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**A Nurse Practitioner-Initiated Educational Program for Health  
Care Providers to Screen for Heart Disease in Hispanic Women**

Robert Hevia

A NURSE PRACTITIONER-INITIATED EDUCATIONAL PROGRAM FOR  
HEALTH CARE PROVIDERS TO SCREEN FOR HEART DISEASE IN  
HISPANIC WOMEN

CAPSTONE PROJECT

Presented in Partial Fulfillment of the  
Requirements for the Degree of  
Doctor of Nursing Practice

Barry University

Robert Hevia

2010

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HEALTH CARE PROVIDERS TO SCREEN FOR HEART DISEASE IN  
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by

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2010

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## ABSTRACT

**Background:** Hispanic women may have an increased risk of developing significant heart disease at a younger age. The problem of increased cardiovascular risk is compounded by an overall lack of early screening.

**Purpose:** To develop a nurse practitioner (NP) driven heart disease screening educational program based on existing American Heart Association (AHA) guidelines, and to instruct a community of emergency medical service (EMS) providers who could implement it in a large Hispanic community to reduce risk of CVD in Hispanic women

**Theoretical Framework:** Kolb's theory of experiential learning.

**Methods:** The project was divided into three phases: (Phase 1) development of course content and objectives; (Phase 2) implementation of the course and pre/post evaluation of EMS providers' knowledge/ability to screen for coronary heart disease (CHD) based on an existing CHD knowledge tool; and (Phase 3) conducting focus group interviews of select participants and data analysis.

**Results:** Findings from Phase 2 revealed that after the NP driven educational curriculum was implemented, a statistically significant improvement was identified in both the Coronary Heart Disease in Women Knowledge posttest and Framingham risk assessment posttest scores. The significance value in both instances was .000, this data supports providing heart disease prevention education to EMS providers who can subsequently screen for CVD in the community. Focus group data collected in Phase 3 revealed commonalities among participants that encouraged further implementation of the NP-driven educational program, while identifying potential barriers in the actualization of the community screening and provided suggestions for future implementation and on-going research of the program.

**Conclusion:** The Nurse Practitioner Implemented Curriculum for Heart Disease Screening and Prevention in Hispanic Women can be used as a framework for community healthcare providers aimed to improve healthcare delivery to Hispanic women.

## ACKNOWLEDGEMENTS

I would like to thank everyone who supported me during my doctoral education. I am grateful to my faculty for guiding me with great diligence during the completion of my capstone project. I would like to offer a very special thank you to Dr. Andra Hanlon, my committee chairperson, who has tirelessly worked throughout the span of my graduate education to provide me with enduring scholarly insight.

I would also like to thank Tori Gabriel, director of the Florida Heart Research Institute for her contribution of materials during the implementation phase of the capstone project. I would like to thank the director of the city of Miami department of Fire-Rescue, Chief Maurice Kemp for granting approval to conduct the capstone project within fire department premises. I am also especially grateful to Dr. Joni Thanavaro for granting permission to use her Coronary Heart Disease Knowledge Tool for Women during the capstone project.

The greatest debt I have incurred is to my wife Julissa, who has supported me without fail during some very difficult times. She has not only stood by me, but has been the impetus of every great accomplishment in my adult life. Without a doubt, she has been my greatest teacher and my happiness exists because of her.

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## **CHAPTER ONE**

### **Introduction**

Cardiovascular disease (CVD) claims the lives of approximately 500,000 women each year, and associated costs soar at over 430 billion dollars (Rosamond et al., 2007). More women in the United States (US) die from CVD than do men (Mosca et al., 2007). Historically, Caucasian women have been reported to have the highest risk for heart disease when compared to Hispanic women. A study on the racial and ethnic disparities of coronary heart disease in women by Finklestein et al. (2004), found that Hispanic participants had lower average systolic blood pressures, total cholesterol and 10-year heart disease risk scores compared to white women. A later study, however, conducted by Teeters (2008) found that Hispanic women show the same risk for a major coronary event ten years earlier than Caucasian women. The researcher concluded that Hispanic women have significant cardiac risk factors by the age of 53. Therefore, being a Hispanic woman may potentially be a cardiac risk factor in itself (Teeters). Christian, Rosamond, White and Mosca (2007) also found that Hispanic women are more likely to be obese, diabetic and physically inactive compared to white women. Despite these findings, there is little evidence that young Hispanic women who can benefit the most from early screening and health education are not being evaluated in time.

### **Challenges of Screening for Heart Disease**

The screening and prevention of heart disease in women provides a great challenge for health care providers in the United States (US). The problem is two-fold. Primarily, the published guidelines for CVD screening, prevention and treatment in women are not consistently used by the providers who play key roles in health care delivery. While screening guidelines are available, a recent survey

indicated that primary healthcare providers (PCPs) did not rate themselves as effective in their capacity to help patients prevent CVD (Mosca et al., 2005). PCPs do not often speak about CVD to their female patients and have not traditionally been trained regarding gender differences and CVD (Charney, 2004). Specifically, the review of literature shows that Hispanic women also receive the least amount of heart disease prevention education when compared to other ethnic groups (Mosca et al., 2000). National guidelines for CVD screening, treatment and counseling of coronary risk factors in women are available by the American Heart Association (AHA). In the study conducted by Mosca et al. (2005), physicians stated that constraints on time were a major factor that affected their ability to adequately screen women for heart disease.

Secondly and not exclusive to Hispanics, there appears to be a knowledge deficit in many women related to the severity of heart disease and their gender. This conclusion was based on findings in a study by Mosca et al. (2000) that investigated the knowledge of heart disease risk and prevention among women in the United States (US). Most women aged 25 to 44 could not identify heart disease as the leading cause of death and self-reported that they were poorly informed regarding heart disease and stroke (Mosca et al., 2004). Christain et al. (2005) found that women perceived breast cancer as their greatest concern. Although awareness of heart disease had significantly increased in white and black women from 1997 to 2004, awareness among Hispanic women showed no significant increase (Mosca et al., 2004).

Jackson & Burke (2000) claimed that the lack of information regarding CVD risk and prevention is particularly great among some minority groups. This appears to be the case with Hispanic women, who, according to Mosca et al. (2000), are the least likely to receive information regarding heart disease prevention from any source

within the community. This may be due to lack of access to health care, language difficulty or other cultural barriers (Juarbe, Lipson & Turok, 2003). A study conducted by Goel, McCarthy, Phillips and Wee (2004) suggested that foreign-born individuals who have access to health care receive less counseling on nutrition and exercise in a clinical encounter than do white individuals born in the US. Thus, there is a critical need to generate an efficient method for clinical providers to provide evidence-based and ethnically-appropriate care in the screening and treatment of CVD in Hispanic women.

### **Problem Statement**

Hispanic women may have an increased risk of developing significant heart disease at a younger age. The problem of increased cardiovascular risk is compounded by an overall lack of early screening, which may hinder the identification of disease in this population. Campaigns by the American Heart Association (AHA) have achieved limited success, as PCPs generally rate themselves as less than effective in screening for heart disease in women (Mosca et al., 2005). In summary, there are limited primary CVD screening opportunities for Hispanic women, healthcare providers lack evidence-based knowledge about the disease, and there is a dearth of culturally appropriate interventions for this vulnerable population of women.

### **Purpose of the Study**

The purpose of this project was to develop a heart disease screening educational program for health care providers, based on existing evidence-based guidelines. The program was taught by a nurse practitioner (NP). The intent was to increase the number of health care providers who are educationally prepared to serve

in a large Hispanic community. These health care providers can now serve as primary screeners and a resource for Hispanic women at risk for heart disease.

### **Utilizing an Untapped Resource: Emergency Medical Services**

Emergency medical service (EMS) providers were recruited for a pilot project to collect data for this project. EMS personnel represent a large number of healthcare providers who work directly in the community and have great accessibility to all socioeconomic groups. Moreover, EMS providers are available in most cities in the US. While PCPs, including NPs involved with primary care, have had limited engagement with EMS providers, the community has an extensive relationship with EMS personnel. They are usually the first responders in the event of a cardiac emergency. The community also recognizes them as a valuable resource for healthcare information and assistance. They are often a presence at community health fairs and the neighborhood fire stations, or local EMS stations are frequented by the general population for health information or blood pressure checks.

EMS providers represent a large number of healthcare providers who work directly in the community and are available to render care to the sick and injured at a moments notice. The idea of formally expanding EMS to that of health promotion and disease prevention is novel but timely. A study by Shah et al. (2006) examined the effectiveness of an EMS health promotion education program delivered to older adults receiving emergency care. The study failed to demonstrate that the health promotion activities offered by EMS addressed patient needs. A major limitation of this study was noted to be the timing of the health promotion intervention, which took place during emergency responses and not at times when community members were seeking screening opportunities. In lieu of the findings of this study, it appears feasible that EMS may have a role in health promotion. Perhaps a clear curriculum



and a program led by a nurse practitioner for use during non-emergency patient contacts can provide perspective in the role of EMS in health promotion.

### **Project Research Questions**

The capstone project was guided by the following research question: What will the learner outcomes be for health care providers who complete a course curriculum designed and taught by an NP to screen for heart disease in Hispanic women?

### **Project Objectives**

The purpose was achieved through the following project objectives:

- Create an educational program based on current screening guidelines that will educate EMS personnel about community heart disease screening and education strategies for Hispanic women.
- Implement the course with a group of EMS providers.
- Utilize an existing CVD knowledge assessment tool to evaluate competency of EMS participants, pre and post-educational intervention.
- Obtain qualitative data from focus groups composed of EMS providers to discuss the perceived barriers in implementing a community cardiovascular disease screening program.

### **Significance of the Problem to Nursing**

Participants at the World Health Organization (WHO) conference on health promotion in 1986 pledged to reorient health services and resources toward health promotion and to share this power with other disciplines (Ottawa Charter for Health Promotion, 1986). Health promotion has been a worldwide priority ever since and has, again, been stressed as a national health goal by the U.S. Department of Health and Human Services (US DHHS) in *Healthy People* initiatives (What Is Healthy

People, 2009). Since the first Ottawa charter, five additional conferences have focused on health promotion programs as an international priority (Health Promotion, 2009). These conferences include the Adelaide Recommendations on Healthy Public Policy (1988), the Sundsvall Statement on Supportive Environments for Health (1991), the Jakarta Declaration on Leading Health Promotion into the 21<sup>st</sup> Century (1997), the Mexico Ministerial Statement for the Promotion of Health: from Ideas to Action (2000) and the Bangkok Charter for Health Promotion in a Globalized World (2005).

The significance of health promotion to advanced nursing practice — specifically, heart disease prevention in women—can be quickly identified. Nurses demonstrate interpersonal and management ability in the workplace, and the NP skills of collaboration and leadership can be channeled to enhance the health of populations. Thus, nursing practice, in its most essential form, always involves health promotion. However, there is limited community value in screening women within a single primary care practice. Subsequently, at this level, nursing practice is limited in changing awareness heart disease within a large community.

For many NPs, contact with women in the community is restricted to those who are seen in clinical practice. This narrow degree of exposure limits ability to screen women for heart disease on a large scale without the help of additional resources. NPs possess the knowledge to implement and effectively manage a program that utilizes workers available in the healthcare community. NPs continue to effectively fill a gap that exists in preventative care by providing exemplary leadership in the role of patient educator. The NP as a leader, can instill these same qualities in members of the community healthcare team, which includes nurses, nursing students and emergency medical service personnel.

