The Effects of Coaching Strategies for Primary Prevention of Coronary Heart Disease Involving Asymptomatic Hospital Employees

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THE EFFECTS OF COACHING STRATEGIES FOR PRIMARY PREVENTION OF
CORONARY HEART DISEASE INVOLVING ASYMPTOMATIC HOSPITAL
EMPLOYEES

A thesis submitted in partial fulfillment
of the requirements for the degree of

Master of Science

By

GABRIEL MORENO, B.S.

University of Michigan, 2006

2009

Wright State University
I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY GABRIEL M. MORENO ENTITLED THE EFFECTS OF COACHING STRATEGIES FOR PRIMARY PREVENTION OF CORONARY HEART DISEASE INVOLVING ASYMPTOMATIC HOSPITAL EMPLOYEES BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF Master of Science.

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ABSTRACT

Moreno, Gabriel, M.S., College of Science and Mathematics, Department of Biological Sciences, Wright State University, 2009. THE EFFECTS OF COACHING STRATEGIES FOR PRIMARY PREVENTION OF CORONARY HEART DISEASE INVOLVING ASYMPTOMATIC HOSPITAL EMPLOYEES

Introduction: An effective coronary heart disease (CHD) prevention program is needed. Currently, prevention of CHD is being sought through pre-CHD risk stratification of patients using office-based screening tools such as the Framingham risk model (Greenland, Smith, & Grundy, 2001). However, patients who are given recommendations for lifestyle behavior modification find difficulty employing and sustaining the changes. The recent popularity of coaching for health behavior change has prompted the question of whether coaching is an effective method to produce a higher success rate for lowering cardiovascular disease following risk stratification.

The main purpose of this study was to investigate the effectiveness of a lifestyle counseling program by phone on coronary heart disease risk in a working population with elevated CHD risk factors. Methods: The study utilized a randomized controlled trial in which a group of fifty full-time hospital employees (n=54) participated in risk stratification for CHD and subsequently received access to the hospital’s Wellness Center and information regarding the therapeutic lifestyle changes (TLC) recommended by the National Cholesterol Education Program (Executive summary of the third report of the national cholesterol education program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (adult treatment panel III).2001) Twenty-seven subjects received a wellness coach and twenty-seven subjects served as controls. All measurements were performed at week zero to provide baseline data and week seventeen to provide post-study data. The measurements performed included height, weight, blood pressure, activity monitoring accessed via an accelerometer. In addition, blood sampling was in week zero and week seventeen to assess serum levels of fasting glucose, very-low-density lipoprotein (VLDL), low-density lipoprotein (LDL),
high-density lipoprotein (HDL), total cholesterol (TC), and triglycerides (TG). Lastly, a Well-being Assessment (WBA) from Wellcoaches Inc., completed in week zero and week seventeen identified each participant’s pre- and post-intervention perception of self-efficacy and motivation concerning the areas of nutrition, exercise, and stress. **Results:** There were no significant results from the between group comparison. **Conclusion:** Individuals in both groups experienced beneficial risk factor outcomes. However, the outcomes of the coached group were not significantly different from that of the control group. Adherence to the coaching program was a major obstacle in evaluating its effectiveness.
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1. Introduction.

Coronary Heart Disease (CHD) is the number one killer of Americans today, with approximately one person dying from a coronary event every minute (American Heart Association: Heart Disease and Stroke Statistics, 2007). A study sponsored by the World Health Organization (2006) found that the leading cause of death in 2002 was coronary (ischemic) heart disease, and was projected to maintain the top spot through the year 2030 for high-, middle-, and low-income countries (Mathers & Loncar, 2006). In an effort to avoid drug therapy, the American Heart Association (2002) recommends that hyperlipidemic patients undertake dietary modifications for 12 weeks to avoid use of lipid lowering drug therapy (Pearson et al., 2002). The newest AHA Guidelines for Primary Prevention of Cardiovascular Disease and Stroke (2002) emphasizes that the “continuing message is that the adoption of healthy lifestyle habits remains the cornerstone of primary prevention including the avoidance of tobacco (including secondhand smoke), healthy dietary patterns, weight control, and regular, appropriate exercise.” Based upon findings in the long-term Framingham Heart Study, a bodyweight reduction of 20% in an overweight or obese individual could account for a 40% decrease in the risk of developing coronary heart disease (Kannel, D'Agostino, & Cobb, 1996). In 2002, the AHA declared that, “An important role of healthcare providers is to support and reinforce these public health recommendations for all patients” (Pearson et al., 2002). According to the president of the American Heart Association’s 2006 presidential address, the need to do so is essential and mandatory for improvement of the U.S. healthcare system (Gibbons, 2007). Indeed, the president’s first “fundamental change” outlined to improve healthcare over the next 10 years was, “…a renewed emphasis on patient education and personal health. [because] Patients often fail to understand the importance of their own
lifestyle choices” (Gibbons, 2007). It appears that part of the puzzle lies in increasing the knowledge of patients concerning their lifestyle choices. Yet the question remains, how does one increase his or her tendency to make the beneficial lifestyle choices?

**Statement of Problem**

There is a plethora of evidence linking the factors sedentary lifestyle, high blood pressure, dyslipidemia, and obesity to an increased risk of coronary heart disease. Indeed, each factor has been classified as an independent risk factor (Pearson et al., 2002) (Onat et al., 2004) (Lorenzo, Williams, Hunt, & Haffner, 2007) (Executive summary of the third report of the national cholesterol education program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (adult treatment panel III).2001) The development of coronary heart disease has been found to have an inverse association with increased physical activity (PA) and a positive correlation with abdominal adiposity (Kohl, 2001; Lorenzo, Williams, Hunt, & Haffner, 2007). Armed with this knowledge, it would follow that the informed individual at moderate to high risk of developing heart disease could use these tools to better his/her well-being. Furthermore, heart disease continues to be the number one cause of death in the United States (American Heart Association, 2007). Nevertheless, mixed results have been found when attempting multi-factorial intervention for healthy lifestyle modification (Lochner, Rugge, Judkins, & Saseen, 2006). Therefore, effective primary prevention programs for heart disease are needed.

**Significance and Justification**

As an organization involved in the promotion of primary prevention through physical activity, the American College of Sports Medicine (2006) recommends “behavioral modification techniques” to promote weight loss and prevent re-gain. A successful loss of weight and prevention of regain of excess body weight appears to
require both behavior modification techniques and a structured fitness program (Villanova et al., 2006). The well-intentioned wellness providers in these programs often include an exercise physiologist, a personal or group fitness instructor, and/or dietician who lack adequate training in psychological models addressing change and guidance to elicit behavior modification. Further, long-term success in any endeavor appears to require a sustained effort fueled by a strong perceived self-efficacy (Bandura, 1977). For this reason, training one’s mental processes pertaining to self-efficacy in healthy lifestyle activities may help produce long-term weight maintenance success. However, many people may need an assistant in this process of change; a coach who has the training necessary to support others undergoing change and provide expert advice in health and fitness. Wellcoaches Corporation (Wellesley, MA), trains “Wellcoaches” to provide this service. Each Wellcoach has the ability to provide professional advice in the areas of nutrition, physical activity/exercise, and stress management.

With the support of a Wellness coach, the client may feel more able to lower his/her coronary heart disease risk. The role of a coach to guide participants in lifestyle change has found success in several trials involving secondary heart prevention populations (Vale et al., 2003).

**Statement of Purpose**

The main purpose of this study was to investigate the effectiveness of a lifestyle coaching program by phone on coronary heart disease risk in a working population with elevated CHD risk factors. Secondary purposes were to investigate the effects of this program on anthropometric and a wellbeing score composed of psychometric and behavioral measures. This study examined the change between pre- and post-intervention biometric measurements, 10-year Framingham coronary heart disease risk score, and overall well-being score of each participant. In addition, the mean change in
all measures was compared between matched participants and the intervention and control group.

**Project Objectives Questions**

Several hypotheses were developed for the study and were categorized into three groups.

**Null Hypothesis:** Participation in a Wellness coaching program will not result in a significantly greater reduction in the 10-year risk of coronary heart disease as estimated by the Framingham Heart Score.

\[ H_{01} \]: Participation in a Wellness coaching program will not result in a significantly greater reduction in BMI.

\[ H_{02} \]: Participation in a Wellness coaching program will not result in a significantly greater reduction in systolic blood pressure.

\[ H_{03} \]: Participation in a Wellness coaching program will not result in a significantly greater reduction in diastolic blood pressure.

\[ H_{04} \]: Participation in a Wellness coaching program will not result in a significantly greater increase in HDL.

\[ H_{05} \]: Participation in a Wellness coaching program will not result in a significantly greater decrease in LDL.

\[ H_{06} \]: Participation in a Wellness coaching program will not result in a significantly greater decrease in triglycerides.

\[ H_{07} \]: Participation in a Wellness coaching program will not result in a significantly greater decrease in fasting plasma glucose.

\[ H_{08} \]: Participation in a Wellness coaching program will not result in a significantly greater increase in physical activity.
**H₀:** Participation in a Wellness coaching program will not result in a significant greater increase in the Wellbeing score.

**Definition of Terms**

For the purpose of the study, the following variables have been defined.

**Blood pressure** – the force of blood against the walls of arteries. Blood pressure is recorded as two numbers—the systolic pressure (as the heart beats) over the diastolic pressure (as the heart relaxes between beats) (National Heart, Lung, and Blood Institute, 2005).

**Body Mass Index** – a clinical indicator of obesity; determined by dividing the individual’s weight by height in meters squared (ACSM, 2006, p. 58).

**Cholesterol** – soft, waxy substance found in the bloodstream and in all body cell (American Heart Association, 2005).

**Coronary Heart Disease (CHD)** – the process of the hardening and narrowing of the blood vessels that supply blood to the heart (National Heart, Lung, and Blood Institute, 2005).

**Disease Management Taxonomy**

The taxonomy listed below is recommended by the American Heart Association Disease Management Taxonomy Writing Group to allow for comparisons across intervention and was used in this study (Krumholz et al., 2006). The taxonomy includes the following eight domains:

1) Patient population is characterized by risk status, demographic profile, and level of comorbidity.
2) Intervention recipient describes the primary targets of disease management intervention and includes patients and caregivers, physicians and allied healthcare providers, and healthcare delivery systems.

3) Intervention content delineates individual components, such as patient education.

4) Medication management, peer support, or some form of post acute care, that are included in disease management.

5) Delivery personnel describes the network of healthcare providers involved in the delivery of disease management interventions, including nurses, case managers, physicians, pharmacists, case workers, dietitians, physical therapists, psychologists, and information systems specialists.

6) Method of communication identifies a broad range of disease management delivery systems that may include in-person visitation, audiovisual information packets, and some form of electronic or telecommunication technology.

7) Intensity and complexity distinguish between the frequency and duration of exposure, as well as the mix of program components, with respect to the target for disease management.

8) Environment defines the context in which disease management interventions are typically delivered and includes inpatient or hospital-affiliated outpatient programs, community or home-based programs, or some combination of these factors.

9) Clinical outcomes include traditional, frequently assessed primary and secondary outcomes, as well as patient-centered measures, such as adherence to medication, self-management, and caregiver burden (Krumholz et al., 2006).
Physical Activity – planned or structured; involves repetitive bodily movement done to improve or maintain one or more of the components of physical fitness – cardiorespiratory endurance, muscular endurance, muscular strength, flexibility, and body fat percentage (Centers for Disease Control, 2005).

Primary Care Physician – “a physician who is the first health professional to examine a patient and who recommends secondary care physicians, medical or surgical specialist with expertise in the patient’s specific health problem, if further treatment is needed” (Anderson, 2002).

Risk Factor – “Generally applies to a parameter than can predict a future cardiac event,” (Zipes & Braunwald, 2005).

Four Basic Categories of Risk Factors

1) Predisposing factors – A risk factor that cannot be modified. These include increasing age, male sex, family history of heart disease, and genetic predisposition.

2) Risk-modifying behaviors – Behaviors incorporated into an individual’s lifestyle that influences the development of coronary heart disease. The behaviors include smoking, atherogenic diet, alcohol intake, and physical inactivity.

3) Metabolic risk factors – Risk factors which promote the development of coronary heart disease and may be affected by changes in an individual’s risk-modifying behaviors. These include dyslipidemia, hypertension, obesity, diabetes, and metabolic syndrome.
4) Disease markers – A laboratory parameter indicative of coronary heart disease. These markers include calcium scores, catheterization results, stress test results, left ventricular hypertrophy on echocardiogram, personal history of vascular disease (prior myocardial infarction or stroke, angina, peripheral vascular disease), and inflammatory state (Zipes & Braunwald, 2005).

**Waist Circumference** – a measurement of girth of the trunk used as an indirect measure of abdominal fat. Excess fat on the trunk is considered android obesity, which provides an increased risk of hypertension, type 2 diabetes, dyslipidemia, coronary artery disease, and premature death (Whaley, Brubaker, Otto, & Armstrong, 2006). The Expert Panel on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults recommends measuring at the level of the iliac crest (Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults--the evidence report. national institutes of health.1998)

**Risk Stratification** - process by which a person or group of people is placed into a categories of susceptibility to an unhealthy condition or disease based on established factors (risk factors) thought to contribute its development. An example of such a risk factor and disease is cigarette smoking and cardiovascular disease.

**Wellness Coach** - The Wellcoach Training Manual defines the Wellness Coach as: “Wellness coaches as credentialed health, fitness, and mental health professionals including personal trainers, cardiac rehabilitation specialists, dietitians, health educators, physical therapists, nurses, physicians, and behavioral health therapists, who coach clients on the evidence-based areas of wellness including physical activity, nutrition, weight, stress/depression, health, and the life issues which impact wellness. While wellness coaches have a broad scope, they only provide expert guidance and advice in the areas where they are credentialed” (Wellness Coach Training Manual, 2006).
Assumptions

There are assumptions regarding the validity of the study results and subject behavior and adherence. It was assumed that:

1) Those who assisted in the measurements and assessments followed the prescribed protocols precisely as trained from pre- to post—testing sessions.

2) Participants answered survey forms honestly.

3) As a result of the study methods, participants in both the control and coached group experienced a positive effect on their risk factors and their overall Well-Being score, and a reduction in overall risk.

Summary

Minimizing the modifiable risk factors through lifestyle modification has been shown to reduce metabolic risk factors and overall coronary heart disease risk (Pearson et al., 2002). However, adherence to lifestyle changes to employ risk-modifying behaviors has produced mixed results (Lochner et al., 2006). The purpose of this study was to utilize a randomized controlled trial in which a group of fifty full-time hospital employees (n= 54) partook in risk stratification for CHD and subsequently received access to the hospital’s fitness center and information on the therapeutic lifestyle changes (TLC) recommended by the National Cholesterol Education Program (NCEP). One half of the group (n=27) received a wellness coach and the other half (n=27) served as controls. Measurement of blood pressure, weight, and waist circumference were performed on two occasions, in week zero and week seventeen. In addition, blood sampling performed in week zero and week seventeen assessed serum levels of fasting glucose, very-low-density lipoprotein (VLDL), low-density lipoprotein (LDL), high-density lipoprotein (HDL), total cholesterol (TC), and triglycerides (TG). Lastly, a Well-being Assessment (WBA)
completed in week zero and week seventeen identified each participant’s pre- and post-intervention perception of self-efficacy and motivation concerning the areas of nutrition, exercise, and stress.
II. Review of Literature

Coronary heart disease (CHD) is currently and will continue to be the largest cause of death worldwide (Mashers & Loncar, 2006). Actually, heart disease continues to be the number cause of death in the United States (American Heart Association, 2007). The relationship between lifestyle and risk of heart disease has been studied extensively, which has led to the observation of coronary heart disease risk-modifying behaviors. These behaviors included smoking, physical inactivity, excessive alcohol intake, and an atherogenic diet, while minimizing these behaviors has been shown to reduce metabolic risk factors and overall coronary heart disease risks (Pearson et al., 2002). However, studies of interventions focusing on lifestyle changes to employ risk-modifying behaviors have produced mixed results (Lochner et al., 2006).

