

THE EFFECTS OF HEALTH COACHING  
ON WEIGHT LOSS AND  
BEHAVIOR CHANGE

By

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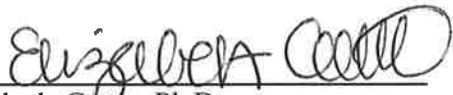
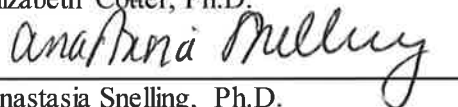
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## ABSTRACT

A sample of 21 individuals participated in a research study to examine the effect of a health mentor on weight status and weight management behaviors during an eight-week weight loss challenge. Weight status was defined as pounds lost and change in Body Mass Index (BMI). The health mentor met with the experimental group (n=10) four times for 15-minute sessions over the course of the eight-week challenge. Data were evaluated through an initial weigh-in to examine start weight and start BMI, also pre and post evaluation surveys were administered to gather weight management information on topics such as physical activity, meal planning, breakfast consumption and water intake. Results showed significant differences between the experimental and control groups' weight loss ( $p=.003$ ) and BMI change ( $p=.002$ ). One behavior change, breakfast consumption, proved to be significant ( $p=.043$ ) as well as a significant change in the experimental group's self-efficacy ( $p=.005$ ). The results of this research showed health mentoring to have positive impacts on participants in a weight loss challenge in regards to weight loss, self-efficacy and weight management behavior change.

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## CHAPTER 1

### INTRODUCTION

#### Health Promotion Programs in the Work Place

Over the past 20 years obesity rates in the United States have been steadily climbing. With more than 35.7% of adults considered obese there is an overwhelming need to address this issue (Song, Baicker & Cutler, 2010). Obesity is associated with a host of chronic diseases including cardiovascular disease, diabetes, hypertension, stroke and even some types of cancer (Centers for Disease Control, 2013). There are more than 130 million working Americans, and an estimated 25-30% of companies' medical costs are spent on employees who have one or more of the chronic diseases listed above (Abrams & Follick, 1983). With that being said, companies are now looking for strategies to lower or manage health care spending by making their work force healthier and happier. Behavior-related health practices are linked, either directly or indirectly, to health care costs, absenteeism, presenteeism, and productivity in the work place. This has been a main focus of worksites to combat the issue of an unhealthy workforce (Goetzel et al., 2007).

With employers becoming more aware of the link between physical and mental health, there has been a need for an outlet at the workplace that can best address these issues. Worksites have a unique opportunity to encourage and promote healthy sustainable habits due to employees spending a large amount of time in the office. Moreover, employers also have the opportunity to offer economic incentives and promote a strong social support network (Song, Baicker & Cutler, 2010). When companies implement a worksite wellness program, the main goal is to create a healthier working population at the given company. A worksite wellness program is described as an organizational policy designed to promote and support healthy



behaviors in the workplace to improve health outcomes (O'Donnell, 2002). Having a worksite wellness program is beneficial not only for the employee, but also for the employer. It has been shown that wellness programs increase productivity, performance, absenteeism, presenteeism, and overall profit for the company (O'Donnell, 2002). Because worksite wellness programs have a positive effect on employees' health and well being, it is also an opportunity for the workplace to lower insurance rates and cut back on the percentage of chronic disease the given company may pay for.

A comprehensive worksite wellness program aims to improve employee's general health and should include specific programs. Currently only 6.9% of all worksite programs are comprehensive (Goetzel & Ozminkowski, 2008). It is important that worksites strive for this gold standard as it produces the best results, which are rooted in scientific evidence (Serxner, Gold, Meraz & Gray, 2009). In order to be considered comprehensive, specific programs must be included; such as tobacco cessation and prevention, regular physical activity, stress management/reduction, early detection/screening, nutrition education and promotion, weight management, disease management, CVD education, and changes in the work environment to encourage healthy behaviors and promote occupational safety and health. Although many wellness programs seek to aim for the comprehensive level, many have a main focus on combating obesity as their primary focus (Carnethon et al., 2009).

### Weight Management Programs

With more than one third of the U.S. population considered obese, it is important that individuals who do lose a substantial amount of weight know the proper techniques for maintaining weight loss. Obesity is directly related to the presence of chronic disease, which accounts for increased insurance spending by employees (Center for Disease Control, 2013).

Therefore, it is imperative that proper weight management techniques are taught so individuals can continue to maintain their weight loss. This includes a balance of healthy eating and physical exercise to equate energy expenditure and energy intake (American Heart Association, 2014). Keeping individuals at a healthy weight and practicing healthy weight management strategies is important for successful, permanent behavior change. It has been shown that individuals who lose a substantial amount of weight gain back at least one third within the next year of it being lost (Wing, Tate, Gorin, Raynor, & Fava, 2006). Therefore, teaching individuals how to successfully manage their weight through a balanced diet, regular exercise and social support might be a more successful approach.

Achieving a successful and cost-effective weight management program can be a challenge for employers; therefore, specific guidelines are needed. Health promotion professionals have created models, such as the Transtheoretical Model, which give employers frameworks from which to develop programming. Having individuals participate in worksite-based exercises, making healthy food options available at the work place, and a strong support group that will help individuals achieve their goals are a few components that contribute to healthy workplace environment (O'Donnell, 2002). Most importantly, there should be a long-term focus on weight management initiatives within the worksite programs. Putting into practice these strategies may benefit someone in the short term, but making them a part of one's habitual lifestyle is the challenge most individuals face. Having an outlet at the workplace where individuals can go to express concerns and ask questions related to weight management is the direction many employers are taking. This outlet can be considered a counselor, on site physician, or a health coach. In the case of the present research study, a health mentor.

### Health Coaching

Health coaching is a relatively new behavioral intervention that has gained popularity in health promotion, public health, and disease management because of the ability to address multiple behaviors, health risks, and self-management of illness in a cost-effective manner (Butterworth, Linden & McClay, 2007). Health coaching pulls from the principles of health promotion and the execution of counseling. Health coaching helps individuals set achievable goals, works with those individuals to reach those goals, and gives them the tools to maintain the behavior (Palmer, Tubbs & Whybrow, 2003).

Health coaching is grounded in a number of specific guidelines including the use of the motivational interviewing techniques. Those include, asking open ended questions, exploring participants' feelings of ambivalence, supporting their optimism regarding behavior change, directing conversation towards desired behavior changes, and keeping the sessions client centered (Appel, et al., 2011). For the purpose of this study, health coaching is defined as, "the practice of health education and health promotion within a coaching context, to enhance the wellbeing of individuals and to facilitate the achievement of their health related goals" (Butterworth, Linden & McClay, 2007). Health coaching crosses over multiple behaviors at once, which is important when dealing with weight management techniques because there are so many factors involved.

### Health Coaching and Weight Management

Learning healthy lifestyle behaviors can help individuals prevent the onset of obesity and other chronic diseases. The strict focus on goal setting is something that has helped participants identify their problem behaviors and manage them (Merrill, Bowden, & Aldana, 2010). Health coaching has been utilized across many disciplines and originated in the

field of substance abuse. It has since been used in improving general health status, well-being, physical activity, nutritional habits, and chronic disease management (Butterworth, Linden & McClay, 2007). The coupling of weight management and health coaching may help individuals achieve their goals and learn strategies to lead a healthy lifestyle.

### Purpose

The purpose of this study is to investigate the relationship between health mentoring, weight status, and weight management behaviors. Specifically, weight lost over the course of an eight-week weight loss challenge according to pounds lost, BMI, and pre and post survey findings in regards to weight management behaviors. For the remainder of the study, the health coach will be referred to as a 'Health Mentor'.

### Hypothesis

The main hypothesis for the current research study states that participants in the experimental group will show greater weight loss over the course of an eight-week challenge than those in the control group. Weight status will be determined by start and end weights, in pounds, as well as start and end BMI's. Changes in BMI will be used to account for the difference in start weights between groups, as well as a second form of weight loss. This is why the use of BMI is incorporated within the current study, as well as BMI being used for large populations.

A secondary hypothesis in the current study is that participants in the experimental group will show a greater shift in behavior change associated with effective weight management strategies as compared to the control group. Behavior change will be measured through a pre and post survey assessing the amount of physical activity, water intake, meal planning and frequency of breakfast consumption.

A third hypothesis states that individuals in the experimental group will demonstrate greater self-efficacy as compared to the control group, also measured through pre and post survey data.

The fourth and final hypothesis states that individuals in the experimental group will move through more stages of change according to the Transtheoretical Stages of Change Model. This information will be evaluated through pre and post surveys.

### Intervention

The Great American Weight Loss Challenge is a weight loss intervention hosted by the faculty and staff wellness program at American University, *AhealthyU*. The purpose of this challenge is to help individuals lose weight by holding them accountable to come to weekly weigh-ins. Weigh-ins are once a week on Monday, Tuesday or Wednesday between 10am-3pm located in the *AhealthyU* office. At the end of the challenge the top 3 teams who lose the largest percentage of weight according to their personally set weight loss goals win a cash prize. Each participant filled out a liability waiver and paid a \$5 registration fee, which counts towards the cash prize. Participants were only allowed to lose up to 14 pounds, or 2 pounds per week, to encourage healthy weight loss practices. If a participant lost more than 2 pounds during any given week only 2 of the pounds lost were counted. Participants were encouraged to participate in complementary *AHealthyU* group exercise classes and attend weekly wellness seminars. Participants who expressed interest in the current study were randomly selected to participate in the health coaching intervention or a control group. This intervention will involve a group of 10 individuals meeting with a health mentor up to 4 times over the course of the eight-week challenge. Sessions will be structured the same and consist of a 15 minute time frame. All sessions are conducted by the same individual and hosted in the same location.