This project incorporated the role of the NP as an educator, resource and multidisciplinary team leader in the prevention of heart disease in Hispanic women. Although the learning needs of healthcare providers may be different, this project provided the framework for NPs to educate nurses, nursing students and other health care providers regarding CVD screening and heart disease prevention education in the community. Nurse practitioners can act as leaders within their communities by stimulating policy change that revisits the use of healthcare personnel. The results of this project reveal implications for nursing in the areas of education, practice, research and social policy.

### **Education**

The intent of this project was to provide a model educational curriculum and evaluation tool that may be disseminated to other NPs for use in educating nurses, nursing students and other healthcare providers about heart disease prevention in women. The significance of this project to nursing leadership within communities is paramount. Nurses have long been accepted as educators in multidisciplinary teams. An important difference with this project was that the NP not only acted as an educator but as a leader and mentor to personnel in another healthcare discipline during an educational program in which they learned how to offer CVD screening and education to the community. The NP educator demonstrated the ability to teach healthcare workers the skills to offer disease preventative practice within the community. One of the biggest challenges for the NP educator was to develop a program that not only met the learning needs of the healthcare providers considered the ethnocultural needs of the community.

### **Practice**

Nurses are charged with developing programs that influence practice in all

aspects of care along the health-illness continuum, and this includes health promotion. The findings of this study suggested a role for NPs that at first glance may be perceived as nontraditional practice in the sense that the role does not involve direct patient care. Implications for practice center on the fact that NPs can indirectly offer health promotion and education through other healthcare providers, so preventive care may be offered to underserved minority populations where NPs are not readily available. The effects of such a health promotion campaign reveal that screening for cardiovascular disease can be made available on a continuous basis within Hispanic communities.

### **Research**

The significance of this project to nursing research was the contribution of data on the role of the NP in a community health promotion campaign aimed to fight heart disease. The review of literature suggested minimal improvement in the awareness of cardiovascular disease in and by Hispanic women over the past few years. An extensive literature review found no evidence of a study that focused on the role of the NP to educate nurses, nursing students and other health care professionals on conducting heart disease screening and prevention campaigns (see Chapter Two for review of literature). The findings of this project may stimulate community health care providers (e.g., emergency medical technicians) to get involved in more health-promoting educational campaigns outside the realm of cardiovascular disease. Qualitative data was also obtained from EMS providers in focus groups, which identified potential barriers in implementing a program directed at community screening of CVD.

## **Social Policy**

Nurses around the world play a pivotal role in recruiting forces for change in individual, family and organizational health behaviors, thus reinforcing the role of nurses for leadership in health promotion (Pender, Murdaugh, & Parsons, 2006). The project allowed the NP to take the lead in effecting change that may positively impact the health delivery system in both rural and urban areas in the US. Even though EMS providers across the nation are located in all types of communities, no formalized campaign in cardiovascular health promotion was found in the literature or in conduction of this project. This capstone project uncovered a resource of health care providers (EMS) who are available in most US communities and the role of the NP in utilizing them.

A clear example of potential social policy change may be viewed through a historical perspective regarding municipalities. Municipalities can be encouraged to make policy changes that utilize employees paid by tax dollars (e.g., EMS providers) in roles that affect health promotion. Historically, municipal governments have not played an active part in promoting health within their communities. It has been demonstrated through this project that an NP-led campaign to fight heart disease can be offered in communities at little or no cost. Thus, the course may be set for municipal government policy change.

## **Theoretical Framework**

Kolb's model of experiential learning was used to guide development of the educational program (see Figure 1) (Kolb, 1984). The model is well-suited for an educational program that relies on use of real life experiences as well as hands-on training and because this learning theory is based on a holistic integrative perspective that considers experience, perception, cognition and behavior (Kolb). The learner is

part of a sequential, four-stage process that includes (1) concrete experiences, (2) reflection on those experiences, (3) abstract conceptualization, and (4) new experiences guided by the conceptualizations (Loo, 2004). More specifically, in developing a course for seasoned health care providers, consideration is given to the philosophy that learning is a process that is continuously modified by experience. What a student may learn in one instance may become an instrument for understanding in future circumstances.

It is the duty of the educator to comprehend how learners learn and to draw on experiences that build knowledge and skill sets for the future. According to Kolb (2004), the educator must recognize that learners have two modes of grasping experience. One way is through immediate concrete experience, and the other is through the recollection of past experiences to form new ones. Kolb described these two ways of gaining knowledge as the *prehension dimension* on the vertical axis of his model. During the concrete experience mode of learning, one basically becomes aware of the sensations of the current experience (i.e., what is seen, felt, heard and smelled). These sensations become reality and this mode of learning was what Kolb termed *apprehension* (Kolb, 1984). To capture the sensations of apprehension and have them become a part of our knowledge, Kolb postulated that human beings then employ an associated mode of learning called *comprehension*, which allows us to store in our knowledge base the vast array of sensations that fade behind once the experience is over. In the process of describing the word “chair,” for example, one can summarize the sensations associated with “chairness” (Kolb, 1984). *Comprehension* is also called “abstract conceptualization.” One can say that concrete experiences are nonverbal, nontemporal and nonrational while *comprehension* is verbal, symbolic and abstract. It is the responsibility of the educator to employ both

mechanisms of gaining knowledge in any educational intervention. This is done by offering new concrete experiences while also providing opportunities to reflect on old ones.

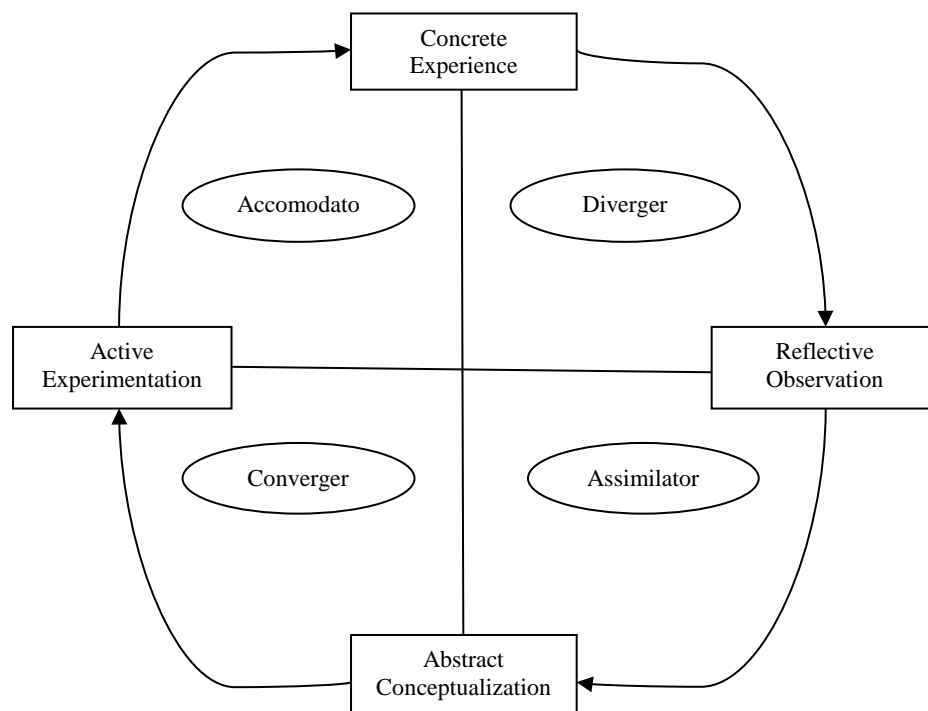
Kolb's theory of measuring outcomes rests on the horizontal axis of his model or the transformation dimension (see Figure 1, below). On one end of the horizontal axis is *intention* or "reflective observation" and on the other *extension* or "active experimentation." During "reflective observation," the learner reflects on experiences from the external world internally (Kolb, 1984). This is a step above comprehension because the learner reflects on old experiences but also incorporates new thoughts of how to apply them. Through *extension* or "active experimentation" knowledge, ideas and thoughts are transformed into action and thus outcomes can be measured.

The effective learner is one that can adapt his or her learning style in different situations based on need (Loo, 2004). Within the stages of learning, Kolb identified four learning styles: *assimilators*, *convergers*, *accommodators* and *divergers*. Accommodators predominately learn from hands-on experiences as they tend to convert concrete experiences into active experimentation. Divergers are able to reflect on concrete experiences from varied points of view. Assimilators are able to gather information and place it in a concise logical form, and convergers find practical use of new concepts (Loo, 2004).

**Relationship of the theory to the project.** Kolb's theory was used as a framework in developing a program to train EMS providers in screening and heart disease prevention for Hispanic women. Most EMS personnel are experienced as health care providers in the emergent treatment of illness and injury. The challenge for the nurse practitioner educator was to introduce a new role to EMS personnel as providers of primary and secondary prevention in CVD. Kolb considers that previous

experiences can simply be reformatted to develop new knowledge. CVD is not a new concept to EMS providers. The effects of CVD are evident to EMS providers who treat victims of myocardial infarction and stroke.

Kolb's theory of experiential learning was the framework used to transform previous experiences with CVD into acts of screening and prevention. Through reflective observation, the program will progress the learner's knowledge of CVD that was once limited to emergent treatment. New concepts of CVD were converged into active experimentation through acts of screening and community education. The learners were able to reflect and assimilate knowledge based on prevention, not the treatment of CVD. The final product was the learner, who possessed a new skill set geared towards primary and secondary prevention of CVD that could be deployed within the community.



*Figure 1.* Kolb's Model of Experiential Learning and Learning Styles (Loo, 2004).



## Summary

Cardiovascular disease is the number one killer of all of America's women (Rosamond et al., 2007). However, recent evidence indicates that Hispanic women are at a higher risk at a much earlier age (Teeters, 2008). Moreover, Hispanic women have consistently demonstrated less awareness about heart disease than their non-Hispanic counterparts (Mosca et al., 2005). Primary healthcare providers, including NPs and physicians, have acknowledged limitations in their ability to adequately screen women for heart disease and provide education regarding prevention (Mosca et al.). Recognizing the need to expand the opportunity for health promotion and disease prevention, this researcher tapped into a previously underutilized resource of healthcare providers, EMS, who are available in just about every community in the nation.

Kolb's model of experimental learning provided the theoretical underpinnings for the educational project designed to train EMS providers in heart disease screening and prevention for their respective communities. This project was under the direction and leadership of an NP who assumed the role of educator, leader and disseminator. Now that the participating EMS providers are trained, the NP can lead a campaign that addresses the needs of a largely uninsured population in need of heart disease education and screening. This project demonstrated that there is potential to provide heart disease prevention education and screening in every community, regardless of socioeconomic or cultural population.

## CHAPTER TWO

### Literature Review

A search of relevant literature across disciplines was conducted to explore the data available related to cardiovascular disease (CVD in women, specifically, the following themes: women's awareness, perceived risk, and associated barriers to prevention. Additionally, the researcher narrowed the search to focus on the disparities and issues specific to Hispanic women and lower socioeconomic groups. The intent of the literature review was to look at the information available in order to help develop a program that addressed the CVD needs of Hispanic women. Considering the objective of CVD prevention, a search on the concepts of screening, healthcare provider awareness and the role of EMS was also performed.

#### Sources for Literature Review

Using EBSCOhost, the National Center for Biotechnology Information (NCBI), Science Direct and OVID, the following computerized databases were used for this search: the National Library of Medicine, National Institutes of Health, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and the *Archives of the Journal of American Medical Association*. The key words used in the search were as follows: *heart disease, Hispanic, women, prevention, screening, awareness, emergency medical services, physician and nurse practitioner*. Citations were limited by language to English and by subject to the exploration of concepts. Synthesis of the literature revealed a collection of expansive findings detailing what is known and what is needed to be done for women in the prevention of heart disease. The obvious need for additional resources to tackle CVD in Hispanic women was also revealed.

