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Creating a Culture of Wellness: A Baseline Multidimensional Analysis of Wellness at a Small Private Historically Black College and University

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Approval Page

This dissertation was submitted by Victor Owen Romano under the direction of the persons listed below. It was submitted to the Gardner-Webb University School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Gardner-Webb University.

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Abstract

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Wellness is something that needs to be taught, encouraged, and valued within a community for it to be obtainable. Preventable health disparities attributed to lack of physical activity continue to be a burden in predominantly African-American communities. Preventative wellness programming has been shown to be successful for students, as well as employees, as long as it is culturally relevant, especially when working within a predominantly African-American population. The purpose of this study was to establish a baseline multidimensional analysis of wellness in correspondence with the opening of a new wellness center.

Data were gathered from employees and students from a small private university by use of MicroFit software in three categories: health history, wellness profile, and fitness profile. Health History showed that students were at an elevated risk for developing cardiovascular disease, while high percentages (18.6%) of employees were already receiving treatment for cardiovascular disease. Wellness profile indicated that employee wellness was better than student wellness in all five categories that were analyzed (exercise, nutrition, safety, stress, and tobacco). Combination of staff and student campus wellness analysis showed that exercise and nutrition were the two aspects of wellness that tied for the worst scores (41 of 100). Overall campus fitness data indicated that blood pressure was pre-hypertensive (133/81), aerobic fitness was in the 30th percentile (VO2max 29.3 ml/kg/min), and BMI was 28.0. Other fitness tests were within normal standards. Data indicated that exercise and nutrition habits are areas that need to be improved.

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Chapter 1: Introduction

During the last 20 years, wellness and health promotion programs at colleges and universities have grown (Bogar, 2008). Colleges and universities are using their close environment to make positive lifestyle changes in their students and employees, along with trying to enhance their overall quality of life (Floyd, 2003). Light (1995) noted that although college students and employees are satisfied with the overall college experience as it relates to their wellness, individuals are less likely to make healthy lifestyle choices if they do not have the prior knowledge that they have an unhealthy lifestyle, which may lead to an increase of health risk factors, thus making wellness assessments key components for individuals to live a healthy lifestyle.

Wellness programs have been proclaimed by the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), Mayo Clinic, and many others as a valuable tool for controlling lifestyle health disparities. Most literature uses the term *wellness* because it is based on or promotes a comprehensive multidimensional model of wellness. Wellness models as early as Hettler (1980) consisted of intellectual, emotional, physical, social, occupational, and spiritual components. The components were developed to provide a comprehensive view of wellness in order to promote physical health. Later models, such as Adams, Bezner, and Steinhardt's (1997) six dimensional model, were developed as the theoretical basis for wellness assessments. Wellness models have been created for many different populations, all of which include conceptualization, assessment, or promotion. Wellness has to be "an active process where individuals become aware of, and make choices towards a more successful existence" (Hettler, 1980, p.77).

The concept of preventative wellness programming has been around since the

1970s, and the number of Americans who struggle with health problems associated with living an unhealthy lifestyle has not changed significantly enough to lower healthcare costs, which continue to rise (Schramm, 2005). The Congressional Budget Office (2007) predicted that healthcare costs, which currently account for approximately 15% of the USA's Gross Domestic Product (GDP), will increase to over half of the USA's GDP by 2020. Sloan (2006) stated that having health insurance is closely related to individuals' income levels. This leads to his conclusion that people who have a lower income level, or no job at all, are more likely to lack basic health insurance and, therefore, access to preventable healthcare. If one cannot obtain the basic healthcare needs due to not being able to afford health insurance, it leaves them at a higher risk for preventative health disparities (Robert Wood Johnson Foundation, 2005).

Universities can do something to assist in closing the healthcare gap by offering preventative wellness programming on their campuses. In an initiative to grow wellness programs and increase the overall health in universities, Healthy Campus 2020 was developed by the United States government as a national movement that is based on Healthy People 2020. Healthy Campus 2020 provides a 10-year national objective for developing a healthier campus, and it is divided into two focuses, students and faculty/staff. The student objective is comprised of 11 topic areas with 54 different objectives with emphasis on stress, injury and violence prevention (safety), tobacco use, nutrition, and exercise. The faculty/staff objective of this program focuses solely on tobacco use, nutrition, and exercise. The overall goal of Healthy Campus 2020 is to show an improvement in overall health on college campuses of 10%. Healthy Campus 2020 plans on doing this by providing assistance in identifying priorities and starting preventative wellness programs in university settings (American College Health

Association, 2012). This research study used this initiative as a guideline to identify the wellness of its campus in five areas: stress, safety, tobacco use, nutrition, and exercise.

Stress among college students has been a topic of interest for many years, whether it is academic or social. When stress becomes excessive, it has been known to affect health and academic performance (Campbell, Svenson, & Jarvis, 1992). In the past, students have reported that daily hassles of just being a college student were the most stressful thing they had to deal with (Ross, Niebling, & Heckert, 1999), with underclassman being more stressed than upperclassman (Baldwin, Chambliss, & Towler, 2003). Now, student financial burdens are helping push student stress to record levels with new stressors such as cost of education, borrowing money for college, need of finding a job after graduating, and paying back student loans (Pryor et al., 2012). In the same report by Pryor et al. (2012), one in three students stated that money problems were hurting their grades, and one in four said money issues have forced them to reduce their college coursework.

Stress and health have long been studied and there has been shown to be a strong correlation to high amounts of stress and its effects on the immune system (Khansari, Murgo, & Faith, 1990; Zakowski, Hall, & Baum, 1992). Stress that continues without relief can lead to a condition called distress, which is a negative stress reaction (Watson & Pennebaker, 1989). Distress can disturb the body's internal balance or equilibrium, which can lead to any of eight physical symptoms: nausea, mood, appetite, insomnia, pain, mobility, fatigue, and bowel movement pattern (McCorkle & Young, 1978). Stress can also become harmful when people begin to use alcohol, tobacco, or drugs to try to reduce their stress levels. Instead of relieving stress and relaxing the body, these substances continue to keep the body in a stressed state and may lead to a new set of

stressors developing (O'Doherty, 1991).

College students in the United States state that they started using tobacco as a means to assist in reducing their anxiety and depression. College appears to be a time when many students are trying a range of tobacco products (Rigotti, Lee, & Wechsler, 2000). There are other reasons why one may choose to use tobacco, but research found that depressed college students are more likely to smoke and have a more difficult time quitting than non-depressed college students (Morrell, Cohen, & McChargue, 2010). Tobacco use is the single most preventable cause of disease, disability, and death in the United States. It has been linked to be the primary cause of at least 30% of all cancer deaths, along with 80% of deaths from chronic obstructive pulmonary disease (COPD), early onset of cardiovascular disease, and death (CDC, 2008). Tobacco prevention programming and research has primarily focused on youth, but for many populations, such as African Americans, targeted prevention programs may be necessary to prevent young adult and adult onset of tobacco use (Fegan et al., 2004).

Safety on the college campus is a natural source of concern for parents, students, and college employees. Safety can consist of many factors but, as it relates to this study, safety includes aggressive driving, seatbelt usage, driving drunk or riding with someone who is intoxicated, and drinking patterns. In 2009, in was reported that in the United States unintentional and violence-related injuries accounted for almost 50% of the deaths among those 1 to 44 years of age. For this age group, that is more deaths than those caused by disease (Gilchrist & Ballesteros, 2012). This includes the lack of seatbelt usage; over 40,000 people die each year in car accidents and seatbelt usage can prevent about half of them (Pickrell & Ye, 2011). Teenage drivers, specifically, have higher rates of motor vehicle crashes and engage in riskier driving behavior than adults (Juarez,

Schlundt, Goldweig, & Stinson, 2006). Another trend in college safety is the increase in fires. Campus housing fires increased significantly since 2009, with an average of almost 4,000 fires each year (Evarts, 2011). Evarts (2011) also stated that fires pose a particular risk on college campuses due to a high rate of disabled smoke detectors, stating that students tend to remove the 9-volt batteries for personal use or because they are tired of hearing false alarms from students cooking in their dorms.

College students are highly exposed to unhealthy eating habits due to high amounts of stress, time mismanagement, cafeteria-style eating, and the lack of availability of healthy foods and full kitchens (Huang et al., 2003). Cafeteria-style foods usually provide students and staff with a high fat, high protein, and high calorie meal that give little-to-no nutritional value (Hartwell, Edwards, & Brown, 2012). Food selection is an important behavior with many long-term consequences in the form of health and longevity, specifically cardiovascular disease and diabetes (Nicklas et al., 2001). There has been some improvement in cafeteria style with the introduction of cafeterias providing point-of-purchase nutrition information which has been found to promote healthy food choices (Freedman & Connors, 2011).

Nutrition has always been a subject of great interest, but it must be expanded to include exercise as an important component for prevention of chronic diseases and promotion of health (Singh, 1992). Exercise has important physiological and psychological health benefits for all individuals, with research showing that an increase of physical activity leads to overall improvement of one's health (Warburton, Nicol, & Bredin, 2006). Exercise can help control cholesterol, diabetes, and the onset of obesity. In addition, aerobic exercise has been shown to reduce blood pressure and resting heart rate (Fletcher et al., 1996).

Statement of Problem

While our country's healthcare expenses continue to rise more than any other country, the prevalence of modifiable risk behaviors and poor lifestyle habits are also rising (Goetzel & Stewart, 2000). The leading causes of death continue to be attributed to lifestyle choices, such as tobacco use, poor diet, and lack of physical activity (National Center for Health Statistics, 2009). The CDC indicates that about half of all deaths of people under 65 years of age are attributed to unhealthy lifestyles. Many of these health problems associated with lifestyle choices, such as hypertension, obesity, and diabetes are increased for people of color in the United States (U.S. Department of Health and Human Services, 1999).

In North Carolina, the state requires each local county health department to conduct a community health assessment every 4 years. In 2011, the State of the County Report was published for Mecklenburg County. From this report, nine priority health concerns were developed. The top priority concern was "Prevention of Chronic Disease and Disability through Health Behaviors" (Mecklenburg County Health Department, 2011, p. i). The report comments on emerging issues noted by the differences in the 2010 County Health Assessment (CHA) to the 2011 CHA. The top emerging issue that was carried over to 2011 was the need for environmental and policy changes that will assist in changing the needed support for those individuals who want to choose and create healthy behaviors (Mecklenburg County Health Department, 2011). Reports from 2010 indicate that in Charlotte approximately 64% of adults were overweight or obese, 24% reported no physical exercise in the past month, and 17% were current smokers. Minority populations reported rates seven times higher than Caucasians in the areas of smoking, obesity, and lack of physical activity. Even higher rates of these behaviors were found

among residents with an annual income of less than $50,000 (Mecklenburg County Health Department, 2011).

As colleges and universities around the country encounter financial hardship, they have seen an increasing need to improve the quality and number of services offered on campus to attract new students. Some of these services include offering a state-of-the-art wellness center that complements and improves the overall campus experience. Wellness is something that needs to be taught, encouraged, and valued within a community for it to be obtainable (Bogar, 2008). Since Hettler (1980) originally defined wellness as multidimensional in 1979, multiple other wellness models have been created, complicating what people understand wellness to be. This makes creating a culture of wellness difficult in any environment. In 2000, Corbin, Pangrazi, and Franks adapted the definition of wellness as "a multidimensional state of being describing the existence of positive health in an individual as exemplified by quality of life and a sense of well-being" (p. 7). Corbin et al.'s (2000) wellness definition is used by the CDC and the WHO, which stated that there is a correlation of health to the quality of life and one's personal sense of well-being.

It is estimated that only 15% to 30% of college students meet the recommended amount of physical activity that would positively affect their health (Haase, Steptoe, Sallis, & Wardle, 2004). Some universities are beginning to require new students to complete a course in personal fitness/wellness to assist with students meeting the required physical activity, and it has shown to be successful (Higgens, Lauzon, Yew, Bratseth, & Morley, 2009). Preventable health disparities through lack of physical activity continue to be a burden in predominantly African-American communities (CDC, 2011). Preventative wellness programming has been shown to be successful for students, as well

as employees, as long as it is culturally relevant, especially when working within a predominantly African-American population (Ballentine, 2010; Bungum, Orsak, & Chang, 1997; McCormick & Lockwood, 2006; Rimmer, Hsieh, Graham, Gerber, & Gray-Stanley, 2010). African Americans need to find and utilize preventative wellness programming that is designed specifically to match the cultural wants and needs of the community (Lewis-Moss, Paschal, Sly, Roberts, & Wernick, 2009).

Wellness Center

With the hiring of the new president for the university, there was a new commitment to providing health and wellness programming and services that would promote positive attitudes, healthy lifestyles, and responsible self-care for the campus and surrounding neighborhoods. With this vision, the university sought out and secured funds to build a new wellness center, a 5,600 square foot facility that will host campus and community wellness programming, along with an applied health research center. Upon establishing the Wellness Department, it was decided that promoting a culture of wellness and prevention would be the primary focus of the wellness center with programming that will encourage individuals to assume responsibility for their own quality of life, motivate them to practice healthy lifestyles, and provide education and resources to achieve health and wellness goals.

As importantly, the new wellness center will provide faculty, staff, students, and community collaborators with science-based research opportunities in the fields of health, human performance, and sport. This research will address those issues, attitudes, and behaviors that limit prospects of healthy living and will increase capacity for innovation and creativity that supports complementary healthcare, wellness, and prevention. To assist in limiting future barriers in tracking the experience and effectiveness of wellness

programing being offered, the new wellness center set out to establish a baseline of wellness on the campus.

Purpose of the Study

The purpose of this study was to establish a baseline multidimensional analysis of wellness on a university campus resulting from the new development of a Wellness Department and opening of a new wellness facility and to determine if there is a significant difference in wellness between employees and students. This study developed an operational knowledge of the current wellness needs and wants of the university, and created a measurable standard for future assessment.

Research Questions

1. What is the current status of overall wellness on the campus of the university?
2. Is there a difference of wellness status between the employees and students of the university?

Definition of Terms

Active. Referring to individuals who meet, or exceed, the minimum recommended amount of daily physical activity as recommended by American College of Sports Medicine (ACSM).

Biometrics. The measurement and analysis of human body characteristics such as blood pressure, heart rate, height, and weight.

Body composition. The measurement of fat free mass verse fat mass, calculated to determine one's body fat percentage.

Cardiovascular fitness. The ability of one's heart, lungs, and organs to consume, transport, and utilize oxygen, also known as maximum volume of oxygen (VO2 Max).

Exercise. Planned activities that are meant to improve one's aerobic capacity, muscular strength, muscular endurance, flexibility, and body composition.

Employee. A person who is currently employed by the university, either on a full-time or part-time basis.

Fitness assessment. A series of measurements that help determine one's level of fitness.

