Measurement of Knowledge, Attitudes and Beliefs of Risk Factors for Heart Disease in College Women

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This research is dedicated to

health educators who desire

to make a difference in the

lives of women.

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List of Abbreviations and Symbols

Abbreviation/ Symbol	*Definition*
CI	Confidence interval
n	Number in a subsample
p	Probability
R^2	Multiple correlation squared; measure of strength of relationship
SD	Standard Deviation

Abstract

The purpose of this cross-sectional study was to measure knowledge, attitudes, and beliefs about heart disease in college women. The dependent variables for the sample population (n = 400) were age, race, and level of education. The respondents were given a Likert scale survey that was developed using the constructs of the Health Belief Model as the dependent variables. The statistical results reported measures of central tendency and measure of dispersion. Regression analysis was used with single and multiple independent variables to find the most significant relationships. The study results showed that there was no significant relationship between age, race, level of education and knowledge, attitudes, and beliefs about heart disease. This has important implications for health educators. The study indicates that it is not necessary to design heart education programs in the college setting based on age, race, or level of education.

Chapter I

Introduction

Purpose

The purpose of this research was to measure knowledge, beliefs, and attitudes about the risk factors for heart disease, and to identify gaps in knowledge of cardiovascular risk factors among college women. This research measured the relationship between three independent variables: age, race, and level of education, and the level of knowledge, beliefs, and attitudes about the risk factors for heart disease in women. While knowledge is an important component of health behavior, attitudes, and beliefs about disease are also very important considerations for health behavior change. Therefore, in addition to measuring knowledge, this research was designed to measure attitudes and beliefs about heart health behavior in women.

Hypotheses

This cross sectional study, conducted in a college environment, collected data from college women about their level of knowledge regarding risk factors for heart disease in women. We attempted to answer two very important questions: Are college women able to recognize risk factors associated with cardiovascular disease and does age, race, and/or level of education have an impact on the knowledge, attitudes and beliefs about heart disease in women?

Ha: Knowledge about the risk factors of heart disease among college women is related to age, race, and level of education.

Ho: There is no relationship between age, race, and level of education of college women and the knowledge about risk factors for heart disease.

Ha: The attitudes and beliefs of college women about heart disease in women are related to age, race, and level of education.

Ho: There is no relationship between age, race, and level of education of college women and attitudes and beliefs about heart disease in women.

Significance

Historically, cardiovascular research has focused its efforts on cardiovascular risk and interventions for men. Women, it was thought, were not vulnerable to cardiovascular disease. This was based on the assumption that female hormones had a protective effect on the heart. In a review of the literature it was identified that the majority of women in the United States are unable to identify heart disease as the leading cause of death. "The truth is that heart disease kills as many women yearly as it does men. It is an equal opportunity killer" (Sullinger, 2000, p. 43).

"Prevalence of coronary heart disease (CHD) in women rises with increasing age. This factor, combined with an aging female population, renders CHD in women a problem of epidemic proportion" (Anderson & Kessenich, 2001, p.12). Heart disease is the leading cause of death among women in the United States (*Heart disease is the leading killer of American women*, 2003). Current literature indicates that women are an underserved population with regard to understanding their cardiovascular risk.
In addition, coronary heart disease is now the leading cause of death among African American women aged 30-39 years and compared to white women, twice as many African American women die from heart disease (Sullinger, 2000).

Recent literature indicates that women are more at risk of dying from cardiovascular disease than men and the early onset of cardiovascular disease symptoms

in women often goes unrecognized and undiagnosed. Furthermore, it is well documented that changes in health behavior can significantly reduce the risk of developing heart disease (Greenland, 2003; Knot et al., 2003; Anderson & Kessenich, 2001; Mosca, Jones, King, Ouyang, Redberg & Hill, 2000). In addition, level of education has a significant impact on level of risk factor knowledge and within various educational levels there is evidence of disparity in baseline knowledge regarding heart disease (Davis, Winkelby & Farquhar, 1995).

There is evidence that the major risk factors for heart disease such as, smoking, diabetes, hypertension, and hyperlipidemia are present in 85% of coronary heart disease cases (Greenland, 2003). While there are established low risk profiles, very few individuals have favorable coronary heart disease risk profiles. In the Nurse's Health Study only ten percent of the participants had the favorable lifestyle habits of healthy eating patterns, daily aerobic exercise, non-smoking, and body mass index of less than 25. These four factors were associated with an event rate 60% less than people who didn't have these characteristics (Greenland, 2003). Furthermore, low-income women have higher rates of cardiovascular disease than higher-income women. In addition, cardiovascular disease mortality rates for African American women, ages 45 to 64, were 274 per 100,000 compared to white women at 107 per 100,000. Often low-income African-American women do not perceive cardiovascular disease as a major health concern. According to Greenland (2003) "despite well-defined strategies for reducing cardiovascular disease risk factors, six out of ten clinicians find that many patients at risk appear to lack the interest or motivation to undertake intensive risk factor treatment efforts" (p. 2270).

While heart disease remains an enormous health problem for both men and women in the United States, there is a great need for an independent focus on the prevention of coronary heart disease in women. The guidelines for the prevention and reduction of risk must be specific to the needs of women regardless of age, race, or level of education. This begins with creating an awareness of the significance of heart disease in women. Therefore gathering baseline information regarding knowledge of risk factors, attitudes, and beliefs about women and heart disease is a vital first step in planning health education programs. The need for increasing awareness and developing effective education programs about heart disease in women becomes clear when one considers the far-reaching ramifications of this health problem.

Definitions

Body Mass Index (BMI) - The measure of body mass based on height and weight.

Cannulization - The process of introducing a tube or sheath into a vessel.

Cardiovascular Disease (CVD) - A disease process of the heart and blood vessels.

Cardiovascular Risk Factors - Genetic and behavioral attributes that can lead to disease of the heart and blood vessels.

Coronary Artery Bypass Graft (CABG) – Surgical establishment of a shunt that permits blood to travel from the aorta or internal mammary artery to a branch of the coronary artery at a point past an obstruction

Coronary Artery Disease (CAD) - A process caused by a fatty plaque built-up that causes a narrowing of the arteries that supply the heart muscle.

Coronary Heart Disease (CHD) - The process by which the arteries that supply the heart becomes blocked.

Diabetes - A metabolic disease in which carbohydrate utilization is reduced and that of lipid and protein enhanced; it is caused by an absolute or relative deficiency of insulin and plays a degenerative role in blood vessel deterioration.

Glycosylated Hemoglobin - Are hemoglobin molecules in red blood cells that have been chemically linked to glucose. The proportion of glycosylated Hgb is

proportional to time and concentration of glucose; measures blood sugar control over an extended period of time.

Health Belief Model (HBM) – A model used to explain change and maintenance of health behavior and as guiding framework for health behavior interventions.

High-Density Lipids (HDL) – The 'good' cholesterol, consists of conjugated chemicals in the bloodstream consisting of simple proteins bound to fat.

Hypercholesterolemia - Abnormally high concentration of cholesterol (fats, steroids) present in the blood

Hypertension (HTN) - A condition in which a person has a higher blood pressure than that judged to be normal.

Hormone Replacement Therapy (HRT) - The use of artificial hormones to replace naturally occurring hormones lost during menopause.

Intermediate risk factors - include postmenopausal with HRT, lipid profile abnormalities, smoker, and hypertension.

Low-density lipids (LDL) - The 'bad' cholesterol, consists of conjugated chemicals in the bloodstream consisting of simple proteins bound to fat.

Major-couplet risk factors - include combinations of angina and diabetes mellitus, age less than 55 years and diabetes mellitus, postmenopausal with HRT and smoking, age greater than 75 years and hypertension, smoking and oral contraceptive use (especially in women greater than 30 years of age).

Major-singleton risk factors - include typical chest pain, diabetes mellitus, postmenopausal without hormone replacement therapy (HRT), and African American race.

Minor risk factors - include obesity, age greater than 55, high stress/low control, positive family history, low socioeconomic status, low social support, sedentary lifestyle, high PAI-1 level, high lipoprotein level, polycystic ovaries, and multigravida (especially six or more pregnancies).

Multigravida - A women who has been pregnant two or more times.

Myocardial Infarction (MI) - Development of an infarct in the myocardium, usually the result of myocardial ischemia following occlusion of a coronary artery.

Plasminogen activator inhibitor 1 *(PAI-1)* - A substance that inhibits a protein found in tissues and body fluids that prevents fibrin clot formation.

Chapter II

Review of Literature

Overview of Heart Disease

Grech (2003) states that in an affluent society coronary artery disease causes more death and disability than any other disease, including cancer. Coronary artery disease is typically the result of a narrowing of an artery due to fatty plaque buildup that is often present in early adulthood. When this plaque causes a significant change in the diameter of a coronary vessel the result is decreased blood flow to the cardiac muscle. The cardiac muscle relies on a sufficient supply of oxygen to maintain the ability to act as an effective pump for distribution of blood and nutrients to cells within the body. When this oxygenation is interrupted by coronary artery disease it may result in pain, infarction, heart failure, and/or death.

Heart disease is often described as a preventable disease. According to Prentice-Dunn and Rogers (1986) the major causes of morbidity and mortality in human beings are preventable. Historically studies have described the enormous role unhealthy behaviors and lifestyles play in the occurrence of illness and premature death. Seven of the ten leading causes of death in the United States are behaviorally determined. These statistics become more alarming when it is realized that people chronically underestimate their own risk of disease and illness (Weinstein, 1984).