### **Gender, Ethnicity and Awareness of CVD**

Mosca, Ferris, Fabunmi and Robertson (2004) conducted a study to assess the awareness, knowledge and perceptions of CVD risk among American women. The results were analyzed to identify if there had been a change in awareness as compared to previous similar studies conducted in 1997 and 2000. Differences among racial and ethnic groups were recognized as they related to the awareness, knowledge and perceptions of CVD. The research participants were obtained from a national sample of women and were considered eligible if they were age 25 years or older. A total of 2025 households were contacted and a final sample of 1024 participants was eligible and participated. The only eligibility requirements were to be female and 25 years of age or older.

A standardized 32-item survey was used consisting of a Likert scale that measured general awareness of women's health, communications and behaviors related to heart disease, prevention and demographic characteristics. Differences in responses between ethnicity, age groups and previous surveys were analyzed with chi-square ( $\chi^2$ ) tests and statistical significance was set at  $P < 0.05$ . The researchers found that only 26% of the participants knew their low-density lipid (LDL) cholesterol number and 29% reported knowing their high-density lipid (HDL) cholesterol numbers. Only a small percentage (28%) reported exercising more than three times per week and the mean body mass index (BMI) was 27.0kg/m<sup>2</sup>, which lies in the overweight category.

Awareness of CVD as the leading cause of death improved from previous surveys among white and black women though the rate of awareness among Hispanic women did not increase. A total of 38% of white women surveyed felt heart disease was the leading cause of death as compared to 30% of black women and 27% of

Hispanic women ( $p<0.05$ ). Only 33% of Hispanic women rated themselves as “very well” or “well” informed about CVD when surveyed. Of great significance, 93% of women surveyed including Hispanics felt they were comfortable discussing heart disease with their healthcare providers yet only 38% had actually had a discussion with their doctors. As compared to white and black women, Hispanic women were the least likely to recognize the availability for early treatment of heart disease (92% vs. 84% vs. 79% respectively;  $P<0.05$ ). This study was limited because interviewers only spoke English and participants required a telephone in their household that may have excluded women of lower socioeconomic status.

A study by Mosca et al. (2000) has proven to be a key citation in research directed at heart disease and women. The purpose of the study was to assess the knowledge of risks of heart disease and stroke as well as the perceptions of heart disease and its prevention among women in the United States. The sampling procedures used both random and targeted samples to gather the total of the participants ( $n=1000$ ). Both quantitative data and qualitative data were collected regarding disease conditions, knowledge of heart disease, information about heart disease, perceptions of heart disease risk factors and heart disease prevention as well as communication with physicians.

The data from Mosca et al. (2000) revealed that only 8% of the women surveyed identified CVD or stroke as the illness that gave them greatest concern. Across ethnic boundaries and representing less than 20% of the population surveyed, few women in all groups felt that they were very well informed about heart disease. Sadly, less than 30% of the women respondents also stated that their physicians had ever discussed heart disease with them. All women surveyed listed breast cancer and smoking as the leading cause of death. Categorized by age, women aged 25 to 44

were the least informed about heart disease and stroke. The data indicated that age was a great factor in predicting knowledge regarding heart disease. Educational programs and screening should be directed at women in younger age groups where the impact can be the greatest.

More recently, Christian, Rosamond, White and Mosca (2007) conducted an American Heart Association national study that examined the nine-year trends, racial and ethnic disparities in women's awareness of heart disease and stroke. The purpose of the study was to investigate and evaluate trends in women's awareness, knowledge and perceptions related to CVD since 1997. A total of 1,005 women of age 25 years or older participated (71% white, 12% black, 12% Hispanic and 6% for other ethnicities) in the study.

Participants were asked questions regarding the leading cause of death, risk factors of CVD, warning signs of heart attack and stroke and methods of CVD prevention. Interviews were conducted in English by professional interviewers. Descriptive statistics of awareness and knowledge were presented as proportions. Univariate relationships between ethnicity and age groups were analyzed using *t* tests with trend analysis performed by using logistical regression models to evaluate women's awareness from all survey years 1997, 2000, 2003 and 2006. Results showed that in comparison to previous year's surveys, there was a significant increase in the total amount of women that correctly identified CVD as the leading cause of death. Important to note is that of all ethnic or race groups, Hispanic women demonstrated the least improvement of knowledge regarding the leading cause of death.

Hispanic women awareness improvement increased only 3% between 2000 and 2006. Only 6% of Hispanic women claimed that heart disease was their greatest

health problem. Hispanic women also showed the highest rate of worrying about cancer instead of heart disease as compared to white women (52% vs. 35%,  $p < 0.05$ ). Hispanic women also rated themselves as the least informed about heart disease when compared to black women (17% vs. 6%,  $p < 0.05$ ). Hispanic women more often agreed that there was nothing that they could do in regards to heart disease when compared to white women (22% vs. 11%,  $p < 0.05$ ). As with previous studies, a majority (>90%) of the respondents could identify the major risk factors for heart disease. Seen in preceding studies, nearly all women (95%) reported feeling comfortable talking about heart disease with their doctors, yet only 46% stated their doctors had discussed heart disease with them. The results indicated that although CVD awareness among women improved in general, CVD awareness in Hispanic women did not. Therefore, awareness education should be targeted at minorities in addressing heart disease in women, especially Hispanics.

### **Socioeconomic Disparities and CVD**

Many Hispanic communities across the nation are populated in areas that characterize a lower socioeconomic status. A pertinent search of the literature was conducted to evaluate the data available relating socioeconomic position, the impoverished community and coronary heart disease (CHD). Lawlor, Smith, Patel and Ebrahim (2005) sought to answer pertinent questions related to CHD and socioeconomic status or position across British towns where 4286 women were randomly selected.

Findings linked lower socioeconomic status with heart disease, coronary heart disease was more prevalent in area most deprived versus areas most affluent, 21.2% to 13.2% respectively ( $p = .001$ ). The British study also demonstrated that the mean BMI was high in areas most deprived versus areas most affluent, 28.2 to 27.1

respectively ( $p < .001$ ). Alarming results demonstrated a 38.9% prevalence of obesity in areas of deprivation versus 24.4% in areas most affluent. The British study also noted that the rate of smoking was also higher in less affluent areas (17.1%) versus most affluent areas (8.1%). The study also revealed that those in lower socioeconomic areas had a tendency to be less educated, have limited transportation, diabetes, or be underweight.

Lawlor et al. (2005) suggested that the CHD and its associated risk factors became more prevalent as socioeconomic status declined. The results of the British study raise significant questions for generalizability in the United States. Considering that the same is true for areas of lower socioeconomic status in the United States, then CVD screening and prevention efforts should be targeted to inner city areas where the need is greatest. Areas with a high immigrant population and lower socioeconomic status need methods for prevention that have been adapted to meet their special needs.

Shaw et al. (2008) examined financial indicators as estimators of major cardiovascular events. The sample was composed of a subset of 819 women enrolled in the Women's Ischemia Syndrome Evaluation (WISE) study, who had symptoms of chest pain and were been evaluated with angiography. Similar to the British study, this research found that socioeconomic factors as well as ethnicity had a correlation with CVD. Women who presented the highest risk for death or hospitalizations due to CVD included those with an annual income of less than \$20,000 as well as those with less than a ninth grade education.

The data regarding ethnicity demonstrated that women of African America, Hispanic, Asian or American Indian descent had the highest risk of cardiovascular death or myocardial infarction. Women in the lower socioeconomic groups also had more refractory chest pain over the course of five years requiring hospitalization. The

women with the most angina also required more medication to control it. The study demonstrated that cardiovascular care costs over a five year period are inversely related to household income. Most extreme cases reveal that the cost was nearly double for women whose household income was less than \$20,000 compared to women whose annual household income was greater than \$100,000 annually. A particular combination of non-Caucasian women, unmarried women and limited education provided for a high risk of worsening cardiovascular prognosis (Shaw et al., 2008).

Shaw et al. (2008) demonstrated that women of low-income used up more healthcare resources and had higher associated healthcare costs. The study reinforces the need for CVD screening and prevention campaigns in areas of lower socioeconomic status. The findings are significant when viewed collectively with other studies that examine CVD risk with socioeconomic status and ethnicity.

### **CVD Screening and Level of Education in Diverse Communities**

A study conducted by Finklestein, Khavjou, Mobley, Haney and Will (2004) provides a snapshot of CVD risk with particular attention to racial and ethnic disparities. Data was collected from the Well-Integrated Screening and Evaluation for Women across the Nation (WISEWOMAN) program, a project funded by the Center for Disease Control (CDC), which provides CVD screening for low-income women. The sample included 5596 WISEWOMEN participants enrolled in one of eight locations. Data was collected on risk factors such as BMI, systolic and diastolic blood pressure as well total and high-density lipoprotein (HDL) cholesterol. After the risk factors were obtained, a history was gathered which looked into the cardiovascular health history of each participant. A ten-year probability of coronary heart disease risk was determined from each participant surveyed. There were no significant



negative findings comparing Hispanics with other ethnicities in cholesterol levels though Hispanics were significantly more likely to be unaware of their high cholesterol. This leads to a statistically significant proportional decrease in the percentage of Hispanics who were taking medication for high cholesterol levels. The study suggests a need for CVD education and screening within the Hispanic female community.

Overall, the study by Finklestein et al. (2004) demonstrated that disparities exist within the realm of cardiovascular disease awareness and treatment. Certain limitations are particular to this WISEWOMAN study, all of the participants are underinsured or uninsured. Consequently, it is not possible by this study alone to determine if the disparities exist because of socioeconomic status, race/ethnicity or a combination of both. Community characteristics were also not included in the study and may also have an influence on the overall CVD risk. Clearly, the findings are significant enough to raise the need for awareness within ethnic communities and replicate studies that explore the validity of the findings.

Christian, Mocharia and Mosca (2005) assessed the perceived risk versus calculated risk of coronary heart disease as well as the benefit of a brief educational intervention aimed to improve CVD awareness in ethnically diverse women. The research participants were generated as a sub-study of a larger clinical trial conducted at Columbia University, with the total sample consisting of 125 women. The research subjects participated in CHD risk factor screening as well as a brief CVD educational intervention with a one-month follow-up telephone survey. The CVD risk assessment was calculated using the Framingham global risk score. The perceived risk was calculated by a survey in which participants were asked what they thought their chances of having a heart attack or dying of heart disease in the next ten years were.

The mean age of the participants in this study was 62.9 years ( $SD \pm 10.9$ ), and 44.8% of them were Hispanic. A large percentage of the research participants were unemployed (73%) with insurance coverage through Medicaid or Medicare (78.4%). Logistic regression was used to calculate the accuracy of perceived risk and preferred risk communication methods as compared to actual risk estimated by Framingham global risk score. Among those participants who were eligible, 59% had a Framingham 10-year risk of less than 10%, 20% had an intermediate 10-year risk, and 21% had a greater than 20% 10-year risk assessment.