Flexibility. The ability to move a joint through its complete range of motion (ROM) as dictated by the normal extensibility of soft tissue surrounding it.

Health. The condition of a person's mind, body, and spirit that is free from illness, injury, or pain.

Wellness center. A 5,600 square foot facility located on the campus of the university that hosts campus and community wellness programming, as well as an applied health research center.

MicroFit. A software package that contains four integrated software programs that is used by health professionals to measure client's fitness and wellness. MicroFit is a PC desktop application compatible with Windows and is sold with a lifetime usage license for a one-time fee.

Muscular endurance. The ability of a muscle, or group of muscles, to sustain repeated contractions against a resistance for an extended period of time.

Physical activity. Any bodily movement of the skeleton and skeletal muscles that leads to expended energy.

Sedentary. Referring to individuals who complete little-to-no physical activity which results in not meeting the minimum recommended amount of daily physical activity as recommended by the ACSM.

Student. A person who is currently enrolled to take coursework at the university, either on a full-time or part-time basis.

Wellness. A multidimensional state of being describing the existence of positive health in an individual as exemplified by quality of life and a sense of well-being.

Chapter 2: Literature Review

Introduction

This chapter conducted a review of the literature to consider the conceptual relevance of the relationship between wellness and the benefits on student academic performance, employee production and satisfaction, and health benefits. After an extensive review of the related literature, defining characteristics of wellness were presented to ascertain the effect of its improvement on various health risk behaviors and health outcomes.

The theoretical framework used in this study was the Holistic Wellness Model. This model explains the importance and the interrelation of a healthy lifestyle within the multidimensional domain of an individual's life. The Holistic Wellness Model is used to explain the multidimensional aspects of wellness. Using Hettler (1980) and Chandler, Holden, and Kolander (1992), it was concluded that wellness consists of six major dimensions: intellectual, emotional, physical, social, occupational, and spiritual. The authors surmised that each dimension impacts the overall wellness of each of the other dimensions, whereas without attending to each component within each dimension, the individual remains incomplete, having a higher risk of living an unhealthy lifestyle.

Health was originally defined by the WHO (1946) as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (p. 1). In 1979, wellness was created from this idea and has been known to have five main domains: social, emotional, physical, intellectual, and spiritual (Lafferty, 1979). Even today, these five domains are still recognized. More recently, researchers have started to add domains to the five core domains, such as occupational (Crose, Nicholas, & Frank, 1992; Hettler, 1980; Leafgren, 1990), psychological (Adams et al.,

1997), and environmental (Renger et al., 2000). Over the past 20 years, researchers, foundations, community-based organizations (such as YMCAs), corporate entities (such as private fitness facilities), and government agencies have designed and implemented a broad range of innovative health promotion and disease prevention programs. Many of these programs have shown to be effective, resulting in a positive impact on a participant's and a community's overall wellness (Norton & Mittman, 2010).

Physical activity does not have to be formal for it to improve one's health. A physical activity expenditure of 1,000 calories per week has been associated with significant health benefits. This equals to about one hour per day of walking per week. Health benefits also have been recorded for even smaller amounts of exercise for those who are extremely deconditioned or elderly (Warburton et al., 2006). The ACSM has reported that the incidence of heart attacks is greatest in the habitually inactive individuals. Maintaining physical fitness through regular physical activity has been shown to reduce these risks (Haskell et al., 2007). There is significant evidence that leading a physically inactive lifestyle may lead to being overweight and even obese. The research shows that even if an overweight or obese adult is unable to achieve the minimum level of physical activity, significant health benefits can be shown by any physical activity and other types of interventions (Jakicic & Otto, 2006). Becoming overweight or obese can increase the risk of developing type 2 diabetes. Structured physical activity combined with modest weight loss has been shown to lower the risk of type 2 diabetes by up to 58%. The best results have been attained when combining physical activity with diabetes prevention interventions (Haskell et al., 2007).

Haskell et al. (2007) recommended that adults, individuals 18 years and older, engage in moderate-intensity cardiorespiratory exercise for a minimum of 30 minutes at

least 5 days a week, for a total of 150 minutes per week. The ACSM also recommended that adults should perform strength training 2 to 3 days per week for each of the major muscle groups, which should also include balance, agility, and coordination (Haskell et al., 2007). The National Strength and Conditioning Association (NSCA) stated that strength training may increase cardiovascular health and reduce health issues associated with cardiovascular disease with a decrease in resting blood pressure, decrease in exercise heart rate, and lowering cholesterol levels, and may assist in the decrease of the risk of type 2 diabetes (Triplett, Williams, McHenry, & Doscher, 2009).

Booth, Bauman, and Owen (2002) and Chinn, White, Harland, Drinkwater, and Raybould (1999) found that there are barriers associated with participants not living a healthy lifestyle and not obtaining the minimum daily amount of physical activity. These barriers may be one, or a combination of lack of time, lack of energy, fatigue, and health problems. Not only are barriers found internally within the participants but they may also be found within their environment such as presence of hills, lack of street lights, and the lack of sidewalks within a neighborhood or community (Cameron, Craig, Stephans, & Ready, 2002). Behavior change is a complex process that must begin at an early age. Many can already distinguish healthy from unhealthy wellness behaviors but will not or cannot make the necessary changes to improve their wellness (Liguori & Carroll-Cobb, 2012). The review of literature sheds light on research that has been conducted to identify, improve, and track wellness from youth to adults in multiple settings to determine what effective practices and standards are in implementing effective multidimensional wellness programming.

Youth Fitness and Wellness

Adolescents (ages 0 to 17) and young adults make up 24.1% of the population of

the United States (Wallman, 2012). Moreover, adolescence is a critical period for developing habits and skills that create a strong foundation for healthy lifestyles and behavior over the full lifespan (McCalla et al., 2012). Unfortunately, many youth develop unhealthy habits from their immediate surroundings, such as family, friends, neighborhoods, and schools that can jeopardize their immediate health and well-being and contribute to an unhealthy lifestyle in the future (Irwin, Igra, Eyre, & Millstein, 1997). Creating a wellness program has an important role to play in promoting healthy behaviors and preventing disease during adolescence (Taylor, Ward, Zabriskie, Hill, & Hanson, 2012). Yet wellness programs in the United States are not designed for young people at this critical time in their lives, or providers often are not adequately trained in combating adolescent issues (National Research Council and Institute of Medicine, 2009).

Agron, Berends, Ellis, and Gonzalez (2010) looked into wellness policies to see what wellness interventions, if any, are being done for children when they are in school. This project used online surveys, focus groups, and key informant interviews to gather its data, focusing on four key areas: (1) the perceptions, barriers, and opportunities of implementing and evaluating policies among key school staff; (2) the readiness to address nutrition and physical activity needs; (3) staff collaboration; and (4) the acceptability of wellness tools available. The results showed that the school board members had confidence that they had the proper staff to implement and evaluate wellness policies, but the perceptions of the school staff were different. Responses from across the nation showed that school systems were trying to improve the wellness of students but had yet to recruit key staff to develop, implement, and monitor/evaluate the wellness policies.

A wellness program called “Bridging the Gap” conducted by Chaloupka and

Johnson (2007) was one school system's way of identifying policies, programs, and environmental issues that influence adolescent alcohol, tobacco, and illicit drug use. This project conducted an analysis on schools, communities, and state policies. Chaloupka and Johnson concluded that there is an increase in a variety of policies, programs, and other interventions that stimulate healthy eating and physical activity, noting that these programs have been implemented even without evidence of a positive impact. The Bridging the Gap program continues to build upon this research base for implementing effective interventions.

A better way to introduce school wellness programming would be to see if academic achievement was related to those living a healthy lifestyle. Castelli, Hillman, Buck, and Erwin (2007) found that positive results on the field test of physical activity were positively associated with third and fifth grader academic achievement, specifically aerobic capacity. Hannon (2008) followed up and researched the physical activity levels of high school students who were overweight and non-overweight during physical education classes. This study showed that physical activity levels among overweight and non-overweight high school students were the same during physical education classes, emphasizing the physical education classes in the school systems are effective in assisting youth to obtain the required amount of daily physical activity. Davis et al. (2011) took a different approach in identifying student achievement and wellness habits, researching brain activation in overweight children. The results showed that an increase in exercise benefits executive brain function and mathematics scores. Preliminary evidence also suggested that there was an increase of bilateral prefrontal cortex activity in those who exercised over those who did not.

School systems have begun to implement successful wellness programming,

helping to change eating patterns and increase physical activity (Schetzina et al., 2009). Schools cannot develop positive wellness patterns solely by themselves though; it must also come from family and friends. Supportive parenting, engagement in challenging activities, positive life events, and high-quality interactions with the significant combination of schools will contribute to the development of a positive and healthy lifestyle (Park, 2004).

College Student Wellness

Astin (1993) found that there are many factors outside of the classroom that have shown to be predictors of student achievement in higher education. It was emphasized by Astin that there is a need to look beyond prior academic success when determining students that may be at risk for not performing well in a university setting. Studies have shown that a student's social relationships and stress management techniques may also help determine their success at the college level. Many of these factors are associated with the many areas that are considered wellness.

With the school systems successfully integrating wellness programming into their curriculum, most universities have begun to require their students to complete a personal fitness/wellness course, usually within their first year of enrollment (Cardinal, Sorenson, & Cardinal, 2012). Mack and Shaddox (2004) studied college students' attitudes toward physical education at the beginning and end of a personal fitness/wellness course and found that these students showed a significant improvement in attitude towards physical activity and exercise after completion of the course. Higgens et al. (2009) conducted a qualitative study on how college personal fitness/wellness courses have influenced the health and wellness of college students, specifically physical, spiritual, psychological, social and community belonging, and growth in leisure activity patterns after the course

was completed. The results suggested that those who completed the course noticed an overall positive influence on their quality of life.

These first-year health/wellness courses have shown success in improving one's perception and attitude towards physical activity, spiritual, psychological, and social and community belonging; but it is still unknown if they help college students grow as individuals. A study by Ballentine (2010) examined the relationship between self-reported wellness and academic success in first-year health science students. This study measured 22 different factors of wellness and an overall wellness score was calculated for each respondent. Correlations were determined to see if there was a relationship between the factors of wellness and academic success as defined by first-semester grade point average. The results show that there is a positive relationship between self-reported wellness and academic success in first-time, first-year college students as it relates to grade point average. McCormick and Lockwood (2006) conducted research to understand college students' perceptions of wellness and revealed that there were significantly higher postperception scores and postknowledge scores for all wellness topics surveyed than their course preknowledge scores at the beginning of the semester. These results showed that after completion of a formal university wellness course, a student's perceived knowledge and actual knowledge of wellness improved, showing that educational wellness interventions can be successful in a college setting.

With this information, universities started to take action in wanting to improve the student's overall health and wellness by building wellness centers to promote a positive community feeling within the university, but construction cannot be the only solution. Fullerton (2011) stated that to build an effective university approach, an internal collaboration between student health centers, campus wellness programs, recreation

centers, and fitness centers must be established. Fullerton also concluded that a collaborative approach will be able to provide a variety of appropriate services in an open and approachable way so it will include a wide variety of students, faculty, and staff.

A study by Lenz (2004) discovered that 32% of college students reported tobacco use during the past month. In addition, a comparative study by Patterson, Lerman, Kaufmann, Neuner, and Audrain-McGovern (2004) identified ethnic differences on college campuses contributed to tobacco use. White students were more likely to smoke than their African American or Hispanic counterparts. Other findings in this study included students who lived in restrictive housing, such as dorms, and participated in physical activity were less likely to smoke. Tobacco control programs have been implemented at the state and community levels which have led to a reduction in tobacco use in college students, but few colleges have implemented policies against tobacco usage or even offer tobacco cessation programming (Rodgers, 2012).

During their time as college students, many may experience the onset of mental as well as physical health problems, such as anxiety, high levels of stress, poor nutrition, and lack of physical activity (Guthman, Oicin, & Konstas, 2010). Not only does physical activity need to be addressed, but so does the mental health of college students (Hefner & Eisenberg, 2010). Research conducted by Downs and Ashton (2011) studied the implications for mental and physical health in college students. Those who reported consistent or current participation in physical activity at recommended levels reported better mental health than that of their peers. Students also began to individualize and establish love, spirituality, sense of worth, stress management, nutrition, and exercise patterns.

Even though most studies on college students have been on undergraduate

students, Bulmer, Irfan, Barton, Vancour, and Brent (2010) focused on female graduate students' health statuses and health behaviors and compared them to female undergraduate students. This study identified that even if all wellness programming is focused on undergraduate students, graduate students benefit from these programs as well.

With wellness having multiple dimensions, Lafountaine, Neisin, and Parsons (2006) wanted to place a value on wellness dimensions so that they could begin to identify the different wellness needs of college students. They found that the two highest scored were love and sense of worth; stress management and nutrition scored the lowest. This study shows that a university can begin to place an identifying number to specific wellness categories so that it can focus on improving the lowest scoring categories. Gieck and Olsen (2007) also concluded that participants who completed a holistic wellness program reported an increase in physical activity, strength training, and walking. This study also reported that those who completed the program also decreased body fat and body mass.

Worksite Wellness Promotion

Healthcare costs are a major problem in the United States. Over the past decade, employer and employee contributions for health insurance have increased significantly (Chernew, Cutler, & Keenan, 2005). As a result, employers are paying insurance companies millions for health issues associated with an unhealthy lifestyle that creates chronic health problems. Between 1999 and 2008, the total cost of coverage doubled, with employer contributions increasing from $154 to $332 and employee contributions increasing from $35 to $60 (Kott & Fruh, 2009).

The current research suggests that wellness interventions can be successful. More

research needs to be conducted to identify if integrating wellness into the workplace will be effective and practical. Tveito and Eriksen (2008) instituted and studied a pilot Integrated Health Program in a workplace that would reduce sick leave and subjective health complaints. The results reported no statistically significant effect on sick leave or health-related quality of life between the two groups. The intervention group did, however, self-report an improvement in health, physical fitness, muscular pain, stress management, and maintenance of health and work situations. These results indicate that a workplace wellness intervention can increase an overall feeling of well-being, but not the amount of sick days used by an employee.

Butler, Grzywacz, Ettner, and Liu (2009) questioned if flexible work arrangements would improve worker self-reported health and increased healthcare utilization. Participant results showed that greater work flexibility was associated with lower levels of stress and better physical health. This study concluded that flexible work arrangements did not lower healthcare costs for the business or individual due to a reduction in sick days. With current research indicating workplace wellness programs having little effect on reducing sick days in workers, researchers focused on the effectiveness of workplace wellness initiatives as they relate to productivity. Leutzinger and Blanke (1991) questioned if a corporate fitness program would affect perceived worker productivity. Leutzinger and Blanke installed an on-site fitness facility where 4,047 employees had free access. The results concerning the relationship between regular exercise and perceived worker productivity were positive. Financially, there was a 23.4% decrease in nonchronic health-related claims, which resulted in a $1.2 million decrease in health claims. The results suggest that there is a strong positive relationship between regular exercise, perception of worker productivity, and individual health.

