were educated until August 31st, 2021. The providers were educated on SMART goal format and exercise recommendations. The education was conducted with individual face to face meetings and an e-mailed PowerPoint presentation. Providers and staff were provided opportunities to ask questions regarding the project. All education was performed by the project facilitator. Providers were encouraged to document a SMART goal in the EHR at every wellness appointment.

Implementation of the project and data collection began September 1st, 2021, to ensure most participants completed the practice change before the holiday season. In prior years, many patients stopped the wellness program close to the holiday season. Each participant was followed for twelve weeks from her first sixty-minute wellness appointment. At everyone’s start date height, weight, and demographics were collected. Participants were also emailed the first hand out. Participant enrollment concluded after twenty participants were enrolled on October 19, 2021. Follow-up wellness visits were typically conducted weekly for the first four weeks, bi-weekly for the second four weeks, and monthly for the third four weeks. The frequency of each participant’s visits was determined based on the participant’s preference. Each wellness visit included education regarding physical activity and each participant was encouraged to increase the physical activity goal. Participants were also receiving dietary recommendations, caloric restrictions, and medication management. After the participant was enrolled for four weeks, a
second hand-out was emailed to the participant. Eight weeks after the participant’s start date the third hand-out was emailed. Finally, twelve weeks after everyone’s start date a final weight was collected. Due to varying patient scheduled, final BMI was collected within a two-week window of each participant’s twelve-week ending date. A reminder e-mail to re-schedule was sent to participants that missed the twelve-week appointment. However, participants who returned after fourteen weeks for a final weigh in were excluded from the data. The project was completed, and all data was collected by January 31, 2022.

Protection of Human Subjects

Protection of human subjects was of utmost importance when facilitating project implementation. The project facilitator received certification from the Collaborative Institutional Training Initiative (CITI) for social behavioral educational research prior to implementation of the project. The project site facilitator also completed education regarding the Health Insurance Portability and Accountability Act (HIPAA) as required by Valparaiso University. In addition, IRB approval was requested and determined as not needed for both Valparaiso University and from the project site. Finally, data was collected from the secure EHR, Athena. The project facilitator has I access via a username and password to collect all data.

All data collected for the project was kept in a password protected file on the project facilitator’s laptop. Access to the laptop can only be obtained by the project facilitator’s unique password. All participant identifiers were removed from the data being collected. The de-identified participant data was stored in an additional password protected file on the facilitator’s personal laptop. There was no determined risk or harm to the providers, staff members, or participants throughout the EBP project.
CHAPTER 4

FINDINGS

The purpose of the EBP project was to promote a greater reduction in body mass index of participants at the EBP practice site by increasing their physical activity levels. Physical activity was promoted through goal setting, self-monitoring, and continuous feedback. A paired t-test was conducted of the EBP project findings. The paired t-test found that the average change of BMI at twelve weeks for the 2020 group following standard protocol decreased by 2.78% with a standard deviation (SD) of 4.12%. In 2021, the average change of BMI for the participants at twelve weeks decreased by 3.48% with a SD of 3.28%. The p-value was 0.639 which indicated the results were not statistically significant.

Participants

The 2021 intervention group was reflective of the patient population at the EBP practice site. Details of participant characteristics are found in Table 4.1 below. The mean starting BMI of the intervention group was 37.9 with a standard deviation of 8.82. The mean of the starting BMI of the comparison group in 2020 was 38.0 with a standard deviation of 6.91. The ratios of the categorical, demographic data of the participants were calculated. The age groupings of the participants in the intervention group were: (a) 10% of participants in the 20-30-year age group, (b) 20% in the 31–40-year age group, (c) 35% in the 41-50-year age group, (d) 25% in the 51-60-year age group, and (d) 10% in the sixty-one and up age group. The comparison group followed a similar pattern. In the comparison group, the 31-40-year and 41-50-year were the most common age groups. The ethnicities of the participants in the intervention group were: (a) 5% African American, (b) 5% Asian, (c) 80% Caucasian, and (d) 20% Hispanic. Again, the distribution of ethnicity in the intervention group was comparable to the comparison group. The most common ethnicity for the intervention and comparison group was Caucasian. In the intervention group, 5% had Medicaid insurance, and 95% had private insurance. This distribution was also similar to the comparison group; 5% of participants were self-pay, 10% had Medicaid,
and 85% had private insurance. The table below shows the demographic data of the participants in both the intervention and the comparison groups.

Table 4.1.

*Demographic Data*

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Initial BMI, mean (SD)</td>
<td>38.0 (6.91)</td>
<td>37.9 (8.82)</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-30</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>31-40</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>41-50</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>51-50</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>61+</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Private</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>Self-Pay</td>
<td>1</td>
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</tr>
</tbody>
</table>
Changes in Outcomes

The EBP projected addressed the following PICOT question: in women with a BMI greater than or equal to 25.0 kg/m² newly enrolled in the existing wellness program at a private obstetrics and gynecology practice in Northwest Indiana, will implementing a structured physical activity intervention that includes goal setting, self-monitoring, feedback, and supplemental materials compared to standard office protocol result in a greater decrease in body mass index over a twelve-week period? The primary outcome for the study was the percent BMI change of participants in the EBP practice change. The percent change of the intervention group participants at twelve weeks was a mean decrease of 3.42% of BMI. The change in the intervention group participants’ BMI was compared to the percent BMI change of the comparison group from 2020. The percent BMI change of the comparison group was a mean decrease of 2.78%.

Statistical Testing and Significance

The statistical software SPSS was used to conduct the statistical analyses of the data from the EBP project. A paired t-test was selected to perform the statistical analyses regarding the EBP project. The paired t-test was selected because it compares the means of two scores from related samples (Cronk, 2020). The paired t-test has the assumptions that the variables must be interval or ratio levels of data that are normally distributed. The variables also needed to be measured on the same scale. The percent BMI change was calculated at both six and twelve weeks post intervention. In addition, a ratio was calculated to compare the attrition of participants in the comparison group versus the intervention group at twelve weeks. Data was considered statistically significant with a p-value of <0.5.