### Limitations

Participants in this study were primarily Caucasian (50.6%) and female (85.4%), which brings up a lack of diversity and limits the generalizability of the results. The small sample size (n=21) brings up concerns regarding having sufficient power to detect significant results. Also, the concern for participant bias in regards to having the primary researcher acting as the health mentor should also be taken into account.

### Assumptions

It is assumed that all participants answered their pre and post surveys honestly and to the best of their ability. It is also assumed that participants in the experimental group answer truthfully in their health coaching sessions, and will also attend each session when it is scheduled. It is also assumed that individuals are using healthy and proper weight loss techniques for the weight loss challenge.

### Definition of Terms

Throughout this document many of the terms listed below will be used.

**AhealthyU:** American University's faculty and staff wellness program.

**Body Mass Index (BMI):** a height to weight ratio used as an indicator of body fatness to screen for weight categories that may result in health problems (Centers for Disease Control and Prevention, 2014).

**Health Coaching:** the practice of health education and health promotion within a coaching context, to enhance the wellbeing of individuals and to facilitate the achievement of their health related goals (Olsen & Nesbitt, 2010).

**Health Mentor:** The individual in this study who will be conducting sessions with the experimental group in the same format a Health Coach would.

**Motivational Interviewing:** Directive, client centered counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence (Rubak, Sandbæk, Lauritzen & Christensen, 2005).

**Physical Activity:** any bodily movement produced by skeletal muscles that requires energy expenditure (World Health Organization, 2014).

**Self-Efficacy:** Self-efficacy is an individual's cognitive estimate of his or her "capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over events in their lives (Chen, Greene, & Crick, 1998).

**Transtheoretical Stages of Change Model:** suggests that health behavior change is done through six stages of change; precontemplation, contemplation, preparation, action, maintenance, and termination (O'Donnell, 2002)

**Weight Management:** a long-term approach to a healthy lifestyle. It includes a balance of healthy eating and physical exercise to equate energy expenditure and energy intake

**Weight Status:** The participants' categorization based on BMI (underweight, overweight and obese)

**Worksite:** place of employment; also referred to as workplace.

## CHAPTER 2

### REVIEW OF LITERATURE

#### Overview

Over the course of this chapter, the framework for the current study will be discussed. This will be discussed through previous literature that is relevant to the current study.

#### Theory:

The Transtheoretical Model, also known as the stages of change model, suggests that health behavior change occurs through six stages of change; precontemplation, contemplation, preparation, action, maintenance, and termination. This theory will be used in the present research study to examine participants' level of readiness at the beginning of the weight loss challenge, and after the course of the eight-week challenge, where they ended in their stage of change. Since the participants in this study are registered for a weight loss challenge, they are likely all in at least the preparation stage. This stage is characterized by being prepared to take action towards a needed behavioral change in the immediate future (Prochaska & Velicer, 1997).

The concept of self-efficacy refers to an individual's perceived belief in his or her ability to influence events that affect their lives. This core belief is the foundation of human motivation, performance accomplishments, and emotional well-being. Self-efficacy plays a large role in weight loss and weight management (Chen, Greene, & Crick, 1998). The health mentor in the current study is expected to promote self-efficacy among the participants to promote a healthy weight status through weight management behaviors.

A study conducted by Linde, Rothman, Baldwin & Jeffery (2006), examined the link between weight loss and self-efficacy. This study was a randomized clinical trial contained a



sample of 349 participants. Participants were involved in an eight-week training session, which was comprised of physical activity sessions as well as dietary informational sessions.

Participants filled out pre and post intervention surveys which assessed baseline data and where participants shifted in weight management behaviors, as well as pre and post weight loss.

Results showed that having strong self-efficacy in physical activity goals as well as dietary goals had a direct impact on the amount of weight loss for participants (Linde, et al., 2006).

This study described the importance of setting goals and the confidence individuals had to achieve their goals on weight loss.

Another dimension of the current study describes a major component of the primary hypothesis, which is the function and description of BMI. BMI is described in the theory section in order to have an understanding of the multiple factors that are being used in this study, which are not only behavioral aspects, but metric factors as well. Body Mass Index is a height-to-weight ratio used as an indicator of body fatness to screen for weight categories that may result in health problems (ACSM's Guidelines for Exercise Testing and Prescription, 2013). There are several categories individuals can be placed in, Normal (18.5-24.9), Overweight (25.0-29.9), and Obese ( $\geq 30$ ). According to the American College of Sports Medicine BMI is best used with large populations as a measure of weight loss as opposed to individual use (ACSM's Guidelines for Exercise Testing and Prescription, 2013). The current study uses BMI as a measure due to the large population size participating in the Great American Weight Loss Challenge.

#### Health Promotion Programs in the Workplace

Maintaining a healthy diet and participating in an adequate amount of physical activity are two important components of a healthy lifestyle. Incorporating a healthy diet and physical

activity into everyday life can prevent the onset of chronic diseases such as heart disease, obesity, diabetes and cancer, which account for 70% of the deaths in the United States (Olsen & Nesbitt, 2010). Behavior change can be difficult for many people; only 15% of adults get the recommended 30 minutes of physical activity a day and only 25% of Americans consume the adequate amount of fruits and vegetables each (Olsen & Nesbitt, 2010). It has been suggested that the worksite may be an important area of expansion for behavioral health as it relates to behavior management (Abrams & Follick, 1983). With more than 60% of Americans getting their health insurance through an employer-based plan, the worksite is a natural place to promote health consciousness (Song, Baicker & Cutler, 2010). Employees rationalize their involvement in a health promotion wellness program due to the large amount of time spent in the office, economic incentives, social support and risk management reports. Further, when the program is run as a comprehensive worksite wellness program, results are typically effective (Carnethon et al., 2009). A comprehensive worksite wellness program aims to improve employee's general health should include specific programs such as tobacco cessation and prevention, regular physical activity, stress management/reduction, early detection/screening, nutrition education and promotion, weight management, disease management, CVD education, and changes in the work environment to encourage healthy behaviors and promote occupational safety and health. By implementing a comprehensive worksite wellness program organizations can help reduce overall health care spending, make employees healthier, and encourage a healthy happy work environment (Carnethon et al., 2009).

Worksite health promotion programs are steadily becoming incorporated into the everyday life of employed individuals. A survey examined if comprehensive worksite wellness programs were implemented in companies with 750 employees or more to assess if they

followed the *Healthy People 2010* guidelines (Linnan et al., 2008). This survey showed that 6.9% of the responding employers had followed the *Healthy People* guidelines. In a similar survey to Linnan et al.'s *Healthy People* examination, Fielding and Pisercha (1989) assessed which types of programs are most commonly used to help understand the comprehensiveness of programming. A nationwide Health Promotion Activities survey went out to all private sector companies who had 50 or more employees. Of the topics included in the survey, smoking cessation programs had the most activity and were implemented most throughout the companies. Exercise and physical activity were included in 22.1% of programs. Stress management programs were found at 26.6% of all the companies involved. Weight control was only found at 14.7% of all companies (Fielding & Piserchia, 1989). In a survey conducted 5 years prior to this one the only component that had no change from prior survey to the one currently being discussed was weight control (Fielding & Piserchia, 1989). This indicates there is a stronger need for emphasis on weight control and weight management within the worksite. There seems to be a gap in the research when it comes to proper weight management techniques, and proper ways to assess the problem. A possible solution to this problem, one of which the current study addresses, is involving individuals participating in a weight management program or interventions as well as the use of a health mentor.

### Weight Management Programs

Weight loss interventions in the work place aim to help individuals reach a healthy weight, maintain their new weight, and reduce health care spending for the given company. With that being said, the underlying goal of weight loss interventions is to help individuals engage in healthy behaviors, offset company spending, and make employees healthier for a longer period of time (Benedict & Arterburn, 2008). Weight loss programs are offered through

many different outlets, such as weight loss programs, exercise routines or diet programs. For the purpose of this study the main focus will be on weight loss challenges and weight management techniques.

In an early study of how weight loss competitions in the work place enhance morale as well as show cost effectiveness, Brownell (1984) demonstrated the effectiveness of three workplace wellness weight loss competitions on employee behaviors (Brownell, Cohen, Stunkard, Felix, & Cooley, 1984). Three separate weight loss competitions were held in the same Pennsylvania County. Three Banks, a banking company with 570 employees, held a 12-week program where 176 employees participated. Litton Industries, a manufacturing firm with 225 employees, held a 13-week program where 53 employees participated. Lastly, Knoppers Industries, another manufacturing firm with 1,200 employees, held a 15-week program. Participants were randomly assigned to teams. For all three competitions participants were asked to pay a \$5 registration fee that went towards the winning team. Participants were weighed in once a week by a research member and were given a behavioral treatment manual. The behavior treatment manual touched on self-monitoring, stimulus control, eating slowly, positive reinforcement, social support, attitude change, nutrition and exercise information. Employees and management completed post-program surveys, which assessed morale, energy levels, employee-management relations, absenteeism and work performance. The attrition rate was 0.5% and the mean weight loss across the three groups was 12.1lbs. The mean change in overweight percentage was 9.1%. Men lost a significant more amount of weight than women (18lbs vs. 11lbs) and had a high goal percentage completion (11.8% vs. 8.9%). Individuals who were less than 10% overweight were not included from the data analyses, which comprised 26% of the total participants. Managers reported improvements

in all work-related factors (Brownell, Cohen, Stunkard, Felix, & Cooley, 1984). This study demonstrates how incorporating a weight loss challenge coupled with a health behavior element can produce positive results. Moreover, the top-down effect gave these weight loss programs a strong start as well. When upper management is involved, programs seem to have more support and cooperation.