Heart Disease in Women

In their research Lefkowitz and Willerson (2001) determined that nearly 60 million U.S. residents – more than one in five – have heart or vascular disease. Heart disease kills more women each year in the United States than any other medical

condition. According to Torpy (2002) heart disease takes the lives of more women in the United States then stroke, breast cancer, ovarian cancer, uterine cancer, and HIV combined. One in ten women, 45 to 64 years of age, have some form of heart disease, and this number increases to one in four women over age 65. African-American women are 60% more likely to die of coronary heart disease than Caucasian women. The risk of developing heart disease increases as one grows older (*Women's health*, 2003). Cardiovascular disease remains the nations leading cause of death claiming nearly one million lives each year. According to a Mayo Clinic Special Report (2003) each year more than 700,000 people die of heart disease in the U.S. – and 375,000 of them are women. In contrast, breast cancer results in an estimated 41,500 deaths per year (Mayo Clinic, 2003).

In a survey conducted by the American Heart Association (2000), 61% of the women surveyed believe cancer is the greatest health threat to women. The reality is that almost twice as many women die from heart disease and stroke than from all forms of cancer combined (*Know Heart and Stroke*, 1998). Each year approximately three million women have a myocardial infarction (MI) and two-thirds won't make a full recovery. It is estimated that approximately one in two women will eventually die of heart disease or stroke (*Heart disease is the leading killer of American women*, 2003).

Risk Factor Awareness

There is the mistaken impression that men are more at risk for cardiovascular disease (CVD) than women (Mayo Clinic, 2003). While more men develop heart disease and experience stroke than women, the mortality rate for women from cardiovascular disease and stroke is higher (*Know Heart and Stroke*, 1998). After age 50, women begin

to develop and die of heart disease at a rate equal to that of men (*Heart disease is the leading killer of American women*, 2003).

Unfortunately, women often learn about risk factors for heart disease in places other than the doctor's office. For example, when women attend screening activities to have their blood pressure checked they are often astonished to discover that they have high blood pressure. Only six out of ten women report having their cholesterol checked in the past 18 months and 76% did not know their high-density lipid (HDL) and low-density lipid (LDL) levels (Robertson, 2001)

According to Lefkowitz and Willerson (2001) emerging risk factors and the predisposition to CVD include: hypertension, hypercholesterolemia, diabetes mellitus, tobacco use, obesity, and physical inactivity. According to Sullinger (2000) risk factors for women can be divided into three major categories: major, intermediate, and minor. The major category is further divided into two subcategories, major-singlet and major-couplet. Knowledge of these risk factors has led to many interventions designed to reduce morbidity and mortality from cardiovascular disease.

However, the known risk factors account for only half of all cases of CVD. Cardiovascular diseases, including coronary artery disease and hypertension, are clear examples of multifactorial genetic diseases. Research for predictors of cardiovascular disease and improved therapies for prevention and cure must be the goal; as the population ages, cardiovascular disease in women will have an even greater human and economic impact.

Studies show that some diagnostic tests and procedures, including the exercise stress test, might be less accurate in women (*Heart disease is the leading killer of American women*, 2003). An article by Caves (1998) suggests that a woman's smaller

coronary arteries make some diagnostic and therapeutic procedures requiring cannulization of the coronaries, more difficult and less successful. The standards for today's diagnostic tests are based on male subjects and may not be reliable for women, as women are physiologically different (Holm, Penckofer, Keresztes, Biordi, & Chandler, 1993). It is currently speculated that cardiovascular disease in women may not be present itself in a typical or classic fashion. It appears that the known male syndrome for cardiovascular disease has just been assumed for women without careful study (Hamel & Oberle, 1996).

Women are more at risk for death from CVD due to the fact that they fail to recognize the symptoms of heart disease (Perry, 2002). Lack of awareness includes the fact that many women and their doctors do not recognize the early signs of heart attack. This results in a higher mortality rate than men after their first MI. In an article written by Anderson (2001) a myocardial infarction in a woman tends to present as shortness of breath, fatigue, flushing, nausea, jaw pain, and abdominal pain. According to an article by Sullinger (2000) women have atypical pain such as neck and shoulder pain, indigestion, and dyspnea; symptoms are more likely to occur at rest than with exertion. In addition, these symptoms occur over hours rather than minutes and a woman would more likely present to a primary physician than an emergency room. Perry (2002) states many women dismiss serious, early signs and symptoms of a heart attack as fatigue or indigestion.

The Framingham Heart Study reveals that women may benefit from more attention to atypical symptoms because unrecognized myocardial infarction is a particularly significant problem (Hamel & Oberle, 1996). According to Sullinger (2000) women often do not recognize symptoms as serious, confuse them with symptoms of

menopause, or have had similar symptoms diagnosed as non-cardiac and delay coming to the emergency room an average of 30 minutes to five hours longer than men.

An article by Mitka (2000) implies that the longer delay of treatment for women under age 70, compared to men, may contribute to a higher mortality rate for women. Current literature supports the lack of information available to women and a lack of attention given by health care professionals, and the media in educating women about their risks (Mayor, 2002). According to Mitka (2000) the issue of higher mortality rates for younger women, compared to men, suggests that the delay in initiating treatment could be attributed to the fact that women may not recognize the symptoms of a heart attack, because such symptoms can present differently in women than in men.

According to the American Heart Association (2000) the current level of familiarity with heart disease might be described as a mixture of incomplete knowledge, perceptions, and misperceptions. Most women do not understand the magnitude of the risk posed by heart disease. Sixty-three percent of women who die suddenly from cardiovascular disease have no previous symptoms. That's why it is so important to know the risk factors of heart disease, to know if a woman is at risk, and know how to protect oneself against this often-preventable disease (Mayo Clinic, 2003). In a study conducted by Mosca et al. (2000) a majority of women reported that they were not well informed about heart disease and did not know the major risk factors for coronary vascular disease.

According to Knot et al., (2003) the prevalence of risk factors is greater in women than in men. Of the four conventional risk factors, cigarette smoking, diabetes, hypertension, and hyperlipidemia, one was present in 84.6% of women with CHD. Women frequently develop heart disease ten years later than men. Research has shown that a higher prevalence of these conventional risk factors is necessary for women to

develop heart disease at the same age as men. For example, the higher prevalence of diabetes as a powerful risk factor in women has actually negated the protective effects that women generally have prior to menopause. Therefore as the prevalence of a conventional risk factor such as diabetes increases in women they will begin the development of heart disease at the same age as men.

In a survey of women conducted by Mosca et al., (2000) the perception of the effect of cardiovascular disease was not in agreement with the seriousness of the known consequences of CVD on morbidity and mortality. This survey revealed that nearly 44% of women surveyed believed it was somewhat or very unlikely that they would suffer a heart attack. Fifty-eight percent believed they were as likely or more likely to die of breast cancer than heart disease; yet 74% of these women rated themselves as fairly or very knowledgeable.

According to the American Heart Association, (2000) more than 73% of women recall hearing, seeing, or reading information about heart disease in the last 12 months. However, only one-third of women consider themselves well informed about heart disease. Often women don't know they have a risk factor for heart disease; therefore it must be a public health objective to discern why women don't understand their risk factors for heart disease. (*Hospital group targets lack of awareness regarding women and CVD*, 2002).

According to Rakowski, Lefebvre, Assaf, Lasater, and Carleton (1990) risk of illness increases in populations with limited resources such as formal education. This population is more likely to report mixed patterns of risk factor knowledge and favorable and unfavorable behaviors. Therefore, program interventions must be prepared to address various combinations of knowledge and practices. "If persons are not aware of

the full repertoire of risk factors contributing to disease, then correlations among behaviors that have now been deemed by the professional community to have a common outcome are not likely to be high" (Rakowski et al., p. 490).

In an article by Parker and Schwartzberg (2001) Americans are more educated now than at any time in history, yet completion of school doesn't necessarily translate into functional literacy. This lack of health literacy is a barrier to awareness and effective medical diagnosis and treatment. The health care industry has overlooked the fact that almost half of the U.S. population has limited literacy skills, meaning that patients struggle to understand and act on basic health information. However, the vast majority of medical encounters involve information giving. Health literacy is about what patients understand and what physicians assume patients know about their health, and how to best take care of themselves. Low health literacy is becoming recognized as a major public health issue for the 21st century. The federal government's public policy initiative, Healthy People 2010, includes health literacy among its health indicators and objectives. In a 1993 National Adult Literacy Survey, 44 million Americans were identified as being unable to read or write well enough to meet the needs of everyday living and working (Parker & Schwartzberg, 2001). There is a significant gap between what people understand and what we assume people know about their health. Parker and Schwartzberg state that an individual's ability to obtain, process, and understand basic health information and services needed is not a reading literacy issue, but a comprehension problem. Therefore it is important to question whether or not failure to act is a result of lack of perceived susceptibility, or is perceived susceptibility a result of an inability to understand health issues and risk (Parker and Schwartzberg). The high

prevalence of health literacy problems and a person's reluctance to admit their struggles makes this problem a silent epidemic.

In a study of women with known coronary artery disease Viejo, Oliver-McNeil, and Artinian (2002) found no relationship between knowledge of cardiovascular risk factors and risk-reducing behaviors. The women in this study had limited awareness of their personal risk and were not prepared to deal with preventing progression of CHD. The perceived risks of women with heart disease were considerably fewer than the number documented in their medical records. For example, overweight women did not perceive themselves as overweight and women with known risk factors for heart disease did not see themselves as having cardiovascular disease risk factors. In addition, 100% of the women who smoked or had a history of smoking did not perceive smoking as a cardiovascular risk factor (Viejo et al., 2002).

According to Biswas, Calhoun, Bosworth and Bastian (2002) older women and married women were less worried about heart disease than younger women. Worry about heart disease was not associated with a diagnosis of diabetes or hormone replacement therapy. Less than half of women with hypertension, sedentary lifestyles, or tobacco use worried about heart disease. In this women's health questionnaire fewer than 60% of women with any one risk factor worried about heart disease. Women who were obese, had a family history of heart disease and hyperlipidemia were more likely to worry about heart disease. According to this study 84% of all respondents thought that the average woman had a low lifetime risk of CAD and compared to others their age, 66% thought they were less likely to get heart disease (Biswas, Calhoun, Bosworth, & Bastian, 2002).