This chapter will focus on a review of the current empirical literature relating strategies for behavior modification with primary prevention of coronary heart disease. To begin, the most common psychological models used will be introduced and each model will be followed by descriptions of the studies which use them. Each study presented used an intervention design. A description of the recipient of the intervention, delivery personnel, method of communication, the intensity, and complexity of the study, and the outcome measures of each study are included. Finally, the major findings are discussed and the importance to this research demonstrated.
In 1997, the Behavior Change Consortium (BCC), was formed by the National Institutes of Health (NIH) as “a collective of 15 National Institutes of Health-funded behavior-change projects and was conceived with the goal of evaluating the efficacy and effectiveness of novel ways of intervening in diverse populations to reduce tobacco dependence, and improve physical activity, nutrition and other health behaviors,” (Ory, Jordan, & Bazzarre, 2002). The NIH realized that while the past two decades have experienced great gains in the identification of health behaviors which impact modifiable risk factors, only a small percentage of the national targets for improving overall health set by the US Department of Health and Human Services have been reached (Ory et al., 2002). Their work has identified the five most common theoretical models among behavior change interventions involving nutrition/diet and physical activity/exercise: Motivational Interviewing (MI) (Miller, 1983), Self-Determination Theory (SDT) (Ryan, 2000), Social Cognitive/Learning Theory (SCT) (Bandura, 1977), Social Ecological Theory (SET) (Bronfenbrenner, 1979) and the Transtheoretical Model (TM) (Prochaska and Velicer, 1997).

**Psychological Models for Behavior Change and Associated Studies**

**Motivational Interviewing**

Motivational interviewing (MI) was developed as a method of counseling first used for alcohol abuse. Although not considered a theory in of itself, the method has evolved from Rogerian counseling and Bem’s self-perception theory (Bem, 1972). Its creator describes it as, “a client-centered, directive therapeutic style to enhance readiness for change by helping client explore and resolve ambivalence” (Hettema, Steele, & Miller, 2005). The Roger’s person-centered counseling approach produces an empathetic counselor and avoids creating resistance from the client. Bem’s self-perception theory
assumes that a person was more aligned to an idea which he or she articulate via speech (Bem 1972). MI seeks to resolve ambivalence by allowing clients to speak their reasons for change, called the generation of “change talk.” The effectiveness of MI for encouraging and initiating health behaviors has been observed by researchers in the health behavior field, although larger sample sizes and more standardized methods for counseling are needed (Knight, McGowan, Dickens, & Bundy, 2006).

**Studies Employing Motivational Interviewing**

In a 3 month intervention study, two groups of healthy, yet initially sedentary men and women employees of a large medical university in the Northwest of mean age 39.9 years were self-selected to a health coached group (Treatment, n=121) or elected to a control group (Control, n=118)) by Butterworth and colleagues (2006). In the study, the participants in the Treatment group were given health coaching by a health care professional trained in MI. There was a minimum of one initial coaching session and two follow-up contacts; each session lasted 30 min in duration. The researchers sought to evaluate the impact of MI-based health coaching on the physical and mental health status of the employees. At commencement and at the end of 3 months, all the participants completed the Short Form version (SF-12) Health Survey. The SF-12 allowed the researchers to derive two composite scores: the Mental Composite Score (MCS) and the Physical Composite Score (PCS), which are standardized to 0 to 100 point scale. The Treatment group showed a statistically significant increase on the PCS (1.69 points, p = .035) and MCS (4.40 points, p = .035), while the control group did not exhibit a significant difference in either score. There were significantly fewer males in the Treatment group and therefore a case-control design was used to control for bias were 44 pairs were matched based on baseline characteristics and SF-12 scores. This design failed to reveal a statistically different PCS score between the case-control group (1.58 vs. 1.69), yet the MCS was significantly increased for the case group versus the control (p
In light of these results, the researchers concluded that the use of motivational interviewing was able to positively affect the mental health of the employee participants and given a larger sample size, a positive effect on the physical health would likely have been observed.

*The Transtheoretical Model*

In the early 1980s Prochaska and DiClemente (1982) developed the transtheoretical model (TTM) to find common ground among all the major systems of psychotherapy regarding the process of change, regardless of the specific behavior sought to be modified. The researchers were able to define six stages of change which were proposed to be common among individuals undergoing behavior change (also known as stages of readiness for change):

- Precontemplation
- Contemplation
- Preparation
- Action
- Maintenance
- Termination (Prochaska and DiClemente, 1982)

Since its introduction, many studies have utilized the model for health behavior change interventions. In a review of 150 published studies (38 were intervention, 70 population, and 42 were validation), the identification of stage and stage specific support for individuals in a exercise intervention was found to be effective to either increase stage progression and/or increase exercise behavior (Spencer, Adams, Malone, Roy, & Yost, 2006).
Studies Employing the Transtheoretical Model

An observational study presented by Doherty and colleagues (1998) in the United Kingdom, examined the stage of change of individuals at high risk of cardiovascular disease at found that the stages of changes varied with the particular elevated risk factor. Those with high serum cholesterol had further stage progression concerning the behavior of reducing consumption of dietary fat than those of lower cholesterol levels. Similarly, non-smoking individuals who were overweight and inactive had a higher degree of readiness to increase their physical activity than active and normal weight individuals, while smokers displayed a lower degree of readiness to increase physical activity (Doherty, Steptoe, Rink, Kendrick, & Hilton, 1998). In the same intervention, Steptoe et al. (2001) reported odds of moving to action/maintenance for the behavioral intervention versus the control group were 2.15 (95% confidence interval [CI]= 1.30, 3.56) for fat reduction, 1.89 (95% CI= 1.07, 3.36) for increased physical activity, and 1.77 (95% CI=0.76,4.14) for smoking cessation.

Self-Determination Theory

Self-determination theory (SDT) is described by its creators as “an approach to human motivation and personality that uses traditional empirical methods while employing an organismic metatheory that highlights the importance of humans’ evolved inner resources for personality development and behavioral self-regulation” (Ryan, 2000). The theory explains that there are inherent growth tendencies and innate psychological needs which form the basis for a person’s self-motivation and personality integration. The needs identified include the needs for competence, relatedness, and autonomy (Ryan, 2000). SDT proposes that these needs can be nurtured, which in turn produce the conditions necessary for self-motivation and personality integration. This proposition is applied to behavior change to enhance a person’s ability to act by nurturing the aforementioned needs of the individual.
Studies Employing the Self-Determination Theory

In the Smoker’s Health Study, a 6 month intervention led by Williams and colleagues, 1,006 adult smokers were recruited from 1999 to 2002 from physician offices and by newspaper advertisements and randomized into an intensive intervention group (II, n = 714) and community care group (CC, n = 292). At the time of recruitment, the participants were smoking 5 or more cigarettes per day, were 18 years of age or older, read and spoke English, had no history of psychotic illness, and had a minimum life expectancy of 18 months. The researchers employed counseling methods based on SDT for the intervention group. In the study, both groups received the II group received the National Cancer Institute booklet “You Can Quit,” the American Dietetic Association booklet “The New Cholesterol Countdown,” and a list of active area smoking cessation programs. The II group received additional support in the form of 4 minimum SDT based counseling sessions and 2 sessions with a dietician. The group also received information on their personal 10 year cardiovascular disease risk. The researchers hypothesized that the II group would have significantly greater tobacco abstinence and lower serum LDL-C levels versus the CC group by the end of the intervention. The baseline questionnaires for all participants included demographic information, medical history, smoking history and psychological questionnaires including: the Fagerstrom Addiction Severity Scale (FAS), the treatment of self-regulation questionnaire (TSRQ-S) for autonomous motivation and also for diet (TSRQ-D), the general perceived competence scale (PCS-S) and also specifically for diet (PCS-D). Lastly, the Nutrition Data System for Research, three 24-hour dietary recall was performed. The clinical measures used were serum low-density lipoprotein-cholesterol and blood pressure.

Results of the study indicated a significantly higher number of intensive intervention participants able to abstain for 12-months from tobacco use versus the community care group. The II group perceived significantly greater autonomy support at 1 month which
was found to predict 12-month abstinence. This group was also displayed significantly increased internalized greater autonomous motivation for cessation for taking medications, and greater perceived competence from baseline to 6 months. The groups did not differ in percent calories from fat change from baseline to 18 months. Linear regression did reveal a significant effect of autonomy support on change in percent calories from fat from baseline to 18 months and change in autonomous motivation for diet from baseline to 6 months was able to predict a decline in this variable. The change in perceived competence for dietary change did not predict a change in the percentage calories from fat. The 18-month change in LDL-C was unable to be predicted by the psychological questionnaires. However, the II group had a significantly greater reduction in LDL-C from baseline to 18 months as compared to the CC group. The intensity of the treatment at 6 months, estimated by the total minutes spent with health care professionals and study practitioners, was significantly greater in the II groups versus the CC group. The intensity was able to predict 1-month autonomy support, baseline to 6 month change in autonomous reasons for taking medications, change in autonomous reasons for cessation, perceived competence, and 12-month prolonged tobacco abstinence. The researchers concluded that the SDT-based intervention effectively increased prolonged abstinence from tobacco and reduced LDL cholesterol in those smokers with an elevated serum level versus the CC group. They concluded that the use of SDT facilitated the beneficial changes as demonstrated by the psychological outcomes (A self-determination multiple risk intervention trial to improve smokers' health. CrossRef DOI query.2006)

Social Cognitive Theory

Albert Bandura, the creator of social cognitive theory, proposes that changes in fearful and avoidant behavior can be predicted and analyzed through the concept of self-efficacy, or one’s belief in his/her ability to perform a task. The theory explains that a person’s level of self-efficacy will affect his/her choice of behavioral settings and how
much effort is expended in the task. For example, individuals with low self-efficacy may
avoid situations which they perceive to be beyond their coping skills and display less
effort and persistence at the task. Bandura also outlines sources of increasing self-
efficacy-through performance accomplishments, vicarious experiences, verbal
persuasion, and emotional arousal.

Studies Employing Social Cognitive Theory

In a 6 month intervention study, two groups of healthy, yet initially sedentary men
and women of mean age 45.9 years were randomly assigned to either a structured
exercise group (Structured, n=121) or to a lifestyle physical activity group (Lifestyle,
n=114) by Dunn and colleagues (1997). The researchers in this study based their
intervention on the TM and SCT. In the study, the Structured group was offered
individual supervised exercise sessions 5 days per week for 6 months at a state-of-the-art
fitness center, while the Lifestyle group met in small groups weekly for the first 16 weeks
and bi-weekly for the remainder of the 6 months with a facilitator who taught "cognitive
and behavioral strategies appropriate to their level of motivational readiness" (Dunn et
al., 1997) The researches sought to report the cardiovascular risk factors of the
participants and determine the psychological strategies used in each group. At baseline,
the participants completed medical histories and psychological questionnaires concerning
information on stage of physical activity readiness, strategies of behavior change,
benefits and barriers for physical self-efficacy, and a 7-Day Physical Activity Recall.
The clinical measurements taken included: height, weight, percentage body fat via seven-
site skinfold technique, blood chemistries, and resting blood pressure.

At the conclusion of the intervention, the questionnaires and clinical measures were
again administered to all participants to allow comparison to the baseline data. After six
months, both groups significantly lowered their total cholesterol, total cholesterol/HDL-C
ratio, systolic blood pressure, diastolic blood pressure, and percentage of body fat. There
were no significant between group differences in the number reductions for these measures. According to the Framingham Coronary Risk Profile performed, the Structured group was able to reduce their CHD risk 17% and the Lifestyle group was able to lower their risk by an average of 12%. While both groups significantly increased their maximal oxygen consumption, the Structured group experienced a greater increase as compared to the Lifestyle group. Next, the researchers found that those who increased their use of behavioral and cognitive strategies, self-efficacy, and the Benefits to Barriers index for physical activity were more likely to meet the CDC and the ACSM recommendation of accumulating 30 min or more of moderate intensity physical activity on most, preferably all, days of the week. The researchers concluded that the use of cognitive and behavioral strategies to elicit lifestyle changes which encourage greater amounts of physical activity is as effective as a structured exercise program.

*Social Ecology Theory*

The social ecology theory (SET) addresses the relationship between socioeconomic, cultural, political, environmental, organizational, psychological, and biological determinants of health (Stokols, 1996). This relationship between individuals and their environment is affected on multiple levels, including intrapersonal, interpersonal, institutional, community, and public policy (McLeroy, Bibeau, Steckler, & Glanz, 1988). Advocates of SET propose that an effective intervention would take all levels into consideration. A key difference is that unlike the other psychological theories presented, SET also includes the physical environment’s effects on an individual’s health.

*Studies Employing Social Ecology Theory*

In the Mediterranean Lifestyle Study by Toobert et al., a 6 month intervention study with a long term follow-up period of 24 months, two groups of postmenopausal women with type 2 diabetes, at high risk for CHD were randomly assigned to a usual care
group (UC, n = 123) and the Mediterranean Lifestyle Program group (MLP, n = 156). The researchers sought to report the lifestyle behaviors, psychosocial factors, and the social environment of the participants and positively affect these variables through an intervention in this group which was at high risk for CHD. The investigators used a combination of Social Cognitive Theory, Goal Systems, and Social Ecology Theory as the basis for the program. The recruitment took place through collaboration with 59 separate physician practices and inclusion criteria included: having type 2 diabetes for at least 6 months, being postmenopausal, living independently, having a telephone, having the ability to read English, not being developmentally disabled, and living within 30 miles of the intervention site. The exclusion criteria was being older than 75 years of age and planning to move from the area during the study. The UC group received typical care from their primary care physician, while the MLP group received instruction concerning the primary risk behaviors of diet, physical activity, stress management, and social support. Specifically, the MLP group was taught the Mediterranean alpha-linolenic acid-rich diet by a registered dietician and given instruction on how to achieve the CDC/ACSM recommendation of 30 minutes of moderate physical activity on most days of the week from an exercise physiologist. Also, MLP group was given social support via weekly 4-hr meetings, including a telephone call absent group members. Finally, the MLP group was taught stress reduction techniques including: meditation, yoga, progressive deep relaxation, and directed in receptive imagery. Six months after the start of the intervention, the MLP group was randomly assigned to one of two maintenance groups, half to a lay-led peer group and to computer-assisted program support. Both groups were designed to encourage goal setting and social support. At baseline, the participants completed behavioral assessments including: the semi-quantitative food frequency questionnaire (FFQ) developed at the Fred Hutchinson Cancer Research Center to document the percent of calories from saturated fat, the CHAMPS Activities Questionnaire for Older Adults to provide an estimate of
kilocalories/kilogram/hour of moderate-intensity exercise related activities, and monitoring for 7 days with the Yamax DW-500 pedometer. In addition, to assess social desirability, the Balanced Inventory of Desirable Responding was used and a self-monitoring form to report stress management was developed for the study as seen in the following Figure 1.

<table>
<thead>
<tr>
<th>Stress Management</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record minutes of</td>
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</tr>
</tbody>
</table>

Figure 1. *Mediterranean Lifestyle Study Stress Management Assessment* (Toobert et al., 2007)

The psychological questionnaires included: the Brief Chronic Illness Resources Survey (CIRS) and UCLA were both used to assess social resources, the Diabetes Problem-Solving Interview was used to assess problem solving ability specific to program adherence, and the Confidence in Overcoming Challenges to Self-Care and Sallis Self-Efficacy for Diet and Exercise Behavior instrument were used to assess self-efficacy in their respect areas. In addition, the Center for Epidemiological Studies Depression Scale (CES-D) was administered to measure depressive symptoms, the Perceived Stress Scale and Diabetes Distress Scale (DDS) were administered for assessment of general perceived stress and as a diabetes-specific measure of quality of life, respectively. Medical history had been obtained through coordination with the participants’ primary care clinic.
At the 24 month follow-up, the MLP group showed significantly greater behavioral outcomes in all measures. The MLP group showed a significantly greater reduction in percentage dietary calories from saturated fat versus the UC group. Next, the physical activity level (in term of frequency, intensity, and duration) of the MLP was also significantly greater than the UC group. Lastly, the MLP group spent significantly more minutes in stress-management techniques and also had significantly greater flexibility and range of motion versus the UC group (Toobert et al., 2007). The psychosocial measures revealed that the MLP group displayed significantly greater ability or use of social resources, problem-solving ability, self-efficacy, and perceived stress. The groups did not significantly differ in measures of depression, self-monitored stress, and quality of life.

**Summary**

The theories discussed have found success in intervention studies in improved physical health and/or psychological elements supporting a positive wellbeing. However, the improvement in these aspects is not easily comparable due to differing study populations used as well as the methods used to measure the outcomes. Therefore, until further standardization of intervention studies involving health behaviors occurs, this trend will continue. Due to the partial success of these theories, they have been integrated into health interventions and products.

The current study utilized the Wellcoaches wellness coaching program for behavior change. The program employs the aforementioned studied psychological theories of motivational interviewing, the transtheoretical model, and social cognitive theory. Therefore, a standardized and widely available program such as the program offered by Wellcoaches is advantageous in that it can be rigorously studied and evaluated.
III. Methods

The purpose of this study was to examine the change between pre- and post-intervention risk factors for coronary heart disease and well-being of individuals in a coached and control group. This chapter will discuss the methodology employed for this study. It will review the research design, setting, population, sample human subjects consideration, research instruments, methods, and data analysis.