However, limitations of this research include researchers setting the participants goals for them, as well as randomly assigning them to teams. The random assignment to teams could counteract the need for social support when trying to lose weight. Researchers also did not factor for weight management techniques when the intervention ended (Brownell, Cohen, Stunkard, Felix & Cooley, 1984). In the current research, *AhealthyU* has participants set their own goals and create their own teams. Having individuals set their own goals empowers them to take weight loss into their own hands. Also, individuals who are trying to lose weight can thrive when surrounded by individuals who they feel comfortable with, social support plays a large role with weight loss. Moreover, the current study with *AhealthyU* also addresses if participants will continue to monitor their current weight management behavior. This is an important factor because the main barrier to weight management is an individual not being able to successfully keep weight off. This gap in the research will be addressed.

Researchers have also investigated how a worksite wellness weight loss program coupled with a behavior change aspect can positively affect weight loss along with weight management techniques (Abrams & Follick, 1983). Employees at the Miriam Hospital in Providence, Rhode Island participated in a weight loss competition with a strong emphasis on healthy behavior change. The program was a 10-week intervention with 250 participants, all 10% - 60% overweight. Treatment sessions consisted of a 10-session behavior modification

program. This program consisted of energy balance, self-monitored calorie intake and expenditure, stimulus control, nutrition education, goal setting, cognitive restructuring, contingency management, exercise and social support. Participants were split into one of three groups and were placed in their groups by their percentage of overweight. A component of the challenge was the “Buddy System” where participants paired up with a teammate, spouse, friend, or colleague. The three groups would attend weekly sessions going over their program outline; a psychologist and a health educator led the sessions. Participants were asked to complete homework on the program topics. Along with the behavioral component, this study added a vast social support variable. These techniques were referred to “Organizational Level” influences because of the organizational antecedents, incentives and reinforcement/feedback components. Participants were asked to wear yellow and red buttons on their shirt while at work; the buttons said “I’m Doing It!” This was an optional procedure but the researchers suggested it showed public commitment to weight loss and the weight loss program (Abrams & Follick, 1983).

After the initial 10-week program had ended they offered a biweekly follow up session to encourage weight management and maintenance. Within the follow up sessions, there were structured sessions, which followed an outline, and a non-specific group, which had an open conversation about what participants think is important in regards to weight management. Results showed that all participants had a significant weight change; the average weight loss was 9.7lbs across all groups. During the follow up period, the eight-week maintenance period with the structured group or non-specific group results showed there was no significance between the groups but both groups showed significant weight loss over the additional eight-week period. To further assess this information a 3 and 6 month weight was taken for each of

the two groups. This showed that individuals in the structured group maintained weight loss at the 3 and 6 month follow up as opposed to the non-specific group. Individuals who completed the 10-week and eight-week training and were also in the specific group for the follow up period lost an average of 11.6lbs more than the initial weight loss. Moreover, the nonspecific, control group experienced significant weight relapse at the 6-month follow up (Abrams & Follick, 1983).

The results of this study indicate that a professionally led health behavior weight loss program can be successfully implemented in the workplace. However, a major flaw of this study is low retention rate. Of the original 250 participants, only 113 entered treatment, and from there only 69 participants completed all 10 sessions. Another flaw involved the organizational level that attempted to enhance social support. Having participants wear the bright colored buttons to show they were in a weight loss challenge could have negative effects on an individual's self-efficacy and confidence towards weight loss. Moreover, the assignment to group based on weight status could also negatively affect a person's wellbeing. Placing people on teams with people they don't know, and have a similar weight as them could create an uncomfortable environment (Abrams & Follick, 1983). Overall this study did demonstrate the importance of coupling behavioral interventions with weight loss interventions. It also demonstrated how the workplace is an effective setting for health interventions.

### Review of Health Coaching

The review by Butterworth (2007) describes the evolution of health coaching from unproven interventions to current, uniform, and evidence based techniques. Health coaching began in the late 1990's, when nurse coaching was used to teach patients supportive therapy. This was a method for enhancing self-care and self-management for people who had chronic

diseases. This basic idea has transformed into what we now call health coaching. An early definition of health coaching used in the parameters of health promotion and this paper is; “Health coaching is the practice of health education and health promotion within a coaching context, to enhance the wellbeing of individuals and to facilitate the achievement of their health related goals” (Butterworth, Linden, & McClay, 2007). There is a wide spectrum to what constitutes health coaching. It ranges from individuals who have nationally recognized certifications to an untrained individual giving health advice to a friend. However, with the emergence of its success it has now become a standard to become certified. Health coaching is able to target multiple behaviors at once. Crossing over multiple behavior changes is what the worksite aims to achieve with a health coach. So many behaviors run parallel to each other, such as weight loss and nutrition management, and the health coach achieves changing multiple behaviors at one time by addressing multiple behaviors at once, this is why health coaching has been shown to be extremely effective. When implementing a health coaching intervention it is important to follow specific considerations. Things to consider may be the target population, how to recruit participants, coaching mode, delivery method (online, telephonic, in person), and program evaluation. When it comes to evaluation it is ideal to use a randomized control trial to give equal opportunity, reduce bias and distribute variability. It is also important to recognize specific factors that contribute to health coaching such as health status, current behaviors, and self-actualization in health related goals. This will keep the evaluation of health coaching uniform and consistent (Butterworth, Linden & McClay, 2007). Having reviews that set the guidelines and standards is very important, especially with a new emerging practice. With the promising future of health coaching it is important to conduct research in a consistent manner to enhance the validity of the practice.



Health coaching pulls from the principles of health promotion and the skills of counseling. Health coaches help individuals set achievable goals and work with those individuals to reach those goals, and give them the tools to maintain the behavior (Butterworth, Linden, & McClay, 2007). Health coaching is a relatively new practice within worksite wellness programs, and therefore it is necessary for health promotion professionals to continue researching the effectiveness of health coaching as it pertains to health behaviors. Health coaching has specific guidelines that the health coaches must follow for desired results from their clients. These guidelines include motivational interviewing techniques such as, asking open ended questions, exploring participants feelings of ambivalence, supporting their optimism regarding behavior change, directing conversation towards desired behavior changes, and always keeping the sessions client centered (Appel et. al, 2011).

The empirical success of health coaching has been limited. Grant (2003) conducted a small study in which 20 participants set three tangible goals over a 13-week period. These goals had to do with weight loss, nutrition management or physical activity (Grant, 2003). Participants met in a group health coaching setting for 10 sessions that were each 50 minutes long. The main topics discussed included, goal attainment, stress, depression, anxiety, and self-reflection and insight. These topics were also included in three separate surveys that were completed pre and post evaluation. Results showed that stress, depression and anxiety significantly decreased across the entire population, proving to be statistically significant. Insight and self-reflection did not show statistically significant results in relation to each other, however, when analyzed separately self-reflection had an insignificant decrease while insight had a significant increase. Lastly, goal attainment proved to be statistically significant as well (Grant, 2003). Overall, this research found that having a health coach can generally enhance

quality of life and mental health. This research is important because it shows how health coaching has a significant effect on individual's well-being and can help with their mental state. Health covers all realms of the body, physical health is extremely important, but it is also imperative that researchers do not overlook mental health. Limitations to this study include having self-reported data for the variable of goal attainment as well as the small sample size. Despite those limitations, this study depicts a promising picture of health coaching and the success it has with individuals (Grant, 2003).

Another study, Bennett (2009) addresses the empirical evidence of successful health coaching. In a randomized control trial of 300 individuals with poorly controlled hypertension, researchers examined how individual's blood pressure was affected by health coaching and home hypertension monitoring. Of the 300 participants a control group of 150 participants received weekly health coaching phone calls on home blood pressure monitoring, medication understanding, and medication adherence for a six-month period. An active group underwent weekly health coaching phone calls on home blood pressure monitoring and medication understanding and adherence, as well as assistance with home-titration of their antihypertensive medications. The third group underwent care as usual from their primary physicians. Health coaches were trained in discussing methods for blood pressure management, as well as goals related to blood pressure. Health coaching sessions were conducted for 15 minutes over the phone, to eliminate the need to travel to the physician's office. What was hypothesized was that individuals in the active group would achieve equal if not better blood pressure readings than those in the control group. Results are still being determined by the researchers. Strengths on this study include the highly trained individuals conducting the health coaching sessions as well as randomization (Bennett, et al., 2009).

### Health Coaching and Weight Management

The main outcomes for a health coach are assisting individuals with health related behaviors and health goals that help combat chronic diseases and enhance their overall health (Olsen & Nesbitt, 2010). Employers are becoming more aware of the link between behavior management and health outcomes and are implementing health coaching in the work place (Abrams & Follick, 1983). In a recent study conducted by Butterworth (2006) at the Oregon Health and Science University, the effectiveness of an onsite wellness program for faculty and staff members involving a health coaching intervention was researched (Butterworth, Linden, McClay & Leo, 2006). It was hypothesized that individuals in the experimental group would show survey data of increased mental and physical health status with the assistance of a health coach for a three-month period. A total of 276 participants were involved, 145 in the experimental group and 131 for the control. Randomization was not performed in this study; a Power Bar incentive was given to participants who elected to be in the control group. Health coaches were trained in Motivational Interviewing techniques and evaluated for proficiency. Experimental participants were given a three-month health coaching intervention with one initial session and two follow up contacts. The participant got to choose the total number of sessions they would attend over the three-month period. Each session was 30 minutes long and discussed issues such as weight loss, fitness, stress, and nutrition. The control group received no health coaching but did have the opportunity to receive it once the research had ended. All participants took the Short Form 12 health survey pre intervention and post intervention (Butterworth, Linden, McClay & Leo, 2006). The survey includes questions that had 8 domains; physical function, role limitations due to physical functioning, general health perception, bodily pain,

social functioning, energy/vitality, role limitations due to emotion functioning, and mental health.

