

Practice Inquiry Project Proposal:

The Feasibility of a Resistance Training (RT) Program in Targeting Obesity of Women
in Low Socioeconomic Status (SES) Environments.

Melissa L. Garnett, RN-BSN, DNP Student

University of Hawaii at Hilo Doctorate of Nursing Program

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Faculty Committee Member: Jeanie Flood PhD, RN, IBCLC; Alice Davis, PhD, APRN;

Stefanie Basso NSCA-CPT, BS, MS

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Committee Chair

Jeanie Flood

Committee Members

Alice Davis

Stefanie Basso

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Abstract

Problem. Obesity of women in low Socioeconomic Status (SES) environments ranges from 34% to 49% of America's low SES female population. Many barriers to weight loss and health management exist for low SES obese women. Risks for health problems, such as Diabetes, Stroke and Cancer, rise with obesity. Health programs, which extend beyond low SES barriers, are lacking. Many women do not know of resistance training's benefits for improving health and aiding weight management. **Objectives.** The aim of this project is to formulate and evaluate the feasibility of a financially reasonable, time allowable, and research based weight reduction and health improvement program through the use of in-home resistance training for obese low SES women. **Methods.** The project employed an epidemiological approach an evidence-based design (EBD). The findings from a literature review and study analysis were compiled to build a weight reduction and health improvement program extending beyond low SES barriers. Questionnaires on the feasibility of the program were answered by five target population women, five health care providers, and five fitness professionals. **Data Analysis.** Studies included in the review were analyzed for inclusion criteria, which was used in the design of the Lift for Health program. Likert results from the questionnaires were tallied and a mean for each question was determined. Common themes in the qualitative responses were summarized. **Expected Results.** The proposed resistance training based wellness program will be effective for weight management and health improvement in obese women in low SES environments.

The Feasibility of an Anaerobic Exercise Program in Targeting Obesity of Women
in Low Socioeconomic Status (SES) Environments.

CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

Building muscle through resistance training and weight bearing exercises greatly benefits women of all ages. It is a widely accepted fact that exercise, in general, is beneficial. Until recently, through media and common culture, certain forms of exercise have been geared towards men and other forms towards women. Building muscle through weight training has generally been geared towards men (Yun, 2011). However, new research is proving that it is highly valuable for women to focus on building muscle. Increasing muscle mass, in women, aids weight loss and toning, benefits postmenopausal women with improved bone density, and may help women with diabetes (Fiatarone, et al., 1994). Among the fore mentioned benefits, women may also see an improvement of bone density and physical frailty in the elderly female population (Fiatarone, et al., 1994).

Concerns that limit many women from participating in what seems to be a highly beneficial routine are stigmas that aerobics is more beneficial, building muscle makes women bulky, a lack of knowledge of weight training routines, economic resources, such as finances, facilities, time and equipment (Gearhart, Grabert, & Vanata, 2008). Additionally, there is little research in the ways of effectively aiding weight loss and health benefits for average women with an increased basal metabolic index (BMI) and low Socioeconomic Status (SES) (Gearhart, Grabert, & Vanata, 2008). Addressing programs targeting these barriers is an area in need of evaluation (Yun, 2011).

The goals and aims of this program is to build and evaluate the feasibility of an at home weight training based wellness program for obese women of low socioeconomic status (SES), which relies on the minimal guidance of fitness professionals. The program will include a routine that extends beyond several barriers, including finances, time, and access to facilities and equipment. This is thought to aid in the support of women succeeding with the wellness benefits of weight training.

Background

The decline in female muscle mass seen in aging and life circumstances has been linked with physical frailty, unwanted weight gain, and negative health attributes (Fiatarone, et al., 1994). Even though many factors, including chronic illness, nutritional deficiencies, sedentary lifestyle, and aging in general, may play a role in the loss of skeletal muscle mass, currently skeletal-muscle disuse is among one of the only factors that are potentially preventable or reversible with direct interventions (Fiatarone, et al., 1994). According to Fiatarone, et al (1994), in a previous strength training study that nutritional supplementation aided in muscle hypertrophy. However, muscle strength and ability improvement was seen only when resistant training was added to the regimen.

Aerobics exercise has been widely geared towards female exercise, which in the past, has suited the psychological and physiological characteristics of a majority of females. This preference was seen because of the desire for weight control and to mold a physically desirable shape in addition to health benefits. However, findings in recent research, aerobics was unable to satisfy the desires of the female participants as they were unable to attain their desired physical physique (Yun, 2011). Weight training in female exercise routines has met resistance, which is partially due to limited research on the boundaries of implementing such programs. Also,

popular opinion on female exercise tends to favor aerobic exercise and the benefits of weight training have been geared towards males due to the outcome of muscle hypertrophy (Yun, 2011).

The understanding of the process in which bone reacts to weight bearing exercise holds much significance in building health programs for the prevention and treatment of osteoporosis. Many previous research studies have shown benefits of weight-bearing exercise on the improvement of bone density. Researchers have shown in comparable studies that strength training significantly improves bone density whereas endurance exercise programs did not (Kerr, Ackland, Maslen, Morton, & Prince, 2001).

The problem remains that barriers to the sociocultural implementation of such a program for women have interfered with the benefits seen by many (Yun, 2011). A lack of research has incorporated weight training programs that consider financial, time, stigmas, and additional socioeconomic barriers (Ryan, Pratley, Elahi, & Goldberg, 1995). It has been seen that resistance or strength training offers many benefits for women, especially for postmenopausal women. Weight loss of postmenopausal obese women is well documented in several studies from the 1990s. In a study conducted by Ryan, Pratley, Elahi, and Goldberg (1995), article observed significant changes in resting metabolic rate and increases in fat-free mass with or without weight loss. This showed that abdominal fat, which has become a sign for health risks, is changed as a part of the body composition outcomes of resistance training.

The primary goals of a weight loss and health program are for the prospective individual to be able to maintain the program for a lengthened period of time and promote a lifestyle change. Mid-life women being treated for weight loss in a clinic setting often regain the weight within five years (Schmitz, Jensen, Kugler, Jeffery, & Leon, 2003). This is generally due to inadequate energy expenditure and disproportion of energy intake. The common first approach has been to reduce energy intake or increasing dietary control. However, research indicates there

is an overall decline in physical activity throughout adult hood with a relatively stable dietary consumption. Increasing effective anaerobic exercise, such as weight training, is theorized to control for these changes through the adult aging process (Schmitz, et al., 2003).

Problem Statement

Obesity of women in low SES environments ranges from 34% to 49% of America's low SES female population (Center for Disease Control and Prevention, 2012). There are many boundaries faced by low SES obese American women in the attempt to build health and initiate weight loss programs. Anaerobic exercise through weight training offers a suitable program in the battle for weight loss and overall health.

The deterioration of health from a combination of obesity and the taxing results of low SES demands are costly and detrimental (Albright, et al., 2005). There is a lack of targeted programs that are geared towards weight loss in low SES obese females and attempt to control for the confounding variables that limit activity in a low SES environment. Safety concerns in low SES communities limit an individual's ability to frequent public parks, walk outdoors and engage in physical activity outside of the home. The increase in obesity in low SES environments is thought to be multifactorial. However, providing a safe and effective program for physical wellbeing that is financially feasible and time considerate is proposed as one solution in the growing face of obesity (Gearhart, Grabert, & Vanata, 2008).

Additionally, many women are not educated on the benefits of weight training since it has been geared towards men until recent years (Yun, 2011). Weight training offers multiple benefits, including weight loss, increase in fat-free tissue, and improvement in bone density, insulin sensitivity, and blood lipid levels (Cullinen & Caldwell, 1998; Ryan, Pratley, Elahi, & Goldberg, 1995; Srikanthan & Karlamangala, 2011; Cauza, et.al., 2005; Bea, et al., 2010; Kerr, et al., 2001; Vaapio, Salminen, Vahlberg, & Kivela, 2010). However, multiple barriers exist to

the acceptance and implementation of such a program. The stigma of muscle building as a goal for men and the belief that aerobics is more beneficial have decreased the popularization of weight training for women (Yun, 2011). Additionally, economic resources, such as equipment, time, finances and facilities, and knowledge of such programs place barriers to the implementation of weight training programs (Schmitz, et al., 2003).

Significance of the Problem

Research has shown that with obesity, the risks for the following conditions increase: Coronary Heart Disease, Type 2 Diabetes, Cancer, Hypertension, Dyslipidemia, Stroke, Liver and Gallbladder disease, Sleep Apnea, Osteoarthritis, and Gynecological problems (Center for Disease Control and Prevention, 2012). Economic consequences arise from the cost of treatment, decreased productivity, and comorbid factors. The national estimated cost of obesity in 2008 was \$147 billion (Center for Disease Control and Prevention, 2012).

As advanced practice health care providers, it is of the upmost importance to advocate holistic health care and health promotion. As proponents of disease prevention in rural communities, advanced health care providers have an obligation to address the increase of obesity in low SES populations (Gearhart, Grabert, & Vanata, 2008). Providing treatment options that empower self-care, wellness, and general health prevention will decrease the burden of rural clinics in treating advanced health ailments. Advanced practice providers will become agents of change that improve community wellness, adopt broad approaches to health promotion and risk reduction, and manage care of rural communities with evidenced-based practice (Doctorate of Nursing Practice, 2013).

Health prevention and promotion through empowering women to take charge of their own health is one proposed leading avenue for reduction of obesity in low SES women (Adler, & Newman, 2002). Providing affordable, timely, and understandable concepts for the effective

treatment of obesity is crucial for the successful implementation of any program. Research has offered options for programs, including physical exercise and diet. However, barriers for low SES women, such as finances, time allotment and community safety have not been sufficiently addressed within these programs (Adler, & Newman, 2002).

Lifestyle factors of many low SES women, such as poor portion control, low accessibility to quality food, and a lack of physical activity have been associated with an increase in weight particularly an increase in abdominal visceral adipose tissue (Bea, et al., 2010). An increase in visceral adipose tissue has been associated with an increase in a risk for or exacerbation of Type II Diabetes (T2D), insulin resistance, inflammatory diseases, cardiac diseases, blood lipid instability, and other obesity related comorbidities (McEwen, 2008).

Post-menopausal women develop an increased deposition of highly inflammatory abdominal adipose tissues due to loss of endogenous estradiol. According to Bea and associates (2010), post-menopausal women may gain an average of 0.7 kilograms (kg) and a 0.7 centimeter (cm) in waist circumference per year. In an attempt to lose weight, many women have attempted diet and exercise. However, high levels of attrition and regaining of initial weight lost at an average of 77% within four to five years are large issues in the fight against obesity.

When reviewing weight and health management programs geared towards low SES women, many challenges are faced. Dietary intakes among women from low SES environments are lower in fresh fruit and vegetables, whole-grains, and fiber; and higher in total fat, saturated fat, and refined sugar (Gearhart, Grabert, & Vanata, 2008). Low SES shows a significant connection between obesity and a lack of recreational physical activity in women. Low income, ethnic minority women have the highest inactivity rate in the United States of America (USA). The negative stigma among modern American society intensifies in females with the pubertal change on an increase in body fat. Adolescent girls of higher SES have a higher rate of practicing

dieting and exercise behaviors designed to maintain a thin appearance, thus there is a less rate of obesity and comorbid factors of women in higher SES. Much of this is attributed to higher crime rates and unsafe environments in low SES communities. Public health promotions recommend reducing television viewing and increase activity within the home and promote positive attitudes towards all body sizes should be used (Gearhart, Grabert, & Vanata, 2008).

Hospitalization following a fall often leads to further disuse atrophy and physical decline with a common outcome of loss of independence. As a result of falls, complications constitute the sixth leading cause of death of people over the age of 65. In addition, a natural result of aging and hormonal changes, muscle mass reduces by an average of one-third between the ages of 50 and 85 years. This reduced muscle mass accounts for a loss in muscle strength, balance, gait, and general physical ability with aging (Borst, 2004).