Lack of Research

"Although cardiovascular disease has been the leading cause of death in females for decades, it has only been recently that this fact receives the attention and careful research that is required" (Mitka, 2000, p. 3185). According to the review of literature, research of heart disease in women is an important issue that has been grossly overlooked by women, physicians, health educators, and the media. A report by the *Agency for Healthcare Research and Quality* shows evidence of insufficient studies done on women and heart disease. Much of the research over the past 20 years has focused on the diagnosis and treatment of coronary heart disease in men. Most of these studies excluded women entirely or included only limited numbers of women and minorities (Morantz & Torrey, 2003).

Historically, reproduction, contraception, screening, and early detection of cancer have been the primary focus of women's health care. This focus on gynecological screening, by women and practitioners, has taken precedence over the assessment, diagnosis, and treatment of heart disease in women (Hamel & Oberle, 1996). Anderson (2000) goes on to say that a possible explanation for the higher mortality rate in women may be a difference in primary prevention and lack of aggressive treatment of early symptoms. There has been a successful drive to reduce cardiovascular death in men over the past decade. However, rates of heart disease in women have continued to increase.

According to Hamel and Oberle (1996) there is speculation that gender differences in medical treatment may exist. There is evidence that even though heart disease results in greater disability for women, physicians pursue a less aggressive approach to treatment. In a review of data from more than 350,000 patients hospitalized for MI, women were less likely than men to receive standard cardiovascular therapies

such as, thrombolytics, aspirin, heparin, and beta-blockers. In addition, women had fewer cardiac catheterizations and coronary artery bypass grafts (Tsang, Barnes, Gersh, and Hayes, 2000).

In an article by Mayor (2002) women were shown to have been underrepresented in cardiovascular clinical trials. For example, in the early 1990's the Food and Drug Administration (FDA) policy prohibited women of childbearing age to participate in phase I drug trials because of the concern about birth defects. While concern about birth defects was cited as the principle reason for this policy, women on birth control, who were sexually inactive, pregnant, post-menopausal, or had partners with vasectomies were restricted from participating in these studies (Sullinger, 2000). As a result of these trials, the safety, efficacy, and dosages of new drugs were based solely on their effects on men. However, more recent evidence shows that women also benefit from the aggressive management of risk factors such as hypertension and hypercholesteremia and from the drugs now recommended for primary and secondary prevention of heart disease (Mayor, 2002).

Age and Heart Disease

Heart disease risk is not limited to older women. The Bogalusa Heart Study reported that early stage atherosclerosis in young people aged two to thirty-nine was directly related to the number of cardiovascular risk factors they possessed (Spencer, 2002). According to Mosca et al., (2000) a higher percentage of women aged 25 to 44 years felt they were not informed at all about heart disease compared with older women. Younger women have significantly lower awareness levels and doctors are less likely to speak about heart disease to women younger than the age of 35. In a study of 1,000

women only eight percent knew that cardiovascular disease is their most serious health threat. Fifty-nine percent of women, including those 60 years of age or older, who saw a physician regularly, reported that their physician never spoke to them about heart disease (Mosca et al).

In addition, statistics indicate that many women die of coronary heart disease (CHD) at younger ages than what most women realize. While 16% of younger women (25 to 34 years) recognized heart disease as the leading cause of death for women, only four percent perceived heart disease as their greatest health problem (Mosca et al., 2000). According to Perry, the perception appears to be that CHD occurs very late in life. This perception may have serious ramifications because if women don't believe that they are vulnerable to heart disease they likely will not pay attention to preventive messages across their lifespan (Perry, 2002).

A study by Spencer (2002) reveals that even when women indicate they know a lot about cardiovascular risks, their behaviors do not reflect their knowledge. It has been documented that even with warning signs young people tend to ignore their increased risk for heart disease. According to Spencer (2002) heart disease is the third leading cause of death among adults aged 25 to 44 years and accounted for more than 16,000 deaths in this age group in 1997.

According to a five year study cited by Larkin (2002) there is no evidence that in instances when a severe cardiovascular event occurred in a family that the young adult in the family made any positive changes in health behaviors. According to Bonow (2002) although a 20 year old would not be treated as aggressively as an older patient, modification of diet, lifestyle, exercise routine, and smoking status can reduce risk substantially over a lifetime. Smoking as few as three to five cigarettes per day increases

the risk of heart disease in women, but especially in young women. Women smokers who also use contraceptives have an even higher risk of myocardial infarction than non-smokers who use contraceptives (Birchfield, 2003).

According to research by Gilmer, Speck, Bradley, Harrell, and Belyea (1996) "cardiovascular disease has its roots in childhood" (p.106). The time to start educating is early. Women's health problems relate to choices they make at a very young age. Often women in their 20's have poor health habits that are deeply entrenched and difficult to correct (Voelker, 1998).

In an article by Ressel (2003) the *Council on Cardiovascular Disease in the Young* published a statement on cardiovascular health in childhood. It states that the change in the vascular system begins in childhood and that it is critical that clinicians promote cardiovascular health in their care of children. Even though cardiovascular disease does not manifest itself until adulthood, risk factors such as high blood pressure, serum cholesterol, and obesity stem from particular behaviors in childhood and adolescence. The risk factors for cardiovascular disease are associated with the presence of atherosclerosis in childhood and other risk factors such as, elevated blood pressure, excess weight, and abnormal plasma lipoprotein levels that occur in childhood will persist into adulthood (Winkleby, Robinson, Sundquist, & Kraemer, 1999). Finally, these behavior patterns developed during adolescence are likely to influence risk factors for cardiovascular disease (Gilmer et al., 1996). Educating youth during the time that they are receptive to learning about their bodies may prevent them from developing unhealthy behaviors that result in the development of cardiovascular disease (Skybo & Ryan-Wenger, 2002).

Due to the fact that the African American adult populations have a high incidence of coronary vascular disease, these risk factors in ethnic children are especially important. A review of the literature suggests that preventive interventions for cardiovascular disease need to start early in childhood, continue through adolescence, and into adulthood. Ethnic differences in risk factors such as Body Mass Index (BMI), cigarette smoking, hypertension, high fat diet, and glycosylated hemoglobin were evident as early as six to nine years of age; reinforcing the need for early interventions (Winkleby et al., 1999). "Given the increasing diversity of Americans, it is critical to tailor programs to the culture of youth, their group-specific attitudes, perceptions, expectations, norms and values, and to appropriate languages and literacy levels" (Winkleby et al., 1999, p. 1014).

A review of literature suggests that even when young people are able to identify cardiovascular risk factors; their behaviors may not reflect their knowledge. There is evidence that college students have behavioral and biological risk factors for coronary heart disease, therefore, it is imperative that college health educators develop effective screening and health education programs. Although most women know that heart disease develops gradually, two thirds of them believe they are most likely to begin to develop heart disease after the age of 35. However, there is solid evidence that the process of atherosclerosis begins in the very young (Robertson, 2001). Typically, younger women underestimate their risk of CHD therefore it is important to improve college students' perception of risk. "In a survey of college undergraduates, 68% of the respondents viewed their risk of a heart attack as lower or much lower than that of their peers" (Green, Grant, Hill, Brizzolara, & Belmont, 2003, p. 207).

While clearer perceptions of heart disease risk factors don't translate into improved behaviors, making an attempt to persuade women to change risky behaviors

would be beneficial (Green et al., 2003). According to Spencer (2002) the college environment affords a unique opportunity to educate young adults about heart disease. There is evidence that college students often have poor health habits such as unhealthy diets, lack of exercise, overweight, high stress, tobacco use, and excessive alcohol consumption. Therefore interventions must focus on behavior change in the areas of tobacco use, diet, alcohol, stress reduction, and exercise in an effort to reduce risk factors for future heart disease (Spencer, 2002).

A study by Green et al., (2003) stated that young women rated the strength of cardiovascular risk markers higher than men. This may be related to the fact that women generally have a more accurate perception of their health than men. Furthermore, this fact may be related to more exposure to contemporary media related to women's health issues, or the fact that women's health is becoming more of a social issue on college campuses.

In an article by Weinstein (1987) egocentrism in adolescence is a factor that seems to produce optimistic biases. This unrealistic optimism about susceptibility to harm is typical in young populations. College students, simply by the fact that they are seeking higher education, may be a biased group in this respect because they are more likely to be healthier and better educated than the average person their age. Therefore they may view themselves as healthier overall, more knowledgeable about health, and therefore less susceptible to the cardiovascular risks of the average non-college population.

African American Women and Heart Disease

African American women experience high rates of CVD. This is likely the result of biological, social, and economic factors. These factors influence physiological factors such as hypertension, obesity, physical inactivity, smoking, and diabetes that are primary risk factors for heart disease (Behera, Winkleby, & Collins, 2000).

A study done by Mask (2002) states "the link between poverty and adverse health is well established, and since women of color are over represented among the poor, a lack of resources had been the prevailing explanation for their disparate health outcome" (p.563). In addition, Cort and Fahs (2001) suggest that the disparity in mortality rates due to heart disease between African American and white women may be a result of differences in education level and income. According to Jones, Chambless, Folsom, Heiss, et al., (2002) "disparity in health outcomes based on assessment by race is well documented" (p. 2565). However, because of the difficulty of defining race, there is controversy as to whether health issues should be considered in terms of race. In addition, the influence of race on health status is very complex and is often intertwined with socioeconomic status.

In an article by Williams (2002) it is highly unlikely that genetic differences alone contribute to racial/ethnic disparities in health. Over time people of various races adapt to the conditions within their environment and the interaction between biological makeup and environmental exposures produces an adaptation response that may contribute to the differences in health between various populations.

According to an article by Krieger, Rowley, Herman, Avery, and Phillips (1993) sexism and racism have had an effect on women's health because women's health and minority health are identified as two distinct areas. While a number of women in the

United States are women of color, one must consider the relationship between social class and health when analyzing the health of black women.