Study design

A randomized controlled trial study design was used for the proposed study. The treatment for the participants in the control group differed from those coached group only in that they were not given access to a Wellness coach.

Subject Selection Criteria

Fifty-four adult participants (n=54) were recruited from Miami Valley Hospital employees. To be eligible for the study, the participant must meet the following criteria: 1) aged 40-65 years old; 2) BMI $\geq 27$ kg/m$^2$ for men and $\geq 26$ kg/m$^2$ for women; 2) free of any signs or symptoms of and metabolic disease (as ascertained by a health history questionnaire; those with a known metabolic disease would automatically be excluded due to placement into the high-risk stratum); and 3) waist circumference of $>102$ for men and $>88$ cm for women. A systolic blood pressure of $\geq 200$ mmHg or diastolic blood pressure $\geq 110$ mmHg excluded the given employee from the study in accordance with ACSM’s Guidelines for Exercise Testing and Prescription, Seventh Edition (2006). Over the course of a few days, the investigators reviewed the applicants’ health profile and risk factor information. All racial/ethnic groups were accepted. According the American Heart Association (AHA) Risk Stratification Criteria, these participants are considered, “Class A: Apparently Healthy Individuals” (Fletcher et al., 2001; ACSM, 2006). The
fifty-four participants was assigned randomly to the intervention (coached; n = 27) group or control group (n = 27).

**Human Subjects Consideration**

Human subjects have several rights when participating in research. These rights include the right to self determination, the right to privacy, the right to anonymity and confidentiality, the right to fair treatment, and the right to protection from discomfort and harm (Burns and Grove, 1997). In order to ensure the protection of these rights, the Institutional Review Board (IRB) approved the study before any data collection began. The purpose of the IRB is to make certain that the research is ethical, no discomfort or harm will transpire during the research, and the subjects receive fair treatment.

Protected health information is any personal health information through which the patient can be identified. Participation in this study was completely voluntary. The researchers provided the subject with an informed consent form. The subject had an opportunity to go through and understand the details of participation in the study. The researchers addressed any queries or concerns that the patient has. Once the patient agreed to participate in this research, he/she agreed to the use of his/her health information, such as height, weight, resting blood pressure, and ejection fraction, in order to determine the appropriate strength-training protocol for different cardiac populations.

The researchers will use the information until June, 2010. When information is transmitted to the research institution, only a short identifier, (three letters, code#), was attached. The principal investigator kept a list with the subject’s name, short identifier, and medical record number in a locked file so that no one has access to it. When the study is completed, that list was destroyed, and all specific identifiers were removed from electronic files. The investigator removed the identifiers from the subject’s information
making it impossible to link him to the study. The subject’s identity will not be revealed in any publication that may result from this study.

The subject was free to withdraw his/her consent and to discontinue participation at any time. Such withdrawal did adversely affect patient care at the institution or cause a loss of benefits to which he/she may have been otherwise be entitled. The subject was able contact the hospital administration at the Department of Consumer Relations with any questions concerning his/her rights or the privacy officer with concerns about his/her privacy.

**Setting**

The study was conducted at an employee wellness center in an eight hundred bed, level I emergency and trauma hospital in a Midwestern State.

**Research Instruments**

Actical activity monitor (Philips Respironics, Bend, OR.) - A very small, lightweight device about the size of a wrist watch. The device is waterproof and needs to be worn continuously.

Wellsource Coronary Risk Profile Software (Wellsource, Inc., Clackamas, OR) – assesses the global (absolute) and relative risk of heart disease for individuals based on the Framingham Heart Study Model. A personal report explains the known risks and makes recommendations for risk reduction according to the National Cholesterol Education Program III (NCEP III) guidelines.
Procedures

Pre-study screening

A hospital wide e-mail was sent to all employees with e-mail access which included a description of the study and the dates of the informational and screening session (see Appendix C for the initial hospital wide e-mail). At the informational and screening sessions, employees were given information on how to apply to the study and three forms including: 1) an informed consent form (see Appendix E for the informed consent); 2) a demographic data (see Appendix F for the demographic data collection form) 3) a coronary risk profile questionnaire (see Appendix G for the coronary risk profile data collection form); and 3) a health profile questionnaire (see Appendix H for “The Wellness Center Health Profile”). The potential participant was explained the contents of the informed consent and was made aware that he or she is not yet accepted to participate in the remainder of the study. Pending the completion and review of the forms, the employee was led into a private room where height, weight, blood pressure, and waist circumference was assessed. Blood pressure was measured after being seated for 5 minutes. In addition, body mass index was calculated. Those who meet the inclusion criteria and were able to be matched to another employee based on the number of similar risk factors was notified via telephone and e-mail and was sent a Miami Valley Hospital Wellness Center application for membership, a laboratory voucher for lipid panel testing, and a sign-up sheet for an orientation to the Wellness Center. The printed instructions included how to undergo a pre-intervention blood sampling with CompuNet Clinical Laboratories and how to complete the online Well-being Assessment (an optional printed copy may be given). See Appendix I for the Wellness Center Membership Application, Appendix J CompuNet Coronary Risk Voucher and Appendix K for the Well-being Assessment. In the event that the participant had a response of, “Thought about or wanted to commit suicide some of the time, most of the time, or all of
the time,” in the “Depression Evaluation” section of the well-being assessment, his or her physician was to be notified immediately. In addition, the participant would have been contacted via telephone and e-mail and strongly encouraged to call the Dayton, OH Suicide Prevention Center at 1-800-320-HELP (4357). The completed forms were returned to the study personnel through inter-hospital mail or in-person to the Wellness Center office. The results of the lipid panel allowed a coronary heart disease (CHD) risk assessment to establish a risk based on the Framingham Heart Study requiring the clinical measures of blood pressure, non-fasting serum total cholesterol, and serum HDL cholesterol. Once the risk data had received by the study personnel, a coronary risk profile was generated by the Wellsource Coronary Risk Assessment Suite software (Wellsource, Portland, OR) which was used to place the participant in a low, intermediate, or high-risk category for developing coronary heart disease and graph a 10-year risk of developing coronary heart disease using the Framingham Risk Score worksheets (Wilson et al, 1998). Figure 2 below explains the strata defined by Greenland and colleagues in order to improve coronary heart disease risk assessment in asymptomatic people.
(Greenland, Smith, & Grundy, 2001)

Figure 2 Stratification of Asymptomatic Patients by Greenland and colleagues

During the scheduled orientation to the Wellness Center, the participant was given the results of the coronary risk profile and information on how to lower the risk of CHD. In order to assess a participant’s activity level, he or she was asked to wear an activity monitor for one week and carry out normal daily activities (Matthews, Ainsworth, Thompson, & Bassett, 2002). The participants were given an Actical activity monitor [(Mini Mitter Co., Inc., Bend, OR)] and instructed on its use. The Actical device is a very small, lightweight, and waterproof device about the size of a wrist watch. The device needs to be worn continuously. The device can be worn while bathing, swimming, sleeping, or during normal daily activities and will not harm the participant or the Actical device. An average of approximately 5 minutes was spent to fit the participant with a belt and to record the information (name, age, sex, height, and weight) into a computer program. The Actical device must be worn on the left hip just above the hip bone, and it was fitted so that it is comfortable for the participant. In order to assess a
participant’s activity level, he or she was asked to wear activity monitor for one week and continue with their normal daily activities.

At the first meeting of the intervention, the data concerning daily energy expenditure and activity data for the previous week was downloaded from the Actical activity monitor. Both the coached and non-coach groups were given information on how to initiate TLC and instructions on the use of fitness equipment in the hospital wellness center for which they had access.

A Wellcoach Corp. trained health professional (coach) individually met with each participant in the coached group weekly, for a total of 1 to 12 sessions of wellness coaching. Meetings were 40 minutes in length and appointment times were scheduled individually for flexibility. The participant was also taught the components of therapeutic lifestyle changes (TLC) involving nutrition and physical activity in accordance with NCEP criteria. The first meeting for each participant of the coached group established his or her wellness vision and goals for the program, which was consistent with the therapeutic lifestyle change recommendations. The coached participants were asked to make weekly and three-month nutritional and physical activity goals to progress towards their personal wellness vision. The goals were cognitive and behavioral focused. For example, a cognitive goal would be to monitor their negative self-talk for a week, while a behavioral goal may be to walk for an additional ten minutes per day for a week. Subsequent meetings followed the same general structure. The overall goal of the coaching process was to increase compliance to beneficial lifestyle behaviors. These behaviors were focused on increasing the individual’s amount of physical activity, reducing mental stress, and increasing adherence to a heart-healthy diet.

In week 12, the participant was given the Actical device to wear from week 12 to week 13. The following week (week-13) included a second coronary risk assessment appointment with identical measurement procedures to that of the first assessment in
week one, excluding a family history assessment. The coronary risk profile generated and each modifiable risk factor follow-up measurement was then compared to that of the baseline data. The comparison was performed between groups using an independent t-test and within groups using a dependent t-test analysis. Most participants completing the final measurements of the study completed a survey to assess what they believed to be the beneficial and non-beneficial aspects of the intervention as well as recommendations for future interventions. The Figure 3 on the following page explains the course of the study.
Step 1: Point in time: two weeks prior to week 0

- Initial “E-mail Recruitment Paperwork” is sent hospital wide via e-mail.

Step 2: Week 0

- Information and Screening meeting - 3 forms given: 1) an informed consent form (see Appendix E for the informed consent), 2) a demographic data (see Appendix F for the demographic data collection form) 3) a coronary risk profile questionnaire (see Appendix G for the coronary risk profile data collection form) and a 3) health profile questionnaire (see Appendix H for “The Wellness Center Health Profile”). Measurements taken - waist circumference, blood pressure, height and weight.

- If accepted, the participant is contacted and given a Wellness Center Membership Packet, CompuNet Coronary Risk Voucher, and Well-Being Assessment. Actical activity monitor is worn for 8 days. The coached group is contacted by a wellness coach to set up meetings for weeks 1-12 after completion of the well-being assessment.

Step 3: Week 1: Intervention Begins Coronary risk results are explained; participants are orientation to the Wellness Center. Exercise information (see exercise information) and methods to lower coronary risk are discussed.

Figure 3 Course of the Study
Step 4: Weeks 1-12: Coached Group (n = 25)

Measurements

- Mid-point assessment at week 6 - waist circumference, blood pressure, height and weight measures
- Week 12 - Coronary risk profile questionnaire is given and Well-being assessment is assigned. Appointment is made for week 13 to discuss results with PI.
- Actical worn from week 12 to 13

Available resources

- TLC information, bi-weekly coaching appointments, and access to fitness center

Step 4: Weeks 1-12: Non-coached (n = 25)

Measurements

- Mid-point assessment at week 6 - waist circumference, blood pressure, height and weight measures
- Week 12 - Coronary risk profile questionnaire is given and Well-being assessment is assigned. Appointment is made for week 13 to discuss results with PI.
- Actical worn from week 12 to 13

Available resources

- TLC information, access to fitness center

Step 4: Week 14: Post-intervention

Post-intervention coronary risk results are explained, all participants are offered membership to the Wellness Center for a fee, all participants are offered wellness coaching for a fee.

Figure 3  Course of the Study (continued)
Data Analysis Plan

This study utilized a randomized controlled trial including one treatment and one no treatment concurrent control group to compare the outcomes of the risk factors for each group. The outcome for each variable was defined as the post minus the baseline value. The outcomes included the 10-year coronary risk, modifiable risk factors, and well-being assessment scores and were compared using an independent t-test. The baseline and post-values were evaluated within each group by way of a paired samples t-test. The alpha level for both the between and within group comparison was set to 0.05. An ad-hoc analysis was performed to investigate the effect of the number of coaching session on the study outcomes. An independent t-test compared the outcomes of those coached participants who received 8 or more coaching sessions to the control group. This analysis did not reveal any significant results. However, a paired t-test comparing the baseline and post-study risk factor data found a significant decrease in BMI of 0.711 kg/m² (p = 0.0434).

Summary

This study was designed to demonstrate the effects of the Wellcoaches coaching program over the course of 12-weeks on the coronary heart disease risk factors and 10-year risk reduction of coronary heart disease in hospital employees. Participants were placed into two groups and given identical risk counseling and exercise guidelines according to the American College of Sports Medicine. One group received additional support in the form of wellness coaching, which consisted of weekly telephone sessions to encourage beneficial behavior change. This study used a pretest-posttest design incorporating an independent t-test to determine significant differences in the amount of change in the pre- and post-values of body mass index, fasting glucose, total cholesterol, high density lipoprotein, low density lipoprotein, triglycerides, physical activity counts, and Framingham 10-Year Risk Score between the two groups.
IV. RESULTS

The purpose of this study was to determine if a 12 session coaching intervention was effective in reducing risk of coronary heart disease in full-time hospital employees. This chapter has three aims. The first is to present a description of the study sample. The second is to present the data on the coronary heart disease risk factors measured and the behavioral data collected. The last aim is to evaluate the hypotheses postulated in Chapter I.

Descriptive Analysis

Individuals employed at a Midwestern hospital were invited to participate in this study. Approximately sixty-five employees were risk-stratified for their individual level of coronary heart disease risk. Based on the risk stratification, fifty-four were found to have a moderate level of CHD risk, the target level for the study, and were invited to continue. Of those participants with moderate risk, pre-study measurements were performed and most individuals were matched with another individual in the study with identical sex and similar age, BMI, menopausal status, and ethnicity. Next, an equal number of individuals were assigned randomly to either the coached group or to the control group. The results of t-tests concluded that there were no statistically significant differences in means of the physical characteristics and pre-study variables between the control and coached group. For each test, a test-wise level of significance of $\alpha = 0.0038$ was used, ensuring there would be an overall level of significance $\alpha = 0.05$ (Table 1). Nineteen individuals in the coached group and eighteen individuals in the control group completed post-testing. However, only thirteen participants in the coached group had complete post-blood sampling results and anthropometric measurements. Seventeen individuals in the control group had complete post-blood sampling results, while all eighteen had complete anthropometric measurements. Eleven participants in the coached group and ten participants in the control group completed post-Wellbeing assessments. A
sample size determination was performed using current literature and a minimum of 128 participants, with 64 allocated to each group. However, this sample size was not met.

Descriptive data were collected and analyzed for each group. The control group consisted of nineteen participants who ranged in age from 41 to 60 years, with the average age being 50.72 years. The coached group consisted of nineteen participants who ranged in age from 39 to 62 years, with the average age being 50.16 years. In total, 17 participants did not receive follow-up measurements for use in testing the main hypothesis. This included nine subjects in the control group and eight in the coached group. The reasons given by these subjects were lack of interest, familial concerns, or a non-permitting work schedule. The distributions of the participants’ ages at the time of baseline measurements are shown in Figure 4.
The control group consisted of thirteen women and five men, while fifteen women and four men were in the coached group. Both groups contained one smoker. The results of independent samples t-test indicated that there were no significant differences in any of the baseline descriptive variables between the two groups. Additional demographic data collected from the participants included height, weight, and are included in Table 1.

Figure 4  Distribution of Ages by Group and Completion of the Study.
Table 1

*Baseline Descriptive Statistics by Completion of Study and Study Group*

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<thead>
<tr>
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<th>Completed Study**</th>
<th>Did Not Complete Study</th>
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<td>Control</td>
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<td>5.04</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>18 Caucasian, 1</td>
<td>17 Caucasian, 1 African-American Hispanic</td>
</tr>
</tbody>
</table>

*Note: ‘Time on Study’ was the number of days between blood sampling.*

** The participant was considered as completed the study if they had at least one of the post-measurements performed.

**Intervention Data and Hypotheses**

In order to determine the effects of coaching on the risk factors for coronary heart disease, nine hypotheses were developed. In order to test the hypotheses, baseline and follow-up measurements were performed concerning the effect of the intervention. The variables measured were separated in to five conceptually distinct groups. These groups were coronary heart disease risk data, behavioral data, anthropometric and biometric data, metabolic data, and activity data. The outcome for each individual for a given variable
was the change between the post-value minus the pre-value. The mean outcome for each
group was found and subject to an independent samples t-test. The means were
calculated from only those individuals who were able to perform post-study
measurements. Table 1 shows the outcomes for each variable in the two groups
associated with the hypotheses.