Findings

The primary outcomes of the EBP project were the change in BMI at six weeks and twelve weeks (see Table 4.2). The secondary outcome for the EBP project was the rate of attrition at twelve weeks.
**Primary Outcome**

**BMI Change at 6 Weeks.** BMI was collected from the EHR at the initial visit and six weeks into the wellness program. A percent change of each participant’s BMI was calculated. The participants who did not return for any follow up visits were given a BMI change of 0%. In the intervention (n=20) in 2021, the participants had an average decrease in BMI at six weeks of 2.08% with a standard deviation of 2.03%. In the comparison group from 2020 (n =20), the participants had an average decrease in BMI at six weeks of 2.38% with a standard deviation of 2.96%. The comparison group had a slightly larger decrease in BMI at six weeks. A paired t-test was conducted to compare the mean change in BMI of the comparison group compared to the intervention group. The results indicated there was no statistically significant difference found (t (19)= -.335, p>0.05).

**BMI Change at 12 Weeks.** BMI was collected from the EHR at twelve weeks and compared to the BMI collected at the initial visit. Again, each participant’s percent change in BMI was calculated, and participants who did not return at twelve weeks were given a BMI change of 0%. In the intervention (n=20) in 2021, the participants had an average decrease in BMI by 3.42% with a standard deviation of 3.28%. The participants in the intervention had a slightly greater decrease in BMI at twelve weeks. The comparison group from 2020 (n=20) had an average decrease in BMI of 2.78% with a SD of 4.12%. The paired t-test that was conducted to compare mean change in BMI indicated there was no statistical significance (t (19)= 0.476, p>0.05).
Table 4.2.

**Primary Outcomes**

<table>
<thead>
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<th>2020</th>
<th>2021</th>
<th>t (19)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Change in BMI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 6 weeks</td>
<td>-2.38%</td>
<td>-2.08%</td>
<td>-0.335</td>
<td>0.742</td>
</tr>
<tr>
<td>% Change in BMI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 12 weeks</td>
<td>-2.78%</td>
<td>-3.42%</td>
<td>0.476</td>
<td>0.639</td>
</tr>
</tbody>
</table>

**Secondary Outcome**

The secondary outcome was the attrition of the intervention group compared to the comparison group. A rate was calculated to determine the attrition of the comparison group in 2020 compared to the intervention group in 2021. Attrition was determined when participants did not return for a scheduled follow-up visit within two weeks of the six- and twelve-week dates. For example, if a participant returned for a twelve week visit at thirteen weeks, the BMI at thirteen weeks was used for the data calculation. If a participant returned at fifteen weeks for a twelve-week visit, the participant’s BMI was not included. In 2020, 55% of participants did not complete the program at twelve weeks. In 2021, 30% of participants did not complete the program at twelve weeks. The rates indicate that in 2021, participants were more likely to return for the appointments.
CHAPTER 5

DISCUSSION

This EBP project addressed the following PICOT question: in women with a BMI greater than or equal to 25.0 kg/m² newly enrolled in the existing wellness program at a private obstetrics and gynecology practice in Northwest Indiana, will implementing a structured physical activity intervention that includes goal setting, self-monitoring, feedback, and supplemental materials compared to standard office protocol result in a greater decrease in body mass index over a twelve-week period? This chapter will address the findings of the EBP project in detail. The chapter will also address the project’s strengths, limitations, and sustainability. Finally, this chapter will explain recommendations for future practice changes.

Explanation of Findings

A thorough literature review conducted prior to the implementation of the EBP project indicated that increasing physical activity through a structured diet and physical activity program would produce a greater long-term weight loss than diet alone (Khanh-Dao Le, 2021). The EBP practice site had an existing wellness program that included the promotion of caloric restriction, increasing physical activity, and medication management. The existing physical activity component lacked a structured intervention to promote an increase in physical activity. The literature review indicated that a structured physical activity intervention that included a face-to-face intervention with goal setting, continuous feedback, and self-monitoring was essential. Implementing this intervention into the existing wellness program at the clinical practice site would assist in increasing the physical activity level of the participants to produce a greater BMI decrease of the participants.

Primary Outcomes

The percent change of BMI of the participants in the EBP intervention group was analyzed at both six- and twelve-week intervals. At six weeks, the EBP intervention group had a smaller decrease in BMI compared to the comparison group. The intervention group at six weeks
had a decrease in BMI of 2.08% and the comparison group had a decrease in BMI of 2.38%. However, after performing the paired t-test the data was determined to be not statistically significant. When comparing the BMI change at twelve weeks, the intervention group had a greater decrease in BMI compared to the comparison group. The decrease in BMI of the intervention group was 3.42% and the comparison group was a BMI decrease of 2.78%. Although the decrease was greater for the intervention group at twelve weeks, the data was found to be not statistically significant. The greater decrease in BMI at twelve weeks of the intervention group may have been due to attrition of the participants. More participants dropped out of the wellness program in the comparison group than the intervention group. In addition, some participants returned for a wellness visit at six weeks but did not return at twelve weeks. This will be discussed further in the secondary outcomes below.

These findings were inconsistent with the literature. The literature indicated that the implementation of a structured physical activity component would result in a greater decrease in BMI (Meurer, et al., 2019). The literature also identified that diet and physical activity together results in a greater decrease in BMI than interventions that included diet alone (Oh, et al., 2018). The findings from the EBP project may differ from the literature due to some limitations of the above EBP project. Overall, the EBP project group had a greater decrease in BMI of 0.64% over a twelve-week period.

In both the intervention and comparison groups, participants had a decrease in BMI. Although the difference between the two was not statistically significant, the overall decrease of BMI is consistent with literature findings. Weight loss supported by healthcare providers do provide a significant benefit for decreasing BMI and increasing physical activity (Eaton, et al., 2016). The findings of the EBP project support that the existing wellness program was beneficial for all participants. Although the structured physical activity component only resulted in a modest difference in BMI decrease, it was a BMI decrease, nonetheless. This indicated that the
structured physical activity component was not harmful and should be continued throughout the existing wellness program.