Putting socioeconomic considerations aside, a study by Gates and McDonald (1997) showed that African American women had significantly higher BMIs, and a significantly higher mean intake of cholesterol than white women. Therefore, African American women are more likely to be overweight than white women. Interestingly, African American women were able to indicate that their diets should be lower in total fat, saturated fat, cholesterol, and salt; white women were more able to report knowledge of the relationship between diet and health problems. According to this study, African American women used more animal fats when cooking and their diet was higher in cholesterol and saturated fats. In addition, the majority of women in both ethnic groups agreed or strongly agreed that nutrition is important to consider when shopping, that food choices influenced disease risk, and that many dietary recommendations are confusing (Gates & McDonald, 1997).

This same study by Gates and McDonald also identified attitudes by African American women as the greatest barrier between diet and health. They refer to the fact that the challenge is to develop intervention strategies that promote self-efficacy and result in more positive attitudes toward the impact of nutrition on one's health. Additional studies report that African American women have a less positive attitude toward nutrition than white women and that they believe making changes in dietary habits would be expensive.

According to Behera, Winkleby and Collins (2000) other themes cited by African American women include lack of knowledge and misconceptions about cardiovascular disease. For example, African American women were unaware of high rates of CVD and

perceived CVD as an acute traumatic event rather than a chronic progressive illness. Additionally, stress was seen as a trigger of heart attacks. Stress, particularly when associated with single parenthood, was equated with an increased risk of heart disease. African American women see themselves as more vulnerable to hypertension because of the stress of family responsibilities. Many of these women believe they have less family support, poorer job opportunities, and fewer economic resources than white women. These beliefs interfere with their ability to become involved in health promotion activities (Behera, Winkleby, & Collins, 2000).

These women also believe that the media plays an important role in their knowledge and attitudes about heart disease, and promotes unrealistic short-term solutions such as fad diets and diet pills. In addition, these women feel that the media promotes smoking in African American women, and they felt that programs tailored to the needs of low-income women should be made available in their neighborhoods, and modeled after the media campaigns for AIDS and childhood immunizations (Behera, Winkleby, & Collins, 2000).

In a 2001 survey by the American Heart Association, more African American women report that their doctors have discussed heart disease with them and 68% know that they are more likely to die from a heart attack than white women. Unfortunately black women (52%) incorrectly associate heart disease with sudden death. While more physicians are now talking to their female patients about heart disease, the total number is still only 38%.

Role of Health Education

Health education is an important component that can affect change in self-confidence and promote motivation to change unhealthy behavior. The American Heart Association has approved guidelines on improving cardiovascular health at the community level. This includes implementation of health education programs in settings such as churches, schools, and work sites. The goal of this effort is to prevent the onset of risk factors by targeting behavior changes. These must include changes in diet, sedentary lifestyles, tobacco use, and early recognition of heart disease and stroke. Improving cardiovascular health at the community level must include a community wide assessment of heart disease, followed by efforts to increase awareness.

According to a new survey by the American Heart Association (Robertson, 2001) the effectiveness in the critical first step of raising awareness among women remains a serious concern. Positive changes have been made, but there are many issues that need to be addressed. For example, women hear messages about heart disease, but they don't seem to personalize the seriousness of the disease. They also view heart disease as something to worry about later in life.

While women aged 25 to 34 years continue to be less aware about information concerning heart disease, 86% perceive themselves as empowered to prevent heart disease, and are able to identify prevention activities. As a key audience for prevention messages, nearly two thirds believe cancer is their greatest health threat. If women are hearing messages about risks for heart disease, why aren't they taking action? Clearly, health education efforts must include designing interventions and education at an individual level and promoting through the media; those corrective steps that can reduce cardiovascular disease risk (Morantz & Torrey, 2003).

Health Belief Model

In a study by Meischke et al., (2000) perception of personal risk for a disease is an important factor in many preventive health behaviors. While perceived risk has been studied extensively in many theoretical frameworks, the Health Belief Model (HBM) suggests that an individual is likely to engage in a recommended health action if they perceive themselves as vulnerable to getting the disease, that getting the disease is serious, and the benefits of a suggested health action outweigh the barriers of the action.

The Health Belief Model (HBM) will serve as the theoretical framework for conducting this survey (see Appendix A) of college women and heart disease.
The HBM is the most useful framework for addressing the dependent variables of this research proposal. "The origins of the Health Belief Model can be traced back to the 1950's, at which time several social psychologists sought to understand the infrequent acceptance of preventive practice and pre-illness screening tests" (Prentice-Dunn & Rogers, 1986, p. 153).
The key constructs of the Health Belief Model include:

1. Perceived susceptibility: one's opinion of chances of getting a condition.
2. Perceived severity: one's opinion of how serious a condition and its sequelae are.
3. Perceived benefits: one's opinion of the efficacy of the advised action to reduce risk or seriousness of impact.
4. Perceived barriers: one's opinion of the tangible and psychological costs of the advised action.
5. Cues to action: strategies to activate one's "readiness."
6. Self-efficacy: one's confidence in one's ability to take action.

According to the Health Belief Model, knowledge, age, sex, ethnicity, socioeconomic status, and personality are modifying factors that impact an individuals perception of susceptibility (Glanz, Lewis, & Rimer, 1997). The Health Belief Model offers direction for structuring questions about beliefs and other predisposing factors that may influence behavior. Demographic characteristics such as age, gender, and ethnicity are important predictors of health behavior. A study by Mosca et al., (2000) concluded that awareness, perception, and knowledge of heart disease risk and prevention often vary by age and ethnicity. In an article written by Mullen, Hersey, and Iverson (1987) the Health Belief Model affirms that readiness to take action for health stems from a perceived threat of a disease, an individuals perception of their susceptibility to disease, and its potential severity. A cue for action can be triggered by an individual's private perception or by reading about health matters.

Individuals evaluate their behavior through an estimate of the potential benefits of that health-seeking behavior in reducing susceptibility or severity. The benefits are then weighed against perceptions of physical, psychological, financial, and other costs or barriers to the health-finding effort.

Creating an environment that provides positive reinforcement in response to health behavior is critical. "It is widely acknowledged that actions are strongly influenced by an individuals' perception of the extent to which family, friends, and associates engage in a particular type of behavior" (Beaudin, Jacoby, & Quick, 1997, p. 31). In addition, self-efficacy is a key predictor of change in health behavior particularly when a person has confidence in their ability to make healthy changes. Self-efficacy gives a person a sense of control over their health and this confidence was a predictor of a person's ability to make positive changes regarding their health (Mullen et al., 1987).

The goal of this study is to identify the relationship between age, race, and level of education, and knowledge, attitudes and beliefs of college women about heart disease in women, and apply that to health education programs targeted at college age women. The literature supports the fact that women need an increased awareness of their risk for heart disease. It is fundamental to begin with an assessment of the knowledge, attitudes, and beliefs about heart disease, and use this foundation to build a heart education program that meets the needs of the target population. The opportunity exists to plan and implement a women's heart health program in conjunction with the new health and fitness center at Baker College. In addition, students enrolled in the health science programs would benefit from planning and participating in future educational and screening programs.

Knowledge of heart disease is critical to the future health of American women. It is imperative that efforts to educate and prevent heart disease begin in childhood and continue through adulthood. The college campus is a perfect place to implement health education that is relevant to young women and capable of having a dramatic impact on reducing their risk for developing heart disease in the future.

Chapter III

Methodology and Design

Subjects

Participants in the study were college women of various ethnic groups, ages, and levels of education enrolled at Baker College of Flint. Subjects were representative of a variety of college programs and course levels. Subjects were representative of a variety of different class times, including day and evening classes. The range of education of subjects was greater than high school and less than a doctorate level.

Variables

The dependent variables were knowledge, attitudes, and beliefs about heart disease in women. The independent variables were age, race, and level of education.

Procedures

The researchers selected classes included in this survey. The classes were selected from a complete list of classes offered at Baker College in the winter term of 2004. The survey was distributed to the selected classes. This included day and evening classes. The surveys were placed in an envelope in the mailbox of the faculty member whose class had been selected to participate in the study. If an instructor was teaching more than one class on the selected day, the researcher chose the class to be surveyed. Baker College faculty distributed the survey to women at the beginning of class time. The faculty members returned the survey to the researchers immediately after each class. Participation by students was voluntary. The faculty member read a prepared instruction sheet and the students signed two copies of an informed consent (see Appendix B). The

student retained one copy of the informed consent for their records and the second copy was turned in with the survey. The heart to heart survey took approximately 10 minutes to complete.

Design

The design is a non-experimental, descriptive, cross-sectional measurement of the knowledge, attitudes, and beliefs of college women about heart disease. The study was designed to collect data on all relevant variables at one time. The cross sectional study investigated the relationship among several variables.

Data collection and Analysis

The measurement instrument was a 28-question Likert scale survey. The survey instrument was designed to gather demographic information, along with data on the attitudes, beliefs, and knowledge of risk factors for heart disease within the sample population. To achieve this end, survey questions were designed to measure several aspects of knowledge, beliefs, and perceptions within the context of the Health Belief Model (HBM). Questions included those measured in each of five categories: knowledge of risk factors, perceived benefits of preventative action, perceived barriers to preventative action, personal susceptibility to heart disease, and perceived severity of heart disease. The unit of analysis was college women. Participants answered directly on the survey and results remain confidential.

For each participant, the individual Likert scale question score was adjusted for polarity (some questions will score high to low, some low to high) and summed to the appropriate category or categories. The composite score for each category was divided by

the maximum possible score within the HBM category. This yielded five percentage-based data points for each participant. A computer spreadsheet in Excel was constructed to aid in the calculation process. Data analysis was conducted using Minitab software. The dependent variable data represents a measurement of the normalized state of knowledge, belief, and perception for each participant. The independent variables are age, level of education, and race. These are based on the demographic data gathered from each participant.