Purpose of the Project

The purpose of the project is to formulate and build a research based at-home weight training program proposed to effectively target weight loss, BMI reduction, body measurement changes and body fat percentage for obese women of a low SES. This program will use the expertise of medical providers, fitness experts, and a sample of the target female population as evaluators of the feasibility and other areas of this program.

Expected Outcomes

Outcomes of this project are guided by the program objectives. One outcome is to promote exercise and fitness as a routine part of preventative health care with effective methods and programs in targeting low SES obesity related health issues. A second outcome branching off of the first outcome is to promote community awareness in maintaining health and activity levels to improve health. The third expected outcome is that an effective resistance training program for women based upon research will be built extending beyond low SES barriers, which

will include time constraints, limited finances, unsafe neighborhoods, etc. The final expected outcome is to inspire future research and programs that promote preventative health care in low SES communities that take into account low SES barriers and the needs of this particular population.

CHAPTER II

PROJECT DESCRIPTION

Project Aims

The overarching aim of this project is to formulate and evaluate the feasible implementation of a financially reasonable, time allowable, and research based weight reduction and health improvement program through the use of in-home weight training routines for obese low SES women. Additionally, the aim of this program is to evaluate the effectiveness of weight, BMI, body fat percentage, and body measurement reduction with the use of weight training without unrealistic dietary control and a change in extenuating factors that arise from low socioeconomic environments.

Objectives

The key program objectives are as follows:

1. Formulate an obesity prevention and treatment program using the core concepts and methods of anaerobic weight training for the low SES female population.
2. Build educational methods in a timely and financially allowable manner in ordinance with the needs of the low SES female population.
3. Formulate an in home program with equipment utilized and created from materials readily available in the average low SES household.
4. The program will include monitoring baseline changes in weight, BMI, body fat percentage and body measurements every two months.

5. Have the program evaluated by five primary medical providers, five fitness experts and five women, who would fit the criteria of participants in the program.
6. Create community-wide awareness of a proposed weight reduction and health management program formulated through established research in relation to weight loss, BMI, body measurement and body fat reduction in addition to multiple health benefits.
7. Create community wide awareness of the ease and feasibility of the proposed program with the use of weight training as a core concept.

Review of Literature

The following review of literature will encompass an initial review of health and obesity related challenges faced in low SES environments and the benefits seen in increasing muscle mass for female health and weight loss. Health benefits reviewed will include effects on diabetes, cholesterol, bone density, fall-risk reduction and post-menopausal changes. A review of strengths and limitations in current knowledge will help to guide the aims and objectives of this project. Additionally, discussing the gaps in the literature will provide a guide as to the need for future research.

Low SES and obesity. Social and economic demands of working multiple low waged jobs, managing families and other stressors promote a lack of physical activity. There is also lower neighborhood safety in low SES communities (McEwen, 2008). McEwen (2008) found that the allostatic load of a low SES environment aids in the production of abdominal fat increasing hormones and comorbidities. The otherwise adaptive response to stress is exacerbated in a low SES environment due to the chronicity of stressful circumstances. Holistic manipulation of the physical stress responses in the body, such as cortisol release, which increases the stores of abdominal adipose tissue, can aid in the body's ability to manage these stress reactions.

Increased fat-free tissue increases the body's ability to process cortisol, improve blood pressure, cholesterol levels and insulin sensitivity.

Dietary intake among women from low SES environments is lower in fresh fruit and vegetables, whole-grains, and fiber; and higher in total fat, saturated fat, and refined sugar. In addition, low SES shows a significant bond between obesity and a lack of recreational physical activity in women. Low income, ethnic minority women have the highest inactivity rate in the United States of America (USA). Much of this is attributed to higher crime rates and unsafe environments and a lack of access to nutritional provisions in low SES communities. A physical fitness plan that is cost effective, safe and can be administered in the home would provide beneficial for women of low SES (Gearhart, Grabert, & Vanata, 2008).

Effectiveness of muscle building in female weight loss. The metabolism rate of muscle is higher than that of fat. According to recent research by Yun (2001), one pound of muscle burns 35 to 50 calories of heat per day, whereas, one pound of fat burns 2 to 3 calories per day. Thus, adding muscle increases a person's resting metabolic rate, which will in turn, increase the amount of calories burned throughout the day. For aerobic exercise, a person's metabolic rate is maximally increased only during the exercise period. Calories are burned while engaging in aerobic exercise. However, after the aerobic exercise is finished, especially after a day or two of skipping the exercise, the individual's resting metabolic rate declines (Yun, 2011).

Yun (2011), a researcher from Qingdao University of Science and Technology, randomly selected a group of female college students to participate in 12 weeks of exercise. One group performed 90 minutes of aerobic exercise, and the other group performed half aerobic exercise and half strength training. After 12 weeks, the group that was involved in strength training decreased their Basal Metabolic Index (BMI), lost more weight and improved their Waist Hip Ratio (WHR) significantly more than the solely aerobic group.

Resting metabolic rate (RMR), which is the amount of energy expended (calories burned) by an individual at rest, has a significant role in the long-term ability of a person to maintain a healthy body weight and fat ratio. Fat-free muscle cells consume a higher percentage of calories to maintain function, which increases RMR, as compared to lipid compositions (Cullinen & Caldwell, 1998; Ryan, Pratley, Elahi, & Goldberg, 1995).

Restricting food intake often poses the greatest challenge of any weight loss program. Food intake is difficult to control for each subject and without strict control and calculation, food intake results can be unreliable. Thus, weight loss interventions that do not rely on strict food intake control are often desirable (Cullinen & Caldwell, 1998). Additionally, low SES individuals have financial and access limitations to the provision of healthy and nutritious foods that would often entail a health or weight loss plan (Gearhart, Grabert, & Vanata, 2008).

Cullinen and Caldwell (1998), observed twenty study subjects and fourteen control subjects, which consisted of women aged 19 to 44 years, in a twelve-week weight training program with two supervised training sessions per week. Results showed an increase in fat-free mass from an average of 44.2 kilograms (kg) to 46.2 kg. A decreased percentage in body fat from an average of 29.8 to 27.2 was also observed. These favorable changes in body composition were gained without restricting food intake.

Time and financial benefits of muscle building for weight loss. Lack of time and limited resources are often cited as two common obstacles to weight loss. However, with the right guidance and program, these challenges can be overcome. Effective weight lifting routines more so than aerobic exercises can be accomplished in a decreased amount of time (Schaengold, 2006). Also, there are no or low cost options due to the fact that many household products, such as milk jugs filled with water, chairs, soup cans, etc., can be used as equipment in such programs (Schaengold, 2006).

A physical activity program is only successful in its capacity to be adequately implemented by the participants. Preconceived notions of exercising for weight loss is the devotion to time consuming routines that interfere with daily activities. Schmitz and associates (2003), implemented a study with the primary goal of providing a strength training routine that is effective in weight loss and able to be maintained unsupervised for an extended period of six months. Sixty women aged 30 to 50 years performed twice-weekly supervised strength training routines for ten months followed by six months of unsupervised training. Measurements at baseline, 15 weeks and 39 weeks, showed improvement in lowering body fat percentage. Over 90% of prescribed exercise sessions were completed. The conclusion lends to the feasibility of twice-weekly, 50 minute strength training routines are effective for busy midlife women.

Effects on diabetes. Higher muscle mass is associated with better insulin sensitivity. It is well known that weight control can aid in the prevention and possible reversal of Type II Diabetes (Srikanthan & Karlamangala, 2011). However, building muscle instead of just aerobic exercise is showing to have greater benefits. Srikanthan and Karlamangala (2011) produced a national study of 13,644 diabetic patients. The results showed that with every 10% increase in skeletal muscle, there was an 11% decrease in insulin resistance, and a 12% reduction in pre- or overt diabetes.

Weight training in comparison to endurance training has shown improved long-term outcomes for glycemic control in Type II Diabetes (T2D). In 2005, Cauza, and associates, took twenty-two adults in their late 50s diagnosed with T2D and placed them in a 4-month strength training program. Seventeen adults with T2D were placed in a 4-month endurance training program. The main determinants of outcomes included blood glucose levels, glycosylated hemoglobin (Hb A1C), insulin and lipid assays. A significant decline in Hb A1C was only observed in the strength training group ($8.3\% \pm 1.7\%$ to $7.1\% \pm 0.2\%$, $P=.001$). Blood glucose

(204 ± 16 mg/dL to 147 ± 8 mg/dL, $P < .001$) and insulin resistance (9.11 ± 1.51 to 7.15 ± 1.15 , $P = .04$) improved greatly in the strength training group, whereas no significant changes were seen in the endurance group (Cauza, et al., 2005).

Effects on cholesterol. An effective treatment plan for the reduction of total cholesterol, low-density lipoprotein cholesterol, and triglyceride levels may include strength training. The cholesterol changes in twenty-two participants in a strength training regimen and eighteen participants in a comparative group of endurance training were documented in 4-month study. Baseline total cholesterol levels (207 ± 8 mg/dL to 184 ± 7 mg/dL, $P < .001$), LDL cholesterol (120 ± 8 mg/dL to 106 ± 8 mg/dL, $P = .001$) and triglyceride levels (229 ± 25 mg/dL to 150 ± 15 mg/dL, $P = .001$) showed significant reductions in the strength training group. In contrast, no marked changes were seen in the endurance training group (Cauza, et.al, 2005).

Postmenopausal benefits. If muscle is not actively maintained, women lose one pound of muscle per year during menopause, which is a contributing factor as to why weight control becomes more difficult (Yun, 2011). A longitudinal study by Bea and associates (2010) followed postmenopausal women over six-years. They found that resistance training was an effective method in avoiding additional weight gain and harmful body changes.

Not only is weight training beneficial for overall weight loss, a beneficial change in body composition is seen through the increase in fat-free mass and a decrease in abdominal lipid stores. Ryan, Pratley, Elahi and Goldberg (1995) published a 16-week weight training program performed by 15 postmenopausal women aged 50 to 69 years resulted in significant improvements of women in both the group, who lost weight, and women in the group that was controlled for no weight loss. An increase in fat-free mass was seen in association with an increase in resting metabolic rate (RMR) and a decrease in overall fat composition in postmenopausal women.

Effects on bone density. The effect of weight training on the composition of bone is a commonly understood benefit of the stress/strain weight bearing form of exercise. One in four women above the age of 50 years will experience osteoporosis and bone fractures related to osteoporotic decline (Kerr, et al., 2001). Kerr, Ackland, Maslen, Morton, and Prince (2001) sought to document the changes in bone composition after a two-year weight training program with a mild amount of calcium supplementation (600 mg/day). One hundred and twenty six postmenopausal women were chosen and randomly assigned to study and control groups. Bone mass density (BMD) was measured at the hip, lumbar spine, forearm and whole body every six months. The largest change was seen at the intertrochanter hip site ($1.1 \pm 3.0\%$; $p < 0.01$). The lumbar spine and forearm did not show significant changes. This study concluded that a strength training program would be a positive additive to the support program of preventing osteoporosis of the hip (Kerr, et al., 2001).

The medical treatments, such as hormone replacement therapy (HRT), calcitonin, bisphosphonates and selective estrogen receptor modulators (SERM) for osteoporosis can be costly and potentially have undesirable side effects. Lifestyle changes, including calcium and vitamin D intake, smoking cessation, moderation of alcohol consumption and the addition of weight bearing exercises have been proposed as a healthy alternative of complimentary therapy to medications. Cussler and associates (2003), performed a clinical trial of 140 calcium-supplemented postmenopausal women involved in one year of progressive weight training with BMD measured at baseline and at one year. The increase in femur trochanter (FT) BMD was positively related to the amount of weight lifted. However, changes in the lumbar spine or femur neck were not significant. This study shows the positive relationship between weight lifting as a supportive therapy regimen for an improvement of BMD in women.