**Secondary Outcomes**

The secondary outcome of the EBP project was the rate of attrition. This may also explain the decrease in BMI differences between the six- and twelve-week group. The rate of attrition in the comparison group was 55%. Whereas the rate of attrition of the EBP project group was 30%. For the statistical calculations of the EBP project, any individual lost to follow up was given a BMI change rate of 0%. Some participants returned at six-weeks, but did not return to any visit after the six-week check in. Both the comparison group and EBP project group had twenty participants each. The demographics of both groups were very similar as discussed in the participant data above. In addition, both groups of participants were followed for the same time of the year (September-January). Therefore, factors such as the holiday season should not have changed results from one year to the next. The rate of attrition for the EBP project group may have been less due to the frequency of supplemental materials provided to the participants. Participants were provided with supplemental materials via e-mail every four weeks. In addition, participants were sent a reminder e-mail to return for a visit if it had been greater than two weeks from her twelve-week visit. The BMI of participants who returned greater than two weeks after the designated twelve-week date were given a BMI change of 0% and included in the attrition.

It is important to note that the reduced attrition indicated that more participants continued with the existing wellness program than ever before. This is important because increased physical activity in individuals who are overweight or obese has a positive effect regardless of change in BMI (DOD, 2020). The wellness program provides benefits to participants that extend beyond BMI reduction. Therefore, keeping participants in the wellness program is of utmost importance. Participants may have had additional positive life changes that extended beyond weight loss.
Strengths and Limitations of the DNP Project

The EBP project had many strengths and limitations. The Iowa model was chosen for the implementation of the EBP practice change, and it helped ensure the strength of the EBP practice change. Despite the strengths, there were limitations of the EBP project. The strengths and limitations may have significantly impacted the project findings and are thoroughly discussed below.

**Strengths**

There were many strengths of the EBP project. The EBP project began with a comprehensive literature review. Databases were searched and pieces of evidence were selected. One strength is that all studies were of moderate to high quality and were level I and level II pieces of evidence. This meant that the intervention chosen for this EBP project was supported from the evidence in the literature. Another strength of the EBP project was the use of the Iowa Model. The Iowa model provided multiple decision points. The decision points allowed for project modification and re-evaluation of the EBP practice change. The Iowa model helped the project be implemented smoothly and effectively. In addition, the Iowa model offered the opportunity to develop a team of key stakeholders for the EBP project. The key stakeholders were essential for the success of the EBP project. An additional strength of the EBP project was the involvement of the key stakeholders at the EBP practice site. All stakeholders were supportive of the project, provided feedback, and continued with the designated intervention. A final strength of the EBP project was the two separate participant groups. Both the intervention and the comparison group had similar demographics. For example, each group contained twenty participants. The demographic data of the participants was thoroughly discussed in Chapter 4, and the demographic details can be found in Table 4.1. In addition, the data that was collected was collected during the same time frame of each year, this helped reduced outside factors that may have impacted the findings of the EBP project.
Another strength of the EBP project was the use of the supplemental materials through timed emails. The emails provided additional education and served as reminders for participants to return for the wellness program visits. The reminders helped reduce the rate of attrition in the intervention group which provided more data to be analyzed for the EBP project.

A final strength of EBP project included the existing wellness, weight loss program at the clinical practice site. The providers were already familiar with the program and were able to easily implement an additional intervention without disrupting the flow of the program. No additional time from the providers or participants was necessary to implement the intervention.

Limitations

There were limitations of the EBP project. The limitations may have affected the results of this EBP project. First, of all the evidence reviewed most of the evidence evaluated implementing diet and increase in physical activity together. It was evident throughout the literature review that diet and an increase in physical activity together was most effective at reducing BMI. However, it was difficult to determine which part of the physical activity intervention was most effective in decreasing body mass index due to the confounding factors of each piece of evidence reviewed. In addition, the evidence reviewed also evaluated outcomes of the interventions in additional ways besides a decreased in BMI. A second limitation of the study included that the major outcome evaluated was a change in BMI. If additional outcomes had been evaluated, there may have been other improvements identified related to the intervention. For example, it could have been beneficial to review changes in body composition and waist circumference. In addition, the mental health benefits could have also been evaluated using a variety of screening tools. Finally, the EBP project could have also evaluated physical activity minutes of each participant. Additional outcomes of the EBP project could have been evaluated to thoroughly review the findings of the EBP project.

Due to the brevity of the EBP project, only one major outcome was evaluated. The short duration and small sample size of the EBP project was an additional limitation. The EBP project
took place over a twelve-week period and included twenty participants in the intervention group and twenty participants in the comparison group. Both groups also had a substantial rate of attrition. Individuals who did not return for a twelve-week office visit were given a BMI change of 0%. This impacted the results of the EBP project. In addition, the small sample size and short duration made the results of the EBP project less generalizable. If the EBP project had lasted longer and included more participants, the results may have varied drastically.

Another limitation of the EBP project includes the differences from provider to provider that were performing the EBP practice change. Although thorough education was completed regarding the EBP practice change, some providers failed to document a SMART goal at each visit. Although physical activity may have been reviewed and encouraged in the existing wellness program, without proper documentation of this, it is difficult to determine how thoroughly and to what extent physical activity was reviewed during each office visit. The variation between each provider is a major limitation that is difficult to control. In addition, the frequency of patient visits could also not be controlled. The wellness program is individualized between each patient and provider. As a result, some participants did not return at proper intervals. In addition, some participants missed many visits and returned after more than four weeks for a follow up visit. This could have impacted the findings of the EBP project.

A final limitation of the EBP project included the difficulty in isolating the EBP practice change. The EBP practice change included a structured physical activity intervention for the EBP project participants. The existing wellness program had already promoted an increase in physical activity. However, there was no consistency with how and when physical activity was discussed.

**Sustainability**

Many actions were taken to ensure the sustainability of the EBP project at the clinical practice site. For example, a shared email was utilized between the providers to send supplemental materials and interventions to the participants. The shared account provided access to a shared drive. All the resources for the EBP project were uploaded to the shared drive
to ensure ease of access for the providers. The providers could access the labeled supplemental materials to send to the participants as needed using the shared drive.

Because the EBP practice change is a small part of the existing wellness program, the clinical site can continue to implement this practice change with ease. The intervention was simple, efficient, and could easily be continued. Physical activity can continue to be discussed at every visit without impacting the length of each visit. In addition, the EBP clinical site is also the EBP project facilitator’s primary place of employment. Therefore, the project facilitator could ensure the practice change continued.