Results showed that the experimental group improved their scores on both mental composite scores (4.40pts) and physical composite scores (1.69pts) while the control group did not show a statistically significant change. While the case-control participants had similar increases in the PCS score (1.58 vs. 1.69), the sample size was not large enough to show statistical significance. The MCS increased for the case group by 3.45 points, which was a sufficiently large increase. Again, however, the sample size was not large enough to show statistical significance. It was hypothesized that individuals in the experimental group would show survey data of increased mental and physical health status with the assistance of a health coach for a three-month period. The individuals in the experimental group did have an increase in both MCS and PCS scores; however, lack of randomization was a limitation of the study, indicating bias could be involved (Butterworth, Linden, McClay & Leo, 2006). Within the current study, the concern for bias will be eliminated through randomization.

Another example of coupling health coaching with a weight management program can also come in the form of aiding chronic disease. Wolever (2010) evaluated the effectiveness of individuals using a health coach on psychosocial factors, behavior change, and glycemic control for participants with type II diabetes. Individuals with type 2 diabetes went through a 6-month integrative health coaching program. A randomized control study had a sample size of 56 patients who either spoke to a health coach telephonically for 30 minutes or went through normal care, with no health coaching. A total of 14 sessions were conducted with topics including the patient's vision of health, goals, personal values and self-chosen topics. All discussion topics were chosen by the patient and supported by the health coach. This gave the

patient individual empowerment and enhanced their individualized vision of their health. Pre and post intervention surveys were given to examine medication adherence, exercise frequency, patient engagement, psychosocial variables and AIC levels. The results showed that medication adherence decreased, while patient engagement and social support all increased within the experimental group compared to those in the control group. Moreover, improvements in the experimental group alone were self-reported medication adherence, exercise frequency, decreased stress levels, perceived health status, and AIC levels by 7%. Although the delivery technique of the health coaching was telephonic it suggests that the practice is effective. It is promising that this practice can alleviate the symptoms of a chronic disease, as well as enhance other health behaviors such as exercise and medication adherence (Wolever et al., 2010).

A study that compared face -to-face health coaching practices to telephonic health coaching on a population of obese adults again shows the significance of the practice itself. Appel (2011) conducted a study to examine if behavioral weight loss interventions helped reduce at least one cardiovascular risk factor. To participate in this study, individuals had to be a patient of a primary care provider who was involved with the study. A randomized group of 415 obese patients were selected and split into three groups. The three groups consisted of face-to-face health coaching, telephonic health coaching or no health coaching at all during the intervention. All participants were encouraged to log on to a webpage that would help them with their weight loss goals. Health coaches, both in person and telephonic, touched on topics such as behavioral self-management, weight loss goals, exercise, reduction of caloric intake, self-efficacy and social support. All sessions were 20 minutes long, once a week and all individuals had access to a group session, except the control group. The duration of the study was 24 months with assessment at baseline, 6 months, 12 months and a final assessment at 24

months. Results showed that by the 6 month follow up the telephonic group recorded higher weight loss than the in person group (6.1kg versus 5.8kg). The 24 month follow up showed remote health coaching and in person health coaching yielded the exact same weight loss at 5.1kg. There was no statistical significance between the in person health coaching and the remote telephonic health coaching. However, another goal of this research was to get participants to lose at least 5% of their body weight; 41.4% of telephonic participants achieved that along with 38.2% of in person participants (Appel, et. al, 2011). Although the researchers main hypothesis was not statistically significant, this study showed that the practice of health coaching is effective either in person or electronically. A weakness of this study is that many individuals in the in person group were hospitalized, due to injuries related to obesity. This could be a reason why the results varied for in person health coaching, as obese individuals are at higher risk for injuries and therefore attrition.

### Summary

Health coaching is an emerging practice within the health promotion field. It helps individuals to incorporate healthy behaviors into their everyday life with the hope of combatting chronic diseases. With limited but slowly emerging research, health professionals can now incorporate health coaching into their wellness programs and enhance the lives of their employees. Past literature helps construct the agenda for the current study and shows that it is effective to enhance weight management behaviors in the workplace setting. Current gaps in the literature surrounding health coaching will be addressed in the study using *AhealthyU* weight loss challenge participants. The next chapter will discuss the methods for the current study.

## CHAPTER 3

### METHODOLOGY

#### Overview

This chapter will discuss the methodology of the current study, including the sample population, study design, intervention and comparison groups, study procedure and data analysis. Again, the main purpose of this study was to examine the relationship between health mentoring and its effects on weight status and behaviors regarding weight management.

#### *AhealthyU* Program

The current study was conducted as an extra component of *AhealthyU*'s current weight loss intervention. Participants were in no way required to partake in the research being conducted, and it did not interfere with their results. The Great American Weight Loss Challenge 2013 (GAWLC), hosted by *AhealthyU*, is the faculty and staff wellness program at American University in Washington, DC. There are over 2,500 faculty and staff members at American University that are targeted by *AhealthyU*. In 2012, *AhealthyU* captured 2,625 individuals that participated in at least one of the 20+ programs offered. Participating individuals complete a Personal Wellness Profile (PWP) that evaluates their current health status by entering their health "numbers", such as BMI, weekly amount of physical activity, and stress levels. The PWP from the spring of 2013 showed only 31.0% of individuals participating in weekly physical activity and only 43.7% of individuals eating a balanced diet. This is relevant to the current study due to the nature of the GAWLC and the need to increase the percentages maintaining an exercise regimen and eating a balanced diet.

The eight-week program ran from October 14, 2013 to December 6, 2013. The purpose of the challenge is to encourage healthy weight loss and weight management behaviors for

faculty and staff members of American University. Participants are recruited through word of mouth, the Today@AU announcement system, mass emails/flyers/letters, and *AhealthyU*'s Facebook page and webpage. The GAWLC begins by asking participants to join teams of four and select one individual to be their team captain. The team captain serves as a point of contact for *AhealthyU* and keeps teammates accountable to participate in the challenge. Individuals who enter the competition with no team enter as "Free Agents"; *AhealthyU* then assigns them a team and a team captain.

### Challenge Rules

Participants registered online and completed a registration form in addition to the *AhealthyU* 2013 Liability Waiver. When registering, participants were required to pay a \$5 fee that went towards the challenge winnings. This \$5 is applied towards the possibility of winning a cash prize if part of one of the top three teams in the challenge. The team that has the highest percentage of weight loss towards their individualized goal claimed the prize.

During the first week of the challenge participants came to the *AhealthyU* office for their initial weigh in to establish their weight loss goal. Weight loss goals must result in the participant maintaining a body mass index (BMI) of 20.0 or higher, or they are asked to maintain, this is staying within two pounds of their starting weight. Team standings were based on the percentage of weight loss goals that each team had achieved.

Participants are held accountable by coming to the *AhealthyU* office once a week to weigh in for their team. Participants came in Monday through Wednesday from 10am – 3pm. This gave the participants ample time to coordinate a time to weigh in. This is the only accountability that *AhealthyU* holds the participants to; keeping weight management in mind



was up to the participants in between visits. If participants miss a weigh in, there will be a 2lb penalty for that individual.

### Registration Form

All participants who wished to partake in the GAWLC must fill out the mandatory registration form. This form was given to the entire population of the GAWLC. Questions pertaining to department, contact information and team status were asked on the registration form.

### Intervention

The purpose of the current study was to examine the effect a health mentor had on participants of the GAWLC challenge and their weight status and behaviors towards weight management. Participants chose 'YES' or 'NO' when asked to participate in a research study during completion of the mandatory registration form. A group of 21 participants were chosen randomly and these were again randomly assigned into the experimental group or control group. Individuals in the experimental group attended health mentoring sessions structured around their schedule; each session was 15-minutes in duration. Each participant in the experimental group was asked to attend at least four sessions over the course of the eight-week challenge. The sessions were held in a private room in the Letts Lower Level conference room (See Appendix V for Health Mentoring Session Format). Additional data were collected from the experimental group regarding how the health mentor encouraged weight status changes, weight management strategies, self-efficacy, confidence in weight loss goals, and movement through stages of change according to the Transtheoretical Model.

### Recruitment

All 130 participants in the GAWLC were recruited through similar marketing techniques. These techniques consisted of a mass email to all of *AhealthyU's* constituents, which were around 1,000 individuals who were on the mailing list. Facebook posts were posted three times a week to capitalize on social media. Post cards were sent out to each faculty and staff member by *AhealthyU's* marketing team. Lastly, friends and colleagues did much of the marketing by word of mouth and asking friends to participate with them in the challenge.

### Sample

The GAWLC had 130 participants register, and of the 130 registered 78 selected 'Yes' to participate in a research study. Using an online random number generator tool, 10 participants were randomly selected for the experimental group and 11 were selected for the control group. The participants in this study include 21 adults. If a randomly selected participant did not respond or then selected to not participate a new number was randomly selected. Please refer to Table 1 for demographic and starting weight status information. Tests were performed to detect differences between the two groups regarding weight status as well as behavior changes. Participants are faculty and staff members of American University that enrolled in the Great American Weight Loss Challenge.