Fall risk reduction and activity improvement. Sipila and Associates (2006) conducted a study of (N=187) women with the average age of 75 years and the influence of muscle strength on fall risks. They concluded that women with higher muscle strength had a lower incidence of fall-related limb fractures even after an adjustment for bone density. Another longitudinal study of (N=417) women over 65-years-old over a 12 month period of time. Research found that after 12 months of isometric strength training targeted towards the knees, these women showed improvements in some activities of daily living (ADL) functions and in self-perceived physical condition (Vaapio, Salminen, Vahlberg, & Kivela, 2010).

High-intensity resistance exercise training was documented as a reasonable instrument for counteracting muscle weakness and improving physical weakness in the significantly elderly population aging 72 to 98 years old. This was found in a study of 63 female and 37 male residents of a long term health care facility. Fiatarone and Colleagues (1994) performed a ten week study comparing the muscle growth benefits of strength training versus nutritional supplementation. Findings showed that without strength training, residents, who were provided only nutritional supplementation, did not reduce muscle weakness or physical frailty. In the group, who underwent strength training twice per week for ten weeks, improvements in stair-climbing, general muscle strength, gait velocity, spontaneous physical activity and thigh muscle mass were measured. Energy was also increased for the exercising subjects and not the nutritional supplementation subjects (Fiatarone, et al., 1994).

Strengths of current knowledge. Current research has attempted to organize and obtain knowledge of weight training exercises for women in multiple health categories. Many of the studies provided valid research questions with responses that built awareness of the necessity of weight training for women in the areas of bone mass improvement, insulin sensitivity, blood lipid value control, fall and frailty reduction, and weight loss for post-menopausal women. Even

with small cohorts, many of the studies provided validity to the need for future research in this area.

Current knowledge has shown that there is a positive correlation between weight training and multifaceted health benefits (Bea, et al., 2010). Many of the studies provided a clear overview of their methods and the outcomes. Outcomes were reported using appropriate statistical measures with the necessary *P* values for their documented significance. The provision of control for extenuating variables was seen in several studies, but not all. Several studies that discovered weight loss, fall reduction, and bone density and glucose control improvement attempted in controlling for dietary changes, and further lifestyle modifications (Albright, et al., 2001; Bea, et al., 2010; Borst et al., 2004; Cauza, et al., 2005; Chen, et al., 2008; Cussler, et al., 2003; Fiatarone, et al., 1994; Ryan, Pratley, Elahi, & Goldberg, 1995; Srikanthan & Karlamangala, 2011; Cauza, et.al., 2005; Bea, et al., 2010; Kerr, et al., 2001; Vaapio, Salminen, Vahlberg, & Kivela, 2010). In entirety, current knowledge has built a foundation for the fruition of future research.

Gaps and limitations of current knowledge. Currently applied research and attained knowledge of weight training for women is limited in recent years. The majority of accessible research on the effects of weight training on weight loss for women was done over ten to fifteen years ago. Additionally, the particular form of weight training exercise has not been made apparent through research. Much of the research studies have had small study groups with a lack of diversity in relation to race, culture, and socioeconomic status. The observed changes in certain studies were too small to be clinically significant.

A handful of the studies reported that they did not instruct their participants either way to follow a direct dietary regime or maintain their dietary habits. This lack of understanding of dietary conditions could have accounted for some for the body weight and body measurement

changes. The largest limitation would be the lack of control over the lifestyles and activities of the participants outside of the study environment. Participants in all of the presented research are not maintained in a controlled environment, thus outside factors can unexpectedly play a role on the effects of the study's implemented intervention. Evidence has not been consistent, because studies were small, interventions were not clearly defined, and they utilized a variety of intervention types.

A gap in scientific support exists for low SES obese women and successful interventions for weight loss. Several of the implemented programs required fitness facility memberships, dietary changes, time consuming activities and other factors that limit the generalizability for the majority of women who face time restraints and financial hardships. No readily available research exists on a fitness program that is effective and able to be maintained by a low SES female population. Aerobic and strengthening exercises are broad regimens, and there was often no description of the techniques or movements used in the studies. Many of the studies offer positive ideas for future research. However, there are many questions that need answers to offer full validity.

Literature summary. The implementation of weight training programs and the promotion of women building muscle offers many health benefits as seen in current literature. From aiding weight loss to preventing postmenopausal fractures to preventing diabetes, women greatly benefit from an increase in muscle mass.

For women trying to lose weight, increase fat-free tissue, decrease BMI and improve body measurements, muscle building is superior to only performing aerobic exercises as seen in comparison studies of weight training, aerobics and sole dietary regimens. For postmenopausal women, increasing muscle strength aids in maintaining functionality and preventing hormonal weight gain. For women with diabetic risk factors, building muscle aids in the prevention of

diabetes and decreasing insulin resistance. Cholesterol levels found improved balance and control with weight training as compared to the neutral effects of aerobic interventions. In relation to obesity and low SES women, implemented programs for such populations have not been found in current research studies. Obesity is a growing problem in this population without a clear answer to successful programs or health and weight loss routines.

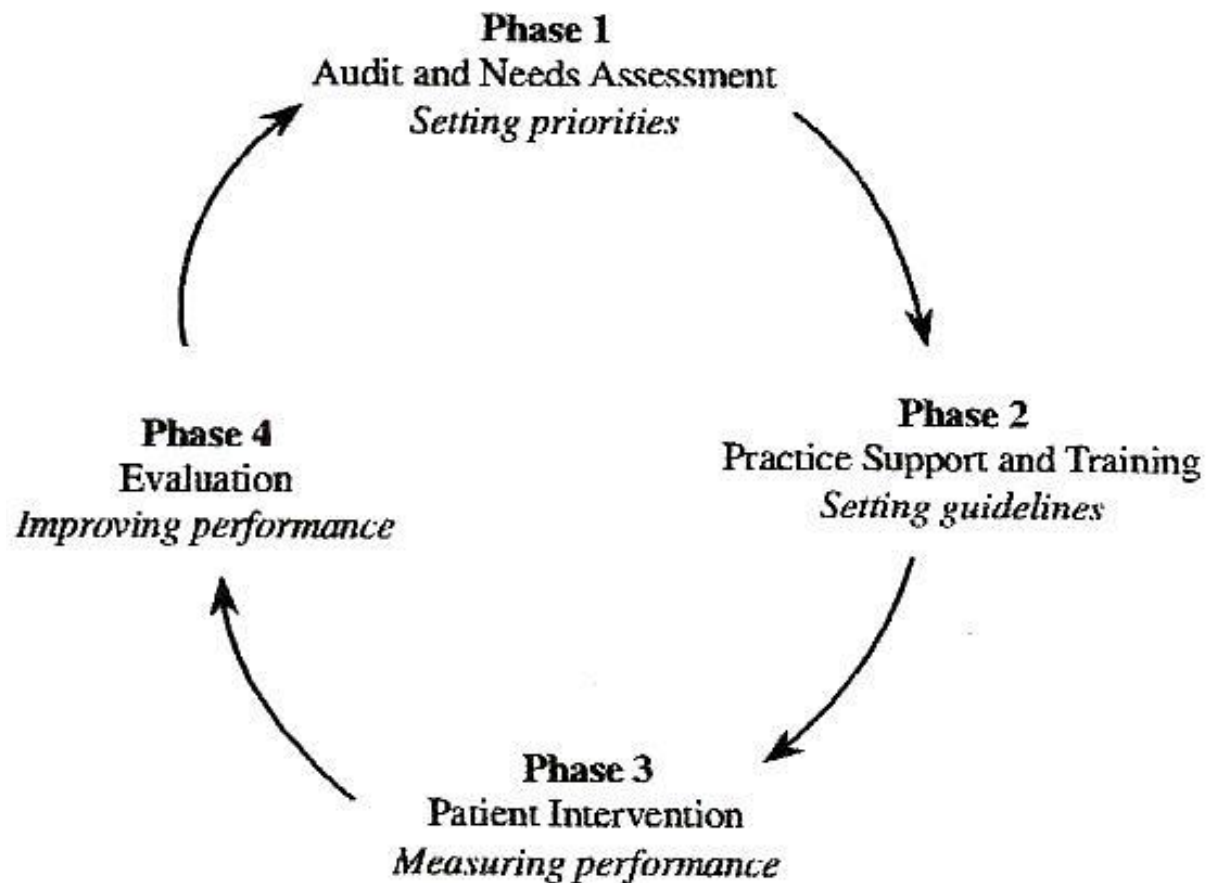
CHAPTER III

PROJECT DESIGN AND EVALUATION PLAN

Theoretical Framework

The theoretical framework for this project was the Counterweight Programme adopted from Gibbs and associates (2004). This model is built from the theory of Evidence-Based Quality Assessment and aims in providing a foundation for studies targeting improvement in the management of obese adults. There are four phases within this model that guide studies and evidence-based health care in the implementation of weight loss and health improvement programs for obese adults. Phase one is audit and needs assessment, which correlates to setting priorities in the evidence-based quality assessment model. Phase two is practice support and training, which corresponds with setting guidelines. Phase three is patient intervention and performance measurement. The final phase is evaluation and performance improvement. Refer to Figure 3.1 for a diagram of the framework.

Figure 1. The Counterweight programme phases and the evidence-based quality assessment model. Adapted from “A new evidence-based model for weight management in primary care: The Counterweight Programme” by Gibbs, et al., (2004).



The overarching aim of this model is to guide the evaluation of the needs of the population and provide an effective strategy in combating obesity that is tailored to the needs of the community. Management and measurement of the effectiveness of the implemented programs and evaluation of overall effect is key in the cyclic phases of the Counterweight Program model.

The use of this model in the construction of the program of weight training and weight loss for low SES women provided groundwork for the fluid evaluation of the treatments and outcomes. With this program, a strong evaluation of the needs of the low SES female population is crucial in the establishment of an effective and feasibly applicable program, which is in

conjunction with the audit and needs assessment phase. Practice support and training was involved in the education of health management providers, fitness experts and sample women on the formulated weight training program and interventions. The patient intervention phase was evaluated during this stage, and defined in the future performance of the studied individuals with the outlined weight training routines when implemented post-doctoral graduation. Evaluation accompanied the final compilation of the answers to evaluator questionnaires performed by the five medical providers, five fitness experts and five sample women.

Methods

Project Design. The project employed an epidemiological approach with the use of an evidence-based design (EBD). Evidence-based design is the process of basing decisions on credibly established research in search of attaining the best possible outcomes (Hamilton, 2006). This design was built upon the platform of evidence-based practice in that the program or study uses current best evidence from literature and research in making critical decisions and actions to target an area of need. Evidence based design can be divided into four steps: reviewing existing research literature to select significant findings; connecting research findings with targeted population demographics and site analysis; predicting outcomes of research based decisions; and tracking the outcomes for implementation.

This project was evaluated by five participants meeting the criteria of the target female population, five health care providers, and five fitness professionals. An in depth review of current literature was performed to compile evidence of health benefits of increased muscle tissue and prior programs using anaerobic exercise. The findings were compiled to formulate a proposed weight reduction and health improvement program. Quantitative and qualitative data on the assessed feasibility of the implementation of this program were collected from the previously described 15 evaluators.

Resources. The primary resources used for the recruitment of the primary medical providers were the connections made through UHH DNP clinical work at the Banner Lassen Medical Center and Dr. Hal Meadows Family Health Clinic in Susanville, California. The fitness experts were compiled of physical fitness professionals working through Anytime Fitness Inc. from multiple regions of the United States, which will include California and Nevada. The sample of women, who meet the criteria as being future participants in this program, evaluating multiple factors of this program were attained within the community members of Susanville, CA.