If the EBP practice change were to be re-done, it would be recommended to assess additional outcomes of the practice change. For example, it would have been helpful to evaluate the mental health benefits. Physical activity can reduce symptoms of anxiety and depression. In addition, there may have been changes in each participant besides a reduction in BMI. For example, the functional capacity of the participant, or the participant’s physical body composition could have been improved. If the practice change was re-done, it would be important to evaluate the changes in body composition, functional capacity, and mental health benefits.

Relevance for EBP Model

The Iowa Model is a model that can be used to implement an EBP practice change into a clinical site (Buckwalter, et al., 2017). The Iowa model was used for this EBP project because of the user friendly and easy to understand format. Many aspects were very helpful and aligned well with the EBP project. The Iowa model was used to identify key opportunities for the EBP practice change. The existing wellness program was a huge component of the EBP clinical site. Therefore, the Iowa Model helped identify that the modification of this program was an essential opportunity for practice improvement. The Iowa Model also identified that the EBP practice change would remain a priority. The next step involved forming a team, which aligned well with the EBP project. A team of providers, medical assistants, and administrative staff was formed to ensure successful implementation of the project. After assembling the team of key stakeholders,
the evidence was evaluated to determine the EBP practice change that should be conducted. In addition, integrating and sustaining the practice change aligned well with the EBP project. The change was determined to be appropriate for adoption into practice and was implemented seamlessly in the clinical site. The final step of disseminating results occurred through the publishing of this paper and the presentation of the EBP project.

Some parts of the Iowa model were less consistent with the EBP project. For example, the design and pilot of the practice change section did not align perfectly with the EBP project. The practice change was designed and evaluated; however, due to time constraints the practice change could not be re-designed during the EBP project timeframe. After designing the practice change, the practice change was presented to the key stakeholders and quickly adopted into practice. Therefore, although opportunities for improvement were determined, these improvements could not be implemented throughout the EBP project timeframe.

Based on experience with the Iowa model, some minor changes could be beneficial for ease of use of the model. It may be helpful to have the formation of the team to occur after the systemic research is conducted. To prevent wasting time of any key stakeholders, determining if an intervention is worthwhile through an evidence appraisal is essential. The team of key stakeholders could be presented with the evidence at the same time the team is being formed. This would also help motivate the key stakeholders to be involved and active participants in the EBP practice change. Overall, the Iowa model was a straightforward model that applied well to the EBP practice change.

**Recommendations for the Future**

The EBP project can be utilized to provide future recommendations for the discipline of nursing. The EBP can help direct future research to build upon the EBP practice change. In addition, further education for students and nursing staff can be completed to help build upon the EBP practice change.
Research

Further research is needed to build upon the EBP practice change. Additional research regarding the exact interventions that are most beneficial for increasing physical activity should be conducted. In addition, further research regarding the benefits of the increase in physical activity for the EBP project participants should be conducted. It is well researched and understood that a reduction in BMI is a significant benefit of increasing physical activity. It would be beneficial to understand the mental health benefits of an increase in physical activity. There could be improvements in mental health conditions such as anxiety and depression. In addition, it would also be important to evaluate improvements in chronic health conditions such as chronic pain, and the functional capacity of the individual.

Also, when the EBP practice change is implemented, it should be implemented with a larger sample size and for a longer timeframe. The longer timeframe and larger sample size could help produce stronger, more generalizable results. The EBP practice change could also be implemented in clinical practice sites without existing wellness programs. Further research is needed to determine alternative benefits of the EBP practice change.

Education

It is important to educate both students and nursing staff regarding the importance of proper weight management education for individuals who are overweight and obese. Student and nursing staff must be educated on the importance of physical activity when reviewing weight management with patients. It is also important that all nurses and future nurses are educated regarding the use of SMART goal format with continuous feedback. Finally, individuals must be educated on the current physical activity guidelines of 150 to 300 minutes of moderate to vigorous physical activity per week (USDHHS, 2018). By educating future nurses and nursing staff together, the EBP practice change could be implemented into any clinical site that offers weight management care to individuals who are overweight or obese.
Conclusion

Obesity is a chronic disease that is impacting more and more citizens in the United States every year. This EBP project aimed to implement an intervention to increase physical activity in an existing weight loss, wellness program to promote a greater weight loss in individuals who are overweight or obese. This EBP project aimed to accomplish this outcome through a structured physical activity intervention that included goal setting, continuous feedback, and supplemental materials. Although, the results of the EBP project were not statistically significant there was an overall decrease in BMI in the individuals. The intervention group (n=20) had an average reduction in BMI by 3.42%. The decrease in BMI indicated that the intervention was useful in assisting in reducing the current impact of the chronic disease, obesity. In addition, the EBP intervention reduced the rate of attrition. The intervention group had 70% of participants return for the twelve week follow up visit. This is an increase compared to the comparison group in which only 45% of participants returned for the twelve-week visit. The wellness program has a multitude of benefits beyond reduction in BMI. Therefore, it is important to recognize this decrease in attrition is a significant improvement for the program. This EBP project involved a simple modification of the existing wellness program and should be implemented into any practice site that provides weight management care.
REFERENCES


program in the PREDIMED-Plus study: a randomized controlled trial. *The international journal of behavioral nutrition and physical activity, 15*(1), 110.


AUTOBIOGRAPHICAL STATEMENT

Ashley N. Kohler graduated with her Bachelor of Science in Nursing in 2015 from Purdue University in West Lafayette, Indiana. Ashley proceeded to work as a registered nurse on a labor and delivery unit in Chicago. Throughout her first year few years of nursing, she became certified in inpatient obstetric nursing. Ashley also became a certified breastfeeding counselor. During her time as a registered nurse, she was a preceptor for students and new labor and delivery nurses. She worked full time as a registered nurse while pursuing her Master of Science in Nursing from Loyola University Chicago. She graduated in 2018 and became a NCC board certified Women’s Healthcare Nurse Practitioner. Ashley began her advanced practice nursing career in a family planning clinic and continued precepting for advanced practice nursing students and new nurse practitioners at the clinic. Ashley worked in the clinic setting for two years prior to transitioning to a private OB/GYN practice in Valparaiso, IN. Ashley began pursuing her Doctor of Nursing Practice from Valparaiso University in 2020. She also was an adjunct instructor of OB Nursing at Valparaiso University for a semester in Fall of 2020. Since then, Ashley has continued to work while furthering her education in obesity medicine. Ashley is a member of the Obesity Medicine Association and obtained her certificate of advanced education in obesity medicine in 2021. Ashley hopes to continue to serve her community in women’s health through her work in obesity medicine. She is also interested in furthering her career in academia.
ACRONYM LIST