Schwartz et al. (2010) studied the economic impact of a business implementing a wellness prevention program. The research team found that participants who were involved consistently in one health promotion/disease prevention program incurred lower annual medical costs. The savings difference was $350 per participant per year. This study also indicated that those who participated in additional wellness programming showed an even greater cost savings per year.

With research demonstrating positive factors in implementing workplace wellness initiatives, Bungum et al. (1997) researched the factors that affect exercise adherence in a worksite wellness program. They found that those who attended workplace wellness programming had higher levels of self-motivation, were more frequently encouraged to participate by others, and perceived fewer barriers to program participation than did workplace wellness programming dropouts and nonparticipants. Dinger et al. (1992) conducted a 4-month university wellness program with the goal of enhancing positive self-esteem and increasing the assumption of responsibility of personal health. The three main areas of the program included physical activity, nutrition education, and stress awareness. It was found that the average participant decreased weight and body fat percentage, lowered total cholesterol, and lowered blood pressure after the 4-month program. On the 8-month follow-up, participants' numbers started to climb again showing that a wellness program would have to be sustained or positive behavior taught in order for change to be successful.

Vanderbilt University conducted a 7-year post start-up study of their workplace health promotion program from 2003 to 2009. The goal of this study was to assess long-term changes in health risks for their employees. The study analyzed descriptive longitudinal trends in required annual employee health risk assessment profiles from the

year of start-up, 2003, to 2009. The key findings in this study were employee participation in physical fitness increased from 72.7% to 83.4% and there were positive annual changes for nonsmokers and seatbelt usage. The study found that most of the largest improvements occurred within the first 2 years of program implementation. This study concluded that big improvements in health can be achieved through a voluntary incentive-based wellness program (Byrne et al., 2011).

Cancelliere, Cassidy, Ammendolia, and Cote (2011) completed a research review study of workplace wellness initiative and improvement in worker presenteeism. The researchers concluded that after screening 2,032 articles, 14 articles were used and they showed preliminary evidence of a positive effect of some workplace wellness initiatives. Successful programs offered organizational leadership, health risk screenings, personalized programs, and a supportive workplace culture. Thornton and Johnson (2010) indicated that community colleges' most prevalent workplace wellness programs offered were walking programs (85.2%), nutrition awareness programs (74.1%), and health fair programs (63%). Seventy-nine point two percent of the community colleges even gave their employees paid time off to participate in these programs.

African-American Health and Wellness

Work-site wellness programs must observe that African Americans are more likely to believe that self-presentation is important (Lemon et al., 2009). A culturally-based health, diet, and fitness program can be successful among African-American employees. For minority populations, wellness programming must be targeted to the relevant cultural, spiritual, and community factors (Campbell & Quintiliani, 2006).

Despite promising gains in the overall health of the country, the health of many Americans continues to lag behind that of the general population. People of lower

socioeconomic status and racial and ethnic minorities tend to experience poorer health outcomes, face more challenges in accessing quality healthcare, and experience a higher mortality rate than individuals of a higher socioeconomic status or Caucasians (CDC, 2011; U.S. Department of Health and Human Services, 1999). These differences in disease are often called health disparities. Health disparities were defined in 2000 through the Minority Health and Health Disparities Research and Education Act of 2000 as "a significant disparity in the overall rate of disease incidence, prevalence, morbidity, mortality, or survival rates in the population as compared to the health status of the general population" (106th Congress, 2000, p. 4).

For many health conditions, African Americans have a disproportionately higher prevalence of disease with the risk factors and incidences, morbidity, and mortality rates for these diseases and injuries than Caucasians (CDC, 2005). Heart disease is the leading cause of death in the United States and African Americans tend to suffer cases of hypertension that are more severe and result in more health complications than people of any other race (Wagner, 1998). Heckler et al. (2008) studied the common illness beliefs, adherence behaviors, and hypertension among African Americans and found mixed results showing that medical interventions helped reduce blood pressure.

Cancer is the second leading cause of death for both African Americans and Caucasians (CDC, 2011). In 2001, the age-adjusted incidence per 100,000 population was substantially higher for African-American females than for Caucasian women for certain cancers, including colon/rectal (+10.7), pancreatic (+4.1), and stomach (+4.5). Yet, an African-American woman's length of time between an abnormal breast cancer screening and the follow-up diagnostic test is twice as long as that of a Caucasian woman. Among males, the age-adjusted incidence was also higher for African-American

males than for Caucasian males for certain cancers, including prostate (+83.5), lung/bronchus (+35.4), colon/rectal (+9.4), and stomach (+16.3) (CDC, 2004).

Unlike any other ethnicity, African Americans have diabetes listed in the top 10 leading causes of death, with it coming in fifth, ahead of kidney disease, respiratory disease, homicide, septicemia, and HIV/AIDS (CDC, 2011). Most likely, this directly correlates to the obesity issue within the African-American population (Flegal, Graubard, Williamson, & Gail, 2007). Among African Americans 20 years and older, more than two thirds of the population are considered overweight or obese, defined as body mass index (BMI) of 25 or more (CDC, 2005). Cowart et al. (2010) conducted a church-based wellness intervention to identify and improve health and quality of life issues, exercise and eating habits, and program interest for building healthy lifestyles. The initial data collected showed that 87% of respondents were overweight (BMI $\geq$ 25) with a mean BMI of 32.5, and half of the participants fell into the obese category (BMI $\geq$ 30).

Nearly one half of the women reported negative evaluations of their appearance and a preoccupation with being or becoming overweight, with the exception of African-American women who have a high percentage of having a positive body image (Cash & Henry, 1995). African-American women also reported higher body satisfaction and least overestimation of guessing their weight and having body size ideals that were less thin than Caucasian women (Miller et al., 2000; Rucker & Cash, 2006). The female participants in the Cowart et al. (2010) study of perceived body weight image showed that those who were classified as obese were 16% higher than those who self-reported themselves as obese.

Burnet et al. (2007) researched weight-related beliefs and concerns of overweight urban youth. This study interviewed nine community leaders to discern family and

community perceptions on addressing overweight African-American youth. The results of this study showed that community leaders felt awareness was high for acute health-related conditions, but not for obesity. Parents were concerned about their child's health, but lacked the proper knowledge to assist. The children perceived negative social consequences of being overweight. The conclusion was that there was interest in family-based interventions to improve nutrition and physical activity.

Since 1895, African-American nutritional habits have been studied, with the first study conducted by Atwater and Woods (1897). The researchers closely followed the eating habits of families in and around Tuskegee, covering Alabama, Georgia, Mississippi, and Louisiana. They discovered that early eating habits of African Americans mostly consisted of fat pork (bacon), cornmeal, molasses, and biscuits. The most popular meal was *sap*, a mixture of bacon and molasses cooked together and eaten with cornbread and water. Seasonal meals often consisted of pork, sweet potatoes, collard greens, turnips, and sometimes opossum. Today these traditions are strong as noted by Hargreaves, Schlundt, and Buchowski (2002). In a focus group setting, African-American women said they discovered that their eating habits were strongly influenced by personal, cultural, and environmental elements that place African Americans at a high risk for chronic diseases. Unfortunately these bad eating habits carry over to their children as it was found that a mother's diet is the single best predictor of their children's eating patterns (Horodynski, Stommel, Brophy-Herb, & Weatherspoon, 2009).

Blachard et al. (2008) looked at the physical activity differences in African Americans and Caucasians and suggested that when designing a physical activity program, practitioners need to consider ethnicity due to the nature of the cultural

differences in health disparities for them to be effective. A separate study looked to identify if maybe there were cultural differences in physical activity enjoyment between different ethnicities. Grieser et al. (2008) showed that African-American girls, when compared to Caucasian girls, perceived significantly lower physical activity enjoyment and teacher support for physical activity. However, African-American girls showed significantly higher enjoyment of physical education when compared to Caucasian girls.

After determining physical activity has a lower level of enjoyment among African-American girls, researchers turned their attention to assessing knowledge among African Americans. Lewis-Moss et al. (2009) researched the health knowledge, attitudes, and behaviors. The results showed that the overall health knowledge of African-American children was relatively low and the participants did not know or did not answer correctly the questions regarding health behaviors, HIV/AIDS knowledge, and health knowledge. The results also indicated a statistically significant relationship between overall health attitude and the amount of exercise that was completed.

Successful African-American wellness intervention studies have been conducted. A great example is Rimmer et al. (2010), as this research looked into a telephone-based intervention to increase physical activity in obese African Americans and found that exercise time per day increased from 6 minutes per day to 27 minutes, and total physical activity time per day increased from 26 minutes per day to 89 minutes. This shows that with the right intervention strategies targeted towards African Americans, physical activity and exercise can be increased. Other research has been conducted and has proved that wellness interventions can be successful in reducing health disparities, such as diabetes (Agurs-Collins, Kumanyika, Have, & Adams-Campbell, 1997; Auslander, Haire-Joshu, Houston, Rhee, & Williams, 2002; Keyserling et al., 2002; Williams et al.,

2006), hypertension (Castillo-Richmond et al., 2000; Hill et al., 2003; Kokkinos et al., 1995), cancer (Ashing-Giwa, 2008; Kramish et al., 2004), and obesity (Baskin, Ahluwalia, & Resnicow, 2001; Crawford et al., 2004; Gortmaker et al., 1999; Story et al., 2003). These wellness interventions have also been known to assist in other health issues, such as stress (Negga, Applewhite, & Livingston, 2007; Zimmerman, Ramirez-Valles, Zapert, & Maton, 2000), depression (Barbee, 1992; Chung et al., 2006) and an increase in physical activity levels (Fleury & Lee, 2006; Flores, 1995; Resnicow et al., 2000).

Summary

Americans are just not as physically active as they were 20 years ago, with the majority of Americans not meeting the daily minimum for physical activity and a very small percentage of those participating in vigorous exercise. As Americans spend more and more time sitting on the job or at home, they spend less time doing physical activity which increases the risk of obesity, diabetes, and other life-threatening cardiovascular diseases.

Healthy wellness habits begin at a young age. Healthy eating, physical activity programs, and other interventions consistently have been shown to be successful when they are consistent within the school systems. School districts across the nation are trying to improve the wellness of students but have yet to recruit key staff and stakeholders who will develop, implement, and monitor effective wellness policies. It has been found that physical activity affects academic achievement positively, which proves to be a simple and important method for enhancing children's mental functioning that is essential for cognitive development.

Research has shown that physical activity levels of individuals from high school

all the way through college graduation are significantly less than when they were in high school. Because of this, most universities have begun to require their students to complete some sort of personal fitness/wellness course because of the known association with academic achievement and physical activity. Multiple studies have shown an improvement in attitude towards physical activity, overall positive influence on their quality of life, reduction in stress, and eating habits. Using a multidimensional, collaborative approach would provide a variety of educational wellness interventions that could be successful in a college setting.

This may be difficult within a historically black college and university (HBCU). Studies show significant differences in negative attitude towards physical activity and perceived behavior of what a healthy lifestyle is among African Americans versus that of other races. Several studies have shown that a lack of overall health knowledge in African-American communities is a problem. Community leaders are aware that there is high incidence for acute health-related conditions, but not for obesity. This may be due to the fact that African Americans have a different perception of what is considered a healthy body weight and do not truly know what is considered healthy as it relates to their well-being. However, positive results have been shown for those participating in regular physical activity and other healthy lifestyle choices, but they must be culturally relevant programs to ensure success.

Americans spend one third of their day at work, so wellness interventions need to be successfully incorporated and integrated into the workplace to ensure that Americans can begin to transform their lifestyle practices into healthy ones. Worksite wellness has reported an improvement in health, physical fitness, muscular pain, and stress management, along with a reduction in employer healthcare cost. Employers are even

beginning to try other methods to assist in reducing healthcare costs and increase worker production, such as offer greater work flexibility in self-adjusting their schedule or working from home; the primary results are good. Employers with workplace wellness programming have higher levels of self-motivation, which lead to happier and more productive employees.

The use of the MicroFit software package easily provides a standard for completing health history screening, wellness profiling, and fitness assessments. The MicroFit software package has been used in research studies evaluating wellness in colleges and universities, as well as conducting comparison studies of physical fitness levels among normal and obese individuals. MicroFit is easy to understand and can be taught to non-fitness professionals so they can easily and effectively assist in providing valuable wellness information. MicroFit can also track trends over time and has the ability to compare results as a group or individual, making it the perfect tool for this study.

Chapter 3: Methodology

Within the next 10-15 years, 20% of the United Sates population is expected to be 65 years old or older (Howden, 2011). Even with the population aging, the leading causes of death still remain due to unhealthy lifestyles such as poor diet, lack of physical activity, tobacco use, and alcohol consumption (Arias, 2007; Mokdad, Marks, Stroup, & Gerberding, 2004; National Center for Health Statistics, 2009). Most of the diseases that are created from unhealthy lifestyles take years to develop; by the time a person's physician diagnoses the disease, it is already present and affecting his/her current lifestyle. However, with a preventative wellness program that screens for health risks by using age, gender, BMI, blood pressure, and lifestyle indicators (nutrition, exercise, tobacco use, and alcohol consumption), an estimate can be made to identify wellness-specific needs (Knight, 2000). With the intervention of specific preventative wellness programming, these health risks and/or diseases can be reduced, allowing individuals to enjoy longer and healthier lives.

The purpose of this study was to establish a baseline multidimensional analysis of wellness on a university campus resulting from the new development of a Wellness Department and opening of a new wellness facility, and to determine if there was a significant difference in wellness between employees and students. This study developed an operational knowledge of the current wellness needs and wants of the university, and created a measurable standard for future assessment.

Design and Procedure

Each participant was asked to complete a paper version of the MicroFit software questions that included the sections of Health History and the 46-question Wellness Profile. This packet was named the New Member Packet. The New Member Packet also

gathered information on the participants to determine if they were a student (freshman, sophomore, junior, or senior) or employee (faculty or staff). A paper version of the questions was utilized due to convenience of not having each participant sit in front of a computer. This also ensured privacy for the participants. The paper New Member Packets were then entered into the Health History and Wellness Profile sections of the MicroFit software package by student research assistants who underwent a 2-hour training that was conducted by the researcher (Appendix A). The informed consent form for research participation was attached to the New Member Packet (Appendix B).