An important result of this study demonstrated that young women found to be at intermediate risk had lower perceived risk of heart disease. Ethnicity did not reveal to be an important predictor of preferred risk communication. The results of the study by Christian et al. (2005) disclosed that 34% of the participants preferred risk expressed in number of risk factors, 27% preferred categories of high, moderate or low, 20% preferred Framingham absolute risk and 6% receiving a cardiovascular age equivalent. A limitation of the study was the fact that the Framingham global risk assessment was based on a study predominately composed of white populations and may have been invalid for Hispanic populations. Researchers concluded that education and prevention strategies need to be targeted at younger female populations. Results also indicated that ethnicity does not play as large a role in CVD teaching reception as does the patient's level of education.

A pilot study conducted by Etnyre et al. (2006) investigated the relationship between cardiovascular risk and anxiety, spirituality, acculturation, and the objective cardiac risk in a small sample of Hispanic women. The researchers were trying to determine if transitioning to a new culture had negative cardiovascular effects on the immigrant population by assessing the psychophysiological effects of stress on

Hispanic females and associated alleviating methods. The sample was generated from the housekeeping staff of a university in the southwestern United States. The investigators used several instruments in the course of the study: the Acculturation Rating Scale for Mexican Americans, the Self-Administered Comprehensive Health Risk Appraisal, the Spiritual Perspective Scale and the State-Trait Anxiety Inventory. CVD objective findings were also measured in the form of BMI, blood pressure, and cholesterol screening.

The data was analyzed with descriptive statistical methods to determine relationships within the sample (Etnyre, et al., 2006). Objective findings revealed that in this small sample of Hispanic women ( $n=21$ ), 86% had a BMI above 25 and 62% had a waist circumference above 35 inches. The mean age of the participants was 50 years. The sample also revealed that 24% of the women were in the hypertensive range and 48% were in the pre-hypertensive range. Interestingly, only 14% of the women felt that they had high blood pressure. Cholesterol findings of the sample exposed that 71% had HDL levels less than ideal, and 67% had LDL levels above 100mg/dl. The investigators noted that overall, Hispanic women involved in the study revealed a lack of knowledge related to CVD but shared an eagerness to learn. The small sample size of this study is an obvious limitation although it clearly identified a need for CVD prevention programs in the Hispanic female community.

To promote health care in a Hispanic community, specific needs of the population must be considered. A study by Zarate-Abbott et al. (2008) focused on strategies for healthcare promotion in low-income Hispanic immigrant women. The study consisted of a small sample size of 21 Hispanic women who were part of the housekeeping staff at a small University in Texas. The investigators performed health screenings at baseline evaluation with three follow-up cardiac education classes with

culturally sensitive material administered in Spanish. The researchers' also aimed to teach at least one skill as part of each educational session component. The Hispanic women were largely of Mexican descent (80%) and were the first generation to live in the United States (Zarate-Abbott, et al., 2008).

Most of the participants had less than an eighth grade education, had a mean age of 50 years, and had resided in the US for 20 years (mean number of years). Objective data disclosed that most participants were either overweight or obese, and had blood pressures in the pre-hypertensive or hypertensive range (Zarate-Abbott, et al., 2008). Considering the results of the objective findings, the researchers felt it was best to focus the educational needs on prevention of high blood pressure as well as diet and physical activity. They conducted three classes that included reduction of salt in the diet, increased physical activity, and lowered fats in the diet. The educational presentations were conducted with consideration for culturally sensitive food choices, and posters and handouts in Spanish.

Additionally, four more courses on blood pressure control were administered over the next 13 months of the study (Zarate-Abbott et al., 2008). After a total of 17 months, the researcher recorded the blood pressure measurements for comparison at baseline and at 12 months. The improvement in both systolic and diastolic blood pressure was significant. A survey was also completed four months after the third class. The researchers concluded that 80% of the respondents were reading labels, using less salt and making better heart-healthy choices. Zarate-Abbott et al. also concluded that a workplace health promotion program can be effective when presented in a culturally sensitive manner considering the educational level of the learners. Although a major limitation was its small sample size, the study offered important considerations about knowing the educational and cultural background of

the learners of a particular group, and using this knowledge as an asset for a disease prevention program's success. This may be less than ideal and difficult when preparing an educational tool that may be presented to a large population with varying idiosyncrasies. Nurses, who find themselves in ideal situations to offer health education to populations generally overlooked, may develop successful health promotion programs.

The established need to combat heart disease in women through screening and prevention has been proven, but many lessons can still be learned. Pollin et al. (2008) studied not only the awareness but prevalence of CVD risk factors during the 2006 Sister to Sister National Women's Heart Day Event. Of the 9404 women who attended the National Heart Day event, 8936 were included in the study, which obtained data from a questionnaire, cardio-metabolic risk factor screening and Framingham risk score. Data was collected to examine relationships among risk factors and Framingham score (Pollin, et al., 2008).

Women of a broad age group (18 to 80 years) participated in the Sister to Sister event, with a mean age of 49 years ( $SD \pm 14$  years). During the screening event, only 4% of the participants self-reported a prior diagnosis of CVD; however, 40% of the respondents claimed to be taking prescribed or herbal medication for heart disease prevention (Pollin, et al., 2008). Investigators also reported that 28% of the participants had a history of hypertension, 25% had a history of high cholesterol and 1% had a family history of CHD. Data was also collected on women who claimed no prior history of hypertension or dyslipidemia. A disturbing 36% of the women who reported no history of dyslipidemia had elevated non-high-density lipoprotein cholesterol (HDL-C) findings as well as an  $HDL-C < 50$ . Also, 7% of the women

screened with no history of hypertension were found to be in the  $\geq 140/90$  mmHg range.

Clearly, screening, prevention and education seminars have value. In this study, nearly 75% of the women were overweight or obese by BMI standards. Pollin et al. (2008) concluded that multiple cardio-metabolic risk factors were highly prevalent in women who were previously considered to be healthy. Even though 85% of the women screened fell into the low 10-year CHD risk category, a high prevalence of obesity and overweight persisted. Also, nearly one-third of the women in the low risk group who had high glucose levels, high blood pressure or were smokers, and had greater or equal to three other CVD risk factors. These findings suggest that women who present with a low Framingham Risk Score may still be at risk for CVD. Conclusively, education must be an integral part of health care that is incorporated into any screening program. A low Framingham risk score should not lead to any false sense of CVD protection. Women need to be educated in risk factor modification as well as lifetime risk during screening.

Feresu, Zhang, Puumala, Ullrich and Anderson (2008) examined the CVD risk factors and 10-year changes in women who were screened in the Nebraska WISEWOMAN program. The investigators evaluated the data available from over 10,000 women who received cardiovascular screening. Study variables included sociodemographic characteristics, CVD risk factors and objective findings from screening. Incidence of hypertension, CHD, stroke, and diabetes were collected from women over the course of 27 months. Of the 10,739 who participated in initial screening, 3416 returned for follow-up. Logistical regression analysis was performed by the investigators for statistical analysis as well as generalized estimating equation to examine changes in risk factors over time.

The women were surveyed prior to screening, and 32.16% had a previous history of high blood pressure, 26.4% had a previous history of high cholesterol and 10.2% had a previous history of diabetes. Overall, of the women screened, 73.8% were either overweight or obese by BMI measurements, and 43% were found to be in the pre-hypertension or hypertensive range. Nearly 20% of the women had high risk total cholesterol levels and over 13% had high or very high LDL levels. Women older than 50 years of age demonstrated the most risk factors, suggesting that screening and prevention efforts needed to begin at younger ages. Of the 3416 who presented with baseline and follow-up data, little change was noticed in the degree of hypertension, hyperglycemia or obesity over the two-year time although total cholesterol levels did improve.

Demographic data revealed results that were consistent with prior studies as socioeconomic data and ethnicity played a role in CVD risk. In the study by Feresu et al. (2008), minority women were more likely to be overweight or obese, despite a low 10-year CHD risk profile. The investigators of the study went as far as to recommend intervention strategies for future education that promote weight loss as an outcome. In the Nebraska WISEWOMAN study, overweight and obesity were associated with higher rates of hyperglycemia, hypertension and high cholesterol. The investigators reported that women who showed up for two or more visits of the screening program were more educated, from a rural area and had never smoked. A strong recommendation from the Nebraska WISEWOMAN investigators concluded that a screening and CVD education program should provide knowledge and skills based on the community or cultural norms of the geographic area. Also the investigators mentioned that the knowledge and skills gained should influence physical activity and healthy eating among overweight women.

Any successful CVD screening program must have a strong educational component in its campaign. The landmark study published in *The New England Journal of Medicine* by investigators Stampfer, Hu, Manson, Rimm and Willett (2000) exposed firsthand the importance of diet and lifestyle in the primary prevention of CHD in women. The large study cohort was composed of 84,129 women who were part of the Nurses' Health Study. The women involved in the study were free of diagnosed CVD at baseline. These participants were contacted every two years and answered a follow-up questionnaire on potential risk factors and newly diagnosed cases of various diseases.

The self-reported questionnaires obtained data on weight, menopausal status, smoking, treatment of CVD, exercise, diet and alcohol intake. Multivariate models with pooled regressions were addressed for statistical analysis in the study. Results of this study exposed that 1128 coronary heart disease events occurred over the 14 years, and 41% were attributed to cigarette smoking. According to Stampfer et al. (2000), over the span of fourteen years, even smoking 1 to 14 cigarettes tripled a woman's risk of a CVD event. Also, women who were classified as overweight or obese by BMI measurement and did not exercise or had an overall low dietary score, were more likely to have significant CVD. Although the research from the Nurses' Health Study had its limitations, the findings suggest that an educational program that focuses on smoking cessation, diet and lifestyle changes would be beneficial in any CHD prevention campaign.

### **Costs of Screening and Prevention**

The findings from screening programs suggest there may be significant benefit in reducing risk factors present in US women (Pollin et al., 2008), but few studies have examined the cost-effectiveness of CVD screening programs. Finklestein,



Khavjou and Will (2006) attempted to quantify the cost-effectiveness of the WISEWOMAN program. The data was obtained from over 3000 WISEWOMAN enrollees who completed baseline and one-year follow-up screenings. The overall costs of providing out-reach follow-up, screening and conducting intervention sessions was calculated bi-annually over a three-year period. Effectiveness was evaluated by calculating changes in baseline to follow-up in average values of CVD risk factors as well as the proportional change of women with abnormal risk factors (Finklestein, Khavjou, & Will, 2006). By using a specialized validated algorithm, the investigators were also able to see the effectiveness of screening by evaluating the change in the ten-year probability of developing CHD as well as life years gained. It was assumed by the investigators that without screening, the status quo would cost zero dollars and risk factors would be constant.

The study revealed that the cost per capita was \$270. The cost of care broke down to an average of \$98 for screening, \$26 for annual prescriptions, \$121 per intervention, \$22 for outreach/follow-up and \$3 for additional office visits. The one-year effectiveness resulted in a 1.3% decrease in systolic blood pressure, 1.8% decrease in diastolic blood pressure, a 2.0% reduction in total cholesterol and a 11.7% reduction in smoking rates ( $p < 0.05$ ). The most indicative reduction was found in the ten-year CHD risk, which improved by 8.7% ( $p < 0.05$ ). The apparent cost-effectiveness was dramatic in smoking cessation, alone, as the calculated costs were far less than the \$35,000 to \$50,000 per life year gained cost of implementing interventions in the United States due to illness caused by smoking (Finklestein, Khavjou, & Will, 2006).