APN: Advanced practice nurse
BMI: Body mass index
CASP: Critical Appraisal Skills Programme
CDC: Centers for Disease Control
CITI: Collaborative Institutional Training Initiative
DOD: Department of Defense
EBP: Evidence-based practice
I: Electronic health record
HIPAA: Health insurance portability and accountability act
IRB: Institutional review board
JBI: Joanna Briggs Institute
MET: Metabolic equivalent
OB/GYN: Obstetrician-gynecologist
PA: Physical activity
RCT: Randomized controlled trial
SD: Standard deviation
SMART: Specific measurable attainable relevant and timely
**Appendix A**

**Literature Search Grid**

<table>
<thead>
<tr>
<th>Database/Resource Searched</th>
<th>Keywords/Phrases Used</th>
<th>Limiters Used</th>
<th>Number of Results</th>
<th>Number of Pieces of Evidence Selected for Use</th>
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<td>PubMed</td>
<td>(obesity OR overweight OR obese) AND (BMI OR “body mass index”) AND (“weight loss” OR “weight reduction” OR “lose weight”) AND (“family medicine” or “primary care” or “primary health care”) AND adult*</td>
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<td>Joanna Briggs Institute</td>
<td>(BMI) AND (Intervention) AND (obese OR obesity OR overweight) AND (“weight loss” OR “weight reduction” or “lose weight”)</td>
<td>Last 5 years</td>
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<td>CINAHL</td>
<td>(obesity OR overweight OR obese) AND (BMI OR “body mass index”) AND (“weight loss” OR “weight reduction” OR “lose weight”) AND (“family medicine” or “primary care” or “primary health care”)</td>
<td>Last 5 years, peer reviewed, full text, English language, adult age group</td>
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<td>2</td>
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<tr>
<td>TRIP</td>
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<td>Clinical practice guidelines, USA, last 5 years</td>
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<td>Cochrane</td>
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## APPENDIX B

### Evidence Table

<table>
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<tr>
<th>Lead Author/Year/Quality</th>
<th>Purpose/Design/Sample</th>
<th>Interventions</th>
<th>Measurement/Outcomes</th>
<th>Results/Findings</th>
<th>Strengths/Limitations</th>
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</thead>
</table>
| Department of Veterans Affairs  
Department of Defense  
2020/Strong | To provide information to assist in decision making when managing patients with obesity. This provides a general guide of best practice recommendations. The guidelines were determined after a systematic review of clinical and epidemiological evidence. The quality and strength of the recommendations is explained. | A systematic review of the literature was conducted to establish clinical practice guidelines for the management of adults with obesity. The guideline development process includes formulation and defining critical outcomes, convening a patient focus group, conducting evidence reviews, convening face to face meetings with group members and drafting and submitting the CPG. The guidelines were | Start with screening patients based on BMI. Involve the patient in shared decision making for weight management options. Strong recommendation of comprehensive lifestyle intervention (CLI) that includes behavioral, dietary, physical activity components. Engaging in moderate to vigorous physical activity is needed to maintain weight loss. Set SMART goals to monitor progress. Strong recommendation for an in-person intervention. A weak recommendation for incorporating a PA component to include aerobic, resistance, | Increased physical activity in individuals with obesity has positive effects regardless of impact on weight status | Strengths: Thoroughly evaluated each recommendation strength and provided rationale for each citing the strengths and limitations of each study. Limitations: A patient focus group was brought in to evaluate the CPGs, it was limited by the small sample size and time constraints. |
| Khanh-Dao Le, L/2021/Strong | To identify the best available evidence for long-term weight-loss maintenance of participants in structured weight-loss programs. The summary included evidence from a meta-analysis with 18 RCTs, a meta-analysis with 46 RCTs, a meta-analysis with 29 studies, systematic review with 5 studies, RCT, systematic review with 45 trials, systematic review of 48 studies, systematic review of 39 RCTs, a large retrospective cohort | Data and evidence were collected from a comprehensive review providing a list of best practice recommendations. | 3 Grade A best practice recommendations were a result of the literature review. | Interventions that include diet and exercise produce greater long-term weight loss than diet alone. A long-term intervention is needed to promote compliance. Decreasing energy intake, physical activity of at least 150 mins/week, and self-monitoring is needed for healthy weight loss and long-term weight maintenance in adults. | Strengths: the evidence summary included an extensive systematic review that was thoroughly documented. Limitations: short length with limited detail provided in the summary. |
study, a systematic review with 53 studies and another RCT with 137 participants.

U.S. Department of Health and Human Services/2018/Strong

To provide information and guidance on the types and amount of physical activity for multiple population groups. This clinical practice guideline was developed through a systematic review of literature regarding physical activity and health. The CPG addresses 38 questions and 104 sub questions and provides graded evidence. Evidence that was graded as strong and moderate was the majority of the guidelines. A 118-page clinical practice guideline was created. Key guidelines were provided for children, adolescents, adults, older adults, and special populations. The special populations included individuals with chronic condition and disabilities. In addition, guidelines were provided for safe physical activity. When individuals are aiming to lose more than 5% of their body weight and to keep off a significant amount of weight more than 300 mins of moderate to vigorous physical activity may be needed. Muscle strengthening should be incorporated two days per week to maintain lean body mass during weight loss. Combining calorie restriction with physical activity is the most beneficial method for weight loss. Any amount of activity is beneficial. Healthy active adults should participate in 150-300 minutes of moderate to vigorous activity/week.

ESL: strong

Level II Evidence (use this format to add additional levels as your evidence warrants)

Eaton/2016/Strong

The purpose of this study was to determine if a tailored lifestyle intervention will help obese patients achieve weight loss. The PCP was responsible for identifying study participants to refer them to the “home-based intervention.” The PCPs were

Data was collected at baseline, 6, 12, 18, and 24 months. Measures included a 7-day physical activity recall questionnaire and height, weight, waist

The difference was significant during the 1st year but not during the maintenance (33.3% vs 24.6%). The EI group included significantly more moderate to vigorous PA

Strengths: detailed, well-designs level II RCT with randomization and a long (24 mo) intervention.