Table 1  
*Demographics & Start Weight Status*

	Mean Age	Mean Race	Gender	Average Start Weight	Average Start BMI
Control					
Men	42	White: 4.8%	1	206.8	28
Women	41.6	White: 26.6% African American:	10	164.1	28.3

		9.5%				
		Asian: 4.8%				
		Other: 4.8%				
Experimental						
Men	28.5	White: 9.5%	2	194.6	29.6	
Women	36.8	White: 24%	8	198.4	36.6	
		African American:				
		9.5%				
		Other: 4.8%				

### Informed Consent

All participants who were enrolled in the current study were required to complete an informed consent form. These participants were provided with a copy of the informed consent, which was hand-delivered by the researcher. The participants reviewed the document and communicated their consent to participate in the research study by signing the form. The informed consent form stated the exact outline of the study and informed them that the health coach would be referred to as a health mentor (See Appendix I).

### Experimental Group

The experimental group consisted of individuals who participated in health mentoring sessions as an add-on to the GAWLC program. Individuals who had health mentoring sessions participated in four, 15-minute sessions throughout the eight-week program. All health mentoring sessions were formatted the same, but may vary slightly due to participant's response. The health mentor practiced general themes such as:

- Identifying a reasonable goal
- How to achieve the goal and identifying strategies
- Planning on overcoming barriers

The main purpose of each session was to have each individual set an obtainable goal for the next session. These goals will be strategies for weight management and will start slow and small. For example: drinking 6-8 glasses of water a day, or taking the stairs three times a week. Once the individual has completed a small goal he or she moved to a larger goal. Overall, these goals are to help the individual practice weight management strategies that can help lead to an overall healthy lifestyle change. All notes taken during a health mentoring session were safely kept, evaluated and locked in the *AhealthyU* office. At the completion of the program all notes were destroyed appropriately. Participants took part in a pre and post program survey.

### Control Group

Individuals in the control group had elected to participate in a research study through their GAWLC registration form, but were randomly assigned to the control group. These participants competed in the GAWLC without a health mentor. The group's success and motivation was compared to the experimental group. This was done through the same pre and post program surveys (See Appendix II-IV). The control group's enrollment and participation in the GAWLC was not hindered due to their participation in the research study. At the end of the program, participants in the control group received an informational packet with all the information the health mentor went over. This included goal setting strategies, overcoming barriers related to weight loss, health related information that is touched upon in a health mentor session, and a general outline of each session (See Appendix VI). However, there was no personal information disclosed in these packets pertaining to individuals in the experimental group. Participants in the control group were offered health-coaching sessions after the research study ended

### Design

This was a randomized controlled experimental research study that attempted to investigate the effect of health mentoring on weight status as it pertains to pounds lost and BMI percent lost, weight management behaviors, self-efficacy and stages of change according to the Transtheoretical Model.

#### Independent Variable

The independent variable of the current research is the group assignment and who was assigned to the health mentor. The experimental group was assigned to the health mentor for a total of four, 15-minute sessions throughout the eight-week weight loss challenge. The control group did not receive health mentoring during the weight loss challenge. The health mentor was intended to help individuals in the experimental group lose more weight and identify best practices for weight management strategies.

#### Dependent Variable

There were two dependent variables associated with the current research. The first is the starting and ending weight and BMI of all participants involved in the current research. The next dependent measure was the pre and post behavioral surveys all individuals completed.

#### Measures

Participants will complete a pre-program survey, to assess current stages of change according to the Transtheoretical Model, self-efficacy, and current weight management behaviors. Moreover, these surveys also seek to identify how participants feel about their current strategies for weight management (See Appendix II-IV). Following program completion, participants filled out a post program survey to evaluate what has changed throughout the course of the study. To assess change the same items that were asked in the pre-program survey will be revisited in the post program survey, and a change score will be

calculated. BMI's will be calculated based on participants' height and weight pre and post intervention.

For the purpose of this study two surveys were designed to collect accurate data and investigating the effect of health mentoring on weight loss during the GAWLC. Surveys administered to the control and experimental groups consisted of the same core content, but were tailored to the appropriate condition.

The pre-program survey was administered to gather baseline data that is needed to see how participants changed over the course of an eight-week program. Both the experimental and control group took the same pre-program survey (See Appendix II).

Participants in the control and experimental group will take slightly different surveys, but again, with the same core content. The differing questions will be in relation to the health mentor and if that helped the participant succeed in their weight loss goals. In the control group survey, it will ask if the GAWLC had an effect on their ability to lose weight.

#### Data Collection

Data collection began during the first week of the challenge when participants filled out their pre-program survey, and again when the challenge ended on December, 6, when the post program evaluation survey was completed. All information was documented in a Microsoft Excel Spread sheet and coded appropriately to export to SPSS.

#### Data Analysis

Data analyses were performed using SPSS, and a p-value of less than or equal to 0.05 was considered significant for all tests. Analyses were performed using all participants who enrolled in this study (n = 21). One-way analyses of variance (ANOVA) were used to test the significance of the experimental and control groups differences in weight, BMI and pre, post

survey data. Also, independent t-tests were used to compare means of variables. All variables, pre and post survey data and pre and post weight and BMI's were used in data analysis, nothing was discarded.

## CHAPTER 4

### RESULTS AND ANALYSIS

#### Overview

This chapter reviews the results of the data analysis as it relates to the four hypotheses of the study. Significance for all variables will be shown with a  $p$  value of .05.

#### Results

The primary hypothesis was the experimental group would have a greater change in their weight status according to pounds lost and BMI change over the course of an eight-week challenge with the assistance of a health mentor, compared to the control group. Starting weight and ending weight were compared using a change score as was the starting and ending BMI. These variables were named WeightLost and BMICChange. The primary hypothesis was tested using a one-way analysis of variance (ANOVA). The primary hypothesis proved to be significant. The variables showed highly significant change WeightLost ( $p=.003$ ) and BMICChange ( $P=.002$ ). In tables 4, 5 and 6 the average start and end weight for both experimental and control group are shown. This demonstrates the starting and ending weight distribution.

*Table 2*  
Oneway ANOVA WeightLost Variable

	Sum of Squares	Df	Mean Squares	F	Significance
Between Groups	196.773	1	196.773	11.784	.003
Within Groups	317.265	19	16.698		
Total	514.038	20			

*Table 3*  
Oneway ANOVA BMICChange Variable

	Sum of Squares	Df	Mean Squares	F	Significance
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Between Groups	7.995	1	7.995	13.641	.002
Within Groups	11.136	19	.586		
Total	19.131	20			

Table 4  
*Experimental Group Weight Loss*

Participant	Total Weight Loss	Total BMI Loss
1	14 lbs	2.8
2	6.4 lbs	0.9
3	9 lbs	1.8
4	0.8 lbs	0.6
5	3 lbs	0.5
6	12.8 lbs	2.8
7	1.8 lbs	0.9
8	6.8 lbs	1.1
9	5.6 lbs	0.8
10	4 lbs	0.7

Table 5  
*Control Group Weight Loss*

Participant	Total Weight Loss	Total BMI Loss
1	+1.6 lbs	+0.2
2	+ 2 lbs	+0.3
3	3.8 lbs	0.5
4	1.2 lbs	0
5	+5.8 lbs	+1.0
6	1.6 lbs	0.3
7	5.8 lbs	1.2
8	4.4 lbs	0.8
9	2 lbs	0.3
10	+5 lbs	+0.8
11	+1.2 lbs	+0.2

Table 6  
*Average Start and End Weight and BMI*

	Average Start Weight	Average Start BMI	Average End Weight Loss	Average End BMI
Experimental	197.6	35.23	191.2	33.94
Control	167.9	28.25	167.7	28.2

A limitation of this finding was that the control group had a lower starting weight than the experimental. Therefore, the significance of the amount of weight lost between pre and post for each group separately was also examined. A t-test was conducted comparing the starting and ending weights and BMI's by comparing both conditions and examining the differences at baseline and post intervention means using the same measurement under different conditions. The experimental group showed significance change between Start weight, and end weight ( $p=.001$ ), and start BMI, and end BMI( $p=.001$ ), whereas the control group did not show changes in either, weight ( $p=.803$ ), or BMI ( $p=.788$ ).

Table 7  
*Paired Samples T-Test Experimental Group*

	t	df	Significance
StartWeight – EndWeight	4.589	9	.001
StartBMI- EndBMI	4.676	9	.001

Table 8  
*Paired Samples T-Test Control Group*

	t	df	Significance
StartWeight – EndWeight	.257	10	.803
StartBMI- EndBMI	.276	10	.788

A secondary hypothesis in the current study is that participants in the experimental group were expected to show a greater shift in behavior change associated with effective weight management strategies as compared to the control group. Behavior change was measured through a pre and post behavioral survey. The behavior change items assessed amount of physical activity, water intake, planning ahead for meals, and frequency of breakfast consumption. The secondary hypothesis was also measured using a one-way ANOVA between the four different behavior categories. All four behaviors were measured using a change score

that described the post from the pre surveys to find the positive change. The first behavior BreakfastChange proved to be significant ( $p=.043$ ). Where-as the remainder of the conditions, WaterIntake ( $p=.325$ ), PlanningMealsChange ( $p=.500$ ), and lastly ChangePhysicalActivity ( $p=.654$ ) did not show a statistically significant change.