Many assumptions regarding adherence to health recommendations needed to be made in the study by Finklestein, Khavjou & Will (2006), which limited the

findings. Controlling as many assumptions as possible, the average cost of the WISEWOMAN program was estimated at \$4,400 per life year gained. The findings disclosed a cost measure for CVD screening and prevention far under the estimated costs of medical intervention in heart disease. Difficult to speculate or presume is the level of follow-up and adherence demonstrated by screened participants. When evaluating the findings, it is understood that the true values are unlikely to fall far out of the statistical prediction. The study by Finklestein, Khavjou & Will (2006) was fiscally comparative to other studies that found equal cost-effectiveness in their CHD programs.

An earlier study by Finklestein, Troped, Will and Palombo (2002) evaluated the cost-effectiveness of providing CVD screening and enhanced lifestyle interventions (EI) compared with CVD screening and a minimum intervention (MI). An *EI* was defined as further counseling sessions and group intervention activities that focused on physical activity as well as nutrition (Finklestein, Troped, Will, & Palombo, 2002). Women in the MI group received the standard CVD screening as well as a single lifestyle counseling session. Women were randomly selected from twelve different sites of the Massachusetts' WISEWOMAN program. Investigators placed the women into the MI and EI groups randomly, 819 women and 767 women, respectively. Cost data were collected from each WISEWOMAN site over the period of one year. Effectiveness was evaluated by CVD and chronic disease risk factors taken at baseline and at the one-year mark. The investigators measured incremental effectiveness by using regression analysis to calculate the change in ten-year CHD risk and comparing the MI group to the EI groups.

The results of this study concluded that at baseline, the ten-year CHD for the MI and EI group were 9.4% and 10.3%, respectively ( $p=0.2$ ). After one year, the ten-

year CHD risks were reduced in the MI and EI groups to 9.2% and 9.8%, respectively ( $p=0.4$ ); this reduction in the EI group totalled a cost of \$191 per women enrolled. In simple terms, each 0.3 reduction in CHD ten-year risk equated to an increase of life expectancy of 2 weeks (Finklestein, Troped, Will, & Palombo, 2002). The cost of CVD screening and EI intervention over time added up to nearly \$5000 for every year of life expectancy gained. According to the investigators, a clear comparison example can be seen in that coronary artery bypass graft surgery is estimated at \$26,000 per life year saved. Thus, it can be safely presumed that a CVD screening program that introduces CVD prevention education to a population that widely goes unscreened will prove to be beneficial and cost-effective.

CVD screening and education programs in the community have been proven both effective and cost efficient. The review of literature demonstrates that CVD screening has repeatedly identified women with significant disease who were assumed to be healthy. The actual treatment of CVD by medical management or intervention has proven to be a costly endeavour. Studies have demonstrated that CVD prevention and education makes fiscal sense. Demographic findings suggest that an aggressive screening campaign that helps prevent CVD in women who may not be aware of regular community screenings could be beneficial. Educational programs also must be the backbone of any heart disease prevention campaign. Programs that deliver the right message about CVD prevention specific to the needs of US women is essential. The challenge is to develop a CVD screening and prevention program that is more accessible on a daily basis to women of ethnicity.

### **Healthcare Provider Awareness**

Despite extensive evidence regarding the need for increased intervention in the fight against heart disease in women, significant data revealed that physicians may not

accurately screen for CVD among women of all ethnicities. A study conducted by Mosca et al. (2005) titled “National Study of Physician Awareness and Adherence to Cardiovascular Disease Prevention Guidelines” helped validate the gender disparity that exists in CVD prevention. The online, cross-sectional study was administered to 500 physicians who identified themselves as cardiologists, primary care physicians (PCPs), or physicians who specialized in obstetrics and gynecology (OB/GYNs).

The stratified random sample of physicians was presented with ten experimental case scenarios. Each scenario included information about the patient’s age, sex, ethnicity/race, smoking status, lipid panel, blood pressure, treatment of hypertension, body mass index (BMI), family history and personal history. After review of the case scenario, the respondents were asked to assign a level of CVD risk and specify preventative treatment recommendations from a pre-specified list of possible modalities. Descriptive statistics were used to help evaluate the data and presented as proportions and mean from the standard deviation.

The physicians’ assignment of cardiovascular risk level was then compared to calculated risk category based on Framingham risk scores and implementation of CVD prevention guidelines. PCPs’ risk assignment was correct on 34% of low-risk patients, 47% correct on intermediate-risk patients and 59% on high-risk patients. These scores were similar with female patients as 43%, 47% and 55%, respectively. OB/GYNs accuracy with low, intermediate and high-risk female patients was 17%, 38% and 37%, respectively. Surprisingly, cardiologists correctly categorized low-risk male patients only 29% of the time. The most interesting finding among the PCPs was that intermediate risk female patients were less likely to be perceived at higher risk than male patients with the same risk profile.

When assessment of guideline adherence was addressed, female patients in an intermediate risk category were more likely than men to be counseled about weight ( $p=0.04$ ), and physicians less frequently recommended participation in aspirin therapy ( $p<0.01$ ). These findings indicated that gender differences and bias beyond risk category may influence therapeutic choices provided by physicians. The most alarming single piece of data collected demonstrated that although more women die each year of CVD than men, less than 20% of the physicians surveyed (including cardiologists) agreed with this fact. Physicians who were surveyed in this study did not rate themselves as very effective in their ability to prevent CVD in their patients and to treat according to national guidelines. When surveyed about perceived barriers to providing preventative CVD care, physicians claimed that the patient was the greatest barrier, as well as time and insurance coverage.

The study by Mosca et al. (2005) had its limitations in generalizability secondary to the relatively small sample size provided. Additionally, only three specialties of physicians were chosen. Thus, the study should be replicated. Despite its limitations, the study revealed a desperate need for alternative measures in the prevention of CVD in women. Physicians, alone, are not capable of achieving a high rate of efficacy in CVD prevention and screening, so other resources should be considered to augment physicians' screening practices for CVD.

Barnhart, Lewis, Houghton and Charney (2007) examined the connection between physician knowledge, attitudes, practice patterns and gender disparities in the primary prevention of coronary heart disease (CHD). The investigators surveyed 529 respondents consisting of general internists and OB/GYNs. The survey was created to help recognize barriers in practice to implementation of cardiovascular disease guidelines for women. Risk prevention demonstrated results that indicated poor

integration into routine care for both OB/GYNs and general internists. More OB/GYNs than general internists reported that a deficiency in education and time were barriers to preventing heart disease in women (53.8% vs. 29.3%,  $p < .001$  for training; 66.0% vs. 51.9%,  $p = .004$  for time). Most of the physicians surveyed did not know that a woman's risk of cardiovascular disease doubles with an increasing BMI. Nearly 33% of the physicians surveyed did not know that smoking cigarettes was the leading cause of myocardial infarctions in young women.

This study by Barnhart et al. (2007) did have some limitations. Self-report with Likert-type surveys may not have accurately reflected actual practice patterns. The findings of the survey may also not be generalizable because respondents were gathered by convenience sample at one educational seminar. However, the results suggested that physicians, themselves, have deficits in knowledge, screening, risk stratification, and the treatment of cardiovascular disease in women. Clearly, an additional avenue is needed for the screening and education of women for heart disease prevention.

### **Role of EMS in Primary Prevention**

Shah, Clarkson, Lerner, Fairbanks, McCann and Schneider (2006) studied the effectiveness of utilizing EMS personnel in screening older adults for risk of falls, influenza and pneumococcal infections. The older adults were also provided with educational materials offered by the EMS providers. The initial program utilized EMS members from two rural communities in upstate New York. The study split the EMS providers into two groups, those who performed screening and an educational intervention and those who did not perform either one. The emergency medical technicians of the intervention group were given training about how to ask screening questions and evaluate the home environment for fall risk. According to the

researchers, the patient's primary care providers (PCPs) were also provided with educational materials regarding the ongoing study. Data from the study was analyzed with a *t* test as well as the chi-square test.

The results of this study revealed that screening led to more patients receiving pneumococcal vaccines than non-screened patients. There was no statistical significance between the intervention group and the control group related to the rate of influenza vaccinations or changes made in the home to prevent falls. The investigators also revealed that the recollection of the education provided by EMTs at two weeks' follow-up was less than 50% for influenza education and less than 25% for both fall risk prevention and pneumococcal vaccine education as obtained by retrospective phone survey.

After reviewing the article, the less than optimal results of the intervention group may have been impacted by two significant limitations. First, the screening and interventions were performed on actual 911 emergency calls. An actual emergency call is typically a less than ideal time to perform any screening or educational intervention, since patients are generally stressed and unlikely to recollect any specifics of an educational intervention unrelated to the actual emergency. Second, the follow-up phone call by the investigators was done at 14 days, which may have been too close to the intervention for the 911 callers to have adequate time to visit their PCPs. A visit to the PCP was a prerequisite for many of the questions on the follow-up survey. This study could easily be repeated with similar interventions and better control for the sited limitations.

A study conducted in Australia by Reeve, Pashen, Mumme, De la Rue and Cheffins (2008) evaluated paramedics' experiences after preparation to deliver health promotion and prevention services. The study is one of the few that re-examined the

role of the paramedic for services outside of acute and emergency care. Twenty-nine Australian paramedics participated in a year-long certificate course that prepared the rural paramedic to provide preventative care, including screening and evaluation of chronic disease. The purpose of the study was to evaluate the experiences of the paramedics after graduating from the Rural and Remote Paramedic course.

Upon completion of the course, 100% of the graduates were committed to undertaking population health activities as paramedics. Also, 81% of the graduates felt that their involvement in health promotion and prevention increased as a result of the advanced training on this topic. Paramedics who graduated felt that they could look at the patient holistically instead of simply as a focused problem. Overall, the study demonstrated that paramedics have the ability and willingness to learn skills for disease prevention and health promotion.

The role of EMS in disease prevention is a novel idea that has had limited attention in the United States. The review of literature provided insight into one program in upstate New York that had limited success. Considering the limitations of that study, the concept of utilizing EMS for health screening in the community is one that should be revisited. Paramedics that have successfully completed programs that prepare them to provide acts of disease prevention and screening are willing and able to do the job. It will take the nurse practitioner to take a leap out of the office and into the streets to help develop a program that enlists the help of EMS.

### **Gaps in the Literature**

The literature reviewed raised another topic of interest that revealed several gaps in the literature. Most of the CVD screening and prevention studies available simply identified Hispanics as mostly Mexican in origin. None of the literature readily available investigates the CVD education needs of the Cuban-Hispanic female



population. Certainly, the needs of various Hispanic populations may be different and this warrants investigation. CVD screening is being done in the Hispanic female population, as clearly stated in the literature, but few researchers delivered CVD screening in an unconventional format or investigated the potential capability of using a primary care screening tool in pre-hospital settings. Finally, the literature revealed that primary care providers, including nurse practitioners, are not able to accurately screen for or significantly impact CVD in women, particularly women in minority populations, on their own. To begin to bridge these gaps, research should be focused on the primary care provider as an educator of other healthcare providers who will screen for CVD in both rural and urban communities.

### **Summary**

Based on the literature and research findings that explored women's lack of awareness of CVD as well as the barriers faced by both patients and PCPs, several conclusions can be drawn. First, gender disparities exist in the screening and prevention for CVD. Women with CHD are also less aware of the severity of their illness and are less likely to confront their PCPs with questions regarding CVD. Other avenues for CVD screening in women need to be researched that explore possibilities outside of the primary care office setting. Physicians have claimed that time is a barrier to screening, which has created serious gaps in preventive measures and education. Barriers also exist within the homes of women wishing to implement heart-healthy alternatives. EMS personnel possess the unique opportunity to provide screening and education to both individuals and families as well within the home. Nurse practitioners may provide a link from primary care to other healthcare providers who can provide services being overlooked by PCPs.