Strengths: a comprehensive literature review was conducted and explained in detail. Limitations: when providing the recommendations, they are not clearly labeled as strong/moderate recommendations.
and physical activity in the primary care setting. The study is a 24-month RCT. The sample included overweight and obese (BMI >25), sedentary patients (18-80 years old) motivated to lose weight and increase their physical activity. Participant received the standard intervention (SI) or the enhanced intervention (EI). The sample included 211 obese individuals from 24 primary care practices. 79% of participants were women with an average age of 48.6 years. BMI of 37.8, with average exercise minutes at 21.2 mins/week. The intervention phase of the study was 12 months.

updated about their patients’ progress during the study. Both groups received 3 (start, 6 mos, 12 mos) face-to-face weight loss meetings with dieticians trained as lifestyle counselors. All participants set a 10% weight loss goal over 6 months. They were given a structured meal plan to support a 500-1000 kcal reduced diet. Participants were encouraged to add 10 mins of moderate intensity activity most days of the week to work up to 300 mins/week by 6 months. Participants were given food and exercise self-monitoring diaries for 6 months. The EI group also received phone calls for counselling (monthly then

circumference, resting heart rate, resting blood pressure. More EI participants lost 5% of their body weight than SI participants. than the SI group throughout the entire study (101.3 mins vs 75.4 mins at 2 years). The EI group lost significantly more weight overall. They were statistically significant at 6 and 12 months but not at 18 and 24 months. Almost half of EI group had lost 5% of baseline weight at 12 months and 1/3 maintained the loss at 24 mos. Postintervention interview suggested that lifestyle counselors personalized goal setting and monthly phone calls were most helpful. Weight loss supported by PCP and delivered by 3rd parties have significant benefit for weight loss and increasing physical activity.

Limitations: conducted in only 1 geographic location, predominantly female sample, and the SI/EI groups were at the same practice increasing risk for bias.
| Lison/2020/ Moderate | The purpose is to examine the short-and long-term efficacy… of a self-administered IBI on patients who are obese with hypertension compared to the control group receiving standard medical care. The study is a prospective, single-center RCT. The sample included 105 adults aged 18-65 years with hypertension who are overweight or obese. | The measures were assessed at baseline, 3-month, and 12 months. The intervention was titled “live better” and it included 3-month multimedia, interactive, self-administered online program with nine modules. The modules aimed to progressively establish healthy eating habits and increase in physical activity. Modules 1-5 were through Wix, a self-hosted | Outcomes included BMI and secondary outcomes included body fat mass, blood pressure, glucose, insulin, physical activity levels and functional capacity for aerobic exercise. Physical activity was tracked using an accelerometer. The 6-minute walking test was completed to assess the functional capacity for aerobics. | At 3 months, the intervention group had a significant decrease in BMI, BFM, and blood glucose. There were no changes for physical activity, but there was a statistically significant increase in function capacity for aerobic exercise. At 12 months, there was a statistically significant improvement in BMI and blood glucose in the intervention group. There was a significant reduction in body fat mass between 3 and 12 months (by double) indicated that this may be due to increase in muscle mass secondary to higher levels of PA. The | Strengths: well-designed, thoroughly explained RCT Limitations: lack of a control group for the analysis at 12 months, small sample size, participants who were enrolled were motivated to change. |
| Meurer/2019/strong | “To evaluate the effectiveness of the VAMOS strategy to improve physical activity, dietary habits, and anthropometric variables.” The study is a RCT with about 300 participants. Participants were randomized in the intervention (VAMOS) vs control group. Participants were mostly women >89%, and the average BMI was 28.7 (overweight). | Baseline measures were conducted. Both groups received routine 60-minute physical activity sessions (health academy program) 3 times per week supervised by physical education professionals. A HAP unit is a facility with equipment and qualified professionals for guidance on physical activity and dietary habits. | Outcomes included physical activity (assessed by accelerometers). Moderate activity was defined as 100-2689 counts/min and vigorous >2690 counts/min according to accelerometer. Dietary intake was evaluated by a diary and food frequency questionnaire. Body weight, heigh, and waist circumference were also assessed. | Among overweight and obese individuals that were in the IG group, lost significantly more weight than the control group. No difference in individuals with a normal BMI. IG participants showed significant increase in mins spent in moderate-vigorous activity. The VAMOS strategy was effective in promoting PA, healthy eating, weight loss. IG were also less likely to consume ultra-processed foods and more likely to consume raw vegetables. | Strengths: well-designed study with randomization of participants. Limitations: difference in education level of participants, the research team was not blinded to the participants, and the study was only conducted in two HAP units. |
The intervention group also had weekly (60-min) sessions in the VAMOS strategy for 12 consecutive weeks. The VAMOS strategy is based on the SCT theory by Bandura. Self-efficacy was addressed by feedback to increase confidence and goals for PA and dietary habits. Self-monitoring was collected by pedometers, written records, self-incentive action, social support identification, barrier identification, outcome expectancy. The meetings took place in a group setting of 20 individuals and covered different chapters of the VAMOS materials.
| Study | The purpose of the study was to investigate if a combined alternate day calorie restriction and exercise program that included both aerobic and resistance training influences cardio metabolic risk factors including body weight, body composition, blood lipids, and insulin resistance. This RCT included 45 overweight and obese, otherwise healthy, individuals. Individuals were randomized into 1 of 3 groups. 1 group was exercise only, 1 group diet only, and 1 group combination treatment. | The intervention included 1 orientation session. Text messages were sent 3 times/week to all participants to encourage participation and adherence. Diet logs were provided and participants were to track diet for 8 weeks. Exercise logs were also provided, and participants were instructed to log every session of exercise. The intervention included 24 “fasting” days and 24 exercise sessions. The diet intervention included alternating fasting days (400-500 cal/day) with regular consumption. The exercise goal included resistance and aerobic training 3 times/week for 8 weeks. For the first week participants | Baseline measures were collected at the orientation session and after 8 weeks of the intervention. Measures included body fat, muscle, and fat mass. BMI, WC, blood pressure, and heart rate were also measured. | In the combo intervention group BMI decreased by 1.3 compared to 0.9 in the diet group and 0.1 in the exercise group. The combo group had a significant decrease in fat mass compared to control groups. The combo and exercise groups experienced less loss of muscle mass than the diet alone group. | Strengths: double-blinded RCT
Limitations: small sample size, diet protocol was not individualized or supervised |
Schroder/2018/ Strong