Sample population and sampling process. After the formulation of the program, the program was reviewed and the feasibility evaluated by fifteen participating evaluators. With the cooperation of several medical and health establishments, a questionnaire and information packet was dispersed to five female clients, five health care providers and five fitness professionals. The selection of the women involved have been established through several years of word of mouth discussion, and their interest in being involved in helping the student researcher with the program. Through personal communication (November 26, 2014) with an administrator of the International Review Board (IRB), Jacob Kowalski , no recruitment material was necessary since the participants have been obtained through informal connections through work and personal acquaintances. However, an informational flyer, seen in Appendix D, with the purpose of the study, tasks required of the participants, the fact that participation is voluntary and the risks and benefits of their involvement were provided. This information packet included information on the program, goals, methods and desired outcomes. What would be expected of them and the benefits that are being assessed were also be included. The only personal data collected, were BMI, and demographic information of income and subjective social status to determine their representation of the program's target population.

Criteria that was included to determine socioeconomic status, included their socioeconomic status perception (SEP) and household income. Research indicates that SES perception aids in disparities (Adler & Newman, 2002). Regardless of level of education, certain groups may not have the same socioeconomic opportunities as others. Refer to Figure 3.2 to see a sample of the McArthur scale of subjective social status that was used in this assessment. Income level for low-income were determined based on the United States Low-Income Level chart (United States Department of Education, 2012). Refer to Appendix A for the income chart. This chart is based off of the United States poverty limit, and for the purpose of this project the participant's income can be within 15% above or below the target limit, which still places them in the low-income bracket. Informational consent and liability sheets were distributed to all participants. The conduction of this study was approved by institutional research regulatory agencies involved.

Figure 2. The MacArthur Scale of Subjective Social Status. Adapted from “Research: Psychosocial Notebook: The MacArthur Scale of Subjective Social Status” by Adler & Stewart, (2007).

Think of this ladder as representing where people stand in the United States.

At the **top** of the ladder are the people who are the best off – those who have the most money, the most education and the most respected jobs. At the **bottom** are the people who are the worst off – who have the least money, least education, and the least respected jobs or no job. The higher up you are on this ladder, the closer you are to the people at the very top; the lower you are, the closer you are to the people at the very bottom.

Where would you place yourself on this ladder?

Please place a large “X” on the rung where you think you stand at this time in your life, relative to other people in the United States.



Five primary medical providers were chosen based on them holding a current license to practice medicine as a Medical Doctor or a current Advanced Practice Registered Nurse license to practice as a Nurse Practitioner. The fitness experts met the criteria of having at least five years of experience in fitness training and program formulation or a post-bachelorette degree with at least one year experience in fitness training and program formulation. The selection of

these professionals have been established through several years of word of mouth discussion, and their interest in being involved in helping the student researcher with the program.

Data sources. Detailed and in depth data for the production of the health program was from primary sources. Initial supportive resources comprise evidenced based articles from academic databases, including EBSCO Host, PubMed, Medline, New England Journal of Medicine and American Medical Association Journals. Statistical databases include the Centers of Disease Control and Prevention and the United States Census Bureau. Questionnaires provide the inclusion/exclusion criteria for each participant as described in the sample population section. Evaluation data was collected through the evaluator responses to pre-determined questions and comments from the 15 participants.

Procedures and data collection. Through the use of a detailed literature review, procedures, programs and methods of skilled weight training techniques were compiled to form an evidenced based program targeting weight reduction and health management for low socioeconomic female populations. This section of procedures and data collection was the focus of this practice inquiry project (PIP). Methods of instruction, exercises, length of the program, intensity and all core requisites were formulated and proposed as an effective weight reduction and health management program for the target population. A detailed evidenced based program was formulated and evaluated as the cornerstone of the PIP. The 15 evaluators directed their evaluation through the use of a Likert scale questionnaire lead by the PIP objectives and an additional qualitative comment section.

Management plan and project evaluation. The project plan and impact evaluation involved questionnaires, which aided in a summative evaluation. The Likert scale questionnaire, as represented in Appendix B, covered topics important to the feasible implementation of the program, including: knowledge and comprehension of weight training, perceived ability to

maintain this routine, desire to maintain this routine, understanding of benefits, and several additional topics important to intervention. This assessed the impact of the program on personal perceptions and beliefs of the effectiveness and ability to maintain these weight training interventions from the five women, who represented the target population for this program. Additionally, five health care providers and five fitness professionals evaluated the effectiveness of this program and its evidence-based ability to target obesity of low SES women.

Project Implementation Description

After successfully defending the PIP proposal on December 11, 2015, an exempt application was submitted to the IRB on January 15, 2015 via email. An official correspondence email from the UH Human Studies Program (IRB) expressing their acceptance of the proposal and all actions and documents involved in the project was received on February 05, 2015. Commencing on February 13, 2015 the initial stages of this project began with an in-depth search for literature on resistance training programs for women, at home exercise programs for women, exercise and wellness programs in low SES communities, barriers and methods to extend beyond those barriers in low SES communities, and methods for retention of low SES women in wellness programs.

This literature and evidence-based search continued until enough studies were found to cover all objectives for this project, which included a resistance training program with specifications on exercise forms, repetitions and sets, and successful implementation strategies. On March 27, 2015, the Lift for Health program was compiled and detailed taking successful strategies and methods from the many studies found. This program is a meshwork of at home resistance training combined with support groups and a pedometer, which is based upon the research found for successful wellness and exercise programs targeting low SES obese females. A brochure, which can be seen in Appendix E, detailing the Lift for Health program with a

condensed literature review was designed. This brochure served as the information and supportive document presentation for the 15 participants, who filled out a questionnaire on the validity and implementation of the program. After many days spent on designing and writing of the brochure and accompanying materials, the brochure and questionnaire was distributed to the 15 participants on April 01, 2015. Between April 07, 2015 and April 15, 2015, the questionnaires were returned and the results of the quantitative Likert scale questions and the qualitative comment responses were analyzed and organized in tables. The final manuscript presenting the Lift for Health program and PIP project was continued until the final defense on May 01, 2015.

Resources and Services Utilized

The detailed literature review was conducted using primary sources, which included PubMed, MEDLINE, CINAHL, and several other article services accessed through the University of Hawaii Mookini library website. Google Scholar was used to find additional article databases. Google Scholar also provided access to and knowledge of additional journals and article databases, including Journal of Obesity, Journal of Exercise Science and additional kinesiology and social science databases.

Participants were acquired through word of mouth and community interactions on behalf of the researcher. Health care providers were obtained from Dr.Hal Meadows Family Health Clinic, Lassen Indian Health Clinic, Banner Lassen Medical Center and North Eastern Rural Health Clinic all located in Susanville, California. The fitness professionals were collected through working relationships at AnytimeFitness Inc. The women representing the target population were obtained through community connections built between the years of 2012 and 2015. These women are from community low-income housing projects, assisted living communities and health club membership inquires.

The printed materials were printed at the Susanville, California UPS Store, and the gift certificates in appreciation of participation were purchased at stores located in Susanville, California. The sample of women from the target population was given a choice of stores from which they desired their \$15 appreciation gift cards.

Protection of Human Subjects

Risks to all subjects were minimized through the process of educating individuals on privacy policies. The program creator completed Collaborative Institutional Training Initiative (CITI) training in 2014 with a focus on protection of human subjects. Risks to subjects are directly relational to the anticipated benefits. Selection of subjects evaluated the presence of vulnerable populations, such as elderly, pregnant, mentally or physically disadvantaged individuals, who were ruled out of selection for participation in this project. Per personal communication (November, 26, 2014) with the International Review Board administrator, Jacob Kowalski, a consent form is not necessary for the 15 evaluators within this PIP. Confidentiality is of high priority, and no names, addresses and personal information were made available to the researcher leading this project. Approval through the International Review Board (IRB) was achieved post scientific review board approval. See Appendix C for IRB application.

CHAPTER IV

RESULTS

Framework Guided Outcomes

The theoretical framework for this project was the Counterweight Programme adopted from Gibbs and associates (2004), which is depicted in Figure 1 in Chapter three. There are four phases within this model that guide studies and evidence-based health care in the implementation of weight loss and health improvement programs as discussed in the theoretical framework section of Chapter three. To revisit the Counterweight Programme framework, phase one is audit

and needs assessment, which correlates to setting priorities in the evidence-based quality assessment model. Phase two is practice support and training, which corresponds with setting guidelines. Phase three is patient intervention and performance measurement. The final phase is evaluation and performance improvement. The overarching aim of this model is to evaluate the needs of the population and provide an effective strategy in combating obesity that is tailored to the needs of the community, which is the overall objective and outcome of this PIP Lift for Health Program.

The detailed literature review accomplished the first audit and needs assessment phase with a strong evaluation of the needs of the low SES female population in regards to implementing and retaining an effective and feasibly applicable program. Phase two of setting goals was involved in the distinction of objectives and aims in the Lift for Health program. Additionally, the compilation of the Lift for Health program is encompassing of phase two. The patient intervention phase led the education of health management providers, fitness experts and sample women on the formulated weight training program and interventions through informational brochures. The completion of the questionnaire by the fore mentioned participants was the main intervention phase in this PIP. The final evaluation phase was presented through the final compilation of the answers to evaluator questionnaires performed by the five medical providers, five fitness experts and five sample women.

Literature and Program Data

Data was collected and organized in several steps. The first wave of data was obtained through a detailed literature search for effective and feasible resistance training based programs and methods of implementing a wellness program in low SES communities for women. The data presented in this section will cover resistance training studies, the use of a pedometer for motivation and accountability, successful implementation strategies for low SES environments,

the Lift for Health program compiled from the afore mentioned categories, the Lift for Health program framework, and the questionnaire data results.

Resistance training studies. Fourteen studies were selected in the building of the resistance training section of the Lift for Health program. These studies were chosen based upon their detailed description of their interventions, feasibility of their methods being performed at home and the effectiveness of their routine for a female population.

The first study found, which was also used in the literature review to promote the benefits of resistance training for post-menopausal women, is published by Bea and associates (2010), who performed a six-year study of 122 post-menopausal women. This study involved eight resistance training exercises, which included leg lifts, bicep curls, and more targeting each muscle group, performed for two sets of 70-80% of one-repetition-maximum (1RM). This routine was performed three times per week. Results showed these post-menopausal women were able to maintain a healthy weight with an increase in fat-free mass, decrease in body fat percentage and prevent muscle loss, which is typically associated with the hormone changes in menopause (Beat, et al., 2010).

Conceicao, Bonganha, Vechin, Berton, Lixandrao and Nogueira (2013) produced an study implementing and evaluating sixteen weeks of resistance training on the effects of metabolic syndrome in postmenopausal women. Twenty post-menopausal overweight women performed ten resistance exercises, which included squats, leg press, chest press, and more targeting large muscle groups, for three sets of eight to ten 1RM repetitions. This was done three times per week with weight increased every two weeks depending on increasing ability level for 16 weeks. Results show a decrease in blood sugar, body fat percentage, improved bone density and muscle strength.

Cullinen and Caldwell (1998) were a critical component of the Lift for Health program. Even though this study was performed 17 years ago, it built a cornerstone for additional resistance training studies with similar beneficial findings. This study organized 20 women aged 19-44 years, who performed a 12-week resistance training program twice weekly with six exercises for two to three sets at 80% 1RM for approximately 45 minutes. Results show an increase in strength and muscle and a decreased body fat percentage without dietary control.

Supporting the amount of repetitions and sets used in the Lift for Health program, Dionne, Melancon, Brochu, Ades, and Poelhman (2003), performed a six-month resistance training program with 19 younger and 12 older women. The routine consisted of nine exercises done for eight to ten repetitions of 1RM for three sets. Results show a loss of body fat percentage and an increase in resting metabolism. Additionally, exercise forms in the Lift for Health program were adopted from this study, which includes squats, rows, chest flies and push-ups. Moreover, Phillips, Patrizi, Cheek, Wooten, Barbee and Mitchell (2012), 23 women performed a 12 week resistance training program. This program involved ten exercises with eight to twelve repetitions for three sets. Women showed improved strength, reduced circulating inflammatory factors and decreased body fat percentage.