The review of literature as it relates to ethnicity and socioeconomic influence in CVD also disclosed several pertinent themes. CVD awareness has improved in women overall in recent years with the exception of the gap between Hispanic and white women. This knowledge gap continues. It is apparent that the message of prevention and subsequent screening is not being offered in the most optimal venues to Hispanic women, who have consistently demonstrated in the literature a lower level of CVD awareness than others. Confounding this issue, women at high risk have been found to underestimate their potential disease.

Socioeconomic factors also continue to play a significant role in CVD. Higher rates of CVD are found among those who live in the most deprived, underrepresented areas. Screening programs must also work their way into the inner city, where limited transportation and finances often limit access to healthcare. Programs that have addressed the needs of the Hispanic female population have thrived, and a program with the potential to expose CVD screening to the masses in large Hispanic communities is needed.

The literature clearly reveals that although CVD awareness is on the rise, Hispanic women are lagging behind. The effectiveness of CVD screening and education, as well as the fiscal savings to an overburdened healthcare system, should encourage researchers to develop new tools for screening Hispanic women in the future. The literature also supports the concept that EMS personnel may be used as valuable resources to primary care providers. Overall, the review of literature depicted a clear picture of the gender disparity that exists in CVD. The review ultimately makes a solid case for a program that addresses the need of Hispanic women as it relates to the screening and prevention of heart disease.

## **CHAPTER THREE**

### **Project Design**

The purpose of this project was for an NP to develop a heart disease screening educational program based on existing guidelines, and to teach it to a community of health care providers who could implement it in a large Hispanic community to reduce risk of CVD in Hispanic women. The project consisted of three phases: (Phase 1) development of course content and objectives (Appendix D); (Phase 2) implementation of the course and pre/post evaluation of student knowledge/ability to screen for coronary heart disease (CHD) based on an existing CHD knowledge tool; and (Phase 3) conducting focus group interviews of select participants and data analysis.

### **Timeline of Project Phases**

The timeline for all three phases of the project was planned over the course of approximately five months. Each week consisted of approximately a 25-hour workweek but varied, according to project requirements. Phase 1, which included course development, was estimated to take two weeks to complete. The interval between Phase 1 and Phase 2 had a planned time of four weeks for completion of the following: print course materials, allocate equipment needed for teaching, and equipment needed for heart disease screening within the community. Time during this interval was also used to allocate funding for the project. Phase 2, which involved course implementation, comprised the majority of project time. It was estimated that this phase would require eight weeks to train an estimated 100 EMS providers and to evaluate course outcomes from pre and posttests. The project then transitioned to Phase 3, which involved the formation of focus groups consisting of

volunteers from the sample of participants from Phase 2. Completion of Phase 3 took approximately six weeks, for a total of 20 weeks to complete all phases of the project.

### Resources

As evident in the review of literature, the cost of screening is less expensive compared to treating coronary disease. The cost of implementing the proposed program utilizing EMS providers was planned. The largest costs associated with the program were the start-up expenses, which required the purchase of both weight scales and cholesterol screening equipment. A large benefit of using EMS providers was that they were readily available to screen for heart disease within community fire stations at no additional cost. The budget proposal for this project included implementing this program in one urban fire department consisting of 14 fire stations. The start-up costs associated with such a program can be burdensome, but compared to the costs of coronary disease interventions, these costs were reasonable. Table 1 provides an itemization of start-up costs for the screening program.

Table 1. *Screening Program Start-up Costs*

Item	Quantity	Cost per item	Total Cost
CardioCheck PA	14	668.47	9358.58
Weight Scale (digital)	14	104.50	1463.00
Projector	1	699.00	699.00
Screen	1	100.00	100.00
Student Packet	100	3.49	349.00
Test Strips	150	150.50	1505.00
Project Cost			\$13, 474.58

After analysis of the commercial cholesterol screening equipment available on the market, the CardioCheck PA was selected for the project due to its ease of function as well as portability. The CardioCheck PA is a handheld unit that is battery powered, offering a fast turnaround time on results (under two minutes). Test strips for the CardioCheckPA have a long shelf life and do not need refrigeration. It is also a waived piece of equipment under Clinical Laboratory Improvement Amendments (CLIA) standards. A CLIA waiver certificate is needed from the Centers for Medicare & Medicaid Services (CMS) to utilize cholesterol-screening tools in the community. To administer these tests legally, you must apply for a CLIA waiver that is reapplied for bi-annually.

After analysis of commercial weight scales available, the SECA Robusta 813 was selected for the project. The weight scale chosen has a wide platform and is of steel construction for durability. It is also is of high weight capacity with a limit of 200 kilograms (kg) and has a digital read-out. The SECA Robusta 813 is suitable for commercial settings and requires no calibration.

### **Phase 1: Course Development**

The course was developed according to the guidelines for heart disease screening as recommended by the AHA (AHA, 2010) and Women's Health Initiative study (Rossouw et al., 2002). Content included blood pressure control, tobacco abuse, physical activity and nutrition, the influence of body mass index, diabetes mellitus and lipid measures on cardiovascular health. Emphasis on the community resources for Hispanic women and heart disease was also offered. Information learned could then be used in educational campaigns by EMS personnel within the community.

## **Course Objectives**

EMS providers who completed the course of training are able to:

- Describe the effects of health management on heart disease in Hispanic women, including the content of: blood pressure, tobacco use, lipids, diabetes, nutrition, physical activity and psychological state.
- Compute a Framingham heart risk score based on assessment findings.
- Explain the findings of evidence-based research in regards to heart disease and women, including the Women's Health Initiative (Rossouw et al., 2002).

### **Phase 2: Course Implementation and Outcome Evaluation**

The implementation phase of the project employed the course outline developed in Phase 1, and the course was taught by an NP to EMS providers.

### **Setting**

Course implementation took place in an urban city of southeastern Florida with a population of nearly 400,000. The area's population was expected to double during weekly business hours due to commerce. The EMS is provided by the municipal government and funded by taxpayers. The emergency response division is a combined fire and EMS service responding to nearly 90,000 calls annually. Approximately 80% of the annual service calls are strictly medical in nature.

Services provided by EMS include both basic and advanced life support with units available 24 hours a day, seven days a week. EMS calls routinely include cardiac arrest, traumatic injuries, obstetric emergencies, and pediatric and adult medical emergencies. Public service also involves visitors of fire stations who request health information and free blood pressure checks. Fire station training rooms used for continuing education were used as the training site.

**Sample**

The course was offered to EMS providers employed by a municipal department. EMS workers were asked to volunteer for Phase 2 due to their experience in working with the community as healthcare providers. The parameter for experience included EMS personnel who had over 6 months of full-time employment with an urban EMS agency. Historically, EMS personnel have not been extensively educated in measures of screening and prevention but do possess the necessary skills to carry out such a task. EMS workers are comfortable dealing with the public and are often asked for healthcare information by the community. EMS personnel are also knowledgeable in the legal aspects of patient confidentiality and trained to perform tasks such as blood pressure tasks and capillary finger sticks.

**Sample size.** Depending on the size of the fire station and number of volunteers, class sizes ranged from three to 14. A target goal of 100 EMS providers was planned.

**Research assumptions.** It was assumed that the healthcare providers who received the educational program had no prior education regarding heart disease screening and prevention practices. It was also assumed that the healthcare providers involved with this project were experienced in interaction with patients and clients of the community.

**Inclusion and exclusion criteria.** Individuals who were eligible to enroll in the course and therefore participated in Phase 2 were employed full-time in an EMS service, certified by the state of Florida at a minimum of the emergency medical technician-basic (EMT-B) level, and completed the entire course. Individuals not meeting the inclusion criteria were ineligible for enrollment.

**Protection of human subjects.** All policies for protection of human subjects

mandated by the Barry University IRB were followed. Approval for course presentation had been obtained from the fire department director of the city of Miami (Appendix J). As the participants in the course will be known, data was considered confidential. Participants were required to sign an informed consent (Appendix B). The informed consent document provided the name of the researcher. Individuals had the option to refuse to participate or withdraw from participation without consequences. The researcher performed all statistical data entry, and only the researcher had access to the raw data. The signed consent forms were kept in a locked cabinet in the researcher's office, separate from the data.

Participants were not expected to experience any adverse consequences as a result of participating in Phase 2. There was a remote possibility that participants could experience slight psychological discomfort associated with the topic of heart disease prevention and screening in Hispanic women, but the risk was not greater than normally encountered in everyday life. There was no work-related consequence or pressure asserted on those who did not volunteer to participate in the training program.

Participants were provided the opportunity for personal growth by learning about the topic. Individuals who completed the entire course and passed the achievement exam were given a certificate of completion. There was no financial incentive of any kind offered to those who volunteered to participate in the study.

Test data was stored in a locked file cabinet in the researcher's office and on the researcher's computer that is password protected. Data will be stored for five years and then will be destroyed by shredding and computer files will be erased.

## **Procedures**

Participants were recruited through a fire station bulletin system for employees



that announced the course opportunity and requested volunteers for enrollment. A flyer (Appendix C) described the project and asked for volunteers to respond to [screenforheartdisease@gmail.com](mailto:screenforheartdisease@gmail.com). The participant's employer, administrator or supervisor did not oppose or advocate employee participation. Participating fire stations have areas designated for classroom training; approval for use of these classrooms had been granted by the director of the fire department (Appendix J).

Once contacted by interested participants, a general information meeting was held to explain the project and review the course topical outline (Appendix D). Those who decided to participate were asked to sign the Consent Form (Appendix B). A convenient time was agreed upon for course completion.

The training program had a planned completion time of one, six-hour session. The topical outline and schedule is provided in Appendix D. Prior to the start of the session, EMS providers were required to complete a CVD screening knowledge pretest. Following the pretest, the program was presented by means of PowerPoint® slides, and the EMS providers received a handout of the slides to assist with notetaking. Following the content presentation, the EMS personnel were asked to sit for the achievement posttest adapted for this study. Students achieving the minimum score of 84% received a certificate of course completion (Appendix E).

### **Project and Instrument Evaluation**

A multiple-choice coronary heart disease knowledge tool for women exam (Appendix F) developed by Thanavaro et al. (2010) was used to assess student achievement in a pre and posttest design. Approval for use of the instrument in this study was obtained from Thanavaro (Appendix I). The tool is composed of 25 items related to CHD in women. The tool has been evaluated for content validity by a team of PhD-prepared nurse educators as well as board certified cardiologists. This

instrument was pilot tested with a sample of 39, followed by analysis of validity and reliability in a final evaluation study with a sample group of 71 participants. The year the tool was pilot-tested and evaluated was not specified in publication. The tool demonstrated good validity and reliability to measure CHD knowledge in women. The Cronbach's alpha coefficient of the CHD knowledge tool created by Thanavaro was .74 and the reliability coefficient for the test, retest was .70 at a one to two week interval.

The aim of the project was to use the instrument in a population composed of both male and female EMS providers, pre and post-educational intervention. Given that the instrument was not evaluated in this population, it was analyzed for reliability and validity using data gathered in Phase 2. Participants were also asked to complete a sample Framingham Risk (Appendix G) assessment based on five scenarios given during the course.

### **Phase 3: Focus Groups and Data Analysis**

In Phase 3, focus groups were conducted to help identify common themes among the EMS personnel who participated in Phase 2.