| Schroder/2018/ Strong | To assess the initial effectiveness of the physical activity component of the PREDIMED-PLUS trial at 1 year compared to the control group of Mediterranean diet recommendations and no physical activity guidance. A six-year, multi-center RCT. Recruitment took place between 20 recruiting centers with a goal of 6,000 participants. The intervention included an energy-restricted Mediterranean diet increased physical activity, and behavioral support. The PA intervention is 12 individual face to face one-hour sessions, 12 telephone calls, and 3 one-hour group session on physical activity. The sessions are led by dieticians with additional training in PA. The REGICOR short physical questionnaire and pedometers were used to track exercise and physical activity adherence. The outcomes were measured at baseline, 6, and 12 months. The questionnaire covers activity, frequency, duration, and intensity. Secondary outcomes included change in body mass index and waist circumference. | The intervention were supervised by a trained exercise specialist. The remainder of the intervention was independent. The independent sessions were assisted by certified trainers in the gym. Exercise logs were monitored weekly. One session included a 5 min warm-up, 40 min resistance, 20 min aerobic, 5 min cool down. | Light physical activity and moderate to vigorous physical activity increased in the intervention group (27.2 METs-min/day in control and 123.1 METS-min/day in intervention). BMI and WC also decreased more in the intervention group than the control group. The intervention group decreased BMI from 32.5 to 31.1 and the control group was 32.5 to 32.2. The intervention group WC went from 107.4 cm to 103 cm. The control group WC went from 107.5 cm to 106.4 cm. | Strengths: study design, repeated data collection, standardized measurement, large sample size. Limitations: cannot rule out the dietary component as part of the outcome, self-reported data, recall bias from questionnaire. |
participants were men and women aged 55-75 who are overweight and obese with metabolic syndrome. The participants are being followed over six years.

intervention included goal setting, action planning, feedback, informational materials, motivation, and self-monitoring. Participants were encouraged to gradually increase to at least 150 min/week of moderate to vigorous PA with a goal to walk 45 min, 6 days per week and do static exercises for strength, flexibility, and balance. Each individual session provided feedback on goals and were tailored to each participant.

To “compare the effectiveness of aerobic exercise, resistance exercise, and combined exercise in reversing frailty and preserving muscle and bone mass during weight loss in obese older adults.”

Over a 26-week period, participants were placed into 1 of 4 groups. 1 group was the control with no exercise programs, 1 group was an aerobic group, a resistance group, and a combination group.

Outcomes included a change in the physical performance test score. The physical performance tests included 7 standardized tasks to assess frailty. Additional outcomes included changes in frailty measures (peak muscle strength).

Physical performance test improved most in combination group 27.9 to 33/4 points (21% increase). Peak oxygen consumption increased more in combination and aerobic groups than in resistance group. (17 and 18% improvement versus an 8% improvement in the resistance group).

Strengths: RCT study design, comprehensive lifestyle program, high rate of adherence, similar weight loss management across the groups, and the tools utilized to measure the results.
Randomized control trial. The sample included 160 persons 65 years of age or older who were obese (BMI ≥30), sedentary (exercise of <1 hr per week), stable body weight (loss or gain of no greater than 2kg) and stable medications for 6 months. Participants had mild to moderate frailty with a score of 18-31 on the Physical Performance Test.

| Adult and resistance exercise training group. The aerobic group received a prescribed balanced diet with 1 g of protein per kg of body weight. They met with a dietician weekly for adjustments and behavior therapy. They attended weekly behavioral goals and weigh in sessions. Food diaries and reports were reviewed. They participated in aerobic exercise training of 60-minute session 3 times per week. The sessions included 10 mins of stretching, 40 mins of aerobics, and 10 mins of balance. Exercises included treadmill walking, stationary cycling, and stair climbing. The resistance group had the same dietary program with 3 60 |
|---|---|---|
| oxygen consumptions and the functional status questionnaire), body composition, bone density, physical function, and quality of life. Measures were assessed at baseline and at 6 months | resistance group). Functional status questionnaire increased more in combination group compared to aerobic and resistance group. Body weight decreased by 9% in all three groups. Bone density decreased in the aerobic group by 2.6%. Bone density did not change in the resistance group. In the combo group it decreased by 1.1%. Combination aerobics and resistance improves physical function and reduces frailty more than weight loss plus aerobic or weight loss plus resistance training. Combined training improved cardiovascular activity as much as aerobic activity along. All exercise resulted in comparable weight loss. Weight loss plus combined training has the greatest reduction in frailty and the greatest improvement in physical function and was associated with preservation of lean mass. | Limitations: participants were physically able and may not represent the general obese population, not large enough to analyze difference between men and women, most participants were women. |
min sessions included 10 mins of stretching, 40 mins of resistance training, and 10 mins of balance. Resistance training included upper and lower body exercises with weightlifting machines. The combination group had the same dietary program with 75–90-minute sessions 3 times per week. The sessions included 10 mins flexibility, 30-40 mins of aerobics, 30-40 mins of resistance, and 10 mins of balance. Sessions were supervised by trainers.
Appendix C

Participant Hand-out

Being Active for a Better Life

Inactive people who start moving get the biggest bang for their buck. Experts now say that any physical activity counts—even just a few minutes! Fit in 2, 5, 10 or 20 minutes throughout your day. Every active minute adds up to better health.

Did you know that not getting enough physical activity can result in the same kinds of health problems caused by smoking and being overweight? Moving more often:

• Improves your mood and sleep;
• Slows the effects of aging;
• Lowers your risk of heart problems, high blood pressure, Type 2 diabetes and many kinds of cancer;
• Helps maintain your immune system, which may help to lower risk of infection, lessen symptoms and speed recovery from various illnesses;
• Helps keep your mind sharp as you get older and lowers your risk of dementia and Alzheimer’s;
• Increases your energy and simply makes life better!

Start where you are. Use what you have. Do what you can.

Getting Started

**Start Simple**

Simply sit less and move around more. Walk to the mailbox. Walk the dog. Dance at your desk. Take the stairs. Find opportunities to move throughout the day.