The New Member Packet had to be completed prior to the participant completing the Fitness Profile. If a participant answered "yes" to any of the questions within the Health History, they were to be referred to their primary care physician for medical clearance prior to completing their Fitness Profile (Appendix C). The Fitness Profile of the software required the participant to undergo a fitness assessment to gather the necessary data. Fitness assessments were completed by the researcher and student research assistants. The student research assistants underwent a three-stage training process for them to be able to conduct a fitness assessment on the participants. The three stages included (1) watch a fitness assessment being conducted, (2) assist the researcher in conducting a fitness assessment, and (3) conduct a fitness assessment supervised by the researcher. When the student researchers successfully conducted all three steps in the training process, they were then able to conduct fitness assessments on their own. The completed fitness assessments were then entered into the Fitness Profile section of the MicroFit software packet by the same student research assistants (Appendix D).

The Fitness Profile package of the MicroFit software package utilized the following fitness components: Biometrics (Body Height, Body Weight, BMI, Waist-to-

Hip Ratio [WHR], Blood Pressure, and Resting Heart Rate), Body Composition (Bioelectrical Impedance Analysis), Cardiovascular Fitness (3-Minute Step Test), and Muscular Endurance and Flexibility (1-Minute Max Push-Ups, YMCA Half Sit-Up Test, and Trunk Flexibility).

The biometrics that were chosen are typical health data that are collected within a physician's office, such as height, weight, blood pressure, and resting heart rate (Gausche, Henderson, & Seidel, 1990). This research tracked WHR. WHR is a common measure of fat distribution. WHR can assist in tracking weight loss progress, while also serving as an estimate for health risks due to excessive body weight around the midsection that are related to being overweight, such as diabetes, stroke, and heart disease. A study in the *International Journal of Obesity* reported that for some age groups, the WHR is a better indicator of increased mortality risk than BMI (Esmaillzadeh, Mirmiran, & Azizi, 2004).

Body composition was measured by use of Bioelectrical Impedance Analysis (BIA). BIA is widely used by researchers and clinicians as a noninvasive, safe, cost-effective, and time-efficient method to estimate body composition (Rombeau, 1994). To ensure feasibility for use in this study, a study conducted by Jackson, Pollock, and Mahar (1988) confirmed the validity of the BIA method for predicting lean body mass in large heterogeneous samples of men and women by measuring body composition and comparing its accuracy with the results obtained by standard anthropometric methods BIA, skinfold fat, and hydrostatically measured percent fat with a correlation of 0.71 to 0.76.

Cardiovascular fitness was assessed by the YMCA 3-Minute Step Test. The cardiovascular fitness assessment conducted assisted in determining the correct exercise

intensity for the participant. The YMCA 3-Minute Step Test was chosen for this study as the tool for predicting cardiovascular fitness due to the small time commitment, little equipment needs, and ease of execution. The YMCA 3-Minute Step Test is an inexpensive test that predicts cardiovascular fitness by measuring heart rate response to stepping at a fixed rate and height for 3 minutes, then measuring postexercise recovery heart rate. Special precautions were made for those who might have had balance problems, such as placing the step close to the wall. This test was validated by Kasch, Phillips, and Ross (1966) when it was compared to the Robinson Treadmill Protocol with a coefficient correlation of .95. The YMCA 3-Minute Step Test was then cross-validated by Sharrock, Gareettm, and Mann (1972), Smothermon (1996), then again by Santo and Golding (2003). With this information, the YMCA 3-Minute Step Test is considered a reliable test for assessing cardiovascular fitness (Appendix E).

Muscular endurance was assessed by the 1-Minute Max Push-Up test and the YMCA Half Sit-Up test. *Muscular endurance* was defined by ACSM as the ability of a muscle group to execute repetitive contractions over a period of time sufficient to cause muscular fatigue (Armstrong et al., 2006). Muscular endurance can be assessed by counting the maximum number of repetitions of a muscular contraction a person can perform to fatigue. The 1-Minute Max Push-Up test is a simple and safe test alternative to the one repetition maximum (1RM) bench press test. When used properly, the 1-Minute Max Push-Up test has a strong correlation to the bench press 1RM test ($r = .80$ for women and $r = .87$ for men). These are considered to be reliable coefficients for a muscular endurance field test (Baumgartner, Oh, Chung, & Hales, 2002). To score the 1-Minute Max Push-Up test refer to Table 3. The test procedure is described in Appendix F.

Several tests have been developed to measure abdominal muscular strength and endurance. The procedure used in this study to determine abdominal muscular strength and endurance is called the YMCA Half Sit-Up test, which is a type of curl-up test since the trunk only gets partially lifted off the floor. This test is preferred to the full sit-up test because it does not strain the lower back and does not require a partner to hold their feet. A 1995 study conducted by Diener, Golding, and Diener (1995) validated the YMCA Half Sit-Up test; their findings included very high test-retest reliability ($r = 0.98$), moderately high inter-apparatus reliability ($r = 0.71$), and high inter-tester reliability ($r = 0.76$) in a mixed sample of 142 subjects. The test procedure is described in Appendix G.

Trunk flexibility was measured by the sit-and-reach test. The sit-and-reach test is the most common way to measure lower back and hamstring flexibility. Tightness in the low back and hamstrings often are related to muscle pain and stiffness; this test may assist in determining a participant's risk for future pain and possible injury (Armstrong et al., 2006). The sit-and-reach test has been validated to determined hamstring flexibility by Chung and Yuen (1999) ($r = 0.71$). The sit-and-reach test has shown slightly better correlations to hamstring flexibility than the alternative back-saver sit-and-reach test (females: $r = 0.66$ vs.0.76, males: $r = 0.51$ vs. 0.59) (Lopez-Minarro, Sainz de Baranda Andujar, & Rodriguez-Garcia, 2009). The test procedure is described in Appendix H.

Analysis Equipment

The MicroFit HealthWizard software package has been used in multiple research studies to assist in data gathering and data calculation. Rideout (2006) wrote an article on key service concepts for wellness and fitness testing where he used the MicroFit software package as an effective way to provide standard fitness assessments and results data, making it easier for staff to help clients in a timely and efficient manner. Program

participation, retention, and new member referrals with the consistent use of MicroFit software all have increased.

The MicroFit software package has been used in research studies evaluating wellness in colleges and universities. A study conducted at Islamic Azad University did a comparison study of physical fitness among college students using a six analysis assessment: 12-minute run, sit-up, vertical jump for explosive strength, 10 meter agility shuttle, flexibility, and push-up. The comparison study identified that male participants performed better on all aspects of the assessment, except on flexibility (Jourkesk, Sadri, Ojagi, & Sharanavard, 2011). Islamic Azad University then used the MicroFit software package in another study to conduct a comparison study of physical fitness levels among normal and obese female university students. This comparison study, with the use of MicroFit, found that there were lower fitness assessment scores in those who reported higher BMIs (Kamyabnia, Jourkesh, & Keikha, 2011).

MicroFit has also been used in the workplace and studied by van den Berg et al. (2008). MicroFit software was utilized for the physical examination portion of this study as it related to physical health. The software was utilized for capturing height, weight, biceps strength, and cardiorespiratory fitness (12-minute sub-maximal cycle ergometer test). The use of the MicroFit software assisted in the conclusion that determinants of mental health were similar to work ability, where physical fitness was directly related to lack of physical activity.

MicroFit can also track trends over time, as used by Pribis, Burtnack, McKenzie, and Thayer (2010), who used it to track the trends of physical fitness related to BMI and body fat among university students over a 12-year span. A linear trend for data was established from 1996 to 2008 for all categories. The MicroFit data showed that

VO2max declined over the years; BMI and body fat percentage fluctuated up and down with indirect correlation to VO2max. This study showed that an increase in physical activity results in lower BMI and body fat percentage (Pribis et al., 2010).

Data Collection

The use of a software package developed by MicroFit called HealthWizard captured and analyzed three dimensions of wellness: (1) Health History, (2) Wellness Profile, and (3) Fitness Profile. The researcher utilized student research assistants to gather the information.

The Health History program is a short set of questions based on the Physical Activity Readiness Questionnaire (PAR-Q) developed by the Canadian Society for Exercise Physiology. It is recommended as a minimal screening tool for anyone starting an exercise program. This program can identify the small number of people for whom exercise might be inappropriate or those who should seek medical advice concerning the most suitable type of exercise activity.

The Wellness Profile program examines lifestyle behaviors that can affect an individual's health and longevity (American College Health Association, 2012). The 46-question Wellness Profile questionnaire analyzes the individual's current health behaviors with a focus on exercise, nutrition, safety, tobacco use, and stress. The Wellness Profile is the result of a joint development project between MicroFit and the Stanford University School of Medicine. Technical information for the program was derived from a number of professional organizations, including the U.S. Center for Disease Control, American Heart Association, American Cancer Association, and the ACSM.

The Fitness Profile software comes preloaded with fitness tests for muscle

strength, muscle endurance, and flexibility. This software records and tracks body composition, blood pressure, blood cholesterol, and cardiovascular fitness. A paper template was utilized for conducting the Fitness Profile so that the client was not limited to testing whenever a computer was available and to assist with assessing a group of people onsite, or in an offsite setting, such as health fairs. Student research assistants then entered the data into the software for each individual. The data was then reviewed for manual input errors by the research team on two separate occasions.

Data Analysis

Health History was analyzed by the total number of participants answering yes to the nine Health History questions as a percentage.

The Wellness Profile assessed five dimensions of wellness: exercise patterns, nutrition habits, general safety habits, stress levels, and tobacco usage. The participant's answers were analyzed and processed by the MicroFit software package into a category scoring system: 0-100 points, with 0 being the lowest possible score and 100 meaning there is no way the participant can improve his/her score. Then each score was categorized with a rating of "room for improvement" (0-33), "fair" (34-66), or "excellent" (66-100). Staff, faculty, and students were scored individually and an overall campus score was developed using the combined scores of faculty, staff, and students.

The Fitness Profile assessed 10 dimensions of fitness: body fat percentage, aerobic fitness, resting heart rate, systolic blood pressure, diastolic blood pressure, BMI, 1-minute curl-up max, 1-minute push-up max, sit and reach, and WHR. The participant's scores were analyzed and processed by the MicroFit software package against national fitness standards set by the ACSM. Then each score was categorized in one of four ratings: "needs work," "fair," "fit," and "excellent." Staff, faculty, and students were

scored individually as groups, and an overall campus score was developed using the combined scores of the three groups.

Research Questions

1. What is the current status of overall wellness on the campus of the university?
2. Is there a difference of wellness status between the employees and students of the university?

Participants

This study was conducted in the southeastern United States on the campus of a small, private HBCU. A total of 2,339 individuals who were active full-time and part-time faculty (159), staff (211), and students (1,669) were eligible for participation in this study. The overall university population demographics were: race (African American, 77.8%; Caucasian, 4.2%; Hispanic, 2.3%; Asian, .8%; Hawaiian or other Pacific Islander, .2%; two or more races, .9%; unknown race, 13.8%); male-to-female ratio (1:1.93); faculty-to-staff ratio (1:1.33); employee-to-student ratio (1:4.5); and average age of research participants (24). Participation in the new wellness center programming and research was on a volunteer basis. This study was able to secure 21% of the total campus population (496) with a fair representation of the underlying faculty (3.7%), staff (14.8%), and student (81.5%) population.

Chapter 4: Results

Although life expectancy in the United States has consistently increased over the past couple of decades, the leading causes of death continue to be the result of unhealthy lifestyles such as poor diet, lack of physical activity, tobacco use, and alcohol consumption (Arias, 2007; Mokdad et al., 2004; National Center for Health Statistics, 2009). The CDC indicated that about one half of all deaths of persons under the age of 65 years are attributed to unhealthy lifestyles (Mokdad et al., 2004). When a representative sample of the United States was surveyed by phone between the years 2000-2001, it was shown that the majority of people in the United States did not engage in enough physical activity consistent with the then-used recommendation of 30 minutes of moderate-intensity activity most days of the week (Macera et al., 2003).

For the last 40 years, researchers have consistently provided evidence that health disparities exist between African Americans and Caucasians in diabetes, heart disease, cerebrovascular disease, and malignant neoplasms (CDC, 1983). Within the arena of preventative wellness programming, recent studies have shown the importance of maintaining healthy eating habits (Deckelbaum et al., 1999). To do so, it is important to shape and change the culture within the organization. In order for a culture to change, there must be a good reason for it that outweighs the trouble and turbulence associated with giving up old habits (Burke, 2009; Hall, 2008). The benefit of preventative wellness programming must provide an incentive and increase the participant's preparedness to change his/her habits in relation to health (Madsen, 2003).

Setting and Population

This study was conducted in the southeastern United States on the campus of a small, private HBCU. A total of 2,339 individuals who were active full-time and part-

time faculty (159), staff (211), and students (1,669), were eligible for participation in this study. The overall university population demographics were: race (African American, 77.8%; Caucasian, 4.2%; Hispanic, 2.3%; Asian, .8%; Hawaiian or other Pacific Islander, .2%; two or more races, .9%; unknown race, 13.8%); male-to-female ratio (1:1.93); faculty-to-staff ratio (1:1.33); employee-to-student ratio (1:4.5); and average age of research participants (24). Participation in the new wellness center programming and research was on a volunteer basis. This study was able to secure 21% of the total campus population (496) with a fair representation of the underlying faculty (3.7%), staff (14.8%), and student (81.5%) population.

Data Collection

The new wellness center utilized a software package designed by MicroFit called HealthWizard. This software package was chosen because it was already utilized in over 300 universities and because of its ease of use. This software package can store thousands of member profiles and create comparison reports to track program effectiveness over time. This software has four components: Health History, Wellness Profile, Fitness Profile, and MicroFit Manager. Fitness Profile is a flexible health data collection and reporting system for people ages 5 to 90+. The software comes with multiple preprogrammed musculoskeletal assessments and other assessments, such as body composition, blood pressure, and cardiovascular fitness. The Wellness Profile section is a 46-question questionnaire that focuses on the areas of exercise, nutrition, alcohol use, safety, tobacco use, and stress. The Health History program is an electronic version of the PAR-Q. This section of the questionnaire was modified to add two additional questions: (1) Do you currently have, or getting treated for diabetes; and (2) Do you currently have, or getting treated for high cholesterol? MicroFit Manager is

specifically designed to assist in creating reports from the stored databases. All collected data is scored off of national age and gender standard norms.

Software data collection utilized printed forms with the Health History and Wellness Profile so that it could be mailed, emailed, or handed to the client upon arrival without waiting for an available computer. A *quick entry* feature allowed the research team to rapidly enter data from the answer sheet into the MicroFit database. Use of a paper template was utilized for conducting the Fitness Profile so that the client was not limited to testing whenever a computer was available, and to assist with assessing a group of people onsite or in an offsite setting, such as health fairs. Student research assistants then entered the data into the software for each individual. The data was then reviewed for manual input errors by the research team on two separate occasions.