What follows are the nine tested hypotheses, in addition to the change in each value
from baseline to follow-up, and the results of the statistical test for significance. For each
hypothesis, the outcome was calculated as the baseline value minus the follow-up value.
This was completed for each completer and the mean outcome in each group was found.
Next, the mean outcomes for each variable of the two groups were compared using an
unpaired sample t-test analysis. All $p$-values were one-sided and the alpha level was set
to 0.05. The primary hypothesis was concerned with the level of coronary heart disease
risk estimated in each group and is presented first.
Table 2

*Hypotheses Results for Each Group*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline</th>
<th>Control</th>
<th>Coached</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>Coached</td>
<td>Control</td>
<td>Coached</td>
</tr>
<tr>
<td>Time in Study* (days)</td>
<td>0</td>
<td>0</td>
<td>143.5&lt;sup&gt;d&lt;/sup&gt;</td>
<td>131.6&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Coach Sessions</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7 ± 4.16&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Framingham Heart Score</td>
<td>9.83 ± 3.37&lt;sup&gt;d&lt;/sup&gt;</td>
<td>9.2 ± 3.44&lt;sup&gt;d&lt;/sup&gt;</td>
<td>9.5 ± 3.72&lt;sup&gt;d&lt;/sup&gt;</td>
<td>10.6 ± 2.82&lt;sup&gt;b&lt;/sup&gt;</td>
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<td></td>
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</tr>
<tr>
<td>BMI (kg/m&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>32.22 ± 3.92</td>
<td>32.76 ± 5.04</td>
<td>31.70 ± 3.91</td>
<td>32.40 ± 5.38</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Systolic Blood Pressure, mm Hg</td>
<td>127.56 ± 22.78&lt;sup&gt;f&lt;/sup&gt;</td>
<td>119.95 ± 9.96&lt;sup&gt;e&lt;/sup&gt;</td>
<td>121.11 ± 12.58&lt;sup&gt;c&lt;/sup&gt;</td>
<td>122.24 ± 9.61&lt;sup&gt;c&lt;/sup&gt;</td>
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<tr>
<td></td>
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<tr>
<td>Diastolic Blood Pressure, mm Hg</td>
<td>81 ± 7.98&lt;sup&gt;c&lt;/sup&gt;</td>
<td>78.79 ± 5.17&lt;sup&gt;f&lt;/sup&gt;</td>
<td>78.5 ± 7.48&lt;sup&gt;f&lt;/sup&gt;</td>
<td>78.94 ± 5.01&lt;sup&gt;e&lt;/sup&gt;</td>
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<tr>
<td></td>
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<tr>
<td>High Density Lipoprotein</td>
<td>51.06 ± 11.67&lt;sup&gt;d&lt;/sup&gt;</td>
<td>57.63 ± 20.45&lt;sup&gt;f&lt;/sup&gt;</td>
<td>51 ± 11.67&lt;sup&gt;d&lt;/sup&gt;</td>
<td>61.25 ± 19.62&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
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<tr>
<td>Low Density Lipoprotein</td>
<td>121.83 ± 27.88&lt;sup&gt;d&lt;/sup&gt;</td>
<td>124.11 ± 27.91&lt;sup&gt;d&lt;/sup&gt;</td>
<td>126.19 ± 38.74&lt;sup&gt;d&lt;/sup&gt;</td>
<td>124.73 ± 20.02&lt;sup&gt;d&lt;/sup&gt;</td>
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<tr>
<td></td>
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<tr>
<td>Triglycerides</td>
<td>120 ± 49.34&lt;sup&gt;d&lt;/sup&gt;</td>
<td>147.26 ± 82.73&lt;sup&gt;d&lt;/sup&gt;</td>
<td>107.56 ± 45.28&lt;sup&gt;d&lt;/sup&gt;</td>
<td>146.63 ± 108.55&lt;sup&gt;d&lt;/sup&gt;</td>
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<tr>
<td>Fasting Glucose</td>
<td>95.72 ± 9.54&lt;sup&gt;d&lt;/sup&gt;</td>
<td>92.58 ± 8.31&lt;sup&gt;d&lt;/sup&gt;</td>
<td>94.94 ± 9.67&lt;sup&gt;d&lt;/sup&gt;</td>
<td>92.82 ± 8.60&lt;sup&gt;d&lt;/sup&gt;</td>
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<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>Activity Counts</td>
<td>110906.4 ± 49759.4</td>
<td>96894.1 ± 39446</td>
<td>152138.1 ± 66127.7</td>
<td>145274.7 ± 65962.8</td>
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<tr>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Wellbeing Score</td>
<td>65.9 ± 3.69&lt;sup&gt;a&lt;/sup&gt;</td>
<td>65 ± 5.87&lt;sup&gt;b&lt;/sup&gt;</td>
<td>71 ± 4.97&lt;sup&gt;a&lt;/sup&gt;</td>
<td>68.64 ± 8.18&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>n = 7, <sup>b</sup>n = 14, <sup>c</sup>n = 15, <sup>d</sup>n = 16, <sup>e</sup>n = 17, <sup>f</sup>n = 18
Coronary Heart Disease Risk Data

**Null Hypothesis:** Participation in a Wellness coaching program will not result in a significantly greater reduction in the 10-year risk of coronary heart disease as estimated by the Framingham Heart Score.

The mean change weight in the Framingham Heart Score for the control group was -0.125, while for the coached group was 0.14 points. The statistical analysis resulted in a $p$ value of 0.5703 and was not considered statistically significant at $\alpha = 0.05$; therefore, the hypothesis cannot be rejected. Figure 1 shows the outcomes for each variable in the two groups associated with the hypotheses.

![Figure 5](image)

**Figure 5  Change in Framingham Heart Score of Each Group**

*Note: A negative point value is considered a beneficial outcome as it signifies a decrease in heart disease risk.*
Anthropometric and Biometric Variables

\( H_{01} \): Participation in a Wellness coaching program will not result in a significantly greater reduction in BMI.

The mean change weight in BMI for the control group was -0.44 kg/m^2, while for the coached group was -0.45 kg/m^2. The statistical analysis resulted in a \( p \) value of 0.4807 and was not considered statistically significant at \( \alpha = 0.05 \); therefore, the hypothesis cannot be rejected. The associated weight loss for the control group was 0.9338 kg and for the coach group was 1.21 kg.

Figure 6  Change in Body Mass Index of Each Group

\( H_{02} \): Participation in a Wellness coaching program will not result in a significantly greater reduction in systolic blood pressure.

The mean change in systolic blood pressure in mmHg for the control group was -6.44, while for the coached group was 0.88. The statistical analysis resulted in a \( p \) value of
0.0667 and was not considered statistically significant at $\alpha = 0.05$; therefore, the hypothesis cannot be rejected.

$H_{03}$: Participation in a Wellness coaching program will not result in a significantly greater reduction in diastolic blood pressure.

The mean change in diastolic blood pressure in mmHg for the control group was -2.50 mmHg, while for the coached group was -0.41 mmHg. The statistical analysis resulted in a $p$ value of 0.1934 and was not considered statistically significant at $\alpha = 0.05$; therefore, the hypothesis cannot be rejected.

![Figure 7](image.png)

*Figure 7  Change in Systolic blood pressure (SBP) and Diastolic Blood Pressure (DBP) of Each Group*

*Note: The Y axis is a scale of mmHg. A negative value indicates beneficial change in blood pressure.*
Blood Sampling Data

\( H_{04} \): Participation in a Wellness coaching program will not result in a significantly greater increase in HDL.

The mean change in HDL for the control group was 0.0625 mg/dL, while for the coached group was 0.500 mg/dl. The statistical analysis resulted in a p value of 0.4301 and was not considered statistically significant at \( \alpha = 0.05 \); therefore, the hypothesis cannot be rejected. See Figure 8.

\( H_{05} \): Participation in a Wellness coaching program will not result in a significantly greater decrease in LDL.

The mean change in LDL in mg/dL for the control group was 4.06, while for the coached group was 2.07. The statistical analysis resulted in a p value of 0.3927 and was not considered statistically significant at \( \alpha = 0.05 \); therefore, the hypothesis cannot be rejected. See Figure 8.

\( H_{06} \): Participation in a Wellness coaching program will not result in a significantly greater decrease in triglycerides.

The mean change in triglycerides in mg/dL for the control group was 6.25, while for the coached group was -4.62. The statistical analysis resulted in a p value of 0.26505 and was not considered statistically significant at \( \alpha = 0.05 \); therefore, the hypothesis cannot be rejected. See Figure 8.

\( H_{07} \): Participation in a Wellness coaching program will not result in a significantly greater decrease in fasting plasma glucose.

The mean change in fasting glucose in mg/dL for the control group was -0.38 mg/dl, while for the coached group was 0.50 mg/dl. The statistical analysis resulted in a
$p$ value of 0.32855 and was not considered statistically significant at $\alpha = 0.05$; therefore, the hypothesis cannot be rejected. See Figure 9.

Figure 8  Change in Triglycerides (TG), High Density Lipoprotein (HDL), and Low Density Lipoprotein (LDL) of Each Group

*Note: The Y axis is a scale of mg/dL.

Figure 9  Fasting Plasma Glucose Outcomes of Each Group

*Note: The Y axis is a scale of mg/dL.
Activity data

**H₀:** Participation in a Wellness coaching program will not result in a significantly greater increase in physical activity.

The mean change in activity counts for the control group was 6.25, while for the coached group was -4.62. The statistical analysis resulted in a p value of 0.2651 and was not considered statistically significant at $\alpha = 0.05$; therefore, the hypothesis cannot be rejected. See Figure 10.

![Figure 10](change_activity_counts.png)

**Figure 10** Change in Activity Counts of Each Group

*Note: The Y axis is a scale of number of activity counts.*
Behavioral Data

\(H_{02}:\) Participation in a Wellness coaching program will not result in a significant greater increase in the Wellbeing score.

The mean change in the Wellbeing score for the control group was 4.0, while for the coached group was 2.85. The statistical analysis resulted in a p value of 0.3628 and was not considered statistically significant at \(\alpha = 0.05\); therefore, the hypothesis cannot be rejected. See Figure 11.

![Change in Wellbeing Score of Each Group](image)

**Figure 11 Change in Wellbeing Score of Each Group**

*Note: The Y axis indicates the percentage change in the Wellbeing score. A greater value indicated a beneficial change for the individual.*

**Summary**

In this chapter, a description of the sample and the data analysis were presented. The main focus of the study was to examine the effect of wellness coaching on coronary heart disease risk. To do so, several null hypotheses were developed and tested. However, the
statistical analysis did not find any significant differences among any of the outcomes for the null hypotheses. As a result, none of the null hypotheses for this study were rejected.
V. Discussion

This final chapter will begin with an overview of the results, follow with study conclusion, the limitations, and recommendations for future research.

Overview of the Results

The purpose of this study was to assess the level of coronary heart disease risk after exposure to wellness coaching. The main research question was whether wellness coaching focusing on risk factor modification can lower the risk of heart disease to a greater extent than self-directed behavior modification.

The variables measured were grouped into four categories: coronary heart disease risk data; anthropometric and biometric data; blood sampling data; activity data; and behavioral data. The effect on these variables from the wellness coaching program was studied by comparing the outcomes between two groups of hospital employees at moderate risk of heart disease. Both groups were explained their individual risk of heart disease as well as given twenty-four hour, seven days a week access to an on-site fitness facility. In addition, each individual in the coached group was paired with a certified Wellcoaches wellness coach, while individuals in the control group were not coached. The data analyzed in Chapter IV displayed the result of the comparison between the groups. Additionally, demographic data were collected to ensure similarity between the groups and to provide information on the participants’ lifestyle and current level of physical activity.
The demographic data collected from both groups included the age of the subjects, department of employment, number of hours worked per week, and the number of years worked at the hospital. A health history form included any medical condition from which they suffered and any prescribed medications taken at the time. The result of the statistical analysis did not reveal any significant differences in any of the pre-intervention variables or demographic data.

**Coronary Heart Disease Risk Data**

*Null Hypothesis: Participation in a Wellness coaching program will not result in a significantly greater reduction in the 10-year risk of coronary heart disease as estimated by the Framingham Heart Score.*

The Framingham Heart Score (FHS) estimates the 10-year risk of heart disease based on an individual’s age, sex, serum levels of total cholesterol and high density lipoprotein, systolic and diastolic blood pressure, and smoking status. A moderate reduction in any of the modifiable risk factors has the potential to reduce the Framingham Heart Score. As presented in the Results chapter, there were no significant differences found between the 10-year risk of heart disease means of changes in the two groups in the study. Therefore, the null hypothesis cannot be rejected. Nevertheless, the control group experienced a statistically significant ($p = 0.0178$) decrease in BMI while the coached group did not ($p = 0.0745$).

The risk of heart disease as estimated by the Framingham Heart Score has been lowered in at-risk participants in comparable lifestyle modification programs. One such program developed by Dr. Dean Ornish included increased physical activity, dietary modification, and stress reduction (Ellsworth et al., 2004). There are several possible reasons for the lack of significant differences in the FHS between the groups. The most obvious may be the poor compliance to the coaching program by the participants in the
study. Poor compliance to the coaching program would decrease its effects of which the TLC was a major component. The participants in the coached group completed an average of 8.7 coaching sessions. In a similar coaching study by Tucker and colleagues (2008), subjects participated in a minimum of 11 coaching session over the course of seventeen weeks. In the present study, 10 participants completed 8 or more coaching sessions.

**Anthropometric and Biometric Variables**

$H_{01}$: Participation in a Wellness coaching program will not result in a significantly greater reduction in BMI.

The participants in the Wellness coaching program made weight loss a goal of their individual program in addition to the reduction of the risk factors which compose the FHS. Although there was not a significant difference in BMI change between the two groups, the results of a paired t-test indicate that the control group experienced a statistically significant ($p = 0.0178$) decrease in BMI with an average loss of 0.93 kg over the course of the study. The coach group also experienced a decrease in BMI with a weight loss of 1.21 kg, yet it was not statistically significant ($p = 0.0745$). The statistically significant weight-loss experienced by the control group indicates that the intervention may have positively affected these participants.

It is well known that exercise and diet changes have been shown to decrease body weight and therefore, BMI through an increase in energy expenditure to result in an energy deficit (Lakka & Bouchard, 2005) In a similar study utilizing phone counseling and an internet program to promote weight loss in a worksite intervention, the employees who received phone counseling experienced the significant weight loss (Van Wier et al., 2009) Furthermore, the groups which received phone counseling experienced greater weight loss than both the control and internet program groups. The weight loss was
encouraged through decreased caloric intake and physical activity that was easily adaptable to the participant’s daily life such as walking during lunchtime. In the present study, while a non-significant weight loss was observed in the coached group, a beneficial change in body composition may have occurred. In a 12-month study of post-menopausal women, moderate-to-vigorous intensity exercise that included aerobic and resistance training did not improve BMI (Exercise program affects body composition but not weight in postmenopausal women (CrossRef DOI query.2009). The authors concluded that the weight did not change significantly in spite of increase physical activity due to an increase in lean body weight and decrease in body fat. Therefore, the authors of the present study realize that the same outcome may have occurred.

\( H_{02} \): Participation in a Wellness coaching program will not result in a significantly greater reduction in systolic blood pressure.

\( H_{03} \): Participation in a Wellness coaching program will not result in a significantly greater reduction in diastolic blood pressure.

The adoption of lifestyle changes including increased physical activity, a DASH eating plan, reduced sodium intake, weight reduction, and limiting alcohol consumption was an essential treatment to reduce both systolic and diastolic blood pressure (Chobanian et al., 2003) Although the participants in the study did not experience significant reductions in systolic blood pressure, the effectiveness of these therapeutic lifestyle changes has been demonstrated. In a study involving prehypertensive men and women based in a community setting, the participants were able to decrease significantly both systolic and diastolic blood pressure (Bavikati et al., 2008)

The groups in the present study failed to show any significant change in either SBP or DBP when decreases in these values were expected. The gold standard for office based measurement of BP is a reading taking by a trained health professional using a mercury
sphygmomanometer and the Korokoft sound technique (Pickering et al., 2005) Also, the Seventh Report of the Joint National Committee on Prevention (2003), Detection, Evaluation, and Treatment of High Blood Pressure Classification recommends that a person be seated for at least five minutes prior to blood pressure measurements and that at least two measure be taken in the same occasion. With one minute between readings. However, a 5-minute rest period and a repeated measure were not always followed due to the time constraints of the environment in which the measurements were performed. Also, several other factors present in the study may have contributed in a higher than normal variance in blood pressure, such as the participant’s work obligations, caffeine consumption, and the differing time of the day of the measurements. These factors have been found to affect blood pressure in a work place study using 24-hour ambulatory blood pressure monitoring (Jeong & Dimsdale, 1990) Several participant in the present study stated that they were experiencing excessive work stress and were consuming caffeinated beverage during their work day. In addition, the majority of the pre-blood pressure measurements were taken in the early morning, while the post-measurement was taken at random times in order to accommodate the schedule of the participant. The inconsistent time of the measurement is an important factor since blood pressure is known to vary by several points according to one’s circadian pattern (Redon, 2004)

**Blood Sampling Data**

\( H_{04} : \) Participation in a Wellness coaching program will not result in a significantly greater increase in HDL.