The score for each of the five HBM categories was sorted in accordance with the three independent variables. Descriptive statistics were calculated for both the HBM categories, and the independent variables of, age, education, and race. The descriptive statistics include measures of central tendency such as median or mean, and measures of dispersion such as standard deviation or variance. Because race is a categorical variable, the independent variable data was sorted in accordance to race, and additional descriptive statistics were generated.

Linear regression was performed to examine the relationships between the measured HBM categories and the independent variables of age, education, and race. Regression analysis was performed with single and multiple independent variables to find the most significant relationships between the dependent and independent variables. Regression produced equations of the form:

Response = constant + coefficient (predictor) + ... + coefficient (predictor)

$y = bo + b1X1 + b2X2 + \ldots + bkXk$

Where:

Response (Y) is the value of the response.

Constant (bo) is the value of the response variable when the predictor variable(s) is zero. The constant is also called the intercept because it determines where the regression line intercepts (meets) the Y-axis.

Predictor(s) (X) is the value of the predictor variable(s).

Coefficients (b1, b2,..., bk) represent the estimated change in mean response for each unit change in the predictor value. In other words, it is the change in Y that occurs when X increases by one unit.

Regression was performed on all five HBM categories using the independent variables in various combinations to discover the strongest relationships between the dependent and independent variables. Measures of significance such as R^2 and p are reported along with any relationships that are discovered. The data is presented in tabular and graphical form to aid in understanding along with discussion of any relationships that are apparent in the results. The relevance of the data within the context of a Health Belief Model is examined.

Chapter IV

Results

Sample

On January 27, 28 and 29, 2004, we sent 774 surveys to selected classes. There were 505 females who reported for class those days. Of the 505 females in class on those days, 415 responded to the survey. We did not use 15 of the surveys because they were incomplete or did not have a consent form for a final count of 400 surveys used. This gave us an overall response rate of 79 percent. The demographics of the respondent sample are summarized in Table 1a and Table 1b. Of the 400 respondents, 251 were white and 149 were non-white. Overall 75% of the respondents were between the ages of 18 and 37 years. The mean age for white females was 34.1 years (SD ± 10.2). The mean age for non-white females was 28.1 years (SD ± 9.4). Comparatively, 61% of the white females were between the ages of 18 and 37, and 79% of non-white females were between the ages of 18 and 37 years.

Descriptive statistics

Means and standard deviations with 95% confidence intervals are presented in Table 2. This includes the five dependent variables; knowledge, perceived benefits, perceived barriers, perceived susceptibility, and perceived severity. Means and standard deviations were calculated for the entire sample, and are reported out in non-white and white racial subgroups.

Of the five dependent variables measured, knowledge, perceived susceptibility, and perceived severity showed a modest difference between white and non-white subgroups with distinct 95% confidence intervals. The mean score for knowledge

questions for white participants was 0.78, on a scale of 0 – 1.0, compared to 0.72 for non-white participants. This indicates that white women were slightly more knowledgeable about heart disease risk factors. In addition, within the knowledge category we removed two questions that we felt were more indicative of communication than knowledge. We then measured the response frequencies of these questions and reported them in a communication subcategory. This is shown in Table 5. For perceived susceptibility the mean score was 0.68 for white participants, compared to 0.63 for non-white participants. This shows that white women perceived themselves to be slightly more susceptible to heart disease than non-white women. For perceived severity the mean score was 0.55 for white participants compared to 0.49 for non-white participants. This indicates that white participants perceived heart disease to be a more severe condition than non-white participants. In addition, the dependent variables of perceived benefits and perceived barriers showed modest differences in mean scores by racial group. However, there was considerable overlap in the 95% confidence intervals. Therefore, we are not confident in drawing any conclusions from the data for these two variables.

Regression analysis

Stepwise regression (Table 3) was performed to find the best linear model to predict each of the five dependent variables: knowledge, perceived benefits, perceived barriers, perceived susceptibility and perceived severity based on the three independent variables of age, race, and level of education. For the regression analysis race and education variables were set at two levels. The analysis levels for the race variable were zero for non-white, and one for white. The analysis levels set for the education variable

were zero for those participants with less than a two year degree, and one for those with a two year degree or more. Regression analysis for the age variable used age in years.

Of the five dependent variables, knowledge of heart disease risk factors showed the strongest regression relationship. The independent variables of race and age produced the best linear model. The regression coefficient for race showed a 0.0594 increase in knowledge scores for white participants compared to non-white participants. The regression coefficient for age showed a 0.00255 increase in knowledge scores for each year of age increase. This linear model accounted for 15.74% of the variance in the data set. This variance does not represent a particularly strong relationship.

The second strongest relationship was for perceived susceptibility. The best linear model for perceived susceptibility was the combination of the independent variables of age and race. The regression coefficient for age showed a 0.00357 increase in the perceived susceptibility score for each year of age increase. The regression coefficient for race shows a 0.042 increase in perceived susceptibility score for white participants compared to non-white participants. This linear model accounted for 7.10% of the variance in the data set, indicating a rather weak relationship.

The best linear model for perceived severity was the combination of the independent variables of age and race. The regression coefficient for age shows a 0.00293 increase in the perceived severity score for each year of age increase. The regression coefficient for race showed a 0.048 increase in the perceived severity score for white participants compared to non-white participants. This linear model accounted for 4.49% of the variance in the data set, again indicating a rather weak relationship.

The relationship of age, race, and level of education to perceived benefits was very weak and uncertain. The best linear model for perceived benefits combined the

independent variables of education and race. The regression coefficient for education showed a 0.075 increase in the perceived benefits score for completion of a 2 year college degree or more. The regression coefficient for race showed a 0.025 decrease in the perceived benefits score for white participants compared to non-white participants. This linear model accounted for 1.39% of the variance in the data set, and had correspondingly weak p values. Based on this result, we rejected this model from further consideration in this research study.

The relationship of perceived barriers was also very weak and uncertain. The best linear model for perceived barriers compared the independent variables of race and age. The regression coefficient for race showed a 0.036 increase in the perceived barriers score for white participants compared to non-white participants. The regression coefficient for age showed a 0.00160 decrease in the perceived severity score for each year of age increase. This linear model accounted for 0.73% of the variance in the data set, and had correspondingly weak p values. Based on these statistics, we also rejected this model from further consideration in this research study.

Each of the measurements was designed as a five level response question. Questions were divided into the following categories: measure of knowledge with a subcategory of communication, perceived benefits, perceived barriers, perceived susceptibility, and perceived severity. The categories reported and their frequencies in our sample are summarized in Tables 4 through 9.

Table 1.1

Demographic Characteristics of respondent sample- age and race

			% (n = 400)
Respondent's age Category	all races (n = 400)	non-white (n = 149)	white (n = 251)
18-27	47.75%	54.36%	32.27%
28-37	27.75%	25.50%	29.08%
38-47	18.00%	16.11%	9.56%
48-57	6.00%	4.03%	7.17%
58+	0.50%	1.34%	0.00%

Table 1.2

Demographic Characteristics of respondent sample – education and race

			% (n = 400)
Respondent's education Category	all races (n = 400)	non-white (n = 149)	white (n = 251)
0-2 years of college	94.25%	94.42%	93.96%
> 2 years of college	5.75%	5.58%	6.04%

Table 2

Dependent Variable Mean, Standard Deviation and Confidence Intervals

	All Races		Non-White		White	
Dependent Variable	Mean (95%CI)	SD (95%CI)	Mean (95%CI)	SD (95%CI)	Mean (95%CI)	SD (95%CI)
Knowledge	0.76 (0.75 – 0.77)	0.10 (0.10 – 0.11)	0.72 (0.70 – 0.73)	0.11 (0.10 – 0.13)	0.78 (0.77 – 0.80)	0.09 (0.08 – 0.10)
Perceived Benefits	0.44 (0.42 – 0.45)	0.16 (0.15 – 0.17)	0.45 (0.43 – 0.48)	0.16 (0.14 – 0.18)	0.42 (0.41 - 0.45)	0.15 (0.14 – 0.17)
Perceived Barriers	0.27 (0.25 – 0.29)	0.20 (0.18 – 0.21)	0.25 (0.22 – 0.28)	0.19 (0.17 – 0.21)	0.29 (0.26 – 0.31)	0.20 (0.19 – 0.22
Perceived Susceptibility	0.66 (0.64 – 0.67)	0.16 (0.15 – 0.17)	0.63 (0.60 – 0.65)	0.16 (0.14 – 0.18)	0.68 (0.66 – 0.70)	0.16 (0.14 – 0.17)
Perceived Severity	0.53 (0.51 – 0.55)	0.18 (0.17 – 0.20)	0.49 (0.46 – 0.52)	0.17 (0.15 – 0.19)	0.55 (0.53 – 0.57)	0.18 (0.17 – 0.20)

Table 3

Regression Analysis of Dependent variables compared to the Independent Variables

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1. Knowledge = 0.6446 + 0.0594*race + 0.00255*age

Race p-value	0.000
Age p-value	0.000
R^2 (adj)	15.74

2. Perceived Benefits = 0.4468 + 0.075*education + -0.025*race

Education p-value	0.024
Race p-value	0.123
R^2 (adj)	1.39

3. Perceived Barriers = 0.2996 + 0.036*race + -0.00160*age

Race p-value	0.080
Age p-value	0.105
R^2 (adj)	0.73

4. Perceived Susceptibility = 0.5263 + 0.00357*age + 0.042*race

Age p-value	0.000
Race p-value	0.01
R^2 (adj)	7.10

5. Perceived Severity = 0.4090 + 0.00293*age + 0.048*race

Age p-value	0.001
Race p-value	0.01
R^2 (adj)	4.49

Table 4

Measures of Survey question response frequencies for knowledge

	%	(n = 400)
1. Being a cigarette smoker.		
Definitely increases	81.25 %	(n = 325)
Probably increases	18.00 %	(n = 72)
Probably does not increase	0.25 %	(n = 1)
Definitely does not increase	0.25 %	(n = 1)
Don't know/No opinion	0.25 %	(n = 1)
2. Being diagnosed with diabetes.		
Definitely increases	41.50 %	(n = 167)
Probably increases	42.75 %	(n = 171)
Probably does not increase	9.75 %	(n = 39)
Definitely does not increase	0.50 %	(n = 2)
Don't know/No opinion	5.25 %	(n = 21)
3. Having a family history of heart disease.		
Definitely increases	78.50 %	(n = 314)
Probably increases	18.75 %	(n = 75)
Probably does not increase	1.25 %	(n = 5)
Definitely does not increase	0.75 %	(n = 3)
Don't know/No opinion	0.75 %	(n = 3)