Research Question 1

What is the current status of overall wellness on the campus of the university? Four hundred ninety-six participants were broken into three categories, either being full-time or part-time: faculty (17), staff (75), or student (404). Each participant category was analyzed in the three main areas of focus (health history, wellness profile, and fitness profile) individually, as well as combined.

Health history. Participation in the Health History had a total of 489 participants, with representation from faculty (17), staff (74), and students (398). As shown in Table 1, 0.6% (3 students) responded that they have a heart condition and should be exercising only under the recommendation of their doctor; 5.4% (1 staff, 26 students) reported chest pain when participating in physical activity; 4.8% (2 staff, 1 faculty, 21 students) reported chest pain even when not participating in physical activity; 4.2% (3 staff, 18 students) of participants experienced loss of balance due to dizziness or

had lost consciousness; 5.6% (3 staff, 2 faculty, and 23 students) reported having a bone or joint problem that could be made worse by a change in physical activity; 5.4% (15 staff, 3 faculty, and 9 students) reported that they currently are taking prescription drugs for blood pressure or a heart condition; 1% (1 staff, 4 students) indicated that there were other reasons that they should not do physical activity; 1.6% (4 staff, 4 students) indicated that they currently have or are getting treatment for diabetes; and 3% of participants (8 staff, 3 faculty, and 4 students) indicated that they currently have or are getting treatment for high cholesterol (see Table 1).

Wellness profile. The Wellness Profile assessed five dimensions of wellness: exercise patterns, nutrition habits, general safety habits, stress levels, and tobacco usage. The participant's answers were analyzed and processed by the MicroFit software package into a category scoring system: 0-100 points, with 0 being the lowest possible score and 100 meaning there is no way the participant can improve his/her score. Then each score was categorized with a rating of "room for improvement" (0-33), "fair" (34-66), or "excellent" (66-100). Staff, faculty, and students were scored individually, and an overall campus score was developed using the combined scores of faculty, staff, and students.

Table 1

Health History Question Results

Health History Question	Percentage of Respondents Answering "Yes"
Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?	0.6%
Do you feel pain in your chest when you do physical activity?	5.4%
In the past month, have you had chest pain when you were not doing physical activity?	4.8%
Do you lose balance because of dizziness or do you ever lose consciousness?	4.2%
Do you have a bone or joint problem that could be made worse by a change in your physical activity?	5.6%
Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?	5.4%
Do you know of any other reason why you should not do physical activity?	1.0%
Do you currently have, or getting treatment for Diabetes?	1.6%
Do you currently have, or getting treatment for High Cholesterol?	3.0%

Participation in the Wellness Profile had a total of 496 participants, with representation from faculty (17), staff (75), and students (404). Overall campus profile results indicated that four categories placed into the "fair" rating: exercise (41), nutrition (41), safety (61), and stress (59); tobacco received a rating of "excellent" (86) (see Table 2).

Table 2

Campus Wellness Profile Score

Wellness Category	Score
Exercise	41
Nutrition	41
Safety	61
Stress	59
Tobacco	86
Overall Wellness	58

Note: Based on a 0-100 scale.

The overall campus wellness score was 58 of 100, with 27.3% scoring "excellent," 67.7% scoring "fair," and 5% scoring "room for improvement." The exercise score was 41 of 100, with 32.3% scoring "excellent," 13.5% scoring "fair," and 54.2% scoring "room for improvement." The nutrition score was 41 of 100, with 7.9% scoring "excellent," 62.4% scoring "fair," and 29.7% scoring "room for improvement." The safety score was 61 of 100, with 51.1% scoring "excellent," 38.2% scoring "fair," and 10.7% scoring "room for improvement." The stress score was 59 of 100, with 36.2% scoring "excellent," 52.1% scoring "fair," and 11.7% scoring "room for improvement." The tobacco score was 86 of 100, with 82% scoring "excellent," 7.7% scoring "fair," and 10.3% scoring "room for improvement" (see Table 3).

Table 3

Campus Wellness Profile Score by Category

Wellness Category	Excellent	Fair	Room for Improvement
Overall Wellness	27.3%	67.7%	5.0%
Exercise	32.2%	13.5%	54.2%
Nutrition	7.9%	62.4%	29.7%
Safety	51.1%	38.2%	10.7%
Stress	36.2%	52.1%	11.7%
Tobacco	82.0%	7.7%	10.3%

Fitness profile. The Fitness Profile assessed 10 dimensions of fitness: body fat percentage, aerobic fitness, resting heart rate, systolic blood pressure, diastolic blood pressure, BMI, 1-minute curl-up max, 1-minute push-up max, sit and reach, and WHR. The participant's answers were analyzed and processed by the MicroFit software package against national fitness standards set by the ACSM. Then each score was categorized within in one of four ratings, "needs work" (0-25), "fair" (26-50), "fit" (51-75), or "excellent" (76-100). Staff, faculty, and students were scored individually as groups, and an overall campus score was developed using the combined scores of the three groups.

The overall campus fitness score was 48 of 100 (needs work), with 0% falling into the "excellent" category, 21.3% "fit," 49.1% "fair," and 29.6% in the "needs work" category. Overall results show that six of the 10 fitness dimensions reported the highest percentage of participants in the "needs works" category (body fat, aerobic fitness, BMI, curl-ups, sit and reach, and WHR), three in the "fair" category (resting heart rate, systolic blood pressure, and diastolic blood pressure), and one in the "excellent" category (push-ups). Overall combined campus scores to be watched were average blood pressure

(133/81), which is considered prehypertensive and BMI (28.0), overweight. Aerobic fitness (29.3ml/kg/min), body fat percentage (29.3), resting heart rate (78), WHR (.81), sit and reach (31cm), and curls-ups (31) all fell into normal standards. Push-ups exceeded standards with 30 (see Tables 4 and 5).

Table 4

Campus Fitness Assessment Scores

Fitness Category	Results/Score
Overall Fitness (of 100)	48
Body Fat (Percentage)	29.3
Aerobic Fitness (ml/kg/min)	37.1
Resting Heart Rate (bpm)	78
Systolic Blood Pressure (mmHg)	133
Diastolic Blood Pressure (mmHg)	81
Body Mass Index (BMI)	28
Curl-Ups: 1 Minute (max)	31
Push-Ups: 1 Minute (max)	30
Sit and Reach (cm)	31
Waist-to-Hip Ratio (WHR)	0.81

Table 5

Campus Fitness Category Ratings

Fitness Category	Excellent	Fit	Fair	Needs Work
Overall Fitness	0.0%	21.3%	49.1%	29.6%
Body Fat (Percentage)	8.6%	16.1%	26.8%	48.5%
Aerobic Fitness (ml/kg/min)	20.1%	22.4%	22.1%	35.3%
Resting Heart Rate (bpm)	29.0%	31.8%	34.1%	5.1%
Systolic Blood Pressure (mmHg)	6.6%	14.2%	47.0%	32.2%
Diastolic Blood Pressure (mmHg)	16.5%	30.4%	33.0%	20.1%
Body Mass Index (BMI)	12.2%	21.4%	30.3%	36.1%
Curl-Ups: 1 Minute (max)	29.3%	12.8%	16.1%	41.8%
Push-Ups: 1 Minute (max)	45.2%	22.3%	13.4%	19.0%
Sit and Reach (cm)	12.3%	14.0%	17.7%	56.0%
Waist-to-Hip Ratio (WHR)	14.3%	14.9%	32.5%	38.3%

Research Question 2

Is there a difference of wellness status between the employees and students of the university? The 496 participants were combined into two categories, either being full-time or part-time: employee (87), which is a combination of faculty and staff members; and students (404). Each category was analyzed in the three main areas of focus (health history, wellness profile, and fitness profile). Generated scores were then compared against the two categories, employees and students.

Health history. The employee grouping had a total of 86 participants, with representation from faculty (17) and staff (69). Zero participants responded that they have a heart condition and should be exercising only under the recommendation of their doctor; 1.2% reported chest pain when participating in physical activity; 3.5% reported

chest pain even when not participating in physical activity; 3.5% of participants experienced loss of balance due to dizziness or loss of consciousness; 5.8% reported having a bone or joint problem that could be made worse by a change in physical activity; 18.6% reported that they currently are taking prescription drugs for blood pressure or a heart condition; 1.2% indicated that there were other reasons that they should not do physical activity; 4.7% indicated that they currently have or are getting treatment for diabetes; and 12.8% indicated that they currently have or are getting treatment for high cholesterol.

Employee and student groupings both had scores leading in four categories, and the groups tied in percentage of participants that reported having a bone or joint problem that could be made worse by a change in physical activity. The student category led in the four categories that indicated that the participants were at risk for future heart disease and other possible medical conditions, where the employee group reported higher occurrences in the categories that showed the participants may currently have underlying heart disease or other medical conditions (see Table 6).

Table 6

Health History Question Results—Employees vs. Students

Health History Questions	Percentage of Respondents Answering "Yes"		Difference
	Employees	Students	
Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?	0.0%	0.8%	0.8
Do you feel pain in your chest when you do physical activity?	1.2%	6.5%	5.3
In the past month, have you had chest pain when you were not doing physical activity?	3.5%	5.3%	1.8
Do you lose balance because of dizziness or do you ever lose consciousness?	3.5%	4.5%	1.0
Do you have a bone or joint problem that could be made worse by a change in your physical activity?	5.8%	5.8%	0.0
Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?	18.6%	2.3%	16.3
Do you know of any other reason why you should not do physical activity?	1.2%	1.0%	0.2
Do you currently have, or getting treatment for Diabetes?	4.7%	0.8%	3.9
Do you currently have, or getting treatment for High Cholesterol?	12.8%	1.0%	11.8

Wellness profile. The overall employee wellness score was 62 of 100, with 42% scoring "excellent," 53.4% scoring "fair," and 4.5% scoring "room for improvement." The exercise score was 42 of 100, with 29.5% scoring "excellent," 14.8% scoring "fair," and 55.7% scoring "room for improvement." The nutrition score was 51 of 100, with

22.7% scoring “excellent,” 60.2% scoring “fair,” and 17% scoring “room for improvement.” The safety score was 67 of 100, with 71.6% scoring “excellent,” 19.3% scoring “fair,” and 9.1% scoring “room for improvement.” The stress score was 63 of 100, with 42% scoring “excellent,” 50% scoring “fair,” and 8% scoring “room for improvement.” The tobacco score was 87 of 100, with 86.4% scoring “excellent,” 2.3% scoring “fair,” and 11.3% scoring “room for improvement.”

The overall student wellness score was 57 of 100, with 24.3% scoring “excellent,” 70.5% scoring “fair,” and 5.2% scoring “room for improvement.” The exercise score was 42 of 100, with 33.2% scoring “excellent,” 13.1% scoring “fair,” and 53.7% scoring “room for improvement.” The nutrition score was 41 of 100, with 4.5% scoring “excellent,” 62.9% scoring “fair,” and 32.6% scoring “room for improvement.” The safety score was 59 of 100, with 46% scoring “excellent,” 42.6% scoring “fair,” and 11.4% scoring “room for improvement.” The stress score was 58 of 100, with 34.9% scoring “excellent,” 52.7% scoring “fair,” and 12.4% scoring “room for improvement.” The tobacco score was 86 of 100, with 81.2% scoring “excellent,” 8.9% scoring “fair,” and 9.9% scoring “room for improvement” (see Table 7).

Table 7

Wellness Score—Employees vs. Students

Wellness Category	Employee Score	Student Score	Difference
Overall Wellness	62	57	5
Exercise	42	42	0
Nutrition	51	39	12
Safety	67	59	8
Stress	63	58	4
Tobacco	87	86	1

Employees reported higher wellness scores on four of five of the wellness dimensions and tied in the fifth. When comparing dimensions scores, the dimension with the highest percentage of users in the "excellent" category was the tobacco dimension with 82% of all users. The next highest percentage of users in the "excellent" category was nutrition dimension with 51.1%, followed by stress (36.2%), exercise (32.3%), and nutrition (7.9%), respectively. The wellness dimension with the highest rate of "room for improvement" category was the exercise dimension with 54.2% of all users. The next highest percentage was the nutrition dimension with 29.7%, followed by stress (11.7%), safety (10.7%), and tobacco (10.3%), respectively.

Students reported lower wellness scores in all of the five wellness dimensions when compared to employees. The nutrition category was where the largest difference in score was, with 86.8% of employees scoring "excellent" or "fair" compared to students with 67.4% scoring "excellent" or "fair," a 19.4% difference. The next closest difference was within the stress category with 4.4% difference, followed by safety (2.2%), tobacco (1.6%), and then exercises (1.5%) (see Table 8).

Table 8

Wellness Score Breakdown—Employees vs. Students

Wellness Category	Excellent	Fair	Room for Improvement
Overall Wellness – Employees	42.0%	53.4%	4.5%
Overall Wellness – Students	24.3%	70.5%	5.2%
Difference	17.7	17.1	0.7
Exercise – Employees	29.5%	14.8%	55.7%
Exercise – Students	33.2%	13.1%	53.7%
Difference	3.7	1.7	2
Nutrition – Employees	22.7%	60.2%	17.0%
Nutrition – Students	4.5%	62.9%	32.6%
Difference	18.2	2.7	15.6
Safety – Employees	71.6%	19.3%	9.1%
Safety – Students	46.0%	42.6%	11.4%
Difference	25.6	23.3	2.3
Stress – Employees	42.0%	50.0%	8.0%
Stress – Students	34.9%	52.7%	12.4%
Difference	7.1	2.7	4.4
Tobacco – Employees	86.4%	2.3%	11.3%
Tobacco – Students	81.2%	8.9%	9.9%
Difference	5.2	6.6	1.4

Fitness profile. The employees scored worse than the students in seven of the 10 categories (body fat percentage, aerobic fitness, diastolic blood pressure, BMI, curl-ups, push-ups, and WHR); the groups tied in resting heart rate; and employees scored better in two categories (systolic blood pressure and sit and reach). These results indicate that employees had a lower level of baseline of fitness when beginning a new exercise regimen (see Table 9).

Table 9

Fitness Score—Employees vs. Students

Fitness Category	Employee Results/Score	Student Results/Score	Difference
Overall Fitness (of 100)	47	48	1
Body Fat (Percentage)	31.7	28.9	2.8
Aerobic Fitness (ml/kg/min)	34.5	39.6	5.1
Resting Heart Rate (bpm)	78	78	0
Systolic Blood Pressure (mmHg)	131	133	2
Diastolic Blood Pressure (mmHg)	89	80	9
Body Mass Index (BMI)	29.1	27.8	1.3
Curl-Ups: 1 Minute (max)	31	32	1
Push-Ups: 1 Minute (max)	27	30	3
Sit and Reach (cm)	32	31	1
Waist-to-Hip Ratio (WHR)	0.83	0.80	.03

The overall employee fitness score was 48 of 100 (“fair”), with 0% falling into the “excellent” category, 17.6% “fit,” 41.2% “fair,” and 41.2% in the “needs work” category. Overall results show that seven of the 10 fitness dimensions reported the highest percentage of participants in the “needs works” category (body fat, aerobic fitness, diastolic blood pressure, BMI, curl-ups, sit and reach, and WHR), two in the “fair” category (resting heart rate and systolic blood pressure), and one in the “excellent” category.