\( H_{05} : \) Participation in a Wellness coaching program will not result in a significantly greater decrease in LDL.

\( H_{06} : \) Participation in a Wellness coaching program will not result in a significantly greater decrease in triglycerides.
The beneficial effects of lifestyle changes on lipoprotein and triglycerides have been well documented (Fletcher et al., 2005). However, the current study did not find a significant change in the lipoprotein and lipid values within and between the groups. The time between blood sampling averaged 143.5 and 131.6 days for the control and coach group, respectively. This is more than the six week time period recommended by the NCEP ATP III for re-evaluation after initiation of therapeutic lifestyle changes.

Prior to continuing to the intervention phase of the study, the participants were risk-stratified by screening tools to assist in selecting a sample of employees who were of moderate risk for CHD. However, the use of the Framingham Heart Score estimated that 37 or the 38 completers were of low 10-year CHD risk. This was due in part to the fact that at baseline, 6 out of the 16 participants in the control group and 6 out of the 16 in the coach met the criteria for the recommendation of therapeutic lifestyle changes. Therefore, the LDL goal set by the ATP III was met by over half of the completers at baseline. Upon completion of the study, none of the participants in the control group and two participants in the coach group were able to lower their serum LDL at or below the recommend level. In addition, one participant in the coach group almost made the <130 mg/dL LDL target as her serum LDL level dropped from 146 to 131 mg/dL upon completion of the study.

In summary, the non-significant changes in LDL cholesterol within and between the groups is most likely because of successful LDL management at baseline involving diet, physical activity, pharmacological, and/or a genetic predisposition. The success rate for meeting the target LDL goal was identical in each group.

The baseline HDL values for the completers revealed a sample which contained relatively few participants with low HDL (<40 mg/dL). For those participants who had baseline and follow-up values, 4 of the 16 participants in the control group and 3 of the 19 participants in the coach group had low HDL levels. However, to be considered a
negative risk factor, the recommended HDL level is >60 mg/dL. In the control group, 6 of the 18 participants in the control group and 6 of 19 participants in the coach group had already met this criterion at baseline. Upon completion of the study, none of the participants in the control group and 4 participants in the coach group were able to increase their HDL to meet this recommended level.

Triglyceride levels were elevated (≥150 mg/dL) in 4 of the 16 participants in the control group and 4 of the 16 participants in the coach group. Of those individuals with elevated triglycerides, one participant in the control group and two participants in the coach group were able to lower their triglyceride to the target of less than or equal to 150 mg/dL. Although the within and between groups analysis of the TG outcome were not significant in the present study, there were several individual cases of relatively large decreases in TG level of 50 mg/dL or more. For example, two individuals in the control group were able to lower their TG level from 162 to 97 mg/dL and 143 to 89 mg/dL. Also, two individuals in the coached group were able to lower her TG level from 300 to 202 and 211 to 119 mg/dL.

In summary, none of the lipoprotein and lipid outcomes were found to be significant in the within and between groups analysis. However, individual cases of successful outcomes suggest that the intervention did have a beneficial effect for several individuals.

**H_{02}: Participation in a Wellness coaching program will not result in a significantly greater decrease in fasting plasma glucose.**

At the baseline of the study, four participants in the control group and three participants in the coach group were considered prediabetic with a fasting plasma glucose level between 100 to 125 mg/dL. The remaining participants had normal levels of fasting plasma glucose. In addition, as a result of the screening at the beginning of the study period, none of the participants were diabetic.
Elevated fasting plasma glucose is expected to decrease with decreasing weight and cholesterol levels. However, the majority of participants were in the normal range of fasting plasma blood glucose and therefore little change in levels was expected. For those with elevated glucose, two of the four participants had lower glucose at follow-up. These participants had changes in values from 120 to 110 mg/dL and 100 to 96 mg/dL. In the coach group, one of the three participants with elevated fasting plasma glucose had a lower level upon follow-up, from 101 to 88 mg/dL.

**Activity data**

\(H_{08}:\) *Participation in a Wellness coaching program will not result in a significantly greater increase in physical activity.*

The Actical activity monitor was worn by each participant at the beginning and end of the study period for the course of eight days. The activity counts recorded during two weekdays and one weekend day were used to determine the average amount of activity counts per day. The three days selected were those in which the activity monitor did not have a period of one hour or greater without a recording of an activity count.

Although, no differences were found between the two groups, each group experienced a significant increase in the average number of activity counts recorded over the course of three days. While metabolic changes were not found in the groups, the increase in physical activity does suggest a positive lifestyle change for each group.

**Behavioral Data**

\(H_{09}:\) *Participation in a Wellness coaching program will not result in a significant greater increase in the wellbeing score.*

The wellbeing score is an average score from the individual scores from in each section of a questionnaire including: life satisfaction, energy, weight, exercise, nutrition,
health, mental and emotional fitness. Each section contains questions designed so ordinal data can be collected. An example of the questions from the health section includes, “When was your last physical examination? Within the last…” which then lists four choices from the time span of “Five of more years” to “12 months.” Ratio data such as mg/dL of cholesterol is converted to ordinal data. The wellbeing score is given as a percentage from 0 to 100, with 100 being the best score available.

Of the seven participants in the control group who completed the post-wellbeing assessment, four had improved scores. While in the coach group, 9 of the 14 completers had improved scores. Even though each group had an increased wellbeing score, the within and between group comparison did not reveal any significant differences. One notable difference in these data is the drastic difference in the completion rate of the wellbeing assessment questionnaire. While 18 completers in each group were given the wellbeing questionnaire, 7 in the control group versus 14 in the coach group returned the questionnaire. This greater rate of completion may reflect a stronger desire for increased wellbeing. At the time of the follow-up measurements, the coach group completers may have believed that because they were coached that they were in better mental and physical health. Consequently these participants would have been more willing to affirm and make known their sense of wellbeing.

Summary

The study concluded that there were no statistically significant differences between the two groups. However, a lifestyle intervention such as this one requires much planning and implementation which may influence the outcome of the study. Therefore, much can be learned from this study in both the successful and unsuccessful attempts of the participants.
In this study, an intention-to-treat analysis (ITT) was the goal, yet was not met. This was due to the fact that the criterion of a complete outcome data set from all the participants was not available and only those participants who had outcome data were included in the analysis. This study was interested in the effect of coaching on heart disease risk; however the amount of exposure to the wellness coaching sessions varied considerably. The amount of exposure to the coaching is an important consideration when making conclusions from the outcomes in the present study. Therefore, an efficacy subset (ES) analysis is a viable alternative for this type of study. This analysis would analyze the outcomes at different levels of exposure to the independent variable, in this case the exposure to coaching. While the use of an ES analysis was not originally planned for this study, a separate analysis was performed posthoc to examine in part the effects of coaching exposure. This analysis included only those participants in the coach group who completed eight coaching sessions. The amount of eight sessions over the course of approximately nine weeks was chosen for this analysis since it would allow sufficient time for outcomes to develop. An independent t-test was performed on the mean outcomes of these coached individuals and the control group. The results of this analysis did not reveal any significant differences between the two groups. However, the results of a paired t-test concluded that the nine participants who completed eight or more coaching sessions experienced a statistically significant decrease in BMI of 0.711 kg/m² (p = 0.0434). In terms of body weight, this was a loss of 0.78 kg versus the 0.04 kg lost by the eight participants who completed eight or less coaching sessions. In a related study of wellness coaching along and weight loss supplement use (Tucker, LA et al., 2008); the participants who received at least 11 coaching sessions experienced a statistically greater amount of weight loss. The study was conducted over a period of 120 days and included coaches trained in the same coaching program as the present study. Therefore, it is plausible to expect that the participants would have had better weight loss
outcomes if they completed a greater amount of coaching sessions, in this case at least eight sessions.

**Conclusions**

In conclusion, the present study did not find a significant difference between the two study groups. While this may have been due to an ineffectiveness of the coaching program since interventions of similar design have found success in other studies (Tucker, LA et al., 2008; Ellsworth et al., 2004). The reasons for the relatively poor adherence to the coaching program in the present study versus similar studies may be due in part to the unique population which was included in the study. The population from which the sample was taken included nursing as the profession of the majority. Nurses have been reported to exhibit more unhealthy habits and are more over weight than the general population (Angard, Chez, and Young, 1998, p.1292; Hope and Kelleher, 1998, p. 439).

The increase in physical activity does indicate a positive lifestyle change for the coached group in the study. It is the opinion of the authors that the participants in the coached group required further adherence to the coaching program for a conclusive evaluation of the effectiveness of the coaching program. Also, greater adherence may be found when the individual is paying for the coaching program rather than receiving it as a free service. In conclusion, individual cases did suggest that the intervention had a beneficial effect on heart disease risk, yet the reasons for success of these individuals can only be speculated.

**Limitations**

This study had several limitations. These limitations were due to factors that were not able to be controlled. As previously mentioned in the Conclusions section, the participants in the coached group exhibited poor compliance with the coaching program.
Therefore, a conclusive evaluation of the effectiveness of the program was not available. Ideally, the coached participants would have completed most or all of the coaching sessions. Alternatively, the non-compliant individuals would have been dropped from the study due if a certain amount of coaching sessions were missed. In addition, the unique population of hospital workers used in the study may have required special techniques for an effective coaching intervention that may not have been required for the general population. In addition, multiple participants took vacations during the study period which resulted in a deviation from the study protocol.

**Recommendations**

The following recommendations are provided in order to improve upon the design of any future studies.

*This study should be replicated using a larger sample size.*

According to a similar study by Tucker and colleagues, a sample size of 128, with 64 participant allocated to each group was necessary to find an effect size of .25 (2008). This would allow for an attrition rate of 25%. The current study chose the current number of participants due to the amount of resources available.

*This study should be replicated using more male subjects.*

The small number of males included in the study was not representative of the general population.

*This study should be replicated using an increased number of blood pressure readings at consistent times of the day.*
Blood pressure readings are highly variable due to environmental conditions and care must be taken to ensure accurate measures. The repeated measures in this study were performed at varying times and may not have been accurate assessment.

*This study should be replicated with a more confined range of functional ability among the participants.*

The current study did not screen physical ability among the participants and therefore the sample contained multiple individuals who were had significant physical limitations. This consequently impeded their progress in the study and may have influenced their outcomes.

*This study should be replicated with a more extensive evaluation of the participants’ readiness to participate in a Wellness coaching program.*

Several participants commented that they had not understood the time commitment involved while participating in the Wellcoaches program. This may have caused them to miss more coaching sessions.

*This study should be replicated with the control group unaware of another study group.*

Several participants in the control group were disappointed that they were unable to receive coaching sessions and felt the need to compete with the participants in the coached group for better outcome measures.

*This study should be replicated using a standardized psychometric questionnaire to quantify health related quality of life.*

The questionnaire used in the current study has not been validated and therefore cannot be compared to the results of other studies.
This study should be replicated using an accurate method of body composition analysis.

This study measured the amount of body mass, yet a beneficial change in the composition of the body mass may have occurred.

This study should be replicated with the assessments performed by researchers blind to the experimental condition.

The researchers in the current study were not blind to the experimental condition of each participant and therefore a biased measurement was possible.
APPENDIX A

BUDGET

The Wellness Department paid for the cost of the metabolic panel for each participant. For fifty participants the estimated sum was $2018.00. The Wellcoach Corporation discounted the cost of coach training for the primary investigator from $895.00 to $200.00. The primary investigator paid the remaining cost of $200.00 for the coach training.
November 20, 2007

Gabriel Moreno, BS
Miami Valley Hospital
One Wyoming Street
Wellness Center, CHE 1822
Dayton OH 45409

Dear Mr. Moreno:

MVH Study # 07-0103

Protocol Title: Coaching Strategies for Primary Prevention of Coronary Heart Disease Involving Asymptomatic Miami Valley Hospital Workers

The Institutional Review Board (IRB) of Miami Valley Hospital has received the revision(s) requested for the above protocol. All restriction(s) have been removed and your protocol has full approval.

The approval requires:
1. That the use of the Informed Consent for Participation in Research Approved by Miami Valley Hospital.
2. That any adverse effects of this procedure will be reported immediately to this Committee.
3. That this approval is for one year and if it extends beyond this period a request for an extension is required.
4. That a progress report must be submitted before an extension of the approved one-year period can be granted.
5. That any change in the protocol or informed consent form must be approved by the IRB; otherwise, approval is terminated.

Our Internal #: 7004
Type of Change: Full Approval
Expedited: Yes
Renewal Date: 10/16/2008
Approval Date: 11/20/2007
Date Received: 11/16/2007
On Meeting Date: 12/19/2007
Description: Full approval, all restrictions have been lifted and enrollment/research can be initiated.

Sincerely,

[Signature]
Thomas E. Herchline, MD
Chair, Institutional Review Board
Research Study: COACHING STRATEGIES FOR PRIMARY PREVENTION OF CORONARY HEART DISEASE INVOLVING ASYMPTOMATIC MIAMI VALLEY HOSPITAL EMPLOYEES

The primary researcher in this study is: Gabriel M. Moreno, Exercise Physiologist

PURPOSE OF THE STUDY: The purpose of this study is to demonstrate how a regular physical activity can reduce the risk factors for coronary heart disease (CHD) in full-time hospital employees. This study will focus on personal wellness coaching affects lifestyle behavior and the 10-year coronary heart disease risk score. Other factors that were measured to show the benefits of exercise include weight, body mass index, body fat percentage, submaximal cardiovascular test, circumference, resting heart rate, and flexibility.

CRITERIA TO PARTICIPATE: To participate, you must be a full-time employee of Miami Valley Hospital, work 36+ hours per week, or be considered full-time by MVH. All participants must have a signed physician’s approval form (form was given to the participants). You do not have to be a member of the Wellness Center to participate. In addition, you must have one or more risk factors for heart disease and be of forty to sixty-five years of age.

BENEFITS: The benefits of participating in this study will include access to the MVH Wellness Center for three months or a three month extension to your current membership, an exercise program designed by an Exercise Physiologist and three assessments to track progress, two coronary risk assessments, and a personal wellness coach for half of the participants (randomly assigned).

RISKS: There are potential physical risks related with this study. You are encouraged to participate in a cardiovascular exercise program. Prior to initiating the study, you are required to have a signed physician’s approval to exercise form. This form serves to notify the primary
researcher that you have a doctor’s approval to begin an exercise program and physical risks are
minimized. If you are physically inactive at the beginning of the study, you are likely to be sore
for the first few workouts. There is a risk of infection accompanying the blood withdrawal for
coronary risk assessment during week zero and week thirteen. CompuNet Clinical Laboratories,
LLC. will perform the blood withdrawal and will perform all safety precautions to minimize
risks. Tenderness of in your arm may occur.

In the case of injury or illness resulting from this study Miami Valley Hospital will provide
reasonable and immediate medical treatment in the unlikely event of injury resulting from
research procedures. Additional medical treatment was provided in accordance with the
hospital's determination of its responsibility to do so. Miami Valley Hospital does not, however,
provide compensation to a person who is injured while participating as a patient in research if
such injury occurred through no fault of the hospital.

TIME COMMITMENTS: The total time of participation was fourteen weeks (Referred to
as week zero through thirteen.) Week zero and thirteen was assessments only. During weeks one
through twelve the participants will perform a regular exercise program. Participants should allow
between three and ten hours a week for exercising.

LOCATION: Three assessments will take place in the Wellness Center, CHE 1822. The
participants had access to the Wellness Center facilities to exercise for twelve weeks, if not
already a member. The participants can exercise at a time and place convenient for to them. The
two coronary risk assessments require two visits to CompuNet lab in MVH for blood sampling.