Table 9  
*Behavior Shifts for Hypothesis Two*

	Sum of Squares	Df	Mean Square	F	Sig.
WaterIntakeChange					
Between Groups	.500	1	.500	1.021	.325
Within Groups	9.309	19	.490		
Total	9.810	20			
Breakfast Change					
Between Groups	1.829	1	1.829	4.690	.043
Within Groups	7.409	19	.390		
Total	9.238	20			
PlanningMealsChange					
Between Groups	.249	1	.249	.472	.500
Within Groups	10.036	19	.528		
Total	10.286	20			
ChangePhysicalActivity					
Between Groups	.229	1	.229	.207	.654
Within Groups	21.009	19	1.106		
Total	21.238	20			

The third hypothesis stated that individuals in the experimental group would demonstrate greater self-efficacy as compared to the control group, also measured through pre and post surveys. This component was examined through a one-way ANOVA. The one-way ANOVA was used to compare change scores from the post and pre surveys to find the positive change within self-efficacy, which proved to be statistically significant ( $p=.005$ ).

Table 10  
*Oneway ANOVA ConfidenceWMChange*

	Sum of Squares	df	Mean Squares	F	Significance
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Between Groups	3.202	1	196.773	11.784	.005
Within Groups	6.036	19	16.698		
Total	9.238	20			

The fourth and final hypothesis was that individuals in the experimental group would move through more stages of change, according to the Transtheoretical Stages of Change Model, than those in the control group. This information was evaluated through pre and post surveys. The information from the survey was examined through a one-way ANOVA, using participant change scores from pre and post survey evaluation ( $p=.156$ ). The fourth and final hypothesis proved to be insignificant.

Table 11  
*Lifestyle Change*

	Sum of Squares	df	Mean Squares	F	Significance
Between Groups	.471	1	.471	2.185	.156
Within Groups	4.100	19	.261		
Total	4.571	20			

## CHAPTER 5

### DISCUSSION

The primary focus of this research was to examine how a health mentor can affect an individual's weight status, specifically BMI, pounds lost, and weight management behaviors over the course of an eight-week weight loss challenge. The current research aligned with past literature on weight loss challenge techniques, (Brownell, Cohen, Stunkard, Felix, & Cooley, 1984; Appel et al, 2011), health coaching techniques (Butterworth, Linden, McClay & Leo, 2011; Butterworth Linden, & McClay, 2007), and health coaching related to weight loss and behavior change (Abrams & Follick, 1983). The four study hypotheses all focused on how a health mentor can positively affect weight management behaviors and weight status. Weight management behaviors included water consumption, frequency of breakfast eaten per week, frequency of meal planning pre week and the amount of physical activity participated in per week. Moreover, behaviors related to participants' self-efficacy and where they stood in relation to the Transtheoretical Stages of Change Model were also assessed. The results showed that individuals in the experimental group lost more weight through pounds lost and BMI reductions than their counterparts in the control group. Participants in the experimental group also reported greater behavior change in one category, breakfast frequency, and higher levels of self-efficacy. This study contributed to the health coaching field by providing significant evidence that health coaching has an effect on weight loss and weight management.

The first and primary hypothesis stated that participants in the experimental group would show greater weight loss over the course of an eight-week weight loss challenge than their counterparts in the control group. This was proven statistically significant in both aspects of weight loss and BMI percentile change. These results are consistent with past research

suggesting that individuals will lose more weight with the assistance of a health mentor (Butterworth, Linden, McClay, & Leo 2011), especially if registered in a weight loss challenge (Brownell, Cohen, Stunkard, Felix, & Cooley, 1984). Although the scale of Brownell et al. (1984) study was much larger, the premise was similar; to have participants compete in a weight loss challenge to lose weight. A similar study design was used in the *AhealthyU* weight loss challenge, one difference between the two was in *AhealthyU*'s weight loss challenge participants chose their own team mates instead of being randomly placed on a team based on weight percentage, which might enhance the participant's personal successes. Participants who choose their own teammates may be positively affected by social support, which is another reason there is a need for non-randomization when it comes to team placement. Brownell et al. (1984) study helped frame the idea that weight loss challenges are effective in the worksite and can enhance motivation for participants. It presented the data that individuals do lose weight when partnered with a team and are held accountable by someone to manage their weight, which was also found to be statistically significant in the current research. With this information *AhealthyU* added more incentives throughout the program to keep participants interested, such as free group exercise classes and wellness workshops. With the assistance of a health mentor, individuals were given the responsibility of attending these sessions and therefore had an extrinsic motivator to keep them interested and motivated throughout the challenge. Individual's in Brownell et al. (1984) research had behavioral aspects involved in the challenge, but not a structured meeting every other week. Having a health mentor holds individuals accountable and responsible for their actions and behaviors as well as weekly meetings. Where Brownell et al. (1984) research showed weakness was randomizing the teams rather than the participants in the study, which reflected in the results of the research by not all participants losing a significant

amount of weight as well as not counting 26% of participants due to weight conflicts as well as a behavior manual. Overall, Brownell et al. (1984) early idea of a weight loss challenge has laid down the framework for all weight loss programs in wellness programs.

The second part of the primary hypothesis, which focused on health mentoring's effect on BMI also proved to be significant. Health coaching information was consistent with Butterworth, Linden, McClay and Leo, 2011 and aided in structuring the health mentoring sessions for the current study. The major differences between Butterworth et al. (2011) and the current research was the use of a randomized study, and participants were asked to come to at least four health mentoring sessions. Butterworth et al. (2011) had participants self-select to receive health coaching as well as choose over the three-month period when they would like to set up a session. A large portion of health coaching research today is not randomized such as Butterworth, Linden, McClay, and Leo, 2006 and Grant, 2003. Therefore it is important to maintain a standard for credible health coaching research. The results of Butterworth et al. (2011) research proved to be statistically significant and were consistent with the findings in the current study. Past literature helped show that health coaching can have a significant effect on weight status and behavior change, with only the use of a health coach and the absence of a program.

Another study that the current research pulled from was Appel et al, (2011). Appel et al. (2011) presented a study similar to Brownell's with the idea of weight loss challenges enhancing weight loss and motivation. However, the only individuals who were able to participate were obese. This study was a randomized study, similar to the current research. The study lasted 24 months, which was much longer than the current research; therefore, it provided information on weight loss and health coaching over a long period of time, which was valuable

because it presented information that individuals could commit to a health coaching schedule for an extended period of time. Moreover, the behavioral aspect of weight management provided information that the use of a health coach can work regardless of the method. Appel et al. 2011 provided significant evidence that health coaching works across different modalities such as, telephonic, electronic in person and group sessions. In the case of the current study, health coaching was only performed in person. The health coaching format of the current research was framed from many aspects of the Appel et al. (2011) study, such as, asking open ended question, supporting patient's optimism when it comes to weight loss or weight management behaviors, keeping conversation client center and directing the conversation towards a desired behavioral goal. This helped facilitate weight loss with the participants involved. The health coach redirected individuals' weight loss frustrations and helped them focus on specific goals to accomplish healthy sustainable weight loss. One aspect of this study that was not performed in the current research was the idea of group health coaching. The current research did not have the time or the appropriate sample size to accomplish a goal such as group health coaching. Overall, Appel et al. (2011) helped frame the current study in the same way that Brownell et al. (1984) did, however, this study was more recent and touched on the aspect of health coaching and specific behavior change methods involved.

The second hypothesis stated that participants in the experimental group would show a greater shift in behavior change over the course of the eight-week weight loss challenge. As previously stated, those behaviors consisted of amount of physical activity, water intake, planning ahead for meals and frequency of breakfast consumption. One of the four behaviors, breakfast consumption, proved to be statistically significant, while water intake, planning for meals, and physical activity were statistically insignificant. These specific behaviors were



chosen due to their positive effects on healthy weight management techniques, according to the CDC (Center for Disease Control, 2013). Research was limited in addressing each of these specific behaviors that are in the current study; however, Butterworth, Linden and McClay, 2007 found consistent results with behavior change in different topics. Some behaviors that were touched on in Butterworth et al. (2007) research included participants' health status of everyday life, how they felt after exercise or if they did exercise, and how they felt when eating a healthy diet if there was absence of a healthy diet before. These behaviors paralleled with the behaviors in the current research, touching on nutrition, physical activity and their overall perception of health. For example, Butterworth et al. (2007) research examined exercise frequency as well as diet habits, which were both examined in the current research.

Reasons for not seeing a significant change in many of the weight management behaviors in the current research could be due to the sample size of the population being too small, or perhaps the study was not long enough to facilitate significant change. However, breakfast consumption, which was slightly significant between groups, was a topic that was largely talked about because many participants inquired about nutritional habits, portion sizes and how eating a regular diet can benefit to their daily health.

Self-efficacy was proven statistically significant and is consistent with current research from Butterworth, Linden, McClay and Leo, 2006, Abrams and Follick, 1983 and Linde, Rothman, Baldwin and Jeffery, 2006. The third hypothesis stated that individuals in the experimental group would show a greater shift in self-efficacy, which proved to be statistically significant by comparing pre and post data between experimental and control groups. Weight loss and behavior change go hand in hand according to a health coaching review by Butterworth, et al. (2006). Having a health mentor throughout a weight loss process may be one

way to boost confidence in people and give them a sense of direction, which was shown in Butterworth et al. (2007). Linde et al. (2006) showed in his research that having a strong self-efficacy component can aid in the enhancement of weight loss, diet, as well as confidence.

The current study also showed consistent findings with Abrams and Follick, (1983) on self-efficacy and weight loss. Abrams and Follick, (1983) conducted a weight loss challenge among staff members at a hospital. In addition to the weight loss component there was a large emphasis on behavior change and how confident the participants felt in their ability to manage their weight and health. All these components helped participants with self-monitoring and self-efficacy. These components proved significant within the study to help the participants with their weight loss goals, weight management, and self-efficacy towards healthy weight loss practices. The current study pulled from Abrams' research to help enhance and measure self-efficacy. The strong need for individuals to choose their teammate was *AhealthyU's* form of the buddy system, because social support is key in regards to confidence, self-efficacy and weight loss. Unfortunately the current study did not touch on specifics regarding nutrition and did not ask participants to record their dietary habits. Self-efficacy is an important concept when it comes to weight loss and management; confidence in oneself is a great way to stay committed to a healthy lifestyle. This information is current with Linde et al. (2006) findings when it comes to weight loss and self-efficacy. The research stated that individuals who had greater self-efficacy were more likely to lose weight, and self-efficacy was strengthened when the health mentor met with participants.