The overall student fitness score was 47 of 100 (“fair”), with 0% falling into the “excellent” category, 21.8% “fit,” 49.8% “fair,” and 28.4% in the “needs work” category. Overall results show that six of the 10 fitness dimensions reported the highest percentage of participants in the “needs works” category (body fat, aerobic fitness, BMI, curl-ups, sit and reach, and WHR), two in the “fair” category (resting heart rate and systolic blood

pressure), one in the “fit” category (diastolic blood pressure), and one in the “excellent” category (push-ups). Overall combined student fitness scores across all 10 categories were borderline unhealthy (see Table 10).

Table 10

Fitness Score Breakdown—Employees vs. Students

Wellness Category	Excellent	Fit	Fair	Needs Work
Overall Fitness - Employees	0.0%	19.2%	42.3%	38.5%
Overall Fitness - Students	0.0%	26.5%	47.3%	25.4%
Difference	0	7.3	5	13.1
Body Fat (Percentage) - Employees	3.3%	6.7%	30.0%	60.0%
Body Fat (Percentage) - Students	9.3%	17.3%	26.3%	47.1%
Difference	6	110.6	3.7	12.9
Aerobic Fitness (ml/kg/min) - Employees	31.7%	19.5%	19.5%	29.3%
Aerobic Fitness (ml/kg/min) - Students	17.6%	22.8%	23.2%	36.3%
Difference	14.1	3.3	3.7	7
Resting Heart Rate (bpm) - Employees	18.6%	41.9%	37.2%	2.3%
Resting Heart Rate (bpm) - Students	29.9%	30.6%	34.0%	5.5%
Difference	11.3	11.3	3.2	3.2
Systolic Blood Pressure (mmHg) - Employees	2.4%	16.7%	59.5%	21.4%
Systolic Blood Pressure (mmHg) - Students	6.9%	14.4%	45.4%	33.3%
Difference	4.5	2.3	14.1	11.9
Diastolic Blood Pressure (mmHg) - Employees	7.0%	11.6%	44.2%	37.2%
Diastolic Blood Pressure (mmHg) - Students	17.9%	32.6%	32.0%	17.5%
Difference	10.9	21	12.2	19.7
Body Mass Index (BMI) - Employees	10.3%	10.3%	34.5%	37.2%
Body Mass Index (BMI) - Students	12.4%	22.7%	30.2%	34.7%
Difference	2.1	12.4	4.3	2.5
Curl-Ups: 1 Minute (max) - Employees	28.6%	3.6%	10.7%	57.1%
Curl-Ups: 1 Minute (max) - Students	30.0%	13.8%	16.2%	40.0%
Difference	1.4	10.2	5.5	17.1
Push-Ups: 1 Minute (max) - Employees	58.6%	20.7%	13.8%	6.9%
Push-Ups: 1 Minute (max)	44.1%	22.4%	13.8%	19.7%
Difference	14.5	1.7	0	12.8
Sit and Reach (cm) - Employees	12.2%	7.3%	17.1%	63.4%
Sit and Reach (cm) - Students	13.1%	14.4%	17.9%	54.6%
Difference	0.9	7.1	0.8	8.8
Waist-to-Hip Ratio (WHR) - Employees	7.4%	14.8%	25.9%	51.9%
Waist-to-Hip Ratio (WHR) - Students	15.4%	15.1%	33.0%	36.5%
Difference	8	0.3	7.1	15.4

Chapter 5: Discussion

Wellness is a concept that combines many of factors. Bill Hettler (1980), who in the 1970s established the National Wellness Institute, defined wellness as "an active process through which people become aware of, and make choices about, a more successful existence" (p. 77). None of these models look into the difference among wellness through one's race. Researchers have consistently provided evidence that health disparities exist between African Americans and Caucasians, specifically in diabetes, heart disease, cerebrovascular disease, and malignant neoplasms (CDC, 1983). The benefit of preventative wellness programming must provide an incentive and increase the participant's preparedness to change his/her habits in relation to health (Madsen, 2003).

The purpose of this study was to establish a baseline multidimensional analysis of wellness on a university campus resulting from the new development of a Wellness Department and opening of a new wellness facility and to determine if there was a significant difference in wellness between employees and students. This study developed an operational knowledge of the current wellness needs and wants of the university, along with creating a measurable standard for future assessment.

Chapter 5 is organized in the following manner: (1) a review of the purpose of this study; (2) a discussion of the results, including the participant demographic information that was reported in Chapter 4; and (3) concluding remarks accompanied by recommendations for future study.

Demographics

A total of 2,339 individuals who were active full-time and part-time faculty (159), staff (211), and students (1,669), were eligible for participation in this study. The overall university population demographics were: race (African American, 77.8%; Caucasian,

4.2%; Hispanic, 2.3%; Asian, .8%; Hawaiian or other Pacific Islander, .2%; two or more races, .9%; unknown race, 13.8%); male-to-female ratio (1:1.93); faculty-to-staff ratio (1:1.33); employee-to-student ratio (1:4.5); and average age of research participants (24). Participation in the new wellness center programming and research was on a volunteer basis. This study was able to secure 21% of the total campus population (496) with a fair representation of the underlying faculty (3.7%), staff (14.8%), and student (81.5%) population.

Research Question 1

What is the current status of overall wellness on the campus of the university?

Health history. As a university, the health data show a small indication of four existing health factors that would affect one's overall wellness and be of concern: (1) 5.6% of all participants reported having bone and joint problems that could affect their participation in an exercise program, (2) 5.4% of participants are currently taking prescription medication for blood pressure or a heart condition, (3) 5.4% of participants reported chest pain when participating in physical activity, and (4) 4.8% of participants reported having chest pain even when not participating in physical activity. Three of the four major health concerns are key indicators for cardiovascular disease.

Regular exercise is useful in reducing coronary heart disease risk. Prevention of exercise-related cardiac events is difficult because of their rarity, and depends on selective preparticipation screening and the careful evaluation of symptomatic athletes before permitting their return to competition (Thompson, 2002). Because underlying cardiovascular pathological processes start shortly after birth, tracking recognized cardiovascular disease health risk indicators during childhood and adolescence can help

develop early preventative wellness strategies (Kemper, Snel, Verschuur, & Storm-van Essen, 1990). There is good evidence that higher levels of moderate-to-vigorous physical activity may lead to increased health benefits which may be useful in promoting physical activity (Hamilton, Hamilton, & Zderic, 2004). Recommendations for physical activity clearances were made for identifying specific increased risks of cardiovascular disease (Thomas, Goodman, & Burr, 2011). Three Health Profile screening questions were designed to identify underlying cardiovascular disease that the participant may, or may not know about. This must be known prior to beginning a wellness program as any alterations in cardiac function may contribute to the risk of sudden death syndrome (Jouven et al., 2005).

Individuals who report having bone and joint problems that could affect their participation in an exercise program lead to higher levels of inactivity (Blair et al., 1996), which may lead to a shorter lifespan than those without bone or joint problems (Wallberg-Jonsson, Ohman, & Dahlqvist, 1997). The two supplemental questions resulted in a low positive response rate percentage; 3% of participants reported that they currently have or are getting treatment for high cholesterol and 1.6% indicated that they currently have or are getting treatment for type 2 diabetes.

Wellness profile. The results indicated that the lowest wellness scores were in exercise (41) and nutrition (41). Past studies have shown numerous barriers for physical activity for men and women in the African-American community (Henderson & Ainsworth, 2003; Izquierdo-Porrera, Powell, Reiner, & Fontaine, 2002; Wilcox, Bopp, Oberrecht, Kammermann, & McElmurray, 2003; Young, He, Harris, & Mabry, 2002). Exercise has been identified as beneficial, but many African Americans lack the time and motivation to participate in regular physical activity. Participants cite family

responsibilities and duties, and environmental, personal, and social factors as reasons for not meeting the daily required amount of physical activity. Social factors may be the most important factors in promoting adherence to an exercise program in African Americans as these factors were cited most often for why they do not participate in a regular physical activity (Trost et al., 1997; Wilcox, Castro, King, Housemann, & Brownson, 2000). All of this suggested that physical activity intervention strategies need to place value on family and cultural responsibilities when dealing with an African-American population (Griffin, Wilson, Wilcox, Buck, & Ainsworth, 2008).

Not only are the barriers to exercise and physical activity great, but the perception seems to be an issue as well. African Americans have been identified for their unique perception on what is healthy. Studies have shown that significant proportions of African-American individuals are unaware of their risk for certain health conditions, such as hypertension and diabetes due to their lifestyle choices (Graham et al., 2006). Until exercise becomes a norm in the African-American community, it is believed that this number will remain one of the lowest reported wellness scores.

Eating habits in the African-American community run deep. Their diet preference, called soul food, has resulted in various preventative health problems for African Americans (Anderson-Loftin et al., 2005; Popkin, Siega-Riz, & Haines, 1996). Soul food tends to be higher in carbohydrates, total fat, saturated fat, and salt, and is also low in fiber (Airhihenbuwa et al., 1996). However, making changes to the African-American diet would be contrary to some traditional cultural practices that stem from American slavery. Learned cooking practices such as to how to fry, boil, and roast dishes use of a mixture of styles used by the British, French, Americans, and Spanish (Collins, 2007). This information makes it clear as to why the nutrition score was tied for the

lowest scoring wellness score as it would be difficult to encourage African Americans to eat healthier or change their diet due to their strong cultural beliefs and social ties in regards to food. To encourage healthier eating habits, it would be best to involve teaching people to cook soul food in healthier and less-expensive ways so they can enjoy soul food and eat healthier at the same time.

Tobacco, stress, and safety reported satisfactory scores with 89.7%, 89.3%, and 88.3%, respectively, with the majority of participants scoring "fair" or "excellent," respectively. These results strengthen the need to focus time and resources on preventive wellness programming that will increase exercise adherence, increase the amount of daily physical activity that one completes, and improve nutritional habits.

Fitness profile. The overall campus fitness score reported that 0% fell into the "excellent" category, only 21.3% were reported as "fit," 49.1% as "fair," and 29.6% in the "needs work" category. These results indicated that the highest percentage of participants fell into the "needs work" category in over half of the fitness dimensions (body fat, aerobic fitness, BMI, curl-ups, sit and reach, and WHR). Of these, three relate to participants carrying an unhealthy excessive amount of weight (body fat, BMI, and WHR). This data may be related to the body image perception among African Americans, which shows African Americans hold a less strict criterion of perceived body fatness (Rucker & Cash, 2006) and are more comfortable with "making what you've got work for you" (Parker et al., 1995). Unfortunately, those who are overweight or obese are at a much greater risk than others for type 2 diabetes (Mokdad et al., 2003). It is not weight alone that increases health risks though; it is also how it is distributed along the body (Dobbelsteyn, Joffres, MacLean, & Flowerdew, 2001).

Blood pressure data gathered (systolic and diastolic) indicated that the combined

blood pressure (BP) of participants on campus was 133/81, which is considered prehypertensive (BP 120/80 - 149/90). This coincides with the growing epidemic of hypertension (BP 140/90 and above) in the African-American community, where almost 30% have hypertension. Of those who have hypertension, only 43% have it under control (CDC, 2011). This number may be hard to change due to BP being affected greatly by one's lifestyle; and with the indicated low wellness scores in exercise and nutrition, it shows that the campus is not currently doing what is necessary to reduce the risk of developing hypertension. Hypertension is highly correlated to those suffering from a first bout of cardiovascular disease, such as heart attack (69%), stroke (77%), and chronic heart failure (74%) (Rodgers, 2012). This is a major concern when comparing rates by race, as African Americans have shown higher coronary heart disease death rates in the 45-74 age groups than women and men of other races (CDC, 2011).

Aerobic fitness (VO2max) is considered the gold standard when determining cardiorespiratory fitness. VO2max is the product of cardiac output; therefore, VO2max results will mimic that of functional capacity of the heart, either being at exercise or at rest. The results indicate this quite clearly with the resting heart rate coming in at 78, which indicates a slightly higher than normal functional capacity of the heart at rest and VO2max scores coming in with the 30th percentile for the participants' mean age (24) range of 20-29 (Armstrong et al., 2006). This indicates that little exercise is being done by the participants which would result in positive cardiovascular health benefits. Sedentary behavior is an important potential determinant of the prevalence of cardiovascular disease. There have been major efforts in reducing the amount of time that U.S. children and adults spend watching television, playing videos games, or using a computer. If these efforts can be paired with increases in physical activity, it could result

in a substantial decrease of the onset of cardiovascular disease (Ford, Kohl, Mokdad, & Ajani, 2005).

Sit-and-reach score results indicated that hamstring and low back tightness were worse than average. This can be associated with students and staff being in a seated position for prolonged periods of time, up to +6 hours a day. This would not be such a problem if participants were participating in regular physical activity, as it would assist in maintaining an active range of motion (del Pozo-Cruz et al., 2012).

Musculoskeletal fitness (curl-ups and push-ups) results reported the highest among all other fitness tests. This indicates that participants put forth some effort into maintaining the physical strength and endurance.

Research Question 2

Is there a difference of wellness status between the employees and students of the university? Research has shown that activities of daily living ability improve until 15 years of age. After age 15, activities of daily living performance ability plateau until age 50 where they begin to gradually decline for the rest of the individual's life (Hayase et al., 2004). To be able to determine effective and relevant wellness programming, the two distinct groups (employees and students) within the university need to be separated and studied individually.

Health history. Data indicate a divide in health where employees and students both lead in four health categories and tie in another. Students reported a higher percentage of participants answering "yes" to health indicators that show participants have a heart condition and should only do supervised physical activity, feel chest pain when doing physical activity, have chest pain even when not doing physical activity, and lose balance and/or consciousness. These health indicators are considered *red flags* by

fitness professionals and answering “yes” corresponds with a high occurrence of an underlying cardiovascular condition (Kemper et al., 1990).

Employees reported a higher percentage of participants answering “yes” to health indicators that show participants may have an underlying reason not listed of why they should not do physical activity and are currently taking medication or getting treatment for blood pressure or a heart condition, diabetes, and high cholesterol. Employees tied students in reported percentage in the question asking if the participant has a bone or joint problem that could be made worse by an increase in physical activity. Results indicated a significant divide in health status between employees and students. Students reported higher in the areas that indicate possible undiagnosed health conditions, especially health conditions that could be made worse by an increase in physical activity. Employees reported higher in the areas of known health considerations that possibly could be affected by an increase in physical activity. These data suggest that students may not be aware of signs and symptoms of underlying health conditions or do not have access to medical assistance needed to address these issues. Employees, on the other hand, are aware of their medical conditions and are receiving treatment for them.