INFORMATIONAL MEETINGS: To learn more information regarding this study, please
attend the informational meeting on: To Be Determined
If you cannot make either meeting, please contact Gabriel Moreno in the Wellness Center at extension 3899 or stop by CHE 1822 for more information. Coming to an informational meeting does not mean you are required to participate in the study.
CONSENT FOR PARTICIPATION IN RESEARCH

COACHING STRATEGIES FOR PRIMARY PREVENTION OF CORONARY HEART DISEASE INVOLVING ASYMPTOMATIC MIAMI VALLEY HOSPITAL EMPLOYEES

Patient Name:

Name and title of investigator who discussed this research with me: Gabriel M. Moreno, Exercise Physiologist, Graduate Assistant at Miami Valley Hospital Wellness Center

This is a type of research study. Research studies only include individuals who choose to participate. Please take your time to make your decision. Discuss it with your friends and family. You are being asked to participate because you have two or more risk factors for coronary heart disease (CHD) and understand that personal lifestyle changes can be made to lower your risk. This study had individuals participate in a three-month guided exercise program with three assessment periods to track the progress of the subjects. The tests that were performed during the pre- and post-assessment include height, weight, waist girth measurement, body mass index, blood sample for lipid analysis, resting heart rate, and blood pressure. The mid-assessment differs only from the pre- and post-assessment in that no blood sample was taken. Questionnaires administered will also include contact information and personal lifestyle in regard to mental and physical health. Once all the information has been collected, your 10-year risk for CHD was estimated.

Why is this study being done?

Coronary Heart Disease, CHD is the number one killer of Americans today, with about one person dying from a coronary event every minute. However, adherence to healthy lifestyle changes to employ risk-modifying behaviors has produced mixed results. Personalized behavior
change support has found success in healthy lifestyle change. The purpose for this study is to evaluate the effectiveness of a coaching program to assist individuals in lowering their risk of coronary heart disease in full-time hospital employees.

**How many people will take part in this study?**

A goal of 40-50 participants was recruited for this study.

**What is involved in the study?**

1) **Health Information:** You are asked to fill out several questionnaires to determine your lifetime health experience. These questionnaires relate to your current health and physical activity status, family history of disease, and your use of alcohol and tobacco. All information from these questionnaires is treated as strictly confidential by the researchers involved in its collection, storage, and analysis. There are no known risks associated with these procedures.

2) **Body Measurements:** You are asked to put on a pair of gym shorts if you are a male or shorts and a top for females. You had a private dressing room in which to change clothes. Any valuables may be locked in a locker. The following measurements will be taken: stature (height), weight, and circumferences (girth) of the waist. The waist girth measurement was taken above the hip. Your seated blood pressure will also be recorded. Other circulation related measurements was recorded (e.g. heart rate) during this procedure. To measure blood pressure, you are asked to sit quietly for at least 5 minutes and then a blood pressure cuff was placed on your arm. This process will take 8 to 10 minutes to perform. There are no known risks associated with these procedures.

3) **Blood Sample:** For this test it may be necessary that you fast (do not eat or drink anything but water) 12 to 16 hours before the test. If you do not eat or drink after your evening meal the night before, the procedure can be done early the next morning with minimal inconvenience. Later in the morning, you will be offered food. We will remind you to fast if necessary. We want to obtain a small sample of your blood (0.5 mL) from your arm. One purpose of this procedure is to measure the levels of blood sugar, cholesterol, triglycerides.
(types of fat molecules) that are normally present in your blood. High levels of these substances are associated with increased risk for heart disease. This procedure simply requires that a sample of blood be removed from a vein in the arm. A medical technologist will perform this procedure and the analysis was performed by a laboratory certified by the College of American Pathologists. There is generally very little or no pain associated except for a slight prick as the needle pierces the skin. Very rarely, an infection or a small bruised area may occur, but this is uncommon.

4) **Actical Physical Activity Monitor:** This test is intended to understand how much exercise or physical activity you get in your daily life. You are asked to wear an Actical device on a belt around your waist for several days, for 24 hours per day. The Actical device is a very small, lightweight device about the size of a wrist watch. The device is waterproof and needs to be worn continuously. If the device is not worn continuously, the information that it collects was less accurate. However, if you must remove the device from your body, we ask that you place it on your hip again as soon as possible. Wearing the Actical device while bathing, swimming, sleeping, or during normal daily activities will not harm you or the Actical device. The Actical device does not record where you go. The Actical device only measures how active you are by recording the amount of exercise you do while wearing the device. It will take less than five minutes to fit you with a belt and to record your information (name, age, sex, height, and weight) into a computer program. The Actical device must be worn on the left hip just above the hip bone, and it was fitted so that it is comfortable for you. You may let personnel know at any time if the belt does not feel comfortable and they will adjust the belt so that you feel comfortable. After you have been fitted with a belt you will go on with your daily life as usual and return later to give back the Actical device. There is no known risk to wearing the Actical device.

You will meet with an exercise physiologist who will explain your 10-year risk of coronary heart disease and how you can lower your risk by using diet and physical activity strategies. During this meeting, you will be given instruction on how to wear the Actical activity monitor for the duration of seven days. Next, you will be randomly assigned by luck of the draw (names was blindly pulled out of a jar) to a control group or a coached group. Both groups will receive
instruction on how to access and use the exercise equipment in the Miami Valley Hospital Wellness Center. The coached group was asked to setup an appointment with a wellness coach (fitness and nutrition professional specializing in behavior change) and will meet in person or over the telephone for bi-weekly sessions of approximately forty minutes to discuss behavior change. At the beginning and end of the study both groups you had blood samples drawn. On three separate occasions, you had the following measures performed:

- Height and weight on a physician’s scale
- Waist girth measurement
- Resting heart rate and blood pressure

**How long will I be in the study?**

The study will last fourteen weeks beginning at the time of the pre-intervention screening assessment to the time of the last meeting with the primary investigator. In week zero, you will meet with the primary investigator to have your height, weight, waist circumference, and blood pressure measured. If you meet the criteria to enter the study and chose to participate in the study, you will be given an activity monitor to wear for seven days and a CompuNet lab form so that you may have your blood sampled to estimate coronary risk. In the following week, you was given an orientation to the Wellness Center and explained the results of you blood sampling. A mid-assessment was carried out at week six in which your weight and blood pressure was measured. In week thirteen, you will again be asked to make an appointment with the primary investigator to have you height, weight, waist circumference, and blood pressure measured. Also, you was asked to wear an activity monitor for seven days and given a CompuNet lab form so that you may have your blood sampled at CompuNet labs. In the following week (week 14), you will meet with the primary investigator and for discussion of your blood sampling results and
information regarding the conclusion of the study. At this time, you was asked to return the activity monitor given the previous week.

**What are the risks of the study?**

There are potential physical risks related with this study. You are encouraged to participate in a cardiovascular exercise program. Prior to initiating the study, you are required to have a signed physician’s approval to exercise form. This form serves to notify the primary researcher that you have a doctor’s approval to begin an exercise program and physical risks are minimized. If you are physically inactive at the beginning of the study, you are likely to be sore for the first few workouts. There is a risk of infection accompanying the blood withdrawal for coronary risk assessment during week zero and week thirteen. CompuNet Clinical Laboratories, LLC. will perform the blood withdrawal and will perform all safety precautions to minimize risks. Tenderness of in your arm may occur.

In the case of injury or illness resulting from this study Miami Valley Hospital will provide reasonable and immediate medical treatment in the unlikely event of injury resulting from research procedures. Additional medical treatment was provided in accordance with the hospital’s determination of its responsibility to do so. Miami Valley Hospital does not, however, provide compensation to a person who is injured while participating as a patient in research if such injury occurred through no fault of the hospital.

Part of the well-being assessment includes evaluation of depression. If you have an assessment results which signals that your life may be in danger, your primary physician was notified immediately. In addition, the participant was contacted via telephone and e-mail and strongly encouraged to call the Dayton, OH Suicide Prevention Center at 1-800-320-HELP (4357).
What are the benefits of the study?

For all participants, the benefit in participating in this study was the guided exercise program, a pre- and post-coronary risk assessment, and no cost access to Miami Valley Hospital’s Wellness Center for three months. In addition, the participants will gain the benefits of performing a regular exercise program. The benefits can include: lower total blood cholesterol, low density lipoproteins, and triglycerides, increases high density lipoproteins, lowers the risk of developing high blood pressure, helps reduce blood pressure in people who already have hypertension, lowers the risk of developing non-insulin dependent diabetes mellitus(type 2), reduces the risk of developing colon cancer, helps people achieve and maintain a healthy body weight, reduces feelings of depression and anxiety, promotes psychological well-being, reduces feelings of stress, helps build and maintain healthy bones, muscles and joints, helps older adults become stronger and better able to move about without falling or becoming excessively fatigued, strengthens the cardiovascular and respiratory systems, and promotes better sleep.

What are the costs of the study?

There is no cost for participating in the study. The exercise guidelines and first three months of coaching are free of charge to the participants. Participants will receive a temporary membership to the Wellness Center free of charge, if not currently a member. Participants who are not currently members had their badge activated to both the cardiovascular and weight training room for twelve weeks in order to complete the exercise program. After the twelve weeks are completed, participants’ badges will be deactivated. If the participants wish to continue using the Wellness Center after the twelve weeks, they must join the Wellness Center at regular cost, but this is not required. Participants who wish to start or continue sessions with a wellness coach may do so on their own and at their own expense, but this is not required.

If participants are currently members of the Wellness Center, they will receive a three month free membership. This was completed by delaying their next renewal due date by three months.
For example, if members are to renew membership in April, they will not receive notice until July. After the three first months, the members must complete their renewal form to continue their membership.

What about confidentiality?

Any information that is obtained in connection with this research and that can be identified will remain confidential to the extent provided by federal, state, and local law. This includes all information that is disclosed between participant and coach during a coaching session. In addition, this includes all the information received even if you are not ultimately accepted for the study. I understand, however, that an authorized representative of the investigator, the Miami Valley Hospital IRB, the Department of Health and Human Services (DHHS) and the sponsoring agency may examine my records, and this will not be considered a breach of confidentiality. Once disclosed, it may not be protected by these rules.

Protected Health Information (PHI) is any personal health information through which you can be identified. If you agree to participate in this research, you agree to the use of your health information for the following purposes explained:

The researchers will use your information from January 2\textsuperscript{nd} 2008 until April 25\textsuperscript{th} 2008. When information is transmitted to the database operators, or others, only a short identifier, (3 letters, code #) was attached. The principal investigator will keep a list with your name, short identifier, and medical record number in a locked file that no one else has access to. When the study is complete, that list was destroyed and all specific identifiers removed from electronic files and the investigator will remove the identifiers from your information, making it impossible to link you to the study. Your identity will not be revealed in any publication that may result from this study.

The decision whether or not to participate is voluntary. If you decide to participate, you understand that you are free to withdraw consent and to discontinue participation at any time. Such withdrawal will not adversely affect your care at this institution or cause a loss of benefits to
which you might otherwise be entitled. If you decide to end your participation in the study or withdraw authorization for use of PHI, please send written notice to the investigator or ask them to send you a form letter for completion.

_Miami Valley Hospital_

1 Wyoming Street

Dayton, OH 45409

Wellness Center, CHE 1822

ATTN: Gabriel M. Moreno

Who do I contact if I have questions?

Please contact Gabriel M. Moreno at (937) 208-3899 to answer any questions regarding the study.

You can contact the hospital administration at the Department of Consumer Relations (937) 208-2666 if I have any questions concerning my rights with regards to the research or if I have a research-related injury.

_I HAVE READ THE ABOVE MATERIALS AND UNDERSTAND THEM COMPLETELY. I HAVE HAD A CHANCE TO ASK QUESTIONS AND ANY ITEM THAT WAS UNCLEAR HAS BEEN FULLY EXPLAINED TO ME._

_______________________________________  ________________
Signature of subject                       Date

_______________________________________  ________________
Signature of investigator obtaining consent Date

_______________________________________  ________________
Signature of Witness (Not connected with research) Date

Copies to: Medical Record Patient Original Research Record
APPENDIX E

Demographic Data

Name: ________________________________ Date: ________________

History at Miami Valley Hospital

Total years MVH: ________________

Department: _______________________

Hours worked per week: ____________

Shift: ___________________________

Years at current department: _________

Previous departments: __________________________________________________________

What physical demands does your job require? ____________________________

__________________________________________________________________

History of Physical Activity or Current Physical Activity and Health

Number of days currently exercising: ____________________________

Exercises performed: ________________________________________
Time spent exercising each sessions: _____________________________________

What intensity do you workout at? 1 2 3 4 5 6 7 8 9 10

1 (very light) 5 (moderate) 10 (very hard)

Do you smoke? ________________________________

If yes, how many cigarettes/cigars a day? _________________

How many years/months have you smoked? ________________

Do you have a family history of coronary heart disease? Yes No

Do you think you are at risk for Coronary Heart Disease? Yes No
Name:________________________________________________  Date:___________

Have you seen a nutritionist before? _ Yes _ No

If so, who and when?______________________________________________________

Does your food feel out of control? _ Yes _ No

Are you taking any vitamin or nutritional supplements? _ Yes _ No

List:____________________________________________________________________

Do you have any family history of:

   Diabetes      _ Yes _ No

   High cholesterol? _ Yes _ No

Do you drink alcoholic beverages? _ Yes _ No

   Describe use:_________________________________________________________________

Are you currently on a special diet? (i.e., vegetarian, low-carb, gluten-free, etc) _ Yes _ No

   Describe:____________________________________________________________________

   Who recommended the diet? ________________________________________________

   If you have been on a special diet in the past, define it. _____________________
Describe changes, if any, that you have made to your eating habits. When did you implement these changes?

Where do you eat most often?  __ Home  __ Restaurant

Other:__________________________________________________________

Do you eat at approximately the same time every day?

Do you skip meals? If so, when?

Do you usually eat between meals? What do you snack on most often?

Would you describe you appetite as hearty, moderate, or poor?

What barriers, if any, stand in the way of you achieving your nutritional goals?
AGREEMENT AND RELEASE OF LIABILITY

1. In consideration of gaining membership or being allowed to participate in the activities and programs of The Wellness Center of Miami Valley Hospital and to use its facilities, equipment, and machinery in addition to the payment of any fee or charge, I do hereby waive, release and forever discharge Miami Valley Hospital and its officers, agents, employees, representatives, executors, and all others from any and all responsibilities or liability for injuries or damages resulting from my participation in any activities or my use of equipment or machinery in the above-mentioned facilities or arising out of my participation in any activities at said facility. I do also hereby release all of those mentioned and any other acting upon their behalf from any responsibility or liability for any injury or damage to myself, including those caused by the negligent act or omission of any of those mentioned or others acting on their behalf or in any way arising out of or connected with my participation in any activities of the Wellness Center or the use of any equipment at Miami Valley Hospital.

(Please initial _____)

2. I understand and am aware that strength, flexibility, endurance and aerobic exercise, including the use of equipment, are potentially hazardous activities. I also understand that fitness activities involve a risk of injury and even death and that I am voluntarily participating in these activities and using equipment and machinery with knowledge of the dangers involved. I hereby agree to expressly assume and accept any and all risks of injury or death. (Please initial _____)

3. I do hereby further declare myself to be physically sound and suffering from no condition, impairment, disease, infirmity, or other illness that would prevent my participation in any of the activities and programs of the Wellness Center or use of equipment or machinery except as hereinafter stated. I do hereby acknowledge that I have been informed of the need for a
physician’s approval for my participation in an exercise/fitness activity or in the use of exercise equipment and machinery. I also acknowledge that it has been recommended that I have a yearly or more frequent physical examination and consultation with my physician as to physical activity, exercise, and the use of exercise and training equipment so that I might have recommendations concerning these fitness activities and equipment use. I acknowledge that I have had a physical examination and have been given any physician’s permission to participate. (Please initial _____)

4. I understand that Ohio law (Ohio Revised Code 4123.01(C)(3) explicitly states that I can waive my rights to receive Workers Compensation Benefits for injuries or disability incurred in voluntary participation in an employer-sponsored recreation or fitness activity. In advance of my voluntary participation in the activities and programs of the Wellness Center, I hereby waive any and all rights to have to Workers Compensation Benefits or compensation as a result of any injuries or disabilities or death arising from my participation in any activities or programs of the Wellness Center. (Please initial _____)

Date____________________ Signature________________________________
APPENDIX G

Physician Consent

Report of Personal Physician

Dr. Doctor,

Your patient, _________________________, is interested in joining an exercise program through the Miami Valley Hospital Employee Wellness Center. As part of the initial assessment process, he/she has the option of participating in a submaximal bicycle test on a stationary bike administered by a qualified medical professional. The exact program of exercise your patient will follow may include walking, jogging, stationary cycling, etc. and was based upon the results of the evaluation. Please take this into consideration when checking the appropriate box for your response below.

☐ I know of no reason why he/she may not participate.

☐ I believe he/she could participate, but because of the following reason(s):

_____ history of hypertension

_____ history of chest pain

_____ history of lightheadedness, dizziness, or fainting

_____ history of history of orthopedic problems; please list: _______________________

_____ history of lack of exercise

_____ other (please explain) _______________________________________________

recommend the following restrictions: ________________________________________
If no recommendations are made, then we are obligated to follow the ACSM guidelines for program participation. *

- I recommend he/she have a graded exercise test before participating. *

- I recommend he/she not participate.