Table 4 cont'd

Measures of Survey question response frequencies for knowledge

	%	(n = 400)
4. Being overweight or obese.		
Definitely increases	84.25 %	(n = 337)
Probably increases	13.25 %	(n = 53)
Probably does not increase	1.50 %	(n = 6)
Definitely does not increase	0.75 %	(n = 3)
Don't know/No opinion	0.25 %	(n = 1)
5. Having an elevated blood cholesterol level		
Definitely increases	61.50 %	(n = 247)
Probably increases	32.50 %	(n = 130)
Probably does not increase	3.25 %	(n = 13)
Definitely does not increase	1.00 %	(n = 4)
Don't know/No opinion	1.50 %	(n = 6)
6. Being diagnosed with high blood pressure.		
Definitely increases	59.25 %	(n = 237)
Probably increases	34.50 %	(n = 138)
Probably does not increase	4.75 %	(n = 19)
Definitely does not increase	0.25 %	(n = 1)
Don't know/No opinion	1.25 %	(n = 5)

Table 4 cont'd

Measures of Survey question response frequencies for knowledge

	%	(n = 400)
7. Not being physically active.		
Definitely increases	50.00 %	(n = 200)
Probably increases	40.25 %	(n = 161)
Probably does not increase	7.25 %	(n = 29)
Definitely does not increase	1.50 %	(n = 6)
Don't know/No opinion	1.00 %	(n = 4)
8. Being postmenopausal.		
Definitely increases	15.50 %	(n = 62)
Probably increases	33.25 %	(n = 134)
Probably does not increase	31.50 %	(n = 126)
Definitely does not increase	3.75 %	(n = 15)
Don't know/No opinion	15.75 %	(n = 63)
9. Being anxious and worried.		
Definitely increases	26.25 %	(n = 105)
Probably increases	44.50 %	(n = 178)
Probably does not increase	17.00 %	(n = 68)
Definitely does not increase	4.25 %	(n = 17)
Don't know/No opinion	8.00 %	(n = 32)

Table 4 cont'd

Measures of Survey question response frequencies for knowledge

	%	(n = 400)
10. There is nothing I can do to prevent myself from getting heart disease.		
Strongly agree	2.75 %	(n = 11)
Agree	3.25 %	(n = 13)
Disagree	31.50 %	(n = 126)
Strongly disagree	60.75 %	(n = 243)
Don't know/No opinion	1.75 %	(n = 7)
11. The majority of women who die from heart disease have no previous symptoms.		
Strongly agree	5.25 %	(n = 21)
Agree	25.25 %	(n = 102)
Disagree	31.00 %	(n = 124)
Strongly disagree	7.50 %	(n = 30)
Don't know/No opinion	30.75 %	(n = 123)
12. I cannot get heart disease if it does not run in my family.*		
Strongly agree	1.25 %	(n = 5)
Agree	1.50 %	(n = 6)
Disagree	48.00 %	(n = 192)
Strongly disagree	44.25 %	(n = 178)
Don't know/No opinion.	4.75 %	(n = 19)

Table 4 cont'd

Measures of Survey question response frequencies for knowledge

	%	(n = 400)
13. Each year in the U.S. more women dies of breast cancer than heart disease.**		
Strongly agree	7.00 %	(n = 28)
Agree	28.00 %	(n = 112)
Disagree	23.25 %	(n = 93)
Strongly disagree	8.75 %	(n = 35)
Don't know/No opinion	33.00 %	(n = 132)
14. Women are less likely to survive a heart attack than men.**		
Strongly agree	11.50 %	(n = 46)
Agree	20.75 %	(n = 83)
Disagree	31.75 %	(n = 127)
Strongly disagree	8.50 %	(n = 34)
Don't know/No opinion	27.50 %	(n = 110)

* This question is reported as both a measurement of knowledge and susceptibility
** This question is reported as both a measurement of knowledge and severity

Table 5

Measures of Survey question response frequencies for Communication.

	%	(n = 400)
1. My physician has spoken to me about heart disease.		
Strongly agree	8.50 %	(n = 35)
Agree	19.75 %	(n = 80)
Disagree	40.25 %	(n = 161)
Strongly disagree	25.25 %	(n = 101)
Don't know/No opinion	5.75 %	(n = 23)
2. I would discuss heart disease with my physician		
Strongly agree	33.50 %	(n = 134)
Agree	55.25 %	(n = 221)
Disagree	6.25 %	(n = 25)
Strongly disagree	1.25 %	(n = 5)
Don't know/No opinion	3.75 %	(n = 15)

Table 6

Measures of Survey question response frequencies for perceived benefits

	%	(n = 400)
1. I am likely to engage in health behaviors that will promote my feelings of wellness and/or delay the occurrence of a disease.		
Strongly agree	26.50 %	(n = 106)
Agree	56.75 %	(n = 227)
Disagree	10.75 %	(n = 43)
Strongly disagree	0.50 %	(n = 2)
Don't know/No opinion	5.50 %	(n = 22)
2. I would likely engage in preventive health screenings if there was no cost to me.		
Strongly agree	45.00 %	(n = 180)
Agree	43.50 %	(n = 174)
Disagree	5.00 %	(n = 20)
Strongly disagree	1.00 %	(n = 4)
Don't know/No opinion	5.50 %	(n = 22)
3. I would be more likely to engage in healthy behaviors if my friends and family participated with me.		
Strongly agree	19.75 %	(n = 79)
Agree	46.25 %	(n = 185)
Disagree	21.00 %	(n = 84)
Strongly disagree	8.00 %	(n = 32)
Don't know/No opinion	5.00 %	(n = 20)

Table 7

Measures of Survey question response frequencies for perceived barriers

	%	(n = 400)
1. My quality of life would suffer if I did all the things that would decrease my risk for heart disease.		
Strongly agree	2.50 %	(n = 10)
Agree	8.00 %	(n = 32)
Disagree	46.50 %	(n = 186)
Strongly disagree	34.50 %	(n = 138)
Don't know/No opinion	8.50 %	(n = 34)
2. If I tried to do all the things to reduce my risk of heart disease, it would be a hassle.		
Strongly agree	3.25 %	(n = 13)
Agree	12.75 %	(n = 52)
Disagree	52.50 %	(n = 210)
Strongly disagree	25.50 %	(n = 102)
Don't know/No opinion	5.75 %	(n = 23)
3. Healthy lifestyle changes are too expensive.		
Strongly agree	3.75 %	(n = 15)
Agree	14.00 %	(n = 56)
Disagree	47.75 %	(n = 191)
Strongly disagree	29.00 %	(n = 116)
Don't know/No opinion	5.50 %	(n = 22)

Table 8

Measures of Survey question response frequencies for perceived susceptibility

	%	(n = 400)
1. I am not worried about getting heart disease.		
Strongly agree	4.50 %	(n = 18)
Agree	23.75 %	(n = 95)
Disagree	44.00 %	(n = 176)
Strongly disagree	20.75 %	(n = 83)
Don't know/No opinion	7.00 %	(n = 28)
2. I cannot get heart disease if it does not run in my family.*		
Strongly agree	1.25 %	(n = 5)
Agree	1.50 %	(n = 6)
Disagree	48.00 %	(n = 192)
Strongly disagree	44.25 %	(n = 178)
Don't know/No opinion	4.75 %	(n = 19)
3. I am not likely to get heart disease in my lifetime.		
Strongly agree	3.25 %	(n = 13)
Agree	19.75 %	(n = 79)
Disagree	44.75 %	(n = 179)
Strongly disagree	17.00 %	(n = 68)
Don't know/No opinion	15.25 %	(n = 61)

Table 8 cont'd

Measures of Survey question response frequencies for perceived susceptibility

	%	(n = 400)
4. Given my lifestyle, I am at an increased risk for developing heart disease.		
Strongly agree	11.50 %	(n = 46)
Agree	28.75 %	(n = 116)
Disagree	39.00 %	(n = 156)
Strongly disagree	15.00 %	(n = 60)
Don't know/No opinion	5.50 %	(n = 22)
5. I am less likely than most women to get heart disease.		
Strongly agree	2.75 %	(n = 11)
Agree	13.00 %	(n = 52)
Disagree	52.75 %	(n = 211)
Strongly disagree	16.25 %	(n = 65)
Don't know/No opinion	15.25 %	(n = 61)
6. I am not old enough to have heart disease.		
Strongly agree	3.25 %	(n = 13)
Agree	7.50 %	(n = 30)
Disagree	50.25 %	(n = 201)
Strongly disagree	32.50 %	(n = 130)
Don't know/No opinion	6.50 %	(n = 26)

* This question is reported as both a measurement of knowledge and susceptibility

Table 9

Measures of Survey question response frequencies for perceived severity

	%	(n = 400)
1. Women are less likely to survive a heart attack than men.**		
Strongly agree	11.50 %	(n = 46)
Agree	20.75 %	(n = 83)
Disagree	31.75 %	(n = 127)
Strongly disagree	8.50 %	(n = 34)
Don't know/No opinion	27.50 %	(n = 110)
2. I am afraid of getting heart disease.		
Strongly agree	21.00 %	(n = 84)
Agree	39.00 %	(n = 156)
Disagree	23.75 %	(n = 95)
Strongly disagree	8.75 %	(n = 35)
Don't know/No opinion	7.50 %	(n = 30)
3. Each year in the U.S. more women die of breast cancer than heart disease.**		
Strongly agree	7.00 %	(n = 28)
Agree	28.00 %	(n = 112)
Disagree	23.25 %	(n = 93)
Strongly disagree	8.75 %	(n = 35)
Don't know/No opinion	33.00 %	(n = 132)

** This question is reported as both a measurement of knowledge and severity

Chapter V

Discussion

Summary

The regression analysis for this study did not reveal any particularly useful relationships with regard to the Health Belief Model. The majority of the variance observed in the data set is not explained by linear regression. The strongest relationship, knowledge of heart disease risk factors predicted by race and age, accounts for less than 16 % of the variance. It is apparent from regression analysis, that for this study population; age, race, and education are not very predictive of any of the five dependent variables studied. For this population, we conclude that targeted interventions based on age, race, or education would not be significantly more effective than interventions that are targeted at the general female student population.