#### **Sample**

At the completion of Phase 2, participants were asked to volunteer for participation within the focus group interviews. Those who decided to participate in the focus groups were asked to sign an informed consent form (Appendix B).

**Setting and sample size.** The focus groups took place at a central fire station easily accessible to participants of the study. The focus group was conducted at a time that was convenient for all who participated. Focus groups were composed of five to seven EMS personnel.

## **Procedure**

The focus group was considered an unstructured group interview, and the principal researcher was considered the moderator. The focus group structure helped identify the common themes among EMS personnel, given the cohesiveness associated with this population. The moderator had the ability to speak with multiple participants at a given time as well as to observe the interaction between them. Specifically, the perceived benefits or barriers of a heart disease screening program for Hispanic women were explored. To accomplish this, the moderator coordinated the focus group with a set of questions (Appendix H) intended to stimulate discussion. The focus group had a planned duration of approximately two hours and began with the researcher thanking the participants for their participation. Brief descriptions of the purpose of the focus group then lead to open discussion. It was the responsibility of the moderator to allow all members of the focus group an equal opportunity to participate. The group interview was audio taped, and each interviewee chose a pseudonym. The principle investigator transcribed the audiotapes. A goal of ten focus groups in Phase 3 was set for this project.

## **Quantitative Data Analysis**

All tests were reviewed for completeness; only complete sets were included in data analysis. Statistical data was entered into and analyzed by means of Statistical Package for Social Sciences (SPSS) version 17 for Windows (2009). A quality assurance technique was employed to assure correct data entry. Scores on the tests were manually summed and entered into the computer. Then a computer-generated score was obtained. Subtraction of the computer-generated score from the manual score was zero.

Descriptive statistics were used to both describe the sample and report the scores obtained on the test. Additional tests included histograms, measures of skew and kurtosis, the Kolmogorov-Smirnov statistic ( $D$ ) to test for distribution of the scores, boxplots to identify outliers, and tests of reliability and validity by means of point-biserial correlations ( $r_{\text{bis}}$ ),  $p$ -values, distractor evaluation, and Cronbach's alpha (  ).

The point-biserial correlation was used to assess the item quality;  $p$ -values were used to assess item difficulty; distractor evaluation was carried out to determine if they were effective, and Cronbach's alpha was used to determine if the reliability of the test increased when an item was deleted.

The *point-biserial correlation* is a type of correlation that measures the association between two variables, one of which is dichotomous (the multiple-choice item score that is right or wrong) and the other continuous (the total score on the test) (Vogt, 1993). Possible values range from -1.0 to +1.0. A large value indicates that individuals with high scores on the overall test are also getting the item right and that individuals with low scores on the overall test are getting the item wrong. A low value indicates that individuals who get the item correct tend to do poorly on the overall test and that those who get the item wrong tend to do well on the test.

The  $p$ -value of an item describes the proportion of individuals that get the item correct. The  $p$ -value converts to a percentage, which is the percentage of individuals that got the item correct. The  $p$ -value statistic ranges from 0 to 1, with lower values indicating that fewer individuals missed the item.

The Cronbach's alpha may range from 0 to 1, with 0 indicating no test reliability and values approaching 1, indicating high reliability. The statistical output provides for an item-by-item reliability coefficient for the test if the item was deleted.

Items with a corrected item-total correlation of .30 or less are considered as poorly performing items.

Distractors should appeal to those individuals who have not mastered the material and thus are selected infrequently by those who have. To determine the appeal of a distractor, a frequency table was constructed. Distractors that are poor performers (those that are never chosen or are chosen by individuals who have otherwise scored well on the exam) are revised, replaced, or removed (University of Texas, 2003).

### **Summary**

The project progressed through three phases with the outcome of each phase providing the foundation for the next. Phase 1 dealt with course development. Phase 2 was involved with the implementation of the course to a group of EMS providers and also used an existing CHD knowledge tool to measure student achievement. This instrument was analyzed for validity and reliability in this new population. Phase 3 dealt with focus groups that helped identify barriers in such a program. Statistical methods were applied to the data collected during Phase 2.

## CHAPTER FOUR

### Overview

In this chapter, the following sections include a discussion of the study's outcomes determined by statistical methodology and focus group findings, and the overall experience gained during project implementation. The capstone project was implemented in three phases as planned. Although intended to occur over the course of 20 weeks, the project was completed ahead of schedule in 16 weeks' time due to varied reasons that are outlined in the discussion of each phase. In each of the three phases, a unique set of acquired knowledge worthy of scholarly dialogue was produced.

#### Discussion of Phase 1

Based on existing guidelines of the AHA, the Nurse Practitioner Initiated Educational Program was created and implemented with a group of EMS providers. Phase 1 involved development of the course content and objectives. As discussed in Chapter Three, a PowerPoint® presentation was created. The conclusion of Phase 1 consisted of printing and allocating course materials. This proved to be the most challenging and underestimated stage of the entire study. The course had an estimated cost of \$13,474.58. At the conclusion of Phase 1, it became very apparent that the difficulty in collecting funds to support the study had been grossly undervalued.

Less than half of the expected funds needed to complete the study as planned were collected. The proposed budget called for fourteen CardioChek PA cholesterol-screening machines, so this was reduced to three. This reduced the cost of the study by \$7353.17. The initial intent was to purchase enough cholesterol-screening machines so that each fire station within the municipality would be provided a

screening machine at the end of the study. As class sizes were smaller than expected, this reduction of available screening machines during course implementation had no adverse effect on the study results. Only one weight scale was purchased for the study, reducing the total cost by \$1358.50. Total costs resulting from reduction of purchased equipment was \$4762.91.

Future attempts to replicate this study should include a detailed plan to raise funds prior to any planned community event. The amount of funds raised will have a direct correlation to the amount of screening equipment available after participants have successful course completion. This will be a strong consideration for conducting Phase 4 in which the screening program will be implemented with a Hispanic community. The estimated time to complete Phase 1 and prepare for Phase II was 150 hours. After the poor response to raise funds, the actual time-span was reduced to 120 hours.

### **Discussion of Phase 2**

Phase 2 of the project consisted of course implementation, which comprised the majority of project time. The course was implemented as planned within fire stations in a large urban area of southeast Florida. Fire station classrooms were utilized as the course setting. The primary researcher/course educator arrived at least one hour prior to the scheduled course start time to set up the classroom in a similar design each time the course was offered. By performing this, the researcher sought to provide continuity amongst the settings. Thus, the course was offered at multiple fire stations but the classroom design within each site was very similar. The classroom set-up consisted of a single row of chairs and desks. The students faced a portable 5-foot by 5-foot portable display screen provided by the researcher. A laptop computer connected to an overhead projector displayed the PowerPoint® presentation

on the screen. There were no sound effects in the presentation, so no audio speakers were necessary.

Once all scheduled participants arrived and were ready to begin, the course was delivered, following the topical outline (Appendix D). Conveniently, the classrooms were within fire stations, so during breaks participants had full access to the fire station kitchen and restrooms. During the educational intervention, participants were not assigned to fire department or EMS vehicles and did not thus respond to emergency calls while attending the training session. The scheduling of participants who volunteered for the study did place a burden on the daily operations of the Fire Department because of limited personnel available each tour of duty.

The scheduling of volunteers was coordinated through the District Chiefs, the highest-ranking supervisors of daily operations in the host fire department. The number of participants during each educational interventional was dependent on variables such as sick call-outs, EMS personnel on vacation and other mandatory fire department training. During the span of eleven weeks, class sizes ranged from a maximum of six participants to a minimum of three per class. Beyond the hurdle of daily staffing issues, participants were eager to learn once they arrived at class. A total of 106 total volunteers participated in the study. Some were recruited by posted bulletin and others by word of mouth once the project began. The researcher did not directly solicit any member of the fire department for participation, using only a posted advertisement (Appendix C). The response was considered strong; roughly 650 EMS personnel are employed by the hosting municipality, so 106 participants represented nearly 16.3 percent of the total.

The following section provides of achievement outcomes of health care providers who participated in the study. Collection of data from phase two concluded



after 106 subjects who met inclusion criteria participated and completed the CVD knowledge assessment tool pre and post educational intervention. Although actual analysis of the data was performed during Phase 3, course and data collection occurred in Phase 2. Tests were reviewed for completeness, and all 106 Coronary Heart Disease in Women Knowledge pre and posttests were complete. Quantitative data was analyzed in both pre and posttest scores. The pretest minimum score was 12 of 25 possible correct choices and the maximum score was 24. The mean score of the pretest was 20.00 with a standard deviation (SD) of 2.350.

The Coronary Heart Disease in Women Knowledge posttest minimum score was 19 out of 25 possible correct choices and a maximum score of 25. The mean score of the posttest was 23.430 with a SD of 1.506. An item analysis of the posttest scores was conducted. Several posttest questions revealed a  $p$ -value of 1.00. The  $p$ -value represents the percentage of students that answer an item correctly (Varma, n.d.). The range of possibility extends from zero to 100% and is typically written as a proportion from 0.00 to 1.00 (University of Texas, 2003). A higher  $p$ -value represents more students answering the questions correctly and thusly the item is considered as an easier question. The inverse is also true with  $p$ -values less than 0.20, which represent questions that should be reviewed for possible confusing language or topics requiring re-instruction (University of Texas, 2003). The following Coronary Heart Disease in Women Knowledge posttest questions had a  $p$ -value of 1.00; questions 1, 2, 6, 7, 11, 12, 23 and 25. Optimal difficulty level is a  $p$ -value of 0.50 (University of Texas, 2003).

Distractor evaluation during item analysis was also conducted. The incorrect answers to an item are referred to as distractors. Distractors are equally important in assessing item quality as correct responses. If a distractor response is never chosen, it

should be removed from the knowledge assessment and replaced with a more attractive distractor response (University of Texas, 2003). Items that revealed all distractors working were 5, 8, 10, 14, and 18 on the post-test. The remaining questions of the posttest revealed a  $p$ -value between .67 and .99, with either one or two functioning distractors. Items with a  $p$ -value of 1.00 had no functioning distractors.

The Kolmogorov-Smirnov statistic of probability distribution was conducted on the Coronary Heart Disease in Women Knowledge posttest scores. This was a one-sample test, meaning that the pre and posttest scores were not compared to one another. The Kolmogorov-Smirnov test compares the distribution of scores to one of a hypothesized normal distribution (Sheskin, 2007). The statistical scores can also be viewed by histogram. Evaluation of the data revealed that the scores were skewed and thus not normally distributed. The histogram displayed scores skewed to the left, indicating that most of the posttest scores were high. This finding coincided with the item analysis that revealed several items having a  $p$ -value of 1.00. A boxplot to identify outliers was also conducted, which exposed one outlier score: participant 27 had a posttest score of 19 out of 25 possible correct choices.

The Cronbach's alpha statistic was used to determine the reliability of the test. In this case, the internal consistency reliability was measured, which indicates how well the items correlate with one another (University of Texas, 2003). High internal consistency reliability scores indicate that items are measuring the same construct. A score of 0.70 or greater is considered acceptable. The internal consistency was rated low at .475 by Cronbach's Alpha reliability statistic. An inter-item correlation matrix was conducted, and items were reviewed to demonstrate their relation to the Cronbach Alpha. The total Cronbach Alpha did not improve to a level of 0.70 or greater with

deletion of any of the 25 posttest items. This finding is not unexpected, as the Coronary Heart Disease in Women Knowledge posttest does not measure one single construct. Thus, a low alpha score in a knowledge assessment that measures multiple constructs is a poor indicator for reliability measurement.