In a detailed literature review on the effectiveness of resistance training conducted by Strasser and Schobersberger (2011), resulted in a presentation of proper form, particular exercises, and the amount of 10-15 repetitions. They were able to conclude that 60-70% of 1RM with at least three sets involving exercises for all large muscle groups is highly effective in weight management and improvement in obesity related health issues (Strasser and Schobersberger, 2011). Finalizing the literature used to support repetitions and sets for the Lift for Health program, Washburn, Donnelly, Smith, Sullivan, Marquis and Hermann (2012) conducted a nine-month trial proposal for a one to three set resistance training program on

overall body composition and weight management. This was based upon current literature promoting and supporting three sets of eight to ten repetitions for 1RM. The trial's completion has not yet been published. Nevertheless, the supporting research in the formulation of this program was highly beneficial to the framework of the Lift for Health program.

Fenkci, Sarsan, Rota and Ardic (2006) studied the effects of anaerobic exercise versus aerobic exercise on body composition and metabolism. Sixty obese women performed either resistance training, which consisted of ten repetitions of 75% of 1RM for three sets, or aerobic exercise for 45 minutes five days per week for 12 weeks. Both groups lost weight, improved cholesterol and blood glucose levels. However, the resistance training group maintained more results after the study concluded. Additionally, the resistance training group was able to obtain these results in a shorter amount of time.

Following the lines of increasing the knowledge of anaerobic exercises versus resistance training exercise or a combination of both, Park, Park, Kwon, Kim, Yoon and Park (2003) produced a study comparing aerobic exercise for 60 minutes per day six days per week, resistance training three days per week and a combination of aerobics exercise and resistance training five days per week. There was a greater reductive of abdominal adipose tissue seen with the combination group more than aerobics or resistance training alone. However, these three groups varied greatly in the times and intensity spent on exercise, so an exact correlation is hard to determine. An additional article authored by Phillips and Winnett (2010) involved a literature review of aerobic and anaerobic programs. Their results show that resistance training is feasible to implement as a complement to a health and fitness program.

In a study comparing aerobic exercise versus a combination of aerobic and resistance exercise, Suleen, Dhaliwal, Hills and Pal (2012), presented a study on women performing 30 minutes of either aerobic exercise or 30 minutes of mild aerobic exercise mixed with resistance

training. This program covered a span of five days per week for 12 weeks. The results show that mild aerobic exercise, such as increased walking, mixed with resistance training is more beneficial than higher intensity aerobic exercise (Suleen, et al., 2012).

Willis, Slentz, Bateman, Shields, Piner, Bales, Houmard and Kraus (2012) also studied the effects of aerobic exercise versus resistance training on BMI, body fat percentage and obesity. They studied 119 sedentary overweight adults performing with aerobic exercise or resistance training for eight-months. Results showed that aerobic exercise and resistance training resulted in similar benefits on decreasing body weight and body fat percentage. However, only the resistance training group resulted in increasing fat-free tissue, which is muscle mass, and lean body tissue (Willis, et al., 2012).

Many of these resistance training studies show an increase in resting energy expenditure. Particularly and associates (2009) saw an increase in resting caloric usage with a very minimal resistance training program. Twenty-two women performed a six month resistance training program consisting of nine exercises done for one set of three to six repetitions of 1RM. This routine took approximately 11 minutes and was executed three days per week. With this very minimal time commitment, the performance group saw an increase in resting calories expended (Kirk, et al., 2009).

Boosting support for the at-home resistance training program, Payne and Associates (2008), implemented a six-week group training program to begin with advising on exercise form and routine. They continued with a 12 week comparison of at-home resistance training with easily found or home-made weighted objects and in-the-gym resistance training. This was followed by a 34-week follow up to see if the participants maintained their exercise routines and results. At the 34-week mark, blood glucose, weight loss, and body fat percentage all maintained

improvement with little difference between groups. The same percentage of women maintained their rate of performing the routines and results accomplished (Payne, et al., 2008).

Pedometer use for motivation, accountability and retention. The use of pedometer and step-count devices was added to the Lift for Health program upon the discovery of multiple articles promoting the use of pedometers to aid in retention and accountability of low SES women in physically active programs. Five pedometer studies were chosen from primary resources.

A Systematic review of primary literature sources was performed by Bravata and associates (2007). This review sought to objectify data on the effectiveness of pedometer usage at a time when subjectively, pedometers were becoming increasingly popular in physical activity programs. The study identified 26 studies with over 2767 participants quantifying multiple variations of pedometer driven activity programs. Results suggest that a pedometer is associated with statistically significant increase in daily activity levels and a possible decrease in BMI and blood pressure. Long term changes were undetermined (Bravata, et al., 2007).

Success with promoting physical activity in overweight low-income mothers using pedometers is seen in an article published by Clarke and associates (2007). Motivational readiness to exercise, exercise self-efficacy, pedometer steps, pedometer kilocalories, and weight loss were evaluated at week zero and week eight of an eight-week physical activity and dietary program. Results showed reductions in body weight, waist circumference and body fat percentage in addition to enhancing motivational readiness to exercise, exercise self-efficacy and pedometer steps. This study concludes that pedometers are a beneficial additive to increasing physical activity levels of overweight low-income mothers (Clarke, et al., 2007).

Showing support for women in low SES environments in being able to increase their walking capacity with pedometers during normal daily routines is seen in a study published by

Lauzon, Chan, Myers and Tudor-Locke (2008). Feedback from focus groups and exit questionnaires provided insight on the use of pedometers increasing activity in the workplace. Participants described the pedometer as a useful tool for increasing awareness of physical activity, providing motivation, immediate visual feedback, encouraging conversation about health and social support. The importance of social support and pedometer feedback was concluded through this study (Lauzon, et al., 2008).

Beyond the use of pedometers, promoting increasing physical activity during daily work and housework activities is proposed as an effective method to increase physical activity in full-time working adults. Smith, Wen, and Popkin (2014) found that promoting increased movement during non-labor market time, such as during housework, leisure time, caregiving, screen activities and daily work breaks, may be a feasible, time allowable and financially reasonable method for increasing daily activity levels. The results of this study were used in conjunction with the pedometer promoting studies to involve a pedometer in the Lift for Health program formulated for this PIP.

The final study used in the promotion of pedometer usage is produced by Tudor-Locke (2002). Tudor-Locke (2002) performed a literature review and analysis on pedometer usages in physical activity programs in regards to motivational factors, steps increased per day, basing programs on frameworks, and how to effectively collect and interpret pedometer data. This report concludes that pedometers are practical, accurate and acceptable as a tool for increasing physical activity with practical importance in targeting obesity (Tudor-Locke, 2002).

Successful implementation in a low SES disadvantaged environment. Eight articles were selected as the foundation for outlining barriers and successful methods to aid in extending beyond these barriers in low SES environments. Beginning with Bock, Jarczok and Litaker (2014), a systematic review of interventions considering the mode of delivery and study quality

was conducted. The results showed that interventions using face-to-face counseling or support group sessions were most effective. Additionally, studies using interventions that were tailored to women, women's needs or specific ethnic groups were also more highly successful. They concluded that tailored interventions with personal contact are most promising.

Chang, Nitzke, Gulford, Adair, and Hazard (2008), conducted a qualitative study analyzing barriers to healthful eating and physical activity among low-income overweight and obese mothers. Eight focus groups were held with eighty low-income overweight mothers. Motivating factors to improve health were personal appearance, fit in clothes, inability to play with children and social support. Environmental and physical barriers found, included eating unhealthy foods for convenience, lack of social support, having little money and time, lack of control, stress and a lack of access to fresh produce grocery stores and to safe parks and recreation areas. This study alluded to barriers that need to be addressed in order to proceed with a successful wellness and health program for busy low-income overweight mothers.

A focus group performed by Hoebeke (2008), also desired to understand low-income women's perceived barriers to physical activity involvement. Hoebeke (2008) identified 16 barriers in order of highest concern to lowest: (1) fatigue, (2) culture, (3) health problems, (4) absence of child care, (5) lack of encouragement, (6) weather, (7) lack of motivation, (8) time constraints, (9) physical discomfort, (10) self-consciousness about looks, (11) lack of results, (12) lack of money, (13) lack of transportation, (14) less time for family and friends, (15) low self-esteem, and (16) unsafe neighborhoods. These findings were used in the Lift for Health program implementation's objectives with the addition of methods to aid in the program extending beyond multiple perceived barriers.

Cleland, Tully, Kee and Cupples (2012), systematically reviewed five databases for papers published on the effectiveness of physical activity interventions in socio-economically

disadvantaged communities. Cleland and associates (2012) found that group-based interventions were effective, and there was some evidence suggesting that community-wide interventions showed benefit in increasing physical activity. Interventions and programs underlined by a theoretical framework were more likely to be effective. They concluded that the majority of successful programs should involve multiple components, including education, physical activity and support groups.

An additional study showing the benefit of support groups is published by Hajek, Humphrey and McRobbie (2010). Hajek and colleagues (2010) proposed that using support groups to complement a task-based weight management program in multi-ethnic and highly deprived communities is a critical component. Two pilot studies assessed the retention rates and successful outcomes of weekly group physical activity sessions and eating habit education. Results showed that task-based lifestyle-modification activity programs with social support groups provided more beneficial outcomes when compared with intensive more traditional interventions.

Adding to the support for finding methods to extend beyond barriers faced by overweight young women with children, Miller, Stewart, Trost and Brown (2002), conducted controlled interventions incorporating different implementation methods amongst 554 women divided into three groups. Group one served as a control. Groups two and three were given printed material handouts and only Group three was invited to participate in support groups. The researchers concluded that communal group meetings and partner-support can be an effective method in increasing physical activity among mothers of young children.

Monteiro and associates (2014) also sought to understand methods of promoting physical activity among overweight busy mothers with young children. Comparing a control group with a six-month multi-strategy program intervention group, the researchers found that the addition of a

home-based physical strength training intervention with group support showed statistically significant improvements in physical activity in hard to reach groups.

The final study used for the compilation of methods for implement of this PIP's program Lift for Health is produced by Withall, Jago and Fox (2011). Withall and associates (2011) performed interviews of 152 participants in highly deprived suburban neighborhoods. Participants reported cost, childcare, lack of time and low awareness as barriers to joining physical activity programs. The need for support, confidence and competence was widely expressed. Throughout the activity program, it is noted that high levels of social interaction, interest and enjoyment will improve retention. Extending beyond the cost of facilities, fear of unsafe neighborhoods, and appropriate communication are necessary for maintenance of physical activity (Withall, et al., 2011).

Lift for health program. The program proposed and developed from the fore mentioned literature and evidence based findings is entitled *Lift for Health*. The brochure for this program distributed to the 15 participants is found in Appendix E. The following is a breakdown of the proposed *Lift for Health* program.

A resistance training (RT) routine, which will take about 30 minutes, will be performed four days per week. Additionally, daily pedometer calculations of steps taken with individual step goals will be set for each participant. Monthly meetings held for monitor and support with telephone calls placed every two weeks, which is half way between meetings, to check on progress and retention of performing the routines. Moreover, each participant will be requested not to significantly change their dietary habits for the purpose of this study in an attempt to control for a person's possible inability to access healthy foods.

Upon the initial meeting of the group of participants with the fitness and health care professionals, weights that meet a resistance of 60-80% of one repetition maximum (RM) will be determined as a base line for individual lifting abilities for each exercise [$1RM = (1.063 \times \text{lifted weight (kg)} + (0.583 \times \text{repetition frequency}) - (0.20 \times \text{age}) - 3.41)$] (Park, et al, 2003). A one RM is the ability of a person to lift a weight only once (Cullinen, et al, 1998; Kirk, et al, 2009; Fenkci, et al, 2006). Based upon resistance training studies previously presented, 60-80% one RM is a safe amount of weight to lift with proper form, which is also sufficient to accomplish the designated eight to ten repetitions for each set (Park, et al, 2003; Payne, et al, 2008; Strasser & Schobersberger, 2011; Washburn, et al, 2012; Willis, et al, 2012). A repetition is defined as each time the weight is lifted, and a set is the amount of repetitions performed before a rest period is taken. Once the 60-80% of one RM is determined, the fitness professionals will assist each participant with determining convenient at-home weighted objects that will be equivalent to the weight needed, these may include soup cans, milk jugs filled with water or sand, plastic pipe filled with dirt, a case of water bottles, a brick, thick rubber tubes, and other resources easily accessible to the individual (Payne, et al, 2008). Additionally, body weight exercises, such as push-ups, will be involved in the program (Phillips & Winnett, 2010).