Data from this research study did reveal useful information that could be used to guide interventions and actions related to heart disease education in this population. In the survey, two questions measured patient / physician communication about heart disease. Responses indicate that up to 65.5% of those surveyed, either disagree or strongly disagree with the statement; my physician has spoken to me about heart disease. It is possible that the age composition of this population might be a limiting factor in this particular survey question. Perhaps the subject of heart disease susceptibility is not a frequent topic of conversation during visits to physicians due to the relatively young age of this study population. If this is true for this age group it is unfortunate because behavior change before cardiovascular disease develops could significantly delay the impact of the progression of this disease process.

The questions in the survey that measured the perceived benefits of behaviors that promoted and/or prevented heart disease were answered by 83.25% of the participants indicating that they would engage in behaviors that promoted a feeling of wellness and delayed the occurrence of disease. This same response prevailed when asked about preventive health screening. The majority of participants, 88.5%, would consider participating in preventive health screening if there was no cost to them. Although it would be preferable for the participants to engage in preventive screening at any cost, the fact that these participants would consider making an effort to do screening is an important consideration for future interventions. Heart health promotion, using point of care testing, which could involve screening for risk factors such as diabetes, high blood pressure, and cholesterol measurement would be a worthwhile effort.

We asked the participants about their thoughts with regard to engaging in healthy behaviors if they had friends and family members participating with them. Sixty-six percent of the respondents indicated that they would be positively inclined to include friends and family and 34% indicated that they would not. The response to this question could be interpreted in various ways. One interpretation is that the participants would engage in healthy behaviors regardless of any outside influence. Another possibility may be that a social network of family and friends is important to this group when it comes to making behavioral decisions about their health and well-being. For this reason it would make good sense for an intervention to promote activities that could be done individually and or with groups of friends and family members.

The perceived barriers to healthy lifestyle changes that would reduce the risk factors for heart disease were not significant according to this group. We asked about inconvenience, expense, and effect on the quality of life if participants pursued a heart

healthy lifestyle. Eighty-one percent of the participants stated that making positive changes would not impact them in a negative way. We felt that this was certainly an indication that the women were willing to make changes. Often, an individual's perceived barriers can be overwhelming. This may prevent them from making the necessary changes that can positively impact their health status.

The section of the survey that measured the participant's knowledge on the topic of women and heart disease was informative. The first nine questions were direct measures of known risk factors for heart disease. The last five questions were related to statistically relevant knowledge about heart disease in women.

An average of 83% of the participants felt that smoking and obesity definitely increased the risk for heart disease. A smaller percentage felt that these risk factors probably increased the risk for heart disease. This provides information that the basic messages of health promotion through the media and other sources are being acknowledged. Other conditions, such as high blood pressure, elevated cholesterol, and not being physically active showed evidence of awareness, but the group was not as confident in this knowledge area.

Approximately 61.5% and 59.25% of the participants indicated that cholesterol and high blood pressure definitely increases a women's chance of getting heart disease. Thirty-seven percent of the survey group did not recognize elevated blood cholesterol as a risk for heart disease. This is unfortunate because elevated blood cholesterol is a key risk factor for heart disease as well as one of the hallmarks for the development of heart disease. In addition, 34.5% of the participants did not recognize high blood pressure as a risk factor for heart disease. This too, is unfortunate because high blood pressure is recognized as one of the conventional risk factors for heart disease.

Ninety percent of the participants indicated that not being physically active probably or definitely increases risk for heart disease. Although the information suggests that the women know that not being physically active increases risk for heart disease it does not mean that women are engaging in physical activity to reduce their risk for heart disease.

A family history was thought to be a major indicator of the potential for heart disease by 97.25% of the participants and yet 92% of the participants disagreed with the statement that I cannot get heart disease if it does not run in my family. According to current literature, these beliefs are not reflective of what recent research is finding. The research states that the familial relationship for heart disease appears to exist if the relative is very young at the onset of coronary heart disease. This contradiction reflects the confusion about family status as a risk factor for heart disease in women. These findings may be due to conflicting information given out by health providers and incorrect perceptions picked up through the popular media.

The participants perception that being anxious and worried contributes to an increase in heart disease was evident in 70.75% of the women indicating that they thought it increased risk. According to current research the effects of anxiety and stress as contributing risks for heart disease are unknown at this time.

The data found from the following questions about diabetes and post menopause was quite surprising. The majority of women did not understand the relationship of having diabetes and its link to heart disease. Having a diagnosis of diabetes and knowing that this was an emerging risk factor was known by only 41.50% of the women surveyed. Some participants, 42.75% thought it might be related, suggesting an educational opportunity that needs to be developed. A limitation of the study is the possibility that the

disease processes of both diabetes and hyperlipidemia may be complex and perceived as separate from heart disease. It may be that health educators need to effectively explain and integrate the roles of these two very important risk factors for heart disease. This approach may be effective in promoting an understanding of the relationship between diabetes, hyperlipidemia, and heart disease. In this study, less than 50% of women knew there was a relationship between being postmenopausal and the risk for heart disease. This data indicates that menopause and its link to heart disease is an area that women need to be educated about. One possible reason for the lack of knowledge about menopause as a risk factor for heart disease is the age of the population that was surveyed. Still, it is important to understand that menopause is a significant risk factor for women and one that is still under discussion in the medical community.

The survey question that states the majority of women who die from heart disease have no previous symptoms revealed that 30.5% of the participants thought that women who die from heart disease have no previous symptoms. Others, 38.25%, indicated that they disagreed with that statement, and 30.75% did not know. This indicated to us that 69% of the participants were not clear about the presence of symptoms for heart disease in women. The data from this study suggests that education about heart disease symptoms in women is an area that needs more attention. This is due to the fact that a large majority of women who die suddenly of coronary artery disease have had no previous symptoms. Unfortunately for women, the usual symptoms for men are the standards by which most people make decisions about or recognize whether they should seek medical care.

The survey question that asked the difference between men and women and the likelihood of surviving a heart attack found that only 30% of the participants knew that

women are less likely to survive a heart attack than men. This indicates that 67% of those surveyed were not aware that women are less likely to survive a heart attack than men. This is significant because women are at two time's greater risk than men from dying during the first two weeks after a heart attack. This may be related to a number of factors such as, denial, delayed treatment, lack of symptom recognition, and women's concern for others taking precedence over their own health.

The participants demonstrated a high level of self-efficacy as it related to their perception of what they would be able to do to prevent heart disease. Overall, 92% disagreed that there was nothing they could do to prevent heart disease. This, we felt was a significant finding and a foundation for development of reinforcement of these perceptions through more education based initiatives. Awareness of the multiple risk factors and the knowledge of preventability will be an important step for women in decreasing morbidity and mortality related to heart disease.

The participants were consistent in their perception that more women in the U.S. die of breast cancer than heart disease. This is a common misconception among women in the U.S. It is evident that the American Cancer Society has done a great job in raising awareness of breast cancer. It is time to enlighten women about the fact that heart disease is by far the number one killer of women. Women are ten times more likely to die of heart disease than breast cancer according to national statistics from the American Heart Association.

The measures of perceived susceptibility revealed a strong perception of susceptibility to heart disease. The survey asked about whether the participants were worried about getting heart disease, likely to get heart disease, less likely than other women to get heart disease, or old enough to get heart disease. In all cases,

approximately 74% of women under the age of 38 years felt that they were definitely susceptible to heart disease. This is an area we feel is an important predictor of their willingness to take action in the direction of behaviors that can prevent or delay heart disease.

Sixty percent of the participants indicated that they are afraid of getting heart disease. Sixty-seven percent of the participants did not know that a woman is less likely to survive a heart attack then men and 68% thought that women were more likely to die of breast cancer that heart disease. There is some work to be done in the area of the participant's perception of severity. While women are afraid of getting heart disease they don't perceive the severity of heart disease in the overall picture of women's health. This may be a result of the fact that the majority of the women in this study are young and underestimate their vulnerability to disease.

The information gained in the knowledge section of the survey indicated that 76% of the women understood the basic risk factors for heart disease. However, analysis of individual questions revealed that the participants are not capturing the more complex concepts associated with heart disease risk such as; the interactions of diabetes, hypertension, menopause, and hyperlipidemia. It is our impression that the term heart disease is not being cognitively recognized. The term is vague and may be linked to or considered synonymous with heart attack. One of the advantages of surveying and studying this population is that the majority of the women are being educated in the field of health. This course of study could have a positive effect on their behaviors. The incorporation of this information to form a solid knowledge base for heart disease education in women will have a major impact on the participants, their families and the patients that they serve.

The purpose of this study was to measure knowledge, attitudes, and beliefs of women about heart disease. We were unable to answer a number of questions that resulted due to the limited information asked for in the survey. Other areas of particular interest for future research are; identifying healthy lifestyles, perception of healthy eating habits, and behaviors that promote feelings of wellness. It is likely that we will gain more insight from these women by asking additional follow-up questions.