____________________________________
Physician’s Signature

____________________________________
Date

Office Phone ________________________

*The American College of Sports Medicine (ACSM) Guidelines for Exercise Testing and Prescription (2006) state that any person over the age of 45 or any person over the age of 35 with one or more risk factors **should** have a graded exercise test before beginning a vigorous exercise program. If this is recommended, the test can either be schedule in your office, a cardiologist’s office of your choice, or Miami Valley Hospital. Please send a copy of the test to the Wellness Center.
APPENDIX H

Exercise Recommendations

Cardiovascular Exercise

American College of Sports Medicine: perform moderate intensity exercise most days of the week

• **VARY your exercise routine – do not perform the same workout everyday**
  
  o Your body will adapt to the stimuli (exercise) and will plateau
  
  o “**Keep your body guessing**”
  
  o Change modality
    
    ▪ If you prefer one mode of exercise (ex. elliptical) perform that mode of exercise for the majority of your workouts, however, include 1-2 days of cross-training per week
  
  o Change length of time
    
    ▪ If you only have 20 minutes to workout, workout those 20 minutes at a higher intensity (80-85%). On days where you can workout for an hour, keep intensity a bit lower (65-70%)
  
  o Change intensity
    
    ▪ Changing intensities will help keep variety in your workout, adjust to different exercise modes (higher heart rate while running compared to elliptical)

According to your cardiovascular chart, exercise at the recommended intensities within the recommended time length. Record your workout on the cardiovascular logs. **Turn in the exercise logs every 4 weeks.**

**Example of a workout week:**
<table>
<thead>
<tr>
<th>Day</th>
<th>Modality</th>
<th>% Heart Rate</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>Upright Bicycling</td>
<td>75%</td>
<td>45 minutes</td>
</tr>
<tr>
<td>Tuesday</td>
<td>Elliptical</td>
<td>80%</td>
<td>45 minutes</td>
</tr>
<tr>
<td>Wednesday</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td>Elliptical</td>
<td>75%</td>
<td>60 minutes</td>
</tr>
<tr>
<td>Friday</td>
<td>Walking on Treadmill <em>(hill program)</em></td>
<td>85%</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Saturday</td>
<td>Elliptical</td>
<td>65%</td>
<td>60 minutes</td>
</tr>
<tr>
<td>Sunday</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week</td>
<td>Days per week</td>
<td>Heart Rate Range</td>
<td>Exercise Time</td>
</tr>
<tr>
<td>------</td>
<td>---------------</td>
<td>------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>60-75%</td>
<td>30 minutes</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>60-75%</td>
<td>30 - 40 min</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>65-80%</td>
<td>30 - 40 min</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>65-80%</td>
<td>30 - 45 min</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>65-80%</td>
<td>30 - 45 min</td>
</tr>
<tr>
<td>6</td>
<td>4-5</td>
<td>65-80%</td>
<td>30 - 45 min</td>
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**Weight Training Recommendations**

**Upper / Lower Body Training Program**
**Number of days per week:** between 3 – 6 days

- Can exercise as few as 3 days and up to 6 days
- Alternate Upper Body and Lower Body exercises
  - Can perform upper/lower sessions consecutive days
    - **EX:** Monday – Upper / Tuesday – Lower … etc
- *Never* exercise the same muscle group two days in a row
  - **EX:** Monday – Upper / Tuesday – Upper
  - Muscles need time to recover and rebuild
- **The weight should be challenging!!**
  - By your last repetition, it should be tough to complete (*keeping your perfect posture*)
  - If you are at your last rep, and you could do 4 or more, do 5 more reps, and increase weight for the next set
  - If you are struggling to complete the assigned repetitions, stop immediately when you lose form, then decrease the weight for the next set to finish within the recommended repetitions
  - *Do not be afraid to increase the weight*
- **Always exhale on exertion!**
  - *Never hold your breath!!*
- You can perform you weight training exercises before or after your cardiovascular workout – it does not matter the order as long as they are both completed
Upper/Lower Body Weight Training Logs

CODE:

__________         REPS: ________         SETS: ________

*Exhale on exertion    *Don’t be afraid to increase weight
*Never hold your breath    *Keep good posture - back straight, ‘abs in’
*Challenge yourself    *Last rep should be tough

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Comments ____________________________________________________

__________________________________________________________________
Weight Training Recommendations

Total Body Training Program

Number of days per week: 2 – 3 days

• Leave a day in-between workouts
  o *Never* exercise the same muscle group two days in a row
  o Muscles need time to recover and rebuild

• **The weight should be challenging!!**
  o By your last repetition, it should be tough to complete (*keeping your perfect posture*)
  o If you are at your last rep, and you could do 4 or more, do 5 more reps, and increase weight for the next set
  o If you are struggling to complete the assigned repetitions, stop immediately when you lose form, then decrease the weight for the next set to finish within the recommended repetitions
  o *Do not be afraid to increase the weight*

• **Always exhale on exertion!**
  o *Never* hold your breath!!

• You can perform your weight training exercises before or after your cardiovascular workout – it does not matter the order as long as they are both completed
## Total Body Weight Training Logs

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*Exhale on exertion  
*Don't be afraid to increase weight!

*Never hold your breath  
*Challenge yourself

*Keep good posture - back straight, 'abs in'  
*Last rep should be tough
RECOMMENDED STRETCHES

Flexibility Tips

- Always be warmed up!!! Do at least 5 minutes are cardio before stretching!
  Never stretch cold muscles. That is when injuries can occur.
- Start each stretch slowly, exhaling as you gently stretch the muscle
- Hold each stretch (each side) 15-30 seconds
- Repeat 2-3 times

Things to Avoid While Stretching

- Do not bounce a stretch. Holding a stretch is more effective and there is less risk of injury
- Do not stretch a muscle that is not warmed up
- Do not strain or push a muscle too far. If a stretch hurts, ease up
- Do not hold your breath

# 1 Hamstrings

- Lie on your back with your left leg straight out. While keeping your left leg extended, bend your right knee and pull it into your chest by clasp your right leg. Breathe deeply, hold for 15 seconds, and release. Then switch legs. Repeat.

- Stand arms at your side. Keeping your legs straight, bend forward and reach for your toes. Hold and repeat. Don't feel that you need to touch your toes. Whether or not you can do so may depend as much on the length of your legs vs. your torso than your flexibility.

# 2 Calf

- To stretch your upper calf muscles, stand facing a wall or tree. Place your hands on the wall or tree and slide your left leg back 3 or 4 feet. Lean forward and shift your weight onto your right leg with the knee bent. Straighten your left leg and press your left heel into the ground. Make certain to point the toes of both feet forward, not out to the side.

# 3 Triceps Stretch

- Stand up straight keeping a slight bend in your knees. Put your right arm over your head and bend your elbow behind your head. With your left arm, slight push your right elbow back until you feel a stretch on the backside of your arms, the triceps. Hold, repeat with other arm.

# 4 Hip Flexor

- Keep your upper body in neutral position the entire time, back straight. Take a large step forward; bend the back knee towards the ground allowing the back heel to come off the ground. The front knee was slightly bent, keeping your upper body straight. Lean back until you feel the stretch of your back leg’s hip flexor.

# 5 Chest

- Clasp your hands behind your back and push gently away from your body.
• Stretch your arms out to the side, keeping them straight. Push your arms gently towards your back side, keeping them straight. You should feel the stretch through your chest. You can alter this stretch by keeping both thumbs facing upwards and holding, then facing the thumbs downward and holding.

# 6 Outer Hips

• Sit up. Keep your right leg straight, bend the left knee and place the outer side of your right foot over your left thigh, just above your knee. Wrap your hands around your left knee or on top of the shin and draw it toward your chest. Keep your head relaxed and flat on the ground. Hold for five breaths and release. Switch sides and repeat three or four times on each side.

# 7 Shoulders

• Place your right arm across the chest of your body. Using left arm, gently push the right forearm towards the body until a stretch is felt through the upper part of the right arm and right shoulder.

# 8 Lower Back and Shoulders

• Stand with your feet 6 inches apart and about 3 feet away from a wall, fence, tree, or other supporting surface of about shoulder height. Place both your hands about shoulder-width apart on the supporting surface, and flex forward at your hips. Press down on the surface, flatten your back, and lower your head between your arms.

# 9 Abdomen

• Lay flat on your stomach, stretched out. Prop your upper body up on your elbows. Pull your elbows towards your body until you reach a comfortable stretch.

# 10 Quadriceps

• You can also do the quadriceps stretch while standing. For balance, rest your right hand on a wall, tree, or fence. Grab your left foot with your left hand. While keeping the thigh muscles of your right leg tight, pull your left knee back and up toward your buttocks. Don't tilt forward. Repeat twice on each side

# 11 Inner Thighs

• Sit on the ground with your feet in front of you. Bring the bottom of your feet together and bring your feet in towards your body as far as you can comfortably go. Keeping your back straight, lean forward until you feel the stretch in your inner thighs.
APPENDIX I

Wellbeing Assessment

Well-being Assessment

Hello and Welcome to Wellcoaches!

We ask you to complete this assessment to help you and your coach evaluate the effectiveness of your coaching program and your progress, before you start work with your coach, and 6 months and 12 months later.

After you complete the assessment, we will estimate your Well-being Score to show how you are doing overall and in eight areas:

1. Life satisfaction
2. Energy
3. Mental & emotional fitness
4. Exercise
5. Nutrition
6. Weight
7. Health

Your well-being assessments will be archived on your private and confidential Wellcoaches website. You will choose your username and password and can change it or inactivate the site when you wish (email eac@wellcoaches.com or clients@wellcoaches.com).

You and your coach can review your well-being assessments for up to 36 months.

CONFIDENTIALITY POLICY

In order for your wellness coach to help you fully, it is valuable, although not required, that you share personal information, openly and honestly, in your well-being assessments and during your coaching sessions.

Wellcoaches and your coach will preserve the privacy and confidentiality of all of your
personal information, including your name and contact information, all communications with your coach and Wellcoaches, and all information on your client website.

Only your coach and Wellcoaches administrative staff will have access to your persona information, including your name, contact information, well-being assessments, and information on your client website.

Your personal information will NOT be shared with any person or organization including your employer, health plan, or healthcare provider unless you provide written permission.

We follow federal HIPAA guidelines to protect the security of your Wellcoaches client website.

As you can probably appreciate, we aggregate coaching outcomes data on an anonymous basis in order to show that wellness coaching is effective and has had a positive impact for you and other coaching clients.

Please email eac@wellcoaches.com or call 888 553 5530 (or clients@wellcoaches.com or call 866 932 6224 ext 1) if you have any questions or concerns.

The Wellcoaches Team

MY AGREEMENT OF RELEASE OF LIABILITY

In consideration of my being allowed to receive coaching services from a certified wellness coach, and, in that process, to be coached in fitness, nutrition, weight management, stress management, mental health, and/or health risk management, I do hereby waive, release, and forever discharge my coach and Wellcoaches Corporation and its officers, agents, independent contractors, employees, representatives, executors, and all others from any and all responsibility or liability for injuries or damages resulting from my participation in any activities or my use of fitness equipment arising out of my participation in any activities under such coaching.

I do also hereby release all of those mentioned and any others acting upon their behalf from any responsibility or liability for any injury or damage to myself, including those caused by the negligent act or omission of any of those mentioned or others acting on their behalf or in any way arising out of or connected with my participation in any activities of wellness coaching.

I understand that as a part of my wellness coaching program, I may be coached to, or it may be suggested that I, participate in exercise activities, e.g. exercise, aerobic training, strength training, flexibility training, etc., that could be potentially hazardous. I also understand that such activities involve risks of injury and even death, and that I am voluntarily participating in these activities and using equipment and machinery with knowledge of the dangers involved. I hereby agree to expressly assume and accept any and all risks of injury or death.

I further understand that my certified wellness coach, as applicable, is an independent contractor and not an agent of Wellcoaches Corporation.

I do hereby further acknowledge that I have either had a physical examination and have been given a physician’s permission to participate or that I have decided to participate in activity and or use of equipment and machinery without the approval of my physician and do hereby assume all responsibility and risks of injury or death from such participation and activities.

☐ I accept the above agreement of release of liability and the terms of the well-being assessment.
☐ I don’t accept.

Contact Info

First Name
Last Name

Birth date (mm/dd/yyyy)
Sex: M/F
Relationship (single, married, separated, divorced)
Children (# and ages)

Occupation
Address
City
State
Email
Phone

Select username/password for my secure coaching client website

Indicate coach name if you already have selected your coach:
Coach first name:
Coach last name:

Indicate your coach’s ID number if known:

If you haven’t selected your coach please indicate your preference:

No preference
Male
Female

If you haven’t selected your wellness coach, please indicate your preferred specialty:

1. No preference
2. Exercise physiologist, personal trainer, athletic trainer
3. Physical therapist, occupational therapist
4. Dietitian
5. Psychotherapist (Masters or PhD level)
6. Nurse, nurse practitioner, physician assistant
7. Physician
Priorities for coaching not included in score

I want to address the following areas with my coach (check up to five areas):

**Overall**

*Improve well-being* (health and happiness)

- Improve family well-being
- Improve energy
- Improve productivity

**Physical**

*Increase physical activity*

- Manage or prevent injury
- Lose weight
- Manage or maintain current weight
- Improve eating habits
- Improve health risks or medical conditions
- Reduce need for medication

**Mental & Emotional**

*Improve work/life balance*

- Improve sleep
- Manage stress better or reduce stress
- Reduce or quit smoking
Spiritual

Improve life satisfaction

Improve work satisfaction

Life Satisfaction

Sense of purpose – I feel a strong sense of purpose in life:

1. Never (20%)
2. Rarely (40%)
3. Sometimes (60%)
4. Frequently (80%)
5. Most of the time (100%)

Joy – I feel a deep satisfaction or joy in my life:

1. Never (20%)
2. Rarely (40%)
3. Sometimes (60%)
4. Frequently (80%)
5. Most of the time (100%)

Gratitude - I feel grateful and appreciative for what I have:

1. Never (20%)
2. Rarely (40%)
3. Sometimes (60%)
4. Frequently (80%)
5. Most of the time (100%)

Work satisfaction – Indicate level of satisfaction:

1. Dissatisfied (20%)
2. Not very satisfied (40%)
3. Mostly satisfied (80%)
4. Very satisfied (100%)
5. Not applicable (100%)

Personal relationship satisfaction – Indicate level of satisfaction:

1. Dissatisfied (20%)
2. Not very satisfied (40%)
3. Mostly satisfied (80%)
4. Very satisfied (100%)
5. Not applicable (100%)

**My Importance**

Rate the importance to me of having a high level of life satisfaction:

1 to 10 (highest level)

**My Confidence**

My confidence level in my ability to reach and sustain a high level of life satisfaction is:

1 to 10 (highest level)

**My Readiness to Change** – My readiness to make changes or improvements in my life satisfaction

1. I am already maintaining good life satisfaction consistently (6 mos. +)
2. I recently started working on this
3. I am planning a change to start this month
4. I am planning a change to start in the next 6 months
5. I have no present interest in making a change

**Energy**

In a typical work-day what percentage of the time are you at (all three add up to 100%) various levels of energy (physical and mental vigor or vitality):

Best: My energy is high, I am vigorous, and I am able to perform at my best.

Average: My energy is good and I am able to accomplish what needs to get done.

Low: My energy is low and it’s hard to accomplish what needs to get done.