An at-home RT routine involving designated exercises performed for three sets of eight to ten repetitions will be provided, which can be seen in Figure 3.3. In between each set, a 30 second rest period will be taken (Payne, et al, 2008). Initially, fitness professionals will work with each person on form and method of performing the exercise during the first meeting (Bock, et al, 2014; Hajek, et al, 2010; Withall, et al, 2011). In the monthly meetings, form and ability to perform each exercise will be reviewed. Additionally, progress on ability to lift more than the initial 60-80% of one RM will be determined. Weight lifted will be increased if the participant

can easily accomplish three sets of ten repetitions or more (Park, et al, 2003).

Table 1

Resistance Training Routine for the Lift for Health Program

3 sets of each exercise. 8-10 repetitions will be performed for the first two sets, and the third set will be performed to exhaustion. There will be a 30 sec. rest in between sets

Day One	Day Two	Day Three	Day Four	Day Five	Day Six	Day Seven
<i>Upper Body</i>	<i>Lower Body</i>		<i>Upper Body</i>	<i>Lower Body</i>		
Wide Push-ups Bent Over Rows Chest Fly Back Extension Triceps -Pushups Shoulder Press Bicep Curls	Deadlift Regular Squats Wide-leg Squats Lunges Leg Raise Extension	Maintain designated step count	Wide Push-ups Bent Over Rows Chest Fly Back Extension Triceps -Pushups Shoulder Press Bicep Curls	Deadlift Regular Squats Wide-leg Squats Lunges Leg Raise Extension	Maintain designated step count	Maintain designated step count

During the initial meeting and in each subsequent monthly meeting, measurements to track progress will be taken, including: weight (pounds), body measurements, which include chest, waist, hip, arms and thighs, BMI, Waist-to-Hip ratio, and body fat percentage with calipers using a three-point skin fold method.

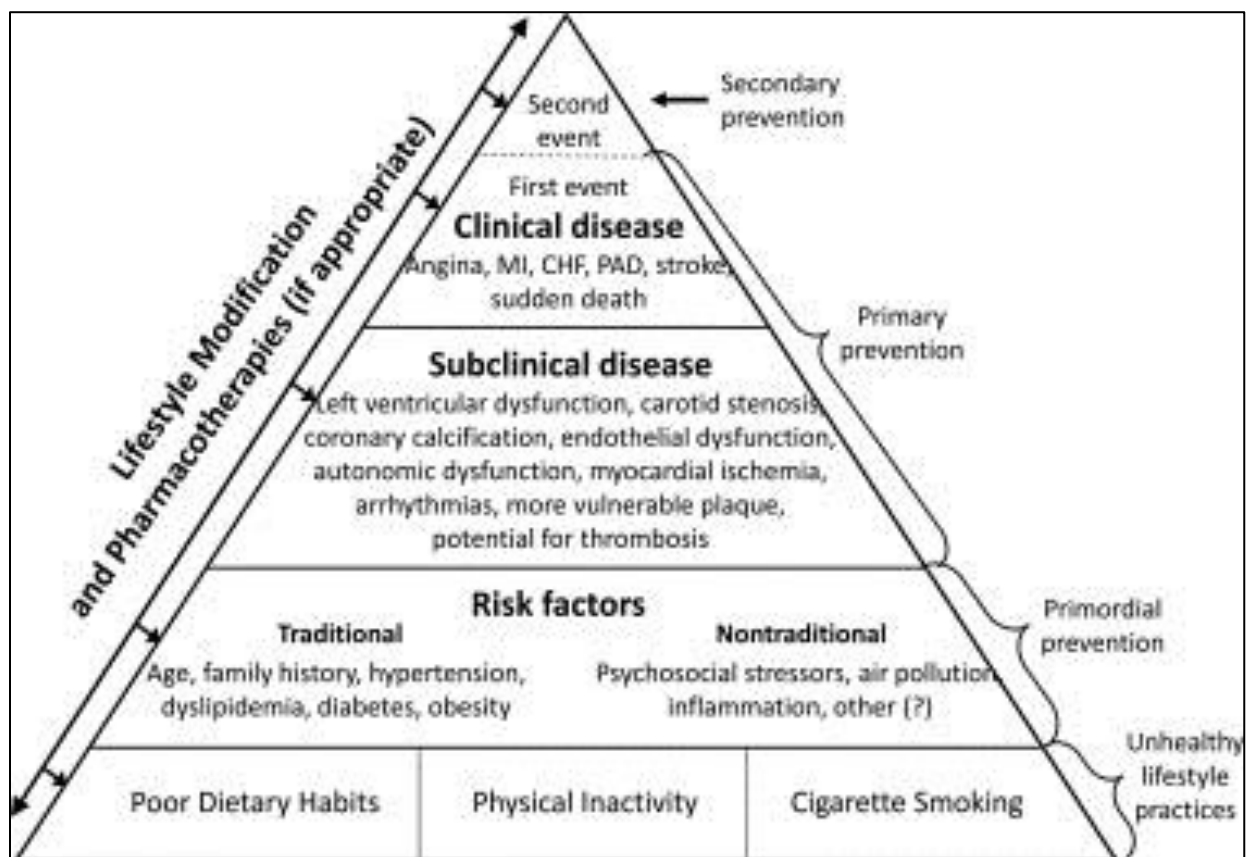
The monthly meetings are not just for the collection of research data. They are for each woman to empower and support one another. Gathering together allows each participant to discuss their goals and progress as well as their challenges with the program or any areas of daily life. Relationships, connections and support systems are forged during these meetings, which is important for the successful adoption of any health and exercise program (Bock, et al, 2014; Hajek, et al, 2010; Cleland, et al, 2012; Miller, et al, 2002; Withall, et al, 2011)

The next method of ensuring success is the use of pedometers, which are otherwise known as step counting devices. This is used to track the amount of steps taken in a given day (Bravata, et al, 2007; Clarke, et al, 2007). Each participant will be given a set number of steps to

accomplish each day determined on their ability level. Steps will be tracked on their individual pedometer worn around the wrist. Increasing walking and mild physical activity throughout an individual's normal daily routine has many health benefits, including increasing blood circulation, increased energy and possibly aiding weight loss (Clarke, et al, 2007). Accumulating enough steps can be attained during house work, walking around the office, and other daily activities (Smith, et al, 2014; Lauzon, 2008)). However, the purpose of this tool is not to rely on steps for significant weight loss. Research shows that through the use of a pedometer, participants in exercise programs are more likely to retain a greater activity level and increase their retention rate within the program. Pedometers provide one avenue of accountability for a person to accomplish a physically active goal, which will aid in accomplishing other physically active tasks, such as the given resistance training program (Bravata, et al, 2007; Clarke, et al, 2007).

Lift for Health program frame work. This program will use the Health Impact Pyramid framework will guide the objectives and goals upon implementation. The Health Impact Pyramid can be seen in Figure 3.4. Proposed by Thomas Frieden (2010), the Health Impact Pyramid proposes that targeting factors lower on the pyramid are more effective and sustainable in public health care. The Pyramid depicts a hierarchy of factors, which can be target by lifestyle modifications and pharmaceutical tools. At the base of the pyramid, unhealthy lifestyle practices and socioeconomic factors are at the root of issues leading to further health concerns. Programs targeting these factors, such as sedentary lifestyle, poor dietary habits and psychosocial stressors, will be able to attack the underlying causes of many preventative health issues (Frieden, 2010). Based on this model, the currently proposed Lift for Health program sought to introduce a feasible and effective health program targeting factors on the base of this pyramid.

Figure 3. The Health Impact Pyramid. Adopted from “A Framework for Public Health Action: The Health Impact Pyramid.” by Friedman (2010).



Questionnaire Results

The presented questionnaire is organized into two sections. There are ten qualitative questions with a Likert scale of five levels. Number one representing strongly disagree and number five representing strongly agree. There are also qualitative questions regarding strengths, weaknesses, and additional recommendations provided by health care providers, fitness professionals and a sample of population representatives.

Health care providers (HCP). All ten questions in the questionnaire filled out by the healthcare providers (HCP) received responses of either agree (4) or strongly agree (5) with only one response of neither agree nor disagree (3) received from one participant. These quantitative

results are shown in Table 2. This three (3) was received in regards to the program being realistic for the average low SES woman to practice at home. The lowest average score of four (4) is in the second question regarding the realistic approach of a low SES woman performing this program at home. The highest average score of five (5) received from all HCP participants is in the question asking if the participant sees the benefit of women building muscle to combat obesity and aid in health improvement through the literature presented.

Table 2

Health Care Providers (HCP) Evaluation Questionnaire Results

	HCP #1	HCP #2	HCP #3	HCP #4	HCP #5	Avg.
1. The program is well organized.	4	5	5	5	4	4.6
2. The program is realistic for the average low SES woman to practice in home.	5	4	3	4	4	4
3. The minimal daily time required to perform the program is reasonable to expect of the average low SES woman.	5	4	4	4	4	4.2
4. The fact that minimal finances are required to perform this program will aid the low SES woman in performing and committing to this program.	5	5	4	5	5	4.8
5. The data collected through BMI, weight, body fat percentage and body measurements will aid in the monitoring and support of participants.	5	5	5	5	4	4.8
6. The program is evidence –based and consistent with current literature.	5	5	5	5	4	4.7
7. The presented program is user friendly with a minimal amount of instruction.	5	4	4	4	4	4.2
8. Through the literature presented, I see the benefit in women building muscle to combat obesity and aid in health improvement.	5	5	5	5	5	5
9. The proposed anaerobic weight training program is feasible to implement.	5	4	4	5	4	4.4
10. I would promote the information provided and type of program in my practice and/or community.	5	4	5	5	4	4.6

The qualitative questionnaire responses are presented in Table 3. Strengths identified by multiple participants included, being evidence based, easy to understand, limited cost to participants, well organized and good support. The main weakness in need of improvement discussed by several participants is in relation to the brochure being a bit too wordy or detailed

for the average low SES woman. A second weakness presented by two HCP participants is the challenge of maintaining motivation and retention of the participating women regardless of adequate support. There are positive and reassuring reviews in the additional comment section. Statements of “excellent study” and “very impressive proposal” are expressed. The need to keep instructions simple and having the personal trainers evaluate home based routines with initial home visits was made by one HCP participant.

Table 3

Health Care Providers (HCP) Question and Comment Questionnaire Answers

1. Please Identify the STRENGTHS of this program:

HCP #1	"Ease of you...evidence based...ease of understanding...limited to no cost...results."
HCP #2	0
HCP #3	"Minimal resource requirements...minimal cost to patients...very well organized...very practical."
HCP #4	"The program is doable by the majority of low income women. Strength training is important in maintaining muscle mass, The support meetings will be helpful, especially in this population which tends to do things sporadically if not supervised. Also the concept of group activities will help keep people on track."
HCP #5	"Simple"

2. Please indicate any WEAKNESSES that may need IMPROVEMENT within this program:

HCP #1	"Getting busy in and consistency from targeted audience."
HCP #2	"The literature may be too wordy and technical for some patients."
HCP #3	"The Lift for Health Flyer is good for giving someone a good amount of info, but for RECRUITING patients, it is too busy and should be simplified."
HCP #4	0
HCP #5	"1) Maintaining motivation, as well as accounting. "phone calls and meetings are a good plan, but I shall suspect this will be a large hurdle)." "2) How will you fund the personal trainers?"