Recommendations

Heart disease is a process that has distinct components that interact throughout a woman's lifetime. These components must be identified and explained in everyday terms to help women demystify the condition known as heart disease. This will allow women to actively participate in the opportunities that are available to them to delay, reduce, and potentially eliminate heart disease. Our data indicates more difficulty understanding complex issues in the area of knowledge related to heart disease. Since we are dealing with a college population, who are primarily health majors, we believe we have a population that is willing to learn and grow their knowledge base about heart disease. We propose that further education could be provided in the form of health education bulletin boards, mini educational lectures, healthy cooking demonstrations, and healthy eating displays. Other ideas include promoting physical activities in the fitness center that involve groups of friends and include various modern dance classes such as hip hop and jazz that would appeal to the younger women. It may be advantageous to consider making the center available to families thus indicating a willingness to act on information provided by this survey group that suggested that women are influenced by their friends and families. This group of women is aware of their susceptibility to heart disease and the desire to have lifestyle behaviors that can

reduce risk factors for heart disease. We believe there is great potential in education and health promotion related to heart disease.

Conclusion

This study did not provide evidence of a strong relationship between the variables of age, race and level of education with respect to knowledge, attitudes, and beliefs about heart disease. However, it is important to note that our findings suggest education about heart disease can be made generalizable to this college population. We found that the majority of women are aware of the seriousness of heart disease, realize that changes are necessary, and are willing to make those changes. With the beliefs and attitudes about heart disease at these young ages, perhaps we can have some real success with changing these young women's lifestyles and have an impact on preventing heart disease. It is important for health educators to promote healthy lifestyle behaviors in this environment in an effort to reduce the morbidity and mortality of heart disease in women. Increasing awareness of heart disease risk factors in women is the first step toward reducing their risk for developing heart disease.

Following our research, we chose to implement the Heart Associations National Women's Heart Disease and Stroke Campaign for the promotion of cardiovascular disease prevention and self- empowerment of women. We used multiple components including; the national media campaign education material, heart education tables, and three educational seminars. Future plans include implementation of a health screening activity in cooperation with the health and fitness center and a physician sponsor.

It is our hope that as a result of our research, additional programs will be implemented in this college environment that will enable women to lower their risk for the development of heart disease through improved lifestyle and prevention practices.

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Heart to Heart
A Survey of women

The following questions have been developed to assist us in learning about your attitudes, behaviors and knowledge about Heart Disease in women. Please answer the following questions as honestly as possible.

Please provide the following information.

1. My age is _____ years

2. My ethnic background is primarily:
   - ☐1 African American
   - ☐2 Asian
   - ☐3 Caucasian
   - ☐4 Hispanic
   - ☐5 Other _____

3. Level of Education **COMPLETED:**

   - ☐ 1 0 to 12 college classes
   - ☐ 2 13 – 24 college classes
   - ☐ 3 2 year college degree
   - ☐ 4 4 year college degree
   - ☐ 5 Master's level degree or higher

4. My major is _____

The following is a list of items which may or may not affect a woman's chances of getting HEART DISEASE.

In this series of questions you are asked to indicate if you think the following items increase or do not increase a woman's chance of getting heart disease. (circle your answer)

		Definitely Increases	Probably Increase	Probably does not increase	Definitely does not increase	Don't know/ No opinion
1.	Being a cigarette smoker.	1	2	3	4	9
2.	Being diagnosed with diabetes.	1	2	3	4	9
3.	Having a family history of heart disease.	1	2	3	4	9
4.	Being overweight or obese.	1	2	3	4	9
5.	Having an elevated blood cholesterol level.	1	2	3	4	9
6.	Being diagnosed with high blood pressure.	1	2	3	4	9
7.	Not being physically active.	1	2	3	4	9
8.	Being postmenopausal.	1	2	3	4	9
9.	Being anxious and worried.	1	2	3	4	9

In this series of questions you are asked to give your opinion as to what extent you agree or disagree with the following statements about heart disease. (circle your answer)

		Strongly Agree	Agree	Disagree	Strongly Disagree	Don't know No opinion
10.	I am not likely to get heart disease in my lifetime.	1	2	3	4	9
11.	I am likely to engage in healthy behaviors that will promote my feelings of wellness and /or delay the occurrence of a disease.	1	2	3	4	9
12.	Women are less likely to survive a heart attack than men.	1	2	3	4	9
13.	Given my lifestyle, I am at an increased risk for developing heart disease.	1	2	3	4	9
14.	There is nothing I can do to prevent myself from getting heart disease.	1	2	3	4	9
15.	I am afraid of getting heart disease.	1	2	3	4	9
16.	I would likely engage in preventive health screenings if there was no cost to me.	1	2	3	4	9
17.	I am not old enough to have heart disease.	1	2	3	4	9
18.	Each year in the U.S. more women die of Breast Cancer than Heart disease.	1	2	3	4	9
19.	I am less likely than most women to get heart disease.	1	2	3	4	9
20.	The majority of women who die from heart disease have no previous symptoms.	1	2	3	4	9
21.	My quality of life would suffer if I did all the things that would decrease my risk for heart disease.	1	2	3	4	9
22.	I cannot get heart disease if it does not un in my family.	1	2	3	4	9
23.	If I tried to do all the things to reduce my risk of heart disease, it would be a hassle.	1	2	3	4	9
24.	I am not worried about getting heart disease.	1	2	3	4	9
25.	My physician has spoken to me about heart disease.	1	2	3	4	9

		Strongly Agree	Agree	Disagree	Strongly Disagree	Don't know No opinion
26.	Healthy lifestyle changes are too expensive.	1	2	3	4	9
27.	I would be more likely to engage in healthy behaviors if my friends and family participated with me.	1	2	3	4	9
28.	I would discuss heart disease with my physician.	1	2	3	4	9

Informed Consent Form

Title: A Heart to Heart Survey of Women

Purpose: The purpose of this survey is to determine the knowledge level and beliefs of women attending Baker College of Flint regarding heart disease. Michelle Dupuis and Deborah Nelson are conducting this survey to assist Baker College of Flint in meeting the needs of the Baker community. This study is also serving to meet a requirement in their Masters of Science in Health Education at the University of Michigan - Flint.

Inclusion/Exclusion Criteria: This study will be conducted by selecting a sample of women at Baker College of Flint.

Method: Participants will be surveyed during one of their courses in the Winter semester of 2004 at Baker College of Flint. The instructor for the selected classes will be asked to read a prepared introduction. Written survey instructions will be provided to the survey respondents in the form of a cover letter preceding the survey. The instructor will collect the completed surveys and forward them back to Michelle Dupuis or Deborah Nelson.

Study description: This study consists of a 28 question survey that will take approximately 10 minutes to complete. The study will survey women attending Baker College of Flint with the intention of determining their knowledge level as well as their attitudes and beliefs about heart disease in women.

Possible benefits:

1. This study may have an impact on the participant's thoughts about women and heart disease and make respondents more aware of issues relating to Heart Disease in women.

2. This study will provide the foundation for the implementation of a health education program for the women of Baker College of Flint which would focus on raising the awareness of women regarding their heart disease risk. You are asked **NOT** to place your name on the survey.

Legal Rights: As a participant in this study, you will not lose any of your legal rights as a research subject by agreeing to this consent form.

Confidentiality: Every reasonable effort will be made to maintain confidentiality. You will only be asked to provide information that is relevant to this study. The information will only be used for the purpose of this study and will only be maintained as long as necessary to support the study conclusion.

Release of your personal data and privacy: Records of your participation in this study will be confidential, except as required by law. The investigators will look at and copy information that is collected during the study. Absolute confidentiality cannot be guaranteed. If the study results are presented at meetings or printed in publications, your identity will not be disclosed. The original surveys will be destroyed at the conclusion of the study.

Contacts: If you have any questions about the study please contact: Michelle Dupuis at (810) 766-4358 or Deborah Nelson at (810) 766-4155.

Participation: Your participation in this study is voluntary. You may refuse to participate without penalty. If you do chose to participate you may withdraw from this study at any time.

Consent: I have read the above information, understand the content, and agree to take part in the study. I realize that I may withdraw from the study at any time.

This study has been approved by the University of Michigan - Flint Human Subject Review committee and the President. of Baker College of Flint

Your signature below indicates that you agree to participate in this study. A copy of this consent form is being provided for your records.

Name _____ Date _____
Signature of participant

Name _____ Date _____
Signature of witness

University of Michigan-Flint
Health Sciences and Administration Department

This is to certify that the thesis proposal prepared

By: Deborah Nelson & Michelle Dupuis

Entitled:

Measurement of Knowledge, Attitudes, and Beliefs of Risk Factors for Heart Disease in College Women

Complies with departmental regulations and meets the standards of the Health Sciences and Administration Department.

For the continued preparation of the thesis in partial fulfillment of the requirements

For the degree of Master of Science in Health Education

Signed by the departmental examining committee:

Bonita D. White RN, MSN

Jan. 12, 2001
DATE

UNIVERSITY OF MICHIGAN – FLINT

January 12, 2004

To: Joan Cowdery

From: Human Subjects Committee JK

Re: Measurement of Knowledge, Attitudes and Beliefs of Risk Factors for Heart Disease in College Women

UM-Flint Approval #40/03

This is to inform you that your proposal "Measurement of Knowledge, Attitudes and Beliefs of Risk Factors for Heart Disease in College Women" has been approved by the Human Subjects Committee. Please take note that your use of human subjects is approved, only as detailed in your approved application. Should you wish to make any changes in the use of human subjects that differ from the approved proposal, you must inform this committee prior to making these changes. If you are seeking funding for this proposal, it is your responsibility to ensure that your proposed use of human subjects in your funding application is consistent with that approved by this memo.

Should you observe any negative change in the health or behavior of a human subject attributable to this research, you are required to suspend your project. If this happens, please inform the committee as soon as possible for our further review and decision as to the continuation /termination of your project.

This approval for your project is valid for a period of twelve months. If your project extends beyond this period (twelve months), please re-submit your proposal for reconsideration.