Three health indicators to be mindful of are 18.6% of employees are currently taking prescription medication for blood pressure or a heart condition, 12.8% currently have or are getting treatment for high cholesterol, and, lastly, 6.5% of students experience chest pain when conducting physical activity. Two of these three health indicators are common health disparities in the African-American community: high blood pressure and high cholesterol. Cholesterol levels need to be watched closely as people with high cholesterol have approximately two times the risk of developing cardiovascular disease (CDC, 2011).

Wellness profile. In comparing wellness scores between employees and students, data indicated that employees reported higher scores on four of five wellness categories; the groups tied in the exercise category with a 41. Employees scored an overall score of five points higher than the students. The largest wellness category gap was nutrition, where students scored 12 points lower than employees (39 vs. 51). Cho and Nadow (2004) stated that this is most likely due to the fact that college students no longer have their parents to assist in choosing food, cooking food, establishing a consistent meal time, and following up to ensure that the student eats a sufficient amount for the day. Eating behaviors of college students can be affected by changes in their social environment that may lead to skipping meals, overeating, and eating out (Branen & Fletcher, 1999). Eating patterns can also be affected by class schedule conflicts, school workload requirements, and part-time employment.

Exercise scores for both employees and students reported low, with employees and students scoring the same, 41. These data show that lack of exercise is not just isolated to employees or students but, as a whole, promoting physical activity has not been a priority on campus at this university. This score can be justified as the university in the past did not provide sufficient facilities for employees and students to utilize for leisure physical activity.

Safety scores indicated an eight point difference between employees and students, with students reporting the lower score. Dworkin (2005) conducted research that showed college students deliberately seek out and participate in a variety of risky behaviors, stating that the college culture promotes participation in behaviors that put them into harm's way as part of their personal development. These unsafe behaviors may be related to several factors, including smoking, alcohol abuse, drug abuse, and binge

drinking (Schneider & Morris, 1991). Binge drinking is prevalent especially among college students with almost 44% of all college students reporting binge drinking at least one time per year. Binge drinking is equal to a minimum of five drinks over a 2-hour period. Not only is binge drinking the issue, but drinking and driving or riding with someone who has been drinking, both have a high prevalence among college students, with 30% of students reporting that they have done one or the other (Correia, Murphy, & Barnett, 2012).

Stress scores indicated that stressors on campus as an employee or student were present but should not be a high concern for the university. There was a slight difference between employee and student stress scores with students reporting five points lower than employees. College students have been identified as struggling with self-esteem, self-reliance, and establishing a new social circle, especially for students of a HBCU (Negga et al., 2007).

Tobacco scores indicated that tobacco usage, including smokeless tobacco, on campus was not a major wellness concern. Both groups reported high findings, employees with 87 and students with 86. This score cannot be used solely to identify those who were currently using tobacco as these results not only include those who were using tobacco, but also those who were exposed to second-hand smoke as well, either on campus or at recreational activities or employment.

Fitness profile. Of the 10 fitness categories, students scored better than employees in seven categories and tied in one other. This is important as Arraiz, Wigle, and Mao (1992) found that those who did not pass the physical fitness tests had significantly higher risks of death from cardiovascular disease and cancer than those who passed. Another key concern was muscular strength, as it is positively associated with

independence and overall quality of life, and negatively associated with morbidity and potentially premature mortality. Elevated muscular endurance may also reduce the incidence of falling and its associated injuries as people age (Warburton, Gledhill, & Quinney, 2011).

The fitness profile comparison of employees and students found three significant differences: aerobic fitness (5.1ml/kg/min), diastolic blood pressure (9mmHg), and BMI (1.3), with students performing better on all three of these fitness components. Employee aerobic fitness scored 5.1ml/kg/min lower than that of the students but scored one point above the students in the exercise section of the wellness profile. A portion of the aerobic fitness difference can be explained due to the natural decline of VO2max when people age, 5% in active and 10% in sedentary individuals (Hagberg, 1987), which may closely be related to the fact that the mean age of employees is 38 and that of the students is 21.

Diastolic blood pressure for employees is borderline hypertension with 89mmHg, with 90 being the cutoff for determination of having hypertension. This number still reported high even though employees report a high instance (18%) of participants currently taking prescription medication for blood pressure or another heart condition. Students' diastolic blood pressure was reported at 80mmHg, which is considered healthy.

Other cardiovascular fitness identifiers (resting heart rate and systolic blood pressure) for both groups were slightly elevated over normal standards. Resting heart rate for both groups was 78bpm, which is within normal standards but at the high end. It is preferred that a resting heart rate is 70bpm or below. Systolic blood pressure was shown to be slightly elevated over the normal standard of 120mmHg, with employees reporting 131mmHg and students reporting 135mmHg. Both groups' systolic blood

pressure categorized them as prehypertensive.

Employees' combined BMI came to 29.1, 1.3 points higher than the combined BMI of students (27.8). The scoring standard for classifying those as obese is 30. BMI is determined by an equation that is based on height and weight. This difference in BMI between employees and students is easily identified when looking at these two variables. The height of employees and students was almost identical (employees = 66.97 inches, students = 66.75 inches), but the weight difference was significant with employees averaging 15.3 pounds more than the students (employees = 19.6 pounds, students = 175.6 pounds). These results are also seen in the results of the WHR and body fat percentage. Employees scored .83 versus students with a .80, meaning that employees are carrying more weight around their midsection than students. In body fat percentage, employees averaged a higher body fat percentage than students with 31.7% versus 28.9% body fat of the students.

Sit-and-reach scores were reported low for both categories, both scoring under the 25th percentile. This outcome is understandable as employees and students are in a seated position anywhere from 4-6+ hours a day. Prolonged sitting shortens the hamstrings, weakens the abdominals, and forces the low back muscle to be overactive, thus making them tight. All of these symptoms create a high probability of participants with a low sit-and-reach score of developing low back pain (Dankaerts, O'Sullivan, Burnett, & Straker, 2006). Fortunately, frequent physical activity can increase sit-and-reach scores, thus reducing the risk of low back pain (Lahovski & Paulson, 2012).

Musculoskeletal fitness (curl-ups and push-ups) results for employees and students were almost identical. Both scores reported in the 50th percentile, meaning that upper body strength and core strength are on par with national standards. These scores

indicate that even if participants are not doing the required cardiovascular exercise needed to improve the aerobic fitness levels, they may be doing some sort of strength training that maintains their musculoskeletal fitness.

Recommendations

This study was designed to establish a baseline of multidimensional wellness on the campus that created a measurable standard for future assessment. With that goal in mind, this study also assisted in determining the wellness needs of the university, which will hopefully lead to the development of relevant preventive wellness programming. Future programming would then positively affect the overall wellness at the university which would lead to a future improvement in the researched areas of wellness. With this being said, the need for follow-up research is imperative. Too often, wellness providers rely on their own instincts or trial and error to provide relevant preventive wellness programming. Unfortunately, over time, service delivery ends up being inefficient and programming becomes ineffective and/or costly. With this consideration, there are two recommendations for future research listed below. Each would assist in increasing the knowledge base of wellness at the university.

A study aimed at using qualitative methodology to explore the participant's view of their wellness to determine if their view differs from the quantitative data would provide additional information to better assist in understanding the results of this research study on the overall wellness at the university. Wellness-seeking behaviors can occur regardless of the state of the individual's actual or perceived current state of wellness. Current data represent only those who have utilized the wellness center programming and services. This data can be drastically skewed due to the lack of utilization of a fitness facility. Quantitative data does not show why people are at their current status of

wellness, only what is. A qualitative approach would allow members of the university to share ideas and issues about how they see their wellness, hopefully leading to the discovering of what the university's wellness concerns and needs truly are.

A second recommendation for future research would be to identify if there are any economic reasons that could, or have, affected the wellness of the university's employees or students. First, the relationships between economic status and health status would need to be identified. Second, major preventable health problems are due to a lack of health insurance and access to preventable healthcare services. Having no health insurance also often means that people will postpone necessary care and forego preventive care, such as routine checkups. This has been widely reported and linked to an increasing incidence of type 2 diabetes, childhood obesity leading to adult obesity, and hypertension. These health problems, most recently, have been linked to economic status, low household savings rates, and high household debt. Based on the results of the data, one could enhance the understanding of the implications of economic downturn and help with the assessment of the needs of Americans living in low socioeconomic areas and, therefore, promote and improve their health and wellness.

Concluding Remarks

Being able to implement free and sustainable preventive wellness programming is one step the university can take to assist in the prevention and elimination of health disparities that predominantly affect African Americans. This research will be used to assist the wellness center in designing and implementing relevant preventable wellness programming that will meet the needs of the participants, such as expanding and redesigning current national, state, and county initiatives that strengthen cultural knowledge and promote a healthier lifestyle.

More value needs to be placed on the overall wellness of all members of the university by university stakeholders to increase wellness perception within the university and within the African-American community. Implementing the perfect overall wellness program is difficult; having buy-in from the people you are trying to serve is even more difficult. Without a change in wellness perception, preventive wellness programming will never be fully successful. Success will only come from continued buy-in and the ability to seek and accept feedback and being able to adjust wellness programming needs accordingly.

Investment in preventative wellness programming can assist African Americans who suffer from a chronic disease that can be easily prevented by simply living a healthy lifestyle. New programming and initiatives can be a costly investment; but a true commitment to wellness must show a commitment to the ones being served and offer these programs at no charge, exempting these benefits from deductibles and other cost-sharing requirements. This will ensure that all who seek help will have access to relevant services that will assist in preventing illness and disease before they require more costly treatment.

The fact that these findings were closely related to the national health reports of African Americans, with the reinforcement of the review of literature, should be a strong enough reason to continue to explore the health and wellness needs and desires of African Americans. This study will, hopefully, bring more attention to the need to offer free-to-low cost preventative wellness programming that will increase the understanding and desire of African Americans to live healthy lifestyles, thus eliminating preventable health disparities within their communities.

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Appendix A

Health Profile and Wellness Profile Questionnaire

JCSU HealthPlex

100 Beatties Ford Road | Charlotte, NC 28216 | Phone 704-330-1370 | Fax 704.330.1330

PARTICIPANT INFORMATION

This packet and a Fitness Assessment are required before you can start using the HealthPlex

□ Student
- ○ Freshman
- ○ Sophomore
- ○ Junior
- ○ Senior

□ Faculty

□ Community Member

□ Staff

Participant Information

First Name	Middle Name	Last Name	JCSU ID Number

Birthdate	Marital Status	Phone Number	Preferred Email

Home Zip Code

Ethnicity □ African American □ American Indian □ Caucasian □ Hispanic □ Mixed Race □ Other: _____

Emergency Contact Information

Name	Phone Number	Relationship

HEALTH HISTORY

Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?
□ Yes □ No

Do you feel pain in your chest when you do physical activity?
□ Yes □ No

In the past month, have you had chest pain when you were not doing physical activity?
□ Yes □ No

Do you lose balance because of dizziness or do you ever lose consciousness?
□ Yes □ No

Do you have a bone or joint problem that could be made worse by a change in your physical activity?
□ Yes □ No

Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
□ Yes □ No

Do you know of any other reason why you should not do physical activity?
□ Yes □ No

Do you currently have, or getting treatment for Diabetes?

□ Yes □ No

Do you currently have, or getting treatment for High Cholesterol

□ Yes □ No

List any medications you are presently taking.

_____

_____

_____

WELLNESS PROFILE

Do you believe your current lifestyle

- □ Positively affects your health
- □ Negatively affects your health
- □ Does not affect your health
- □ Not Sure

Of all the possible actions you could take in order to prevent disease and maintain/enhance your health, how much do you estimate you are currently doing?

- □ 0% (none at all)
- □ 25%
- □ 50%
- □ 75%
- □ 100% (all possible)

Which area of behavior would you most like to change in order to improve your health?

(select only one)

- □ Exercise
- □ Nutrition
- □ Weight Management
- □ Alcohol
- □ Smoking
- □ Stress Management

Have you ever lost ten percent of your weight through dieting/exercise and then gained it back?

- □ No
- □ Yes

Have you recently had a significant loss of weight, and you're not sure why?

- □ Yes
- □ No

How do you feel about your current weight?

- □ Would like to lose weight
- □ Would like to gain weight
- □ Satisfied with weight

Do you accumulate at least 30 min. of physical activity on most (5-6) days of the week? The activity must be moderate to high intensity like walking, house work, cycling, stair climbing, swimming, running or sport games.

- □ Yes
- □ No

On average, how many times a week do you perform aerobic exercise for at least 20 continuous minutes? Examples are fast walking, hard cycling, running, swimming and vigorous sports.

- □ Never
- □ Less than 1 time a week
- □ 1-2 times a week
- □ 3 or more times a week

When you do aerobic exercise, how much time do you spend in the activity?

- □ Less than 20 minutes
- □ 20-30 minutes
- □ 30-60 minutes
- □ More than 60 minutes

How would you describe your aerobic exercise?

- □ Not very vigorous
- □ Somewhat vigorous
- □ Quite vigorous

Do you warm up before and cool down after aerobic exercise?

- □ Yes
- □ No
- □ Not Sure

Do you participate in strength training activities (weight lifting)?

- □ Yes
- □ No

How often do you stretch your muscles in order to gain flexibility?

- □ Never
- □ Occasionally
- □ Often

How often do you perform abdominal exercises such as sit-ups which are intended to strengthen the abdomen?

- □ Never
- □ Occasionally
- □ Often

What is the biggest barrier to increasing and/or maintaining your level of exercise?

(select only one)

- □ Not enough time
- □ Cost
- □ Lack of appropriate facility or equipment
- □ No one to exercise with
- □ Physical incapacity
- □ None

How often do you eat breakfast?

- □ Never
- □ Occasionally
- □ Most of the time
- □ Always

On average, how many servings of foods which are high in calcium do you eat each day? Foods such as milk, cheese, yogurt and green leafy vegetables are high in calcium.

- □ Less than 1 serving each day
- □ 1-2 servings each day
- □ 3 or more servings each day

On average, how many servings of foods which are high in fiber do you eat each day? Foods such as beans, whole grains, cereals, fruits and vegetables are high in fiber.

- □ Less than 1 serving each day
- □ 1-2 servings each day
- □ 3-4 servings each day
- □ 5 or more servings each day

On average, how many servings of foods which are high in fat do you eat each day? Foods such as whole milk, cheese, eggs, red meat, fried foods and some desserts are high in fat.

- □ Less than 1 serving each day
- □ 1-2 servings each day
- □ 3-4 servings each day
- □ 5 or more servings each day

How often do you choose low fat or low cholesterol foods?

- □ Never
- □ Occasionally
- □ Often

How often do you add salt to your cooking or add it to your food at the table?