3. Please provide any further questions or comments:

HCP #1	"Excellent study!"
HCP #2	0
HCP #3	"A very impressive proposal!"
HCP #4	0
HCP #5	"You will need very specific, simple and short instructions for each person's RT routine. The personal trainer should ideally go to the home to help with/design/inspect the equipment and the routine performed."

Fitness professionals (FP). Similar to the HCP results, all questions answered by the fitness professionals (FP) received a combination of agree (4) and strongly agree (5), which is presented in Table 4. In contrast to the HCP response of only one neither agree nor disagree (3), there are three total neither agree nor disagree (3) responses. One is received in the same category as the HCP questionnaire, which is in the second question regarding the program being realistic for the average low SES woman performing the routine in home. The next three (3) is received in the fourth question discussing the fact that the limited financial obligations in this program will aid the low SES woman in performing this program. The final three (3) is received in question number seven (7), which states that the program is user friendly with a minimal amount of instruction. All of these neither agree nor disagree (3) responses are placed by the same FP participant. All average scores are closely distributed among all ten questions with the lowest average being four point four (4.4) and the highest average being four point eight (4.8).

Table 4

Fitness Professionals (FP) Evaluation Questionnaire Results

	FP 1	FP 2	FP 3	FP 4	FP 5	Avg.
1. The program is well organized.	4	5	5	5	5	4.8
2. The program is realistic for the average low SES woman to practice in home.	5	5	3	4	5	4.4
3. The minimal daily time required to perform the program is reasonable to expect of the average low SES woman.	4	5	4	5	5	4.6
4. The fact that minimal finances are required to perform this program will aid the low SES woman in performing and committing to this program.	5	5	3	5	5	4.6
5. The data collected through BMI, weight, body fat percentage and body measurements will aid in the monitoring and support of participants.	4	5	5	5	5	4.8
6. The program is evidence –based and consistent with current literature.	4	5	5	5	5	4.8
7. The presented program is user friendly with a minimal amount of instruction.	4	5	3	5	5	4.4
8. Through the literature presented, I see the benefit in women building muscle to combat obesity and aid in health improvement.	4	5	5	5	5	4.8
9. The proposed anaerobic weight training program is feasible to implement.	5	5	5	4	5	4.8
10. I would promote the information provided and type of program in my practice and/or community.	4	5	4	4	5	4.4

Qualitative responses, which are presented in Table 5, from the FPs, are more detailed as to the implementation of the program and follow up post implementation. Strengths identified by multiple participants, include the use of a pedometer for immediate motivation, being evidence based, simplicity of the program, accountability and the use of a fitness instructor.

Areas in need of improvement identified by the FPs include, clarifying types of household items to be used, clarifying the brochure for low SES women, varying the exercise routine depending on the participant, setting up a follow up program or support group post study implementation to aid in these women continuing exercise, and a possible lack of enjoyment in the program due to it being isolated at home and not in a gym or group setting every day.

Additional questions cover the need to clarify the length of the program. Supportive and positive comments are left in regards to pursuing a way to connect this program to low-income community organizations and the program being thorough and well thought out for the target population.

Table 5

Fitness Professionals (FP) Question and Comment Questionnaire Answers

1. Please Identify the STRENGTHS of this program:

FP #1	"The use of a pedometer for regular feedback and motivation along with the support component. However, you may want to consider weekly phone contacts, at least at the beginning of the program. It is also based upon the current literature and research."
FP #2	"It is user friendly and the fact that it utilizes the qualified fitness instructor to have accountability and encouragement is huge."
FP #3	"This program offers women who may not otherwise have the opportunity to assistance with workout planning... It is evidence and research based, which gives it validity... It provides accountability to lower SES women who may have never had it before... It encourages weight lifting and strength training, something women can tend to shy away from."
FP #4	"The program is simple and easy to understand, which increases the chance that clients will comply."
FP #5	"The strengths in this program are the exercise selections and how they are prioritized in regards to time efficiency and LBM recruitment. As well as overall volume for the beginner client/athlete. Another being able to monitor progress threw multiple outlets and have the motivational support of someone who is going through the same experience."

2. Please indicate any WEAKNESSES that may need IMPROVEMENT within this program:

FP #1	"It is unclear what types of household items will be utilized, and how 60-80% of 1RM will be achieved for the specific exercises utilizing household items... When discussing benefits, make sure your population clearly understands which is in it for them, rather than just stating facts about bone loss and muscle loss. Just reward in a positive sense."
FP #2	"I would like to see that after the program has ended that there be a process to connect participants to either on going groups, programs, gyms, etc., or long-term at home programs set up."
FP #3	"Everyone may not find the exercises conducive for every woman... Squats lunges, and deadlifts specifically, require core and lower back strength that participants may not have."
FP #4	"A huge part of any program is the enjoyment a client feels during the workouts. Working out at home is practical, but is missing the motivation and enjoyment that is present when working with a professional."
FP #5	0

3. Please provide any further questions or comments:

FP #1	"How long is the study and how often will 1RM be measured to monitor strength increases?"
FP #2	"I believe this program can be a prototype for many organizations that work with these demographics. Highly recommend these avenues pursued."
FP #3	0
FP #4	"This is a well thought out program and the start of an answer that helps to solve the obesity problem."
FP #5	"Really thorough and covers only evidence based information that can be turned into application by the audience it was targeted towards with ease."

Sample of population representatives (SPR). Similarly to the health care provider and fitness professional responses, all questions were answered with either agree (4) or strongly agree (5), which is presented in Table 6. In contrast to the other participant categories, the sample population representatives had no neither agree nor disagree (3) responses to the questions. The lowest response averaged a score of four point two (4.2), which is in regards to question number three asking if the minimal daily time required to perform the program is reasonable to expect of the average women. The highest score is seen in response to question number seven, which is a score of four point seven (4.7). Question seven asked if through the literature and supportive evidence presented, does she see the benefit in women building muscle to combat obesity and aid in health improvement. The most common average score seen in response to seven of the ten questions is four point six (4.6).

Table 6

Sample Population Representatives (SPR) Evaluation Questionnaire Results

	SPR 1	SPR 2	SPR 3	SPR 4	SPR 5	Avg.
1. The program is well organized.	5	4	5	4	5	4.6
2. The program is realistic for the average woman to practice in home.	5	5	5	4	4	4.6
3. The minimal daily time required to perform the program is reasonable to expect of the average woman.	5	4	4	4	4	4.2
4. The fact that minimal finances are required to perform this program will aid the participant in performing and committing to this program.	5	5	4	4	5	4.6
5. The data collected through BMI, weight, body fat percentage and body measurements will aid in the monitoring and support of participants.	5	5	5	4	4	4.6
6. The program is based on current literature and research as presented.	5	5	4	4	4	4.4
7. The presented program is user friendly with a minimal amount of instruction.	5	5	5	4	4	4.6
8. Through the literature and supportive evidence presented, I see the benefit in women building muscle to combat obesity and aid in health improvement.	5	5	5	4	5	4.7
9. The proposed anaerobic weight training program is realistic to implement.	5	5	4	4	5	4.6
10. I would promote the information provided and type of program in my practice and/or community.	5	5	5	4	4	4.6

Presented in Table 7, the qualitative responses left by the sample population representatives were also supportive and conducive to the future implementation of the Lift for Health program. Strengths identified include, the program taking only 30 minutes, motivational support, accountability, performed at home, and extends beyond time and financial constraints.

Areas in need of improvement noted by these women include, needing a little more motivational support. However, four out of five women expressed that there were no obvious weaknesses or areas that need obvious improvements. Suggestions and additional comments placed include, the program being great, they would love to be involved, and it may help to add a little help with nutrition and healthy eating on a budget.

Table 7

Sample Population Representatives (SPR) Question and Comment Questionnaire Answers

1. Please Identify the STRENGTHS of this program:

SPR #1	"It only takes 30 min...You can do it at home."
SPR #2	"Motivational support...accountability."
SPR #3	"Your able to do this type of workout at home without having to pay a lot to go to a gym. You also have support throughout the program to help your progress."
SPR #4	"Strengths are women can be moved by the fact to get healthier and more motivated to see how they aren't alone. They have many abilities to succeed."
SPR #5	"To make their own times so women can exercise when they want."

2. Please indicate any WEAKNESSES that may need IMPROVEMENT within this program:

SPR #1	"None that I can see. It looks like something I can actually do."
SPR #2	"None that I see."
SPR #3	"By just reading the project, I don't see any weaknesses. I would have to try the project first, to have an opinion on its weaknesses."
SPR #4	"Well, they can be child care so many single moms can succeed in many goals they have for themselves."
SPR #5	"So many give up."

3. Please provide any further questions or comments:

SPR #1	"If you get women to do it, I would love to do it too."
SPR #2	"I think your program is great."
SPR #3	0
SPR #4	"Hopefully things for healthier diets."
SPR #5	"How maintain eating on a cheap budget?"

Summary of results. Through averaging all the average scores from each participant group, which is presented in Table 8, from all three participant categories, the highest total average score is four point eight three (4.83) received in question eight. Question eight asked if through the literature presented, did the participant see the benefit of women building muscle in targeting obesity and health issues. The lowest total average score of four point three three (4.33) is received in question two and three. Question two asked if the participant agreed that this program is realistic for the average low SES woman to practice at home. Question three asked if the participant agreed that the minimal daily time required to perform the program is reasonable to expect of the average low SES woman.

Table 8

Summary of Participant Averages Evaluation Questionnaire Results

	HCP	FP	SPR	Avg.
1. The program is well organized.	4.8	4.6	4.6	4.67
2. The program is realistic for the average low SES woman to practice in home.	4.4	4	4.6	4.33
3. The minimal daily time required to perform the program is reasonable to expect of the average low SES woman.	4.6	4.2	4.2	4.33
4. The fact that minimal finances are required to perform this program will aid the low SES woman in performing and committing to this program.	4.6	4.8	4.6	4.67
5. The data collected through BMI, weight, body fat percentage and body measurements will aid in the monitoring and support of participants.	4.8	4.8	4.6	4.73
6. The program is evidence –based and consistent with current literature.	4.8	4.7	4.4	4.73
7. The presented program is user friendly with a minimal amount of instruction.	4.4	4.2	4.6	4.4
8. Through the literature presented, I see the benefit in women building muscle to combat obesity and aid in health improvement.	4.8	5	4.7	4.83
9. The proposed anaerobic weight training program is feasible to implement.	4.8	4.4	4.6	4.6
10. I would promote the information provided and type of program in my practice and/or community.	4.4	4.6	4.6	4.53

A summary of the qualitative responses to the questionnaire is presented in Table 9.

Common strengths identified are being evidence based, limited cost and time, support and motivation present and simplicity. Common areas in need of improvement include, maintaining consistency and motivation within the target audience, detail of the brochure, clarification of

household items. However, many responses stated that there were no weaknesses seen.

Additional comments comprise of the study being excellent, great, promising and impressive.

Two responses requested a little information on nutrition on a budget to be added to the study.

Table 9

Summary of Themes in Participant Responses Question and Comment Questionnaire Answers

1. Please Identify the STRENGTHS of this program:

Evidence based, limited cost and financial need, minimal resource requirements, well organized, practical, simple program, regular feedback, user friendly, thorough, no need for additional child care

2. Please indicate any WEAKNESSES that may need IMPROVEMENT within this program:

Consistency in target audience, continual motivation, brochure too technical for some people, clarification of type of household items needed, need a length for particular study, no weaknesses

3. Please provide any further questions or comments:

Excellent study, great, very promising, impressive, prototype for future implementation in community, add information on nutrition on a budget

Data Analysis Process

Articles and studies collected during the detailed literature review were used in the formulation of the Lift for Health program. After sufficient articles were collected, each study was analyzed for its detailed presentation of program information on resistance training, low SES program implementation or promoting retention and motivation in a physically active program. Studies presenting details on the amount of repetitions, sets and particular exercises were included in the review for resistance training programs. Studies detailing methods of increasing retention of women in health and fitness programs were used in the literature review for motivation and retention mechanisms for low SES women. Moreover, studies outlining the effectiveness of pedometers were included promoting the use of pedometers for motivational

factors. Presented in the data section, each study involved was broken down for the beneficial findings and useful information. The Lift for Health program was born after all the effective and feasible findings were molded together.