1. Best energy: 0% 20% 40% 60% 80% 100% (score only Best Energy)
2. Average energy: 20% 40% 60% 80% 100%
3. Low energy: 20% 40% 60% 80% 100%

**Score – Add Best energy % + 75% of Average + 50% of Low**
When you are not working what percentage of the time are you at (all three add up to 100%):

1. Best energy
2. Average energy
3. Low energy

Energy drains – Select the top three things that are draining your energy:

a. Poor or insufficient sleep
b. Too little exercise
c. Unhealthy eating habits
d. Stress
e. Weight management issues
f. Physical health issues
g. Pessimism or emotional issues
h. Work issues
i. Family or relationship issues
j. Financial issues
k. Other – describe

Energy boosters – Select the top three things that boost your energy:

a. Healthy sleep
b. Regular exercise
c. Healthy eating habits
d. Stress management, relaxation, or fun activities
e. Healthy mindset
f. Healthy family and personal relationships
g. Healthy work relationships
h. Maintaining healthy weight
i. Maintaining good physical health
j. Job satisfaction
k. Spiritual activities
l. Healthy finances
m. Other - describe

My Importance

Rate the importance to me of being at my best energy level at least 50% of the time:

1 to 10 (highest level)
My Confidence

My confidence level in my ability to reach and sustain my best energy levels at least 50% of the time is:

1 to 10 (highest level)

My Readiness to Change – My readiness to make changes or improvements in my energy levels:

1. I am maintaining good energy levels consistently (6 mos. +)
2. I recently started working on this
3. I am planning a change to start this month
4. I am planning a change to start in the next 6 months
5. I have no present interest in making a change

Weight

BMI >35.0 (20%), 30.0 – 34.9 (40%), 27.5 - 29.9 (60%), 25 – 27.4 (80%), <24.9 (100%)

Height in inches (without shoes)

Waist Measurement in inches:

Current weight in pounds (without shoes)

Weight in pounds one year ago
Weight in pounds two years ago
Weight in pounds five years ago
Weight in pounds ten years ago

Describe any weight-management program pursued in the last 10 years:

My Importance

Rate the importance to me of reaching and sustaining a healthy weight:

1 to 10 (highest level)

My Confidence

My confidence level in my ability to reach and sustain a healthy weight:

1 to 10 (highest level)

My Readiness to Change – My readiness to make changes or improvements to reach and sustain a healthy weight:
1. I am already at a healthy weight and I am managing my weight consistently (6 mos. +)
2. I recently started working on this
3. I am planning a change to start this month
4. I am planning a change to start in the next 6 months
5. I have no present interest in making a change
6. 

**Exercise**

**Regular physical activity**

Do you currently participate in regular physical activity?

**Regular physical activity is defined as:**

a. At least 20 minutes of **vigorous activity** 3 or more days per week (hard enough to make you breathe heavily or make your heart beat faster) or

b. At least 30 minutes of **moderate intensity activity** 5 or more days per week.

1. No 20%
2. A 100%
3. B 100%

**Other physical activity minutes** – How many minutes in an average day are you physically active (gardening, physical labor, use stairs not elevator, walk not drive, etc):

If No to Regular Physical Activity, add score for other physical activity minutes:

0 – 5 **20%**
6 – 10 – **40%**
11 – 20 – **60%**
21 – 30 – **80%**
> 30 – **100%**

**Current limitations on physical activity**

(e.g., injuries, illness, medical conditions):

**Previous limitations on physical activity (over the last 5 years):**

**Aerobic exercise** – How many days per week do you engage in aerobic exercise of at least 20 minutes duration (fitness walking, cycling, jogging, swimming, aerobic dance, active sports)?
1. None (20%)
2. One (40%)
3. Two days (60%)
4. Three days (100%)
5. Four days (100%)
6. Five days (100%)
7. Six days (100%)
8. Seven days (100%)

**Strength exercises** – How many times per week do you do strength building exercises for ten minutes or more, such as sit-ups, pushups, or use strength training equipment?

1. None 20%
2. Once a week 80%
3. Twice a week 100%
4. Three times or more 100%

**Flexibility or stretching exercise** – How many times per week do you do stretching exercises for five minutes or more to improve flexibility of your back, neck, shoulders, and legs?

1. None 20%
2. Once a week 60%
3. Twice a week 80%
4. Three times or more 100%

**My Importance**

Rate the importance to me of regular physical activity:

1 to 10 (highest level)

**My Confidence**

My confidence level in my ability to reach and sustain regular physical activity:

1 to 10 (highest level)

**My Readiness to Change** – My readiness to make changes or improvements to reach or sustain regular physical activity:

1. I am already exercising regularly and consistently (6 mos. +)
2. I recently started working on this
3. I am planning a change to start this month
4. I am planning a change to start in the next 6 months
5. I have no present interest in making a change

**Nutrition**

**Breakfast** – How often do you eat breakfast, more than just a roll and a cup of coffee?
1. Eat breakfast every day 100%
2. Eat breakfast most mornings 80%
3. Eat breakfast two to three times per week 40%
4. Seldom or never eat breakfast 20%

**Snacks** – How often do you eat “junk” snack foods between meals (e.g. chips, pastries, candy, ice cream, cookies)?

1. Three or more times per day 20%
2. Once or twice per day 40%
3. Few times per week 80%
4. Seldom or never eat “junk” snack foods 100%

**Fat intake** – Indicate the kinds of foods you usually eat.

A. High fat examples: hamburgers, hot dogs, bologna, steaks, sour cream, cheese, whole milk, eggs, butter, cake, pastry, ice cream, chocolate, fried foods, and many fast foods.
B. Low fat examples: lean meats, skinless poultry, fish, skim milk, low fat dairy products, fruit desserts, vegetables, pasta, legumes (peas and beans)

1. Nearly always eat the high fat foods 20%
2. Eat mostly the high fat food, some low fat 40%
3. Eat both about the same 60%
4. Eat mostly low fat foods, some high fat 80%
5. Eat only low fat foods 100%

**Trans fats** are commonly listed as “partially hydrogenated vegetable oil” on food labels.

These processed fats increase shelf life and give foods a firmer texture, but they can greatly increase your risk of developing heart disease. Many snacks, baked goods, and even healthy-appearing breakfast cereals contain trans fat or partially hydrogenated vegetable oil. How often do you eat foods containing trans fats or partially hydrogenated oil?

a. Many times each day 20%
b. At least once a day 40%
c. Occasionally 80%
d. Rarely, if ever 100%
e. I haven’t paid attention to trans fats or partially hydrogenated vegetable oils before 20%

**Breads and grains** – Indicate the kinds of breads and grains you usually eat.

A. Refined grain examples: white bread, rolls, regular pancakes and waffles, white rice, typical breakfast cereals, typical baked goods
B. Whole grain examples: whole grain breads, brown rice, oatmeal, whole grain or high
fiber cereals

1. Nearly always eat refined grain products 20%
2. Eat mostly refined grain products 40%
3. Eat both about the same 60%
4. Eat primarily whole grain products 80%
5. Eat only whole grain products 100%
6. I have gluten intolerance or allergies to certain grains. No score

Fruits and vegetables – How many servings of fruits and vegetables do you eat daily? (A serving is: 1 cup fresh, _ cup cooked, 1 medium size fruit, or _ cup juice)

1. one or less 20%
2. two daily 40%
3. three daily 60%
4. four daily 80%
5. five or more 100%

Water intake – How many eight ounce glasses of water do you drink on average per day?

a. None 20%
b. 1-2 glasses 40%
c. 3-5 glasses 60%
d. 6-8 glasses 100%

Soft drink intake – How many eight ounce glasses of non-diet soft drinks do you drink on average per day?

a. 6-8 glasses 20%
b. 3-5 glasses 40%
c. 1-2 glasses 60%
d. Rarely 100%

Number of drinks – How many alcoholic drinks do you usually have per weekday (one ounce liquor, 12 ounces beer, or 4 ounces of wine)?

a. 5 or more 20%
b. 3-4 40%
c. 1-2 100%
d. Seldom or never 100%

Number of drinks – How many alcoholic drinks do you usually have per weekend day (one ounce liquor, 12 ounces beer, or 4 ounces of wine)?

a. 6-8 glasses 20%
b. 3-5 glasses 40%
c. 1-2 glasses 100%
d. Rarely 100%
My Importance

Rate the importance to me of consuming healthy food and drinks most of the time:

1 to 10 (highest level)

My Confidence

My confidence level in my ability to consume healthy food and drinks most of the time:

1 to 10 (highest level)

My Readiness to Change – My readiness to make changes or improvements to consume healthy food and drinks:

1. I am already consuming healthy food and drinks consistently (6 mos. +)
2. I recently started working on this
3. I am planning a change to start this month
4. I am planning a change to start in the next 6 months
5. I have no present interest in making a change

Health

General Health

Complete the following statement. In general, my overall health is …

1. Poor 20%
2. Fair 40%
3. Good 60%
4. Very good 80%
5. Excellent – 100%

What is your blood pressure:

Systolic (high number) < or = 120 100% 121-140 – 60% Above 140 – 40%; Don’t know (no score)

Diastolic (low number) < or = 80 100%; 81-90 – 80% Above 90 – 40%; Don’t know (no score)

What is your total cholesterol <199(100%), 200-239(60%) >240(20%) Don’t know (no score)

What is your HDL (good cholesterol) > 40 men > 50 female (100%) Below – 40% Don’t know (no score)

What is your LDL (bad cholesterol) <100(100%), 100-129(80%), 130-159(60%), 160-189(40%), >190(20%) Don’t know (no score)

What is your fasting Triglyceride level <150 (100%); 151+ (60%) Don’t know (no score)

What is your fasting glucose level <100 (100%) 101+ (60%) Don’t know (no score)
**Physician relationship** - Do you have a primary care doctor who you trust and see regularly?

1. No 20%
2. Somewhat 60%
3. Yes 100%

**Physical exam** – When was your last physical examination? Within the last …

1. Five or more years 20%
2. 3-4 years 60%
3. 2 years 80%
4. 12 months 10%

**Women’s health issues** – Mark all that apply. Men skip to next question.

No score

a. Currently pregnant.
b. Had PAP smear within last 13 months.
c. Had mammogram within last 12 months.
d. Practice monthly breast self-exam.

**Men’s health issues** – Mark all that apply. Women skip to next question.

No score

a. Had prostate exam within last 12 months
b. Practice monthly testicle self-exam for lumps

**Sick days** – How many days did you miss from work due to illness or injury during the last 6 months?

0 100%
1 100%
2 80%
3 80%
4 60%
5 60%
6 40%
7 40%
8 20%
9 20%
Medications – How often do you use drugs or medicines (include prescription and nonprescription) that treat depression, affect your mood, help you relax, or help you sleep?

No score

   a. Frequently
   b. Sometimes
   c. Rarely
   d. Never

Tobacco status – Mark the appropriate response.

   a. Use chewing tobacco regularly 20%
   b. Currently smoke ten or more cigarettes daily 20%
   c. Currently smoke less than ten cigarettes daily 20%
   d. Smoke pipe or cigar only 20%
   e. Quit smoking less than two years ago 60%
   f. Quit smoking two or more years ago 80%
   g. Have never smoked (or used tobacco) 100%

Family health history – Mark any of the following health problems found in your family (parent, brother, sister).

No score

1. Colorectal cancer
2. Breast cancer
3. Depression
4. Diabetes
5. Coronary heart disease, heart attack, or coronary surgery before age 55 in men, before age 65 in women
6. High blood pressure
7. High blood cholesterol
8. Suicide
9. None

Personal health history – Has a doctor informed you that you currently have any of the following health problems? If yes, mark either “yes and is not under control” or “yes and taking medication or is under control,” otherwise please select N/A.

1. Yes and is not under control (20% for each yes)
2. Yes and taking medication or is under control. 100%
3. N/A 100%

   a. Asthma or lung disorder
   b. Bowel polyps or inflammatory bowel disease
c. Cancer, other than non-melanoma skin cancer

d. Chronic bronchitis or emphysema (COPD)

e. Coronary heart disease, congestive heart failure, angina, heart attack, or heart surgery

f. Depression (mental illness)

g. Diabetes (high blood sugar)

h. High blood pressure (140/90 or higher)

i. High blood cholesterol (200 or higher)

j. Sciatica or chronic back problem (musculoskeletal)

k. Stroke or restricted blood flow to head or legs

l. Arthritis

Current symptoms – Mark any of the following symptoms you have experienced within the last four weeks.

No score – red flag email to admin if any of a through g are selected.

a. Chest pain or discomfort, frequent palpitations or fluttering in the heart

b. Unusual shortness of breath

c. Unexplained dizziness or fainting

d. Temporary sensation of numbness or tingling, paralysis, vision problem, or lightheadedness

e. Frequent urination and unusual thirst

f. Frequent back pain

  g. Have trouble sleeping lately

  h. None

Bodily pain – How much bodily pain have you had during the past four weeks?

1. Very severe (20%)

2. Severe (20%)

3. Moderate (40%)

4. Mild (60%)

5. Very mild (80%)

6. None (100%)

Health limitation – During the past four weeks, how much difficulty did you have doing your work or other regular activities as a result of your physical health?

a. Could not do daily work (20%)

b. Quite a bit (40%)

  c. Some (60%)
d. A little bit (80%)
e. None (100%)

**My Importance**

Rate the importance to me of managing my health:

1 to 10 (highest level)

**My Confidence**

My confidence level in my ability to manage my health:

1 to 10 (highest level)

**My Readiness to Change** – My readiness to make changes or improvements in managing my health:

1. I am already managing my health well and consistently (6 mos. +)
2. I recently started working on this
3. I am planning a change to start this month
4. I am planning a change to start in the next 6 months
5. I have no present interest in making a change

**Mental & Emotional Fitness**

**Coping** – How well do you feel you are coping with your current stress load?

a. Feel unable to cope any more (20%)
b. Often have trouble coping (40%)
c. Have trouble coping at times (60%)
d. Coping fairly well (80%)
e. Coping very well (100%)

**Sleep** – How many hours of sleep do you get on average:

a. Less than 6 (40%)
b. 6-7 (80%)
c. 7-8 (100%)
d. 8-9 or more (100%)

**Stress** - Mark any symptoms below that apply to you.

1. Minor problems throw me for a loop. (20%)
2. I find it difficult to get along with people I used to enjoy. (20%)
3. Nothing seems to give me pleasure anymore. (20%)
4. I am unable to stop thinking about my problems. (20%)
5. I feel frustrated, impatient, or angry much of the time. (20%)
6. I feel tense or anxious much of the time. (20%)
7. None of the above – 100%
**Emotional issues** – During the past four weeks, to what extent have you accomplished less than you would like in your work or other daily activities as a result of emotional issues, such as feeling depressed or anxious?

1. Extremely (20%)
2. Quite a bit (40%)
3. Moderately (60%)
4. Slightly (80%)
5. None at all (100%)

**Social activity** – during the past four weeks, to what extent has your physical health or emotional issues interfered with your normal social activities with family, friends, neighbors, or groups?

a. Extremely (20%)
b. Quite a bit (40%)
c. Moderately (60%)
d. Slightly (80%)
e. Not at all (100%)

**Personal loss** - Have you suffered a personal loss or misfortune in the past year? (For example: a job loss, disability, divorce, separation, or the death of someone close to you)

*No Score*

a. No
b. Yes – one loss
c. Yes – two or more serious losses

**Social support** – Do you have friends/family with whom you can share problems/get help if needed?

1. No (20%)
2. Yes (100%)

**Feelings** – The next questions are about how you feel things have been with you during the past four weeks. For each question, please give the one answer that comes the closest to the way you have been feeling. How much of the time during the past four weeks …

1. None of the time (20%)
2. A little of the time (40%)
3. Some of the time (60%)
4. A good bit of the time (80%)
5. All of the time (100%)
a. Have you felt calm and peaceful?
b. Did you have a lot of energy?
c. Have you been a happy person?
d. Did you take the time to relax and have fun daily?
e. Have you felt downhearted or blue? (if you answer 3 or higher, please complete the depression evaluation) Responses 3,2,1 = (20%)
f. Have you felt worthless, inadequate, or unimportant? (if you answer 3 or higher, please complete the depression evaluation) Responses 3,2,1 = (20%)

(popup) If you answered 3 or higher the previous section “Feelings e. and f.”, please complete the following:

A. None or little of the time.
B. Some of the time.
C. Most of the time.
D. All of the time.

<table>
<thead>
<tr>
<th>Over past two weeks, how often have you:</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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<tbody>
<tr>
<td>Been feeling low in energy, slowed down?</td>
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<td>Been blaming yourself for things?</td>
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<td>Had a poor appetite?</td>
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<td>Had difficulty falling asleep, staying asleep?</td>
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<td>Been feeling hopeless about the future?</td>
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<td>Been feeling blue?</td>
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<tr>
<td>Been feeling no interest in things?</td>
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</table>
Had feelings of worthlessness?

Thought about or wanted to commit suicide?

Had difficulty concentrating or making decisions?

**My Importance**

Rate the importance to me of reaching and sustaining optimal mental and emotional fitness (managing my stress and emotions well and maintaining a positive mindset):

1 to 10 (highest level)

**My Confidence**

My confidence level in my ability to reach and sustain optimal mental and emotional fitness (managing my stress and emotions well and maintaining a positive mindset):

1 to 10 (highest level)

**My Readiness to Change** – My readiness to make changes or improvements to reach and sustain optimal mental and physical fitness is:

1. I am already managing my stress and emotions well and maintaining a positive mindset consistently (6 mos. +)
2. I recently started working on this
3. I am planning a change to start this month
4. I am planning a change to start in the next 6 months
5. I have no present interest in making a change

Many thanks for completing your well-being assessment. You may go back and edit your assessment prior to completion. Once you’ve clicked on Done below, you cannot work on this assessment further.

Our best, The Wellcoaches Team
References