- □ Never
- □ Occasionally
- □ Often

How often do you read nutrition labels on food packages?

- □ Never
- □ Occasionally
- □ Often

On average, how many drinks of alcoholic beverages do you have in a week? A drink is a 12 oz. bottle or can of beer, a 5 oz. glass of wine, a 12 oz. wine cooler, or a shot of liquor.

- □ Less than 1 drink/week
- □ 1 - 7 drinks/week
- □ 8 - 14 drinks/week
- □ More than 14 drinks/week

On average, how many drinks do you have in one setting?

- □ 1 - 2 drinks/setting
- □ 3 - 5 drinks/setting
- □ More than 5 drinks/setting

On average, how many days per week do you drink alcohol?

- □ Less than 1 day/week
- □ 1 - 2 days/week
- □ 3 - 5 days/week
- □ 6 - 7 days/week

How many times in the last month did you ride in a car when the driver was under the influence of drugs or alcohol?

- □ None
- □ One or more times

What percent of the time do you buckle your safety belt when riding in a car?

- □ Never -- 0%
- □ Seldom -- 1-39%
- □ Sometimes -- 40-79%
- □ Nearly always -- 80-99%
- □ Always -- 100%

How would you describe your driving behavior?

- □ Safe and deliberate
- □ Sometimes take chances
- □ Aggressive

How often do you wear sunscreen or protective clothing when you are in the sun?

- □ Never
- □ Occasionally
- □ Often
- □ Always

When riding a bicycle, motorcycle, or similar vehicle, how often do you wear a helmet?
- □ Never
- □ Occasionally
- □ Often
- □ Always
- □ Don't ride such a vehicle

Does your home have a smoke detector that works?
- □ Yes
- □ No
- □ Not sure

When lifting objects, even when they are not very heavy, do you lift them properly?
- □ Yes
- □ No
- □ Not sure

What is your exposure to second-hand smoke?
- □ None
- □ A little
- □ A lot

Do you use cigars, pipes, or smokeless tobacco such as chewing tobacco, snuff or pouches?
- □ Yes
- □ No

Do you smoke cigarettes?
- □ Currently smoke
- □ Used to smoke
- □ Never smoked

What is the primary reason you have not quit smoking?
- □ Can not break the addiction
- □ Too much stress in my life
- □ Enjoy smoking
- □ Afraid to gain weight

During the past year, how much effect has stress had on your health?
- □ None
- □ Not much
- □ A lot

Do you think your current level of stress is high enough to affect your health or quality of life?
- □ Yes
- □ No
- □ Not sure

How effective do you think you are in dealing with the stress in your life?
- □ Not effective
- □ Somewhat effective
- □ Effective
- □ Not sure

Do your sleep patterns promote good health?
- □ Yes
- □ No
- □ Not sure

How often do you feel tense, anxious or upset?
- □ Never
- □ Occasionally
- □ Often

In general, do you have emotional support from others to help you deal with stress?

- □ Yes
- □ No

How often do friends or relatives suggest that you should slow down, take life easier or relax more?

- □ Never
- □ Occasionally
- □ Often

How often do you find yourself getting irritated or annoyed with others?

- □ Never
- □ Occasionally
- □ Often

How often do you feel a chronic sense of struggle with daily events?

- □ Never
- □ Occasionally
- □ Often

Have you suffered a personal loss or misfortune in the past year that had a serious impact on your life?

- □ Yes, 1 loss/misfortune
- □ Yes, 2 or more losses/misfortunes
- □ No

Appendix B

Informed Consent Form

JCSU HealthPlex

100 Beatties Ford Road | Charlotte, NC 28216 | Phone 704-330-1370 | Fax 704.330.1330

PERSONAL INFORMATION AUTHORIZATION

The JCSU HealthPlex is an applied health research facility. You are reading this because you have shown interest in participating in programs and/or activities sponsored by the JCSU HealthPlex. The purpose of this form is to inform you that by taking part in sponsored programs and/or activities by the HealthPlex, you agree that your personal information may be used for research in the following study, **A Multidimensional Study of Wellness within a University Setting**. ***Research will be conducted August 28, 2012 – December 3, 2012***. The information obtained from this study will remain confidential and stored for 5 years. Raw data will be stored in a locked cabinet in the Health Research office and will be made available only to persons conducting the study unless you specifically give permission in writing to do otherwise. No reference will be made in oral or written reports which could link you to the study, and persons conducting the research or administering the questionnaire will make no attempt to link specific participants to specific responses. The raw data will be destroyed at the end of the study, but tabulations and analysis of the data may be included in written and/or published reports.

Research Study Commitment

- Completion of health history and wellness profile paper packet "New Member Form," (10 minutes),
- Completion of fitness assessment (10 minutes)

Description of protected health information that may be used and released with your informed consent:
The health information includes all information created and/or collected during your participation in JCSU HealthPlex sponsored programs and/or activities. Protected health information used may include results of tests, procedures or surveys that are part of the research. If you have any questions regarding this, you may contact Dr. Nicola Bivens, Chair – IRB at 704.330.1481 or irb@jcsu.edu.

Research use of your protected health information with your informed consent:
During the conduct of the research, the researchers may use or share your health information:

- With each other and with other researcher collaborators involved with the study;
- With law enforcement or other agencies, when required by law;
- With the sponsor/funding agency of the research.

Protection of your health information
JCSU HealthPlex and its collaborators agree to protect your health information and will only share this information as described in this Authorization. Please note that individually-identifiable health information disclosed pursuant to the authorization may no longer be protected by Federal laws or regulations and may be subject to re-disclosure by the recipient.

Removal of your identifying information (De-Identification)
If all information that identifies you is removed from your health information, the remaining information is no longer subject to the limits of this Authorization or to the HIPAA privacy laws. Therefore, the de-identified information may be used and released by the researchers (as permitted by law) for other purposes, such as other research projects.

Withdrawal or removal
You may change your mind and cancel this Authorization at any time. To revoke your authorization, you must write to the JCSU HealthPlex at this facility or you can ask a member of the JCSU HealthPlex to give you a form to revoke the authorization. Your request will be valid when the JCSU HealthPlex receives it. If you revoke this authorization, it may affect your participation in certain programs and/or activities sponsored by the JCSU HealthPlex. This will not affect your right to use the Irwin Belk Complex weight room. Even after you cancel this Authorization, the researchers may still use and disclose health information they have already obtained to maintain the integrity and reliability of the research.

Contact information for questions about my rights under HIPAA

The HealthPlex complies with the requirements of the Health Insurance Portability and Accountability Act (HIPPA) of 1996 and its privacy regulations and all other applicable laws that protect your privacy. If you have questions or concerns regarding your privacy rights under HIPAA, contact Victor Romano, Wellness Director at (704) 378-1080.

Right to Refuse to Sign this Authorization

You do not have to sign this Authorization. However, because your health information is required for research participation, if you decide not to sign this Authorization form, it may affect your participation in certain programs and/or activities sponsored by the JCSU HealthPlex.

Signature of Subject

I have read (or someone has read to me) the above information. I have been given an opportunity to ask questions, and my questions have been answered to my satisfaction. I authorize the use and disclosure of my protected health information for research purposes.

Printed Name of Subject: _____ Date: _____

Signature of Participant: _____

Appendix C

Physical Activity Clearance Form

HealthPlex Wellness Program

Physical Activity Clearance Form

Participant's Name: _____ DOB: _____ Date: _____

Healthcare Provider's Name: _____ Healthcare Provider's Signature: _____

Please check the statement that reflects your wishes:

1. _____ This person may engage in an exercise program only under clinical supervision.

2. _____ This person may engage in an exercise program only under the supervision of a qualified and certified fitness professional

3. _____ This person may engage in independent, unrestricted moderate intensity exercise.

Recommendations and/or Restrictions: _____

_____

Please return to: JCSU HealthPlex, Attn: Wellness Director or Fax: 704.330.1330
100 Beatties Ford Rd, Charlotte, NC 28216

Appendix D

Fitness Assessment Recording Form

Name		
	Gender: Male	Female
Date		
Blood Pressure	/	
Resting Heart Rate		bpm
Height	Feet	Inches
Weight		lbs
Waist/Hip Ratio (WHR)	Waist	Hip
Aerobic Fitness *3-Minute Step Test*		bpm
Body Fat % *BIA*		%
Sit Reach		cm
Curl-ups - 1 Minute (max)		
Push-Ups - 1 Minute (max)		
Fitness Assessment Administered by:		

Appendix E

YMCA 3-Minute Step Test

YMCA 3-Minute Step
Test Execution

This test is based on a 12-inch step, so use one as close to 12 inches as possible, otherwise your results will be skewed. Set the metronome to 96 beats per minute and make sure you can hear the beat. Stand facing the step. When ready to begin, start the clock or stopwatch and march up and down on the step to the metronome beat (up, up, down, down) for 3 consecutive minutes. (You can rest if you need to, but remain standing.) When 3 minutes are up, stop immediately, sit down on the step, and count (or have a friend count) your pulse (use your wrist or neck) for one full minute. Scoring is based off of age and gender differentiated VO2max standards listed by YMCA (YMCA of the USA, 2000).

Percentile Values for Maximal Oxygen Uptake (mL*kg-1 * min-1) in Men

Percentile	*20-29*	*30-39*	*40-49*	*50-59*	*60+*
90	55.1	52.1	50.6	49	44.2
80	52.1	50.6	49	44.2	41
70	49	47.4	45.8	41	37.8
60	47.4	44.2	44.2	39.4	36.2
50	44.2	42.6	41	37.8	34.6
40	42.6	41	39.4	36.2	33
30	41	39.4	36.2	34.6	31.4
20	37.8	36.2	34.6	31.4	28.3
10	34.6	33	31.4	29.9	26.7

(YMCA of the USA, 2000)

Percentile Values for Maximal Oxygen Uptake (mL*kg-1 * min-1) in Women

Percentile	*20-29*	*30-39*	*40-49*	*50-59*	*60+*
90	49	45.8	42.6	37.8	34.6
80	44.2	41	39.4	34.6	33
70	41	39.4	36.2	33	31.4
60	39.4	36.2	34.6	31.4	28.3
50	37.8	34.6	33	29.9	26.7
40	36.2	33	31.4	28.3	25.1
30	33	31.4	29.9	26.7	23.5
20	31.4	29.9	28.3	25.1	21.9
10	28.3	26.7	25.1	21.9	20.3

(YMCA of the USA, 2000)

Appendix F

1-Minute Max Push-Up

1-Minute Max Push-Up
Test Execution

The participant's hands are placed slightly wider than shoulder width apart, with fingers pointing forward. Their feet should be together, with0out being crossed. Starting from the up position (total body off of the ground), the participant will lower their body until their upper arms are parallel to the ground in the down position. Then they will return to the up position. In the up position the elbows must be extended, in order to count. This is one repetition. Resting should be done in the up (total body off of the ground position). Both hands must remain in contact with the floor at all times. The total number of correct pushups in one minute is recorded as the score (YMCA of the USA, 2000).

Fitness Categories by Age Groups and Gender for Partial Sit-Ups

Category	*Age 20-29*		*Age 30-39*		*Age 40-49*	
	Male	*Female*	*Male*	*Female*	*Male*	*Female*
Excellent	36	30	30	27	25	24
Very Good	35	29	29	26	24	23
	29	21	22	20	17	15
Good	28	20	21	19	16	14
	22	15	17	13	13	11
Fair	21	14	16	12	12	10
	17	10	12	10	10	5
Needs Improvement	16	9	11	9	9	4

Category	*Age 50-59*		*Age 60+*	
	Male	*Female*	*Male*	*Female*
Excellent	21	21	18	17
Very Good	20	20	17	16
	13	11	11	12
Good	12	10	10	11
	10	7	8	5
Fair	9	6	7	4
	7	2	5	2
Needs Improvement	6	1	4	1

(YMCA of the USA, 2000)

Appendix G

YMCA Half Sit-Up

YMCA Half Sit-Up
Test Execution

Have the participant lay face-up on a mat with their knees at a right angle (90º) and feet flat on the ground. The feet of the participant are not to be held down. Place hands palms facing down on the mat or rug with the fingers touching the first piece of tape. Have them flatten their lower back to the mat or rug, and half sit-up so that their fingers move from the first piece of tape to the second piece of tape six inches apart from the first piece. Then have them return their shoulders to the mat or rug and repeat the movement as described. Keep track of the number of half sit-ups performed in one minute. Record the results (YMCA of the USA, 2000).

Fitness Categories by Age Groups and Gender for Partial Sit-Ups

Category	*Age 20-29*		*Age 30-39*		*Age 40-49*	
	Male	*Female*	*Male*	*Female*	*Male*	*Female*
Excellent	25	25	25	25	25	25
Very Good	24	24	24	24	24	2424
	21	18	18	19	18	19
Good	20	17	17	18	17	18
	16	14	15	10	13	11
Fair	15	13	14	9	12	10
	11	5	11	6	6	4
Needs Improvement	10	4	10	5	5	3

Category	*Age 50-59*		*Age 60+*	
	Male	*Female*	*Male*	*Female*
Excellent	25	25	25	25
Very Good	24	24	24	24
	17	19	16	17
Good	16	18	15	16
	11	10	11	8
Fair	10	9	10	7
	8	6	6	3
Needs Improvement	7	5	5	2

(YMCA of the USA, 2000)

Appendix H

Sit-and-Reach

Sit-and-Reach
Test Execution

The participant is asked to warm up for 5 minutes and then asked to remove their shoes. The participant must sit on the floor with their legs fully extended with the bottom of their feet against the box. The participant places one hand on top of the other, slowly bends forward and reaches along the top of the ruler as far as possible holding the stretch for two seconds. The researcher will record the distance reached by the participant's finger tips in centimeters (cm). The participant must repeat the test three times. The researcher records the best of the three distances (YMCA of the USA, 2000).

Fitness Categories by Age Groups and Gender for Trunk Forward Flexion with a Sit-and-Reach Box (cm)

Category	*Age 20-29*		*Age 30-39*		*Age 40-49*	
	Male	*Female*	*Male*	*Female*	*Male*	*Female*
Excellent	40	41	38	41	35	38
Very Good	39	40	37	40	34	37
	34	37	33	36	29	34
Good	33	36	32	35	28	33
	30	33	28	32	24	30
Fair	29	32	27	31	23	29
	25	28	23	27	18	25
Needs Improvement	24	27	22	26	17	24

Category	*Age 50-59*		*Age 60+*	
	Male	*Female*	*Male*	*Female*
Excellent	35	39	33	35
Very Good	34	38	32	34
	28	33	25	31
Good	27	32	24	30
	24	30	20	27
Fair	23	29	19	26
	16	25	15	23
Needs Improvement	15	24	14	22

(YMCA of the USA, 2000)