**Be Active with a Friend**

Do activities you enjoy and find a buddy at home or work. Those who exercise with a friend tend to stick with it longer than those who go it alone.

**Check Your Health**

If you have health worries, talk with your health care provider before you start exercising. Muscle or joint problems? Ask about doing physical therapy before beginning an exercise program.

**Motivation**

Use a smart phone or activity tracker to measure your progress and stay motivated. Count your steps daily for the first week or two. Gradually build up to 7000-9000 steps each day.

To stay safe and injury free:

• Gradually increase your pace and time spent being active. Start low and go slow!
• Start with light to medium effort.
• Warm up and cool down (easy pace) before and after exercise.
Aerobic Activity

Aerobic activity increases your heart rate and breathing. Build up to doing at least 150 minutes/week of moderate-intensity activity, 75 minutes/week of vigorous activity or a combination of both. You’ll improve your stamina and heart health.

What?
Any rhythmic, continuous activity!

How often?
3-5 Days/week

How hard?
Fairly light to somewhat hard

How much?
Start w/ a few minutes. Gradually build up to 30-60 minutes over the day.

Remember: Walking, biking, dancing, swimming and water exercise are great. Be active however and wherever you can – every minute counts. To lose weight, do twice as much activity.

Strength Training

Strength training, for example working with weights or resistance bands, makes you stronger and helps your overall health. Plus, strength training can make daily activities like lifting laundry baskets or yardwork easier and safer.

What?
Hand weights, resistance bands, weight machines, or your own body (for example, kitchen counter pushups or chair squats)

How often?
2-3 Days/week
* Rest day in between

How hard?
Start with light effort. Build up to medium or hard effort

How much?
10-15 repetitions to start (for each major muscle group). Build up to 8-12 reps of challenging effort. Repeat 2-4 times.

Remember: Avoid straining or holding your breath when lifting. If you need it, get help from a certified exercise professional. They can teach you the right way to do exercises and how to breathe properly.

Other Types of Physical Activity

- Yoga, Tai Chi and Pilates help with balance, flexibility and strength, and are relaxing too!
- Flexibility: Stretch your muscles 2-7 days/week to the point of feeling tightness. Hold for 10-30 seconds (30-60 seconds for older adults). For example, stretch your calves or the back of your thighs.
- Balance: Exercises may include standing on one foot, walking on a line, or using a balance board. Train in an uncluttered area and use a chair or wall for support if needed.

How will I get started this week?

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Time Saver: High Intensity Fitness Circuit in Minutes

What is it?
This workout involves completion of 12 key aerobic and strengthening exercises of all the major muscle groups in rapid succession with 10 seconds of rest between exercises.

What does it feel like?
Each exercise takes 30 seconds and is performed at a high intensity. Your effort level during the seven minutes should be at or near the 8-10 out of 10 points, where 0=rest and 10=highest level of effort you can perform. You will be breathing hard and your heart rate will increase.

Special considerations and safety:
• The execution and form of each exercise is a priority for safety and optimal fitness gains.
• Avoid holding your breath during any exercise.
• ACSM recommends doing an appropriate warm up and cool down before and after any exercise session.

How to access the program:
Online, mobile phone or watch apps ("Sweat", "7 Minute Workout")

What kind of exercises are included?
Workouts may vary slightly, but typically include aerobic exercise (jumping jacks, high-intensity), strengthening exercise (bend row, squats, lunges, step-onto-a-chair, triceps dip on a chair, push-ups, push-ups on a railroad), and core stability (planks, side planks, abdominal crunches). The order of the exercises is important to follow to allow one muscle group to rest while another is exercising.

Why participate in this kind of workout?
• Time: Vigorous exercise can be done in short time this circuit is approximately 7 minutes and can be repeated 2 to 3 times.
• Space: With only your own body weight, a chair and a wall, a door creating exercise that can be strengthened by adding a small object.
• Cost: Free.
• Feels refreshing.

Start
1. Jumping jacks (total body)
2. Wall sit (lower body)
3. Push up (upper body)
4. Abdominal crunch (core)
5. Step-up onto chair (total body)
6. Squat (lower body)
7. Triceps dip (upper body)
8. Plank (core)

9. High knees (total body)
10. Lunges (lower body)
11. Pushup and rotation (upper body)
12. Side plank (core)

Finish

Source: ACSM's Health & Fitness Journal 2013, 1(3):8-12.
Tips for Monitoring Aerobic Exercise Intensity

Substantial health benefits are gained when adults achieve 150-300 minutes per week of moderate intensity exercise, or 75-150 minutes of vigorous intensity exercise per week. Several tools and methods are used to monitor exercise intensity. Utilizing these methods help adults achieve physical activity goals.

**Talk test** is a way to gauge exercise intensity based on ability to carry on a conversation.

**Heart rate** can be monitored by using a wrist watch and chest strap or a smart watch.

**Perceived effort** is a subjective method to monitor how hard exercise feels.

**Motion sensors** are devices used to track steps and other activities.

In addition to the above 0-10 scale, the Borg Scale of Perceived Exertion, which rates exertion on a scale of 6-20, can also be used.

Author: Micah Zuhl, Ph.D.; 2020

American College of Sports Medicine (2020). *Being active for a better life.*

### Appendix D

**INCREASING PHYSICAL ACTIVITY IN WOMEN WITH OBESITY TO PROMOTE WEIGHT**

**Ashley Kohler**

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<th>Task</th>
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<th>End</th>
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<tr>
<td><strong>Phase 1: Development of Project</strong></td>
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<tr>
<td>Development of intervention</td>
<td>6/1/21</td>
<td>7/11/21</td>
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<tr>
<td>IRB approval</td>
<td>7/15/21</td>
<td>7/30/21</td>
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<td>Provider Education</td>
<td>7/30/21</td>
<td>8/31/21</td>
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<td><strong>Phase 2: Project Implementation</strong></td>
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<td>10/29/21</td>
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<td>End data collected</td>
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**GANTT Chart**

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Appendix E
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The American College of Sports Medicine’s resource library offers a comprehensive collection of books, infographics, articles, videos, publications and more for ACSM members and the public about sports medicine and exercise science. ACSM is dedicated to empowering members and advancing a better life for all. Use the search feature or the filters on the left side of the page to locate specific resources of interest.

Resource Library

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My best,

Angie

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