A Likert scale questionnaire, available in Appendix B, was created and distributed to all 15 participants. The rating method involved five levels of rating, which ranged from one being strongly disagree and five being strongly agree with the a fore mentioned statement about the program. A comment section was used for the participants to provide any further assessment or comments about the proposed program. Descriptive Statistics were used to present findings. Likert results were initially tallied and a mean for each question was determined as an effective presentation of the outcome of the designated question. To further visualize the results, tables are presented for each question within each evaluator group of women representatives, health care providers and fitness professionals. Additionally a summary of averages for each question tallied from all 15 responses is seen in the summary of data section.

CHAPTER V

RECOMMENDATIONS AND CONCLUSIONS

Data Discussed within the Aims and Objectives of the Project

The outcomes from the literature review and questionnaire are discussed under the overarching objective, which lead the methods and data collected throughout this practice inquiry project.

Objective One: Formulate an anaerobic program for low SES females. A literature search successfully aided in the completion of objective one with the inclusion of 14 resistance training based studies, which was the basis for the formulation of the Lift for Health program.

These studies were chosen based upon their detailed description of their interventions, feasibility of their methods being performed at home and the effectiveness of their routine for a female population. The Lift for Health program used the foundation of these researched programs to build an at-home resistance training based program targeting obesity of low SES females. This program involves a 30-minute routine completed four days per week. The routine consists of three (3) sets of eight (8) to ten (10) repetitions. On alternating days, exercises targeting the upper body and the lower body are performed. The resistance training program is depicted in Table 1 within the outcomes of this practice inquiry project.

Objective Two: Timely and financially allowable education methods. The timely aspect of this objective is accomplished through the plan of effectively targeting large muscle groups with a handful of exercises, which can be accomplished in approximately 30 minutes four (4) days per week. Even though increased frequency may aid in additional support and retention, the group meetings are performed once monthly to decrease the time commitment of each participant. According to the literature findings, monthly group and support meetings are reasonable to request of busy women. However, only implementation of this program will be able to confirm this hypothesis.

Objective Three: Use of in-home materials/equipment. The use of in-home equipment is accomplished after the first group meeting. During this first meeting, adequate weight to perform the given exercise will be deciphered for each participant by a fitness professional. After the given weight is determined, easily available at home goods will be used to add up to the necessary weight. These goods are not defined within the program at this time, because the available products each participant has easy access to is unable to be determined at this time. Products that may be available, might include, soup cans, chairs, cases of water, milk jugs, etc.

Objective Four: Use of monitoring weight, BMI, body fat and body measurements.

This objective is seen in the monthly support group meetings when the participants will gather with a fitness and health care professional to perform weight (pounds), BMI, body fat percentage and body measurements. Baseline measurements will be taken at the initial group meeting.

Objective Five: Evaluation by five health care providers, five fitness professionals and five sample population women. A qualitative and quantitative questionnaire was produced targeting the evaluation and feasible implementation of the Lift for Health program. The questionnaire was successfully distributed and completed by all five health care providers, fitness professionals and five target population representatives. The results of the questionnaire are discussed in detail in chapter four. Tables 2 and 3 discuss the health care provider questionnaire results. Tables 4 and 5 discuss the fitness professional questionnaire results, and tables 6 and 7 present the questionnaire results by the target population representatives. Tables 8 and 9 provide summary averages of the quantitative and qualitative findings from all groups of participants. Positive responses in support of the program were received along with several constructive improvement ideas.

Objective Six: Community-awareness of program for weight management and health improvement. This objective was partially accomplished through changing the mindset of several health care providers and fitness professionals in using fitness and resistance training as a form of preventative health care in targeting female obesity and related health issues. To accomplish this objective further, written materials and information handed out to community establishments, and health care facilities to promote community awareness of the use of this program. However, for the greatest acceptance of community awareness, this should be done

post implementation of the program to work out any improvements needed and ensure its effectiveness.

Objective Seven: Community-awareness of feasibility and effectiveness of resistance training for women. This final objective is seen in the accomplishment of the literature compiled for the formulation of the Lift for Health program and the initial literature review presented in promotion of the need for a resistance training based program. The evidence-based information used to build and support the Lift for Health program has paved a new path for future resistance training and its use in targeting obesity, which was the goal of this objective. Future informative handouts and brochures may be distributed to community locations and health care facilities to aid in the further spread of this information.

Project Strengths and Facilitators

There has been a great amount of support for this program from university faculty, health care providers, fitness professionals and target population women. Viewing fitness and exercise as preventative health care is a rather new view according to much of the literature used in the formulation of the Lift for Health program and from responses in the questionnaire. This drummed up much interest in the topic, which facilitated the smooth distribution of the questionnaires. Additionally, possible future implementation of this program or similar programs is of great interest as seen through the participant responses. This being a rather new area of research and interest, there are many inquiries. However, this can also be seen as a challenge, because changing the mindset of providers and community members to take charge of preventing disease through health and fitness is a complex undertaking.

The feasible completion of the project methods is also a strength. The detailed literature review was able to be completed via the internet, which was beneficial for a busy working

researcher, who was also residing a distance from the University institution. Article databases and the University of Hawaii Mookini Library were easily accessible and easy to navigate. The use of a convenience sample was beneficial for the purpose of testing the mindset of health care providers, fitness professionals and target population with this project, and this sample builds a base for future research.

A strength seen in the compilation of literature and results of the questionnaire is that there are many future areas of study and research that this project promotes. This project's strongest asset is that it is a base for a new area of research and understanding in nursing and in overall health care. Presenting the use of exercise and fitness as an effective and feasible program targeting obesity of women in low SES environments is currently lacking in many attempts to aid the obesity epidemic. This type of approach is an exciting and necessary area of study in many Western medical practices.

Project Limitations and Barriers

Project limitations included the ability to find sufficient published researched and weight training based programs targeting women seeking health benefits and weight reduction. Much of the thoughts and materials on weight training and women were limited to non-published and non-research based findings. This is a new area of study with many opinions and thoughts from experts and experienced professionals. However, there is little formally published research on the topic of specific forms and exercise formats. Additionally, many of the research studies found imposed multiple resistance training exercise methods, because there is a no clear definition of what resistance training exercises involve. This led to the need for a large accumulation and meshwork of different studies to build the program developed for this project.

The sample population of health care providers, fitness professionals and representative women has already been contacted prior to the questionnaire distribution with forewarning of the desire to include them in the evaluator stage, and they were excited to have been involved. Using a convenience sample for selecting evaluators is a limitation. The implementation of this program is not a part of this PIP, so there will be no limitations associated with the methods and implementation of the resistance training based health program formulated.

A challenge seen in the results of the questionnaire is crossing the wall between health care provider's limited understanding of fitness as preventative health care and the fitness professional's understanding of the need to promote fitness as preventative health care instead of merely as exercise. It is apparent that through the qualitative portion of the questionnaire, health care providers may have been unclear as to the implementation and formulation of a fitness and wellness program via exercise, which skewed the answers in one direction. In conjunction, the fitness professionals left more questions and comments in regards to the need for the program to be implemented at a gym or health facility, which if implemented, may take away from this program crossing certain low SES barriers in regards to health and illness prevention. Molding the brochure and program information to the health care understanding of exercise and fitness with the fitness professionals' understanding of exercise and fitness was a challenge. This is an area in need of improvement as made apparent through the questionnaire results.

Conclusions and Recommendations

Conclusively, through the questionnaire results, there is much support for a health and wellness program that targets low SES female obesity. The average quantitative results of the questionnaire were all either in the agree or strongly agree category. This provides support for the program being feasible and reasonable to implement in the future with minor adjustments.

Adding more frequent communication between the program directors and the participants would aid in higher retention rates and success. This may be through telephone calls, home visits or an additional group meeting.

As presented in the qualitative portion of the questionnaire, it is recommended to work on the clarification of the brochure to aid in clarification for women of low SES populations. However, also seen in the results and through small discussions with each low SES female participant, there was no issues with understanding the brochure from their personal perspective. Finding methods or connection programs to extend beyond the program is recommended to aid in the female participants in continuing a healthy lifestyle and performing similar resistance training and walking activities represented in the program.

CHAPTER VI

IMPLICATIONS FOR PRACTICE

Contributions to Practice

The benefits of resistance training are widely known in the fitness field. However, through the results of the questionnaire, it became apparent that resistance training is not as understood in the health care field. During discussion with the participating health care providers, several had mentioned that they recommend patients to increase walking and cardio activity for health purposes. They discussed that they were not educated on or made aware of forms, programs and methods of resistance training. Additionally, the many benefits of resistance training were surprising to some of the health care providers. Discussing the physiologic basis behind the health benefits of additional muscle in targeting female obesity in conjunction with methods and programs to recommend to patients would greatly benefit nursing and medical practices.

The information compiled and the project outcomes of this PIP bridged a gap between fitness or exercise and health care. Providing future education to health care providers on the benefits and necessity of fitness as a part of preventative health care is an area in need within health care curriculums. Changing the mindset within the practice of health care by guiding people into healthier lifestyles and preventing disease instead of trying to fix the problem after it occurs is the cornerstone of this PIP's contribution to practice. There is great need for future research and study before this shift in health care is to occur. However, the findings and results of this PIP aid in building a basis for future studies and education in exercise and fitness as common preventative health care practice.

Need for Future Research

Between the literature search and the questionnaire, it is apparent that there is a great need for future research in the area of resistance training programs and programs that extend beyond the barriers of low SES environments in targeting obesity. Many current studies on the benefits and effectiveness of resistance training involve time and financially consuming methods on the part of the participants, which is not realistic for all populations. To aid in using these programs for broader populations it is necessary to place emphasis on methods, which extend beyond the barriers of low SES environments previously discussed.

Future research on the implementation of resistance training based programs is needed. There are many hypotheses and theories without implementation, which is what is needed to truly add to the amount of current knowledge on this given topic. Additionally, research on how to appropriately and effectively educate health care providers in either continuing education courses or adding this to pre-graduation program curriculums is needed. Research on methods on how to educate and mold together fitness with health care practice is needed before the

appropriate curriculum can be built. Moreover, research on the best methods to educate and support the public in using fitness and resistance training as a form of wellness and preventative health care is necessary for successful adoption of any wellness theory and program. This area of research is currently lacking and in need of attention.

Addressing the Next Steps

The next steps are already in discussion. Excitingly, one of the fitness professionals, who was a participant in the questionnaire phase of this PIP, helps to run a community women's support program for low-income and socioeconomically disadvantaged women. This program houses and feeds women, who need shelter and assistance. They also provide job search support and training, in addition to promoting health and nutrition through multiple programs. They have a facility, which would act as the location for monthly meetings, and there are several fitness professionals, who are willing to volunteer their time monthly to hold these meetings with the assistance of a registered nurse (RN). There are two RNs, who are interested in also volunteering their time monthly to perform measurements and organize the support group aspect of these meetings. An additional exciting connection made through this support program is their use of a grant writer, who has already expressed her love of this Lift for Health program, and she is excited to search and write applications for grants to implement this program.

A second avenue for implementation of the Lift for Health program is through promotional support from the Anytime Fitness health club in Susanville, CA. The owner of this gym is interested in implementing the Lift for Health program for a six month period as community health promotional program. He would be willing to fund the program, and have the fitness instructors hold the monthly meetings in their group training class room. Either approach

shows the interest of the community in promoting the Lift for Health program and the feasible possibility for implementation in the near future.

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