Lastly, the fourth and final hypothesis stated that individuals in the experimental group would demonstrate a greater shift in stages of change according to the Transtheoretical Model and was statistically insignificant. Questions in the surveys that provided us information to

assess this hypothesis asked if individuals had been thinking about weight management behavior change 6 months prior to challenge and if they felt they could maintain their current weight status. A limitation to these questions is that individuals who have signed up for the GAWLC must have already been in the contemplation phase because they joined a weight loss challenge committed to trying to lose weight, therefore, there was likely not much variance in participants' stage of readiness for change. What could have been done differently was to assess the populations mind set before, during and after the challenge, to see where they were on a six-month spectrum with weight management behaviors, and to assess the weight management maintenance of the participants. Another limitation to this measure was the amount of time the challenge lasted as well as the population size. According to Transtheoretical model research, most behaviors take at least 6 months to become a habitual behavior for the given individual (O'Donnell, 2002).

### Limitations

There were limitations to the current research that should be noted. Mainly, the majority of the participants were Caucasian women. There was a lack of racial and gender diversity in the population. The sample size was another limitation to the current research; the smaller sample size reduced the statistical power to find meaningful effects. Moreover, the length of the study might have also had a negative impact on the current research. Had there been more time to work with participants there could have been greater change in behavior. In addition to unequal demographic and time restraints on the research, participants in the control group also had a lower average start weight. The control group participants' average starting weight was 30lbs lighter than the experimental group's. In weight loss it is harder to lose weight when you have less weight to start with, which could be a possible reason that the experimental group

showed significant results (O'Donnell, 2002). Another limitation is that the health mentor did not have a health coaching certification. However, the health mentor received extensive training with a clinical psychologist in the proper counseling and health coaching techniques were given. Lastly, having the health mentor act as the primary researcher for the current study may have also had some kind of effect on the participants as well as the results. For example, participants may feel as though they are letting the primary researcher down if their results do not provide significant findings. This could skew the results to benefit the health mentor as well as the results and should be controlled for in future research. These limitations are something that could be identified if the research is to be recreated.

### Strengths

The strengths of the current study came from the previous literature's gaps, which were assessed to build a strong case for health coaching and weight loss and management. One of the most obvious strengths in the current study was the utilization of randomization. Randomizing the sample gives all participants an equal chance of being selected into either group and eliminates self-selection into specific groups. Another strength this study possessed was the use of *AhealthyU's* weight loss challenge and being able to have access to participants who were participating in the challenge and also willing to have a health mentor. The use of partnering a health mentor with participants in a weight loss challenge can help alleviate weight loss myths, give opportunities for participants to ask questions and concerns, as well as give the participants a sense of companionship. Another strength of the study was the 100% retention rate of the experimental group, all participants attended all four of their scheduled health mentoring sessions. Most importantly, the ability to partner with *AhealthyU* gave this research a chance to show that the use of a health coach is effective in a worksite health promotion program setting.

### Summary

Although not all of the hypotheses were statistically significant, two of the four, and one component of a third showed significance. Most importantly, the main hypothesis proved to be significant, which was that individuals in the experimental group would show greater decreases in their weight status, including pounds lost and BMI percentage decrease. Also, breakfast consumption and participants felt more confident after the intervention. These findings highlight the importance of health coaching to facilitate weight loss, behavior change and weight management. These outcomes suggest that health coaching has a significant effect on weight loss as well as certain weight management behaviors. These findings could help future research in the health promotion field to enhance weight loss for individuals as well as keep the weight off with weight management behaviors. This information could also be useful to individuals in the workplace to help reduce insurance costs and keep their workforce healthy and attentive. Overall, health coaching coupled with weight loss and weight management is an area that needs to be discussed and researched further.

## APPENDIX I

### INFORMED CONSENT

#### Consent to Participate in Research

##### **Identification of Investigators & Purpose of Study**

You are being asked to participate in a research study conducted by Emily Swartz from American University. The purpose of this study is to evaluate weight loss with the use of a health mentor, to examine whether greater weight loss occurs due to this additional assistance. This study will contribute to the student's completion of her Master's Thesis.

##### **Research Procedures**

Should you decide to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction. If you participate, you will have a 50/50 chance of being assigned to one of two groups. Participants in the study will be randomly assigned to either an intervention or comparison condition, and thus may or may not receive meetings with a health mentor. Both groups will participate in the Great American Weight Loss Challenge.

The intervention group consists of four biweekly sessions with a non-medical health mentor. These sessions will be located in Letts lower level 3. The mentor may take notes during these sessions, which will be stored in the AhealthyU office in a locked drawer. The mentor will use initials rather than full names on these notes to further ensure confidentiality, and they will be destroyed upon completion of the research. The comparison group will receive a packet of health information similar to what would be discussed with the health mentor at the end of the study. If you are assigned to this group, you will be invited to a debriefing session in Letts lower level 3 at the end of the study where you will receive this packet.

The interventions described here may or may not impact physical activity behaviors through planning weight management activities. Both groups will be emailed a series of questionnaires before and after the program. You will be asked to provide answers to a series of questions related to physical activity and your experience with the health mentor throughout the Great American Weight Loss Challenge. In addition, by consenting to participate, you are also allowing the primary investigator, Emily Swartz, to review your data collected from the Great American Weight Loss Challenge.

##### **Time Required**

Overall, it is estimated that participation in this study will require a total of 1 hour, spread throughout the 8 week challenge in 15 minute sessions with the health mentor. The post survey will require approximately 5-7 minutes.

## **Risks**

**The investigator does not perceive more than minimal risks from your involvement in this study. Physical risks associated with aerobic exercise may be faced due to participation in the Great American Weight Loss Challenge. The nature of the program, however, promotes exercising and weight loss at a comfortable pace. AhealthyU addresses issues associated with physical activity in the American University Release, Waiver of Liability and Assumption of Risk for Participation in 2013 AhealthyU Programs, which you must also sign to participate in the program. The health mentoring and surveys of the study pose no additional physical risks. Psychological discomfort may occur while disclosing information related to your weight management behaviors to the health mentor or in the surveys. The health mentor is trained in theory and practice from her thesis advisors, who both hold PhDs in counseling-related fields. In addition, another potential risk includes possible feelings of discomfort while disclosing information to the health mentor, knowing she is also the director of the research study. Participants are encouraged to share any concerns about this with Emily Swartz or her thesis advisors, Drs. Stacey Snelling and Elizabeth Cotter. All participants are encouraged to answer honestly rather than feeling pressured to respond in a certain manner. If the participant feels there is an issue that needs to be dealt with outside of this research study, they will be referred to the Faculty and Staff Assistance Program.**

## **Benefits**

Potential benefits from participation in this study include increased physical activity, which may reduce the risk of some chronic diseases, improve mood, and improve energy levels. This research will benefit the health promotion field as a whole in contributing to the understanding of motivational and behavioral efforts as they pertain to weight loss.

## **Confidentiality**

The results of this research will potentially be presented at a conference or published in a paper. The results of this project will be coded in such a way that the respondent's identity will not be attached to the final form of this study. The researcher retains the right to use and publish non-identifiable data. While individual responses are confidential, aggregate data will be presented representing averages or generalizations about the responses as a whole. All data will be stored in a secure location accessible only to the researcher. Upon completion of the study, all information that could link individual respondents with their answers will be destroyed.

## **Participation & Withdrawal**

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind. You

may also refuse to answer any individual question without consequences. You are still eligible to participate in the Great American Weight Loss Challenge and any individual or team prizes associated with that participation, regardless of whether you choose to partake in the study or not.

### **Questions about the Study**

If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Emily Swartz

Anastasia Snelling

SETH-Health Promotion Management

SETH-Health Promotion Management

American University

American University

[es7826a@student.american.edu](mailto:es7826a@student.american.edu)

[\(202\)885-6278](tel:(202)885-6278)

(716)786-0121

[Stacey@american.edu](mailto:Stacey@american.edu)

### **Questions about Your Rights as a Research Subject**

Dr. David Haaga

Matt Zembrzusi

Chair, Institutional Review Board

IRB Coordinator

American University

American University

[\(202\)885-1718](tel:(202)885-1718)

[\(202\)885-3447](tel:(202)885-3447)

[dhaaga@american.edu](mailto:dhaaga@american.edu)

[irb@american.edu](mailto:irb@american.edu)

### **Giving of Consent**

I have read this consent form and I understand what is being requested of me as a participant in this study. I freely consent to participate. I have been given satisfactory answers to my questions. The investigator provided me with a copy of this form. I certify that I am at least 18 years of age.



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Name of Participant (Printed)

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Name of Participant (Signed)

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Date

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Name of Researcher (Signed)

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Date

## APPENDIX II

### Pre Behavioral Program Survey:

Name:

Year Born:

Sex:

Race:

- A. African American
- B. Asian
- C. Native American
- D. White
- E. Other:

How often do you eat breakfast?

- A. Everyday
- B. Most days
- C. Some days
- D. No days

How much water do you drink daily? (12 ounce servings)

- A. 6 or more glasses
- B. 3 to 5 glasses
- C. 1 to 2 glasses
- D. No water consumption

How regularly do you plan your meals or does someone else plan your meals?

- A. Everyday
- B. Most days
- C. Some days
- D. No days

How well does your significant other, family, or friends support your health decisions?

- A. Very supportive
- B. Supportive
- C. Not Very Supportive
- D. No Support

How many days per week do you engage in 30+ minutes of physical activity?

- 0 days
- 1 – 2 Days
- 3 – 5 Days
- 6 -7 Days

How many days per week do you practice healthy nutrition habits consistent with weight management?

- 0 days
- 1 – 2 days
- 3-5 days
- 6-7 days

How confident are you that you can overcome barriers related to weight management for the duration of the challenge?

- Very Confident
- Confident
- Not confident
- Not likely to participate

How often have you thought about engaging in a healthy lifestyle change in the past 6 months?

- Very Often
- Often
- Not Often
- Never

### APPENDIX III

#### **Post Program Behavioral Survey: Control**

Name:

Year Born:

Sex:

Race:

- African American
- Asian
- Native American
- White
- Other:

How many days per week do you engaged in 30+ minutes of physical activity?

- 0 days
- 1-2 days
- 3-5 days
- 6-7 days

How many days per week do you practice healthy nutrition habits consistent with weight management?

- 0 days
- 1-2 days
- 3-5 days
- 6-7 days

How confident are you that you can continue to overcome barriers related to weight management?

- Very Confident
- Confident
- Not Confident
- Not Likely to participate

How often have you thought about engaging in a healthy lifestyle change in the past 6 months?

- Very Often
- Often
- Not Often
- Never

How often have you thought about seeking out methods for healthy behaviors in the past 6 months?

- Very Often
- Often

- Not Often
- Never

Was the Great American Weight Loss Challenge (GAWLC) effective assisting you in setting your weight loss goals?

- Very Effective
- Effective
- Somewhat Effective
- Not Effective

Was the program effective assisting you in identifying strategies to achieve your weight loss goals?

- Very Effective
- Effective
- Somewhat Effective
- Not Effective

Was the program effective assisting you in achieving your weight loss goals?

- Very Effective
- Effective
- Somewhat Effective
- Not Effective

How confident are you that you can maintain a healthy lifestyle behavior after the program?

- Very Confident
- Confident
- Not Confident
- Not Likely to participate

How often do you eat breakfast?

- Everyday
- Most days
- Some days
- No days

How much water do you drink daily? (12 ounces)

- 6 or more glasses
- 3 to 5 glasses
- 1 to 2 glasses
- No water consumptions

How regularly do you plan your meals or does someone else plan your meals?

- Everyday
- Most days

- Some days
- No days

How well does your significant other, family, or friends support your health decisions?

- Very supportive
- Supportive
- Not Supportive
- No support group

## APPENDIX IV

### **Post Behavioral Survey: Experimental Group**

Name:

Year Born:

Sex:

Race:

- African American
- Asian
- Native American
- White
- Other:

How many days per week do you engaged in 30+ minutes of physical activity?

- 0 days
- 1-2 days
- 3-5 days
- 6-7 days

How many days per week do you practice healthy nutrition habits consistent with weight management?

- 0 days
- 1-2 days
- 3-5 days
- 6-7 days

How confident are you that you overcome barriers related to weight management for the duration of the challenge?

- Very Confident
- Confident
- Not Confident
- Not Likely to participate

How often have you thought about engaging in a healthy lifestyle change in the past 6 months?

- Very Often
- Often
- Not Often
- Never

How often have you thought about seeking out methods for healthy behaviors in the past 6 months?

- Very Often

- Often
- Not Often
- Never

Was the Health Mentor effective assisting you in setting your weight loss goals?

- Very Effective
- Effective
- Somewhat Effective
- Not Effective

Was the Health Mentor effective assisting you in identifying strategies to achieve your weight loss goals?

- Very Effective
- Effective
- Somewhat Effective
- Not Effective

Was the Health Mentor effective assisting you in achieving your weight loss goals?

- Very Effective
- Effective
- Somewhat Effective
- Not Effective

How confident are you that you can maintain a healthy lifestyle behavior?

- Very Confident
- Confident
- Not Confident
- Not Likely to participate

How often do you eat breakfast?

- Everyday
- Most days
- Some days
- No days

How much water do you drink daily? (12 ounces)

- 6 or more glasses
- 3 to 5 glasses
- 1 to 2 glasses
- No water consumptions

How regularly do you plan your meals or does someone else plan your meals?



- Everyday
- Most days
- Some days
- No days

How well does your significant other, family, or friends support your health decisions?

- Very supportive
- Supportive
- Not Supportive
- No support group

## APPENDIX V

### Health Mentoring Session Format

Recruitment will take place via the final item on the Great American Weight Loss Challenge (GAWLC) registration form asking whether individuals would like to participate in a research study. Refusal to participate will in no way affect their participation in the GAWLC program. Participants who respond yes to this item will be emailed and asked to come to Letts Lower Level 3 to complete the informed consent form and learn more about the study. Once all participants have been enrolled, participant IDs will be entered into a randomizing computer generating tool and they will be assigned to either the intervention or comparison group. Participants will receive a phone call informing them of their group assignment and next steps. The items below signify the outline of a typical session with the health mentor. The main objective is to set an obtainable goal for the participant to work on each week. If the goal is completed the next session will focus on a more challenging goal. If not, discussion will focus on which barriers restricted that goal from being accomplished. Since the comparison group will not have the benefit of a health mentor they will receive a packet at the end of the program which will include the information from health mentoring sessions on how to set and accomplish goals, as well as overcoming barriers and becoming successful in weight management.

#### Session Outline:

Main Objective for session: Set one obtainable goal

- Opening remarks
- Identify reasonable goal
- Discussion how to achieve that goal
  - Strategies are identified to achieve that goal
  - Planning around barriers to achieving the goal.
- Give participant objectives to complete until the next session
- Address any questions or concerns
- Closing remarks

## APPENDIX VI

As part of my research study the control group is promised an outline of what was went over in the health coaching sessions with the experimental group. Main topics discussed were nutrition and exercise. Listed below is a general table of recommended servings and a recommended amount of physical activity in order to see results and push yourself into a healthier lifestyle. This table shows the suggested number of servings from each food group based on a daily intake of 1,600 or 2,000 calories. The recommended number of calories for you depends on your age, physical activity level and whether you are trying to lose, gain or maintain your weight. When incorporating physical activity into your daily routine you should be exercising for at least 30 minutes 4-5 times a week to maintain a balanced healthy lifestyle. Overall calorie intake is a personal decision that should be tailored to your needs. Goal setting is a very important idea when trying to change your lifestyle. Try setting nutrition or physical activity related goals in order to help you succeed.

Food Type	1,600 Calories	2,000 Calories	Examples of One Serving
<b>Grains</b>  At least half of your servings should be whole-grain.	6 servings per day	6-8 servings per day	<ul style="list-style-type: none"> <li>• 1 slice bread</li> <li>• 1 oz dry cereal (check nutrition label for cup measurements of different products)</li> <li>• 1/2 cup cooked rice, pasta, or cereal (about the size of a baseball)</li> </ul>
<b>Vegetables</b>  Eat a variety of colors and types	3-4 servings per day	4-5 servings per day	<ul style="list-style-type: none"> <li>• 1 cup raw leafy vegetables (about the size of a small fist)</li> <li>• 1/2 cup cut-up raw or cooked vegetables</li> <li>• 1/2 cup vegetable juice</li> </ul>
<b>Fruits</b>  Eat a variety of colors and types	4 servings per day	4-5 servings per day	<ul style="list-style-type: none"> <li>• 1 medium fruit (about the size of a baseball)</li> <li>• 1/4 cup dried fruit</li> <li>• 1/2 cup fresh, frozen, or</li> </ul>

			canned fruit
			<ul style="list-style-type: none"> <li>• 1/2 cup fruit juice</li> </ul>
<b>Fat-free or low-fat dairy Products</b>	2-3 servings per day	2-3 servings per day	<ul style="list-style-type: none"> <li>• 1 cup fat-free or low-fat milk</li> <li>• 1 cup fat-free or low-fat yogurt</li> <li>• 1 and 1/2 oz fat-free or low-fat cheese (about the size of 6 stacked dice)</li> </ul>
<b>Lean meats, poultry, and seafood</b>	3-6 oz (cooked) per day	Less than 6 oz per day	<ul style="list-style-type: none"> <li>• 3 oz cooked meat (about the size of a computer mouse)</li> <li>• 3 oz grilled fish (about the size of a checkbook)</li> </ul>
<b>Fats and oils</b>  Use liquid vegetable oils and soft margarine most often	2 servings per day	2-3 servings per day	<ul style="list-style-type: none"> <li>• 1 tsp soft margarine</li> <li>• 1 Tbsp mayonnaise</li> <li>• 1 tsp vegetable oil</li> <li>• 1 Tbsp regular or 2 Tbsp low-fat salad dressing (fat-free dressing does not count as a serving)</li> </ul>
<b>Nuts, seeds, and legumes</b>	3-4 servings per week	4-5 servings per week	<ul style="list-style-type: none"> <li>• 1/3 cup or 1 and 1/2 oz nuts</li> <li>• 2 Tbsp peanut butter</li> <li>• 2 Tbsp or 1/2 oz seeds</li> <li>• 1/2 cup dry beans or peas</li> </ul>
<b>Sweets and added sugars</b>	0 servings per week	5 or fewer servings per week	<ul style="list-style-type: none"> <li>• 1 Tbsp sugar</li> <li>• 1 Tbsp jelly or jam</li> </ul>

- 1/2 cup sorbet and ices

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