Point-biserial correlation was used to assess item quality. Essentially, point-biserial calculations assess the correlation between item responses and the total score of the examination. The item is either answered correctly or incorrectly, and this dichotomous variable is compared to the overall test score (Varma, n.d.). Point-biserial scores range from -1.0 to +1.0. A high point-biserial correlation indicates that students with high test scores answered an item correct and students with lower overall test scores answered an item incorrectly (Varma, n.d.). If the point-biserial score is low, an inconsistency exists. Low point-biserial scores are seen when students with high overall test scores do poorly on an item and students with low overall test scores answer an item correctly. Items with a point-biserial value of over +.15 were items 5, 10, 14, 16, 17, 18, 21 and 24.

Based on the Kolmogorov-Smirnov statistic, the Coronary Heart Disease in Women Knowledge posttest scores (dependent variable) were not normally distributed. Thus, the ability of parametric testing for statistical significance was not possible. The Mann-Whitney U non-parametric test for statistical significance was therefore conducted on the scores. The pre and posttest scores were found to be statistically different with a .000 sig value.

Participants were also given five scenarios, both pre and post course, and were asked to complete a Framingham risk assessment. A total of 106 pre and post-course Framingham risk assessment scenario sheets were collected. Each scenario sheet included five scenarios of multiple-choice format with one correct response to each

question. The scores ranged from 1 to 5 on the pre and posttest; the mean score of the pretest was 1.80, with a 1.281 SD. The mean score of the posttest was 4.57, with a 1.008 SD. The  $p$ -values for the Framingham risk assessment scenarios ranged from .82 to .92. None of the Framingham risk assessment scenario posttests had a  $p$  value of 1.00.

Just as with the Coronary Heart Disease in Women Knowledge posttest, item analysis for distractor evaluation, internal consistency reliability and point-biserial correlation was performed. On distractor evaluation, scenarios 2, 4 and 5 exposed all distractors to be functioning in the posttest. This means that in items 2, 4 and 5, all possible answers were selected at least once by the sample of participants. Reliability statistics were also performed on the scenario posttest scores. The Cronbach's Alpha was .577 when all five items were included. Inter-item correlation statistics did not reveal a Cronbach's Alpha of .70 or greater with any of the items deleted. As with the Coronary Heart Disease in Women Knowledge posttest, the Framingham risk assessment does not measure a single construct and requires entry of at least five variables into a risk assessment tool. Thus, it can be argued that a low alpha score applied to this data set has limited value.

The point-biserial correlation was also conducted, and all items with the exception of question number one revealed a score of  $+ .15$  or above. The Kolmogorov-Smirnov statistic of probability distribution was conducted on the Framingham risk assessment scenario posttest scores. A histogram revealed scores skewed to the left, indicating that most of the posttest scores were high. A boxplot to identify outliers was also conducted, with 10 participants having scores 2 standard deviations or greater from the mean.

Similar to the Coronary Heart Disease in Women Knowledge posttest scores, the Framingham risk assessment scores were found to be skewed to the left. The Mann-Whitney U non-parametric test was performed to evaluate statistical significance between Framingham risk assessment pre and post-course scores. Pre and posttest scores were found to be statistically different, with a .000 sig value.

The Coronary Heart Disease in Women Knowledge test was implemented for the first time in a group of experienced emergency medical technicians (EMTs). Although this group had no formal education about coronary heart disease prevention in women, their overall performance on both pre and posttests on Coronary Heart Disease in Women Knowledge was remarkable. Despite no previous knowledge in this area, non-parametric testing revealed a statistically significant difference in posttest scores as compared to pretest scores. This finding highlights the value of the NP- implemented Coronary Heart Disease in Women course curriculum in this select population of students.

Item-analysis of the posttest questions revealed that several questions had a  $p$ -value of 1.00. This can be directly related to the poor distractor ability in each of these questions as well as the overall difficulty of the exam. Generally speaking,  $p$ -values indicate the percentage of participants who answered the question correctly. When the  $p$ -value is high, the question is considered easy; when the  $p$  value is low, the question is considered difficult (University of Texas, 2003). The Coronary Heart Disease in Women Knowledge posttest proved to be an easy test for participants in this study. This remains true although EMTs are given no formal education in practices of heart disease screening and prevention. Historically, knowledge-based exams are more reliable when the  $p$ -value is spread across the entire 0 to 1.00 range.

In lieu of the above findings, the posttest scores of both exams were significantly higher compared to the pretest scores. After the NP-driven educational curriculum was implemented, a statistically significant improvement was identified in both the Coronary Heart Disease in Women Knowledge posttest and Framingham risk assessment post-test. The significance value in both instances was .000, revealing encouraging data that supports providing heart disease prevention education to EMS providers who can subsequently screen for CVD in the community.

Kolb's theory of experiential learning may be drawn upon to help explain findings like the ones in this study. Reflecting on Kolb's theory leads to the opinion that experience gained in emergent cardiac care has been transformed to create new knowledge, which involves awareness of heart disease prevention. One limitation of the study was the brief interval that was provided between pre and post-curriculum exams. Both exams were administered on the same day, with only the educational intervention separating the two attempts. This could have obviously have had a direct effect on the perceived difficulty of the exam since at the time of post-testing, the course information remained fresh in the participants' minds. Similar findings hold true for the Framingham risk assessment score sheets, where overall, EMTs did poorly prior to curriculum implementation then revealed statistically significant improvement after the educational intervention.

There were no items with a  $p$ -value of 1.00 on the Framingham post-curriculum score sheets. Most of the Framingham scenarios also revealed two or three distractors working. This suggests that both correct and incorrect choices added value to each item. The post-curriculum Framingham risk score sheets were also skewed to the left. This finding is a result of  $p$ -values higher than .50, which is expected in a normally distributed data set. The skewness suggests that the exam was

easy. Similar to the Coronary Heart Disease in Women Knowledge posttest, this finding is also limited by the brief interval between administration of pre and post curriculum scenarios.

On both exams inter-item correlation and analysis was performed to test for exam internal consistency, and point bi-serial calculation was performed to assess item quality. Items that have a point bi-serial value of over  $+0.15$  are recommended, and stronger items have a point bi-serial value of over  $.25$ . Low-values indicate that those who answered the item incorrectly also scored high on the test overall. Items with low values need further evaluation and should be adjusted or removed (Varma, n.d.). Questions 3, 4, 8, 9, 13, 15, 19, 20 and 22 on the Coronary Heart Disease in Women Knowledge posttest also revealed low point bi-serial scores. Therefore, these items should be assessed for their quality and likewise adjusted or removed. Scenario One of the five Framingham risk assessment scenarios had a low point bi-serial score.

The Coronary Heart Disease in Women Knowledge posttest was also evaluated for its internal consistency utilizing Cronbach's Alpha. The overall Cronbach Alpha was  $.475$ , which is below the  $.70$  minimum standard. Individual item analysis was also conducted to estimate the new Cronbach's Alpha if items are deleted. Selection of any item on the Coronary Heart Disease in Women Knowledge posttest for deletion did not improve the overall Cronbach's Alpha to  $.70$  or above. The measure of internal consistency on the Coronary Heart Disease in Women Knowledge posttest was low but expected on a knowledge measure. This holds true because not all items are considered to measure the same construct. The items of a knowledge based exam test different concepts so measures of internal consistency will be expectedly low (University of Texas, 2003).

Completion of Phase 2 required 300 hours, with a total of 106 participants included in this time frame. Phase 2 surpassed the anticipated timeframe of 200 hours by 100 hours. The overage in hours was a direct result of the limited class sizes that were made available during regular work hours. Scheduling conflicts occurred when the amount of personnel who volunteered to participate in the study were limited in their ability to attend the course due to daily staffing issues. Fortunately, once participants were allowed to attend the course, they were not required to go on emergency calls. Ultimately, more training days were made available to meet the goal of 100 participants that extended the hours of involvement in Phase 2. In future studies, course implementation should be attempted with participants out of their work place environment to avoid daily staffing issues. There were also a great deal of questions asked by the participants, both during and post-course. This resulted in an excess of daily hours compared to the planned allotted time. Future plans for phase 2 should include a more generous time allowance for the question and answer session.

The knowledge gained from phase 2 of the study holds great value for similar studies that may be conducted in the future. Primarily, it is reasonable to further assess the applicability of the Thanavaro Coronary Heart Disease in Women Knowledge test in a healthcare provider group. Although the group tested had no prior extensive formal education in heart disease prevention measures, the overall scores that were skewed to the left indicate that the exam did not challenge this group of providers. Strong consideration should be given to developing a knowledge assessment tool for healthcare providers who plan to screen for heart disease in the community yet have a limited formal education in CVD screening measures. Also, the interval between delivery of the posttest post and course implementation should be delayed to avoid a potential bias.



### **Discussion of Phase 3 Focus Group Findings**

Qualitative data was gathered from focus groups comprised of participant volunteers. Three focus groups of six persons each were conducted during a span of two weeks. Unstructured interviews were the format, and members were allowed to discuss various topics with one another. The primary researcher led each focus group; interviews lasted approximately two hours. While the EMTs worked for the same municipal fire department, focus group participants were chosen from different fire stations. The groups were purposely constructed in this manner to avoid linking participants who routinely worked with each other. The intent of this method was to avoid situations where participants would not be completely forthcoming because they were familiar with other members in the group. The focus groups were audio-taped and notes were taken during the session by the primary researcher. The audio-tapes were reviewed and compared to the notes for accuracy, and underlying commonalities were established. There was no observer present during the focus group sessions.

The primary researcher encouraged all members to participate equally. Most questions were directed as open-ended questions in order to facilitate participation by the group. Fire department personnel and EMTs are known to be a close-knit group. The focus groups provided essential data for understanding the emic view of EMTs who completed a course aimed at providing health promotion activities within the community. The focus groups were scheduled at a convenient time and place for all the members of each group—the Fire Department Headquarters’ conference room, which central to all fire stations within the municipality.

After the participants chose pseudonyms to protect their identities, the primary researcher opened each group with the same question, “What do you think about the

course and its aim to train EMS personnel about screening for heart disease?" This question was answered with a general consensus between all groups that the information provided was beneficial. A participant who chose the name Billy expressed a common theme: "I learned a lot, but really, I wasn't thinking about how to teach this in the community. I was sucking up the information for myself and how it applied to my own health habits." This common theme persisted between all three focus groups. Alice stated, "After I took the class, I went home and raided my refrigerator and pantry, started reading labels and have since tried to eat a whole lot healthier." There was discussion in all three groups about the value in attending classes that provided information on health living. One participant stated, "Even if we know this stuff, it's easy to just ignore reading labels and slipping up with a poor diet and no exercise."

Members of the focus groups shared a common premise; they spoke of the value in disease prevention and health promotion. The professional experience of the EMTs has been exclusive to the management of emergency incidents. However, they each verbalized how much of their care involved the emergency management of preventable diseases. More specifically, the group was asked, "What do you think about heart disease screening for Hispanic women?" The groups recognized the great opportunity for heart disease screening in Hispanic women as well as in community education. A member of the focus group mentioned, "Of course, we need to educate the community. I've worked as a medic for all these years, and I'm changing my diet habits as a result of this class. Imagine the good that we could do if we educated the Hispanic women of our community who know nothing about health care."

Once responses revealed the focus groups shared a common premise that related to community education, a follow-up question was offered, "What is the

benefit in providing heart disease screening for Hispanic women within the community?” Two common themes emerged in response to this question. The first related to the value of educating young Hispanic women about healthy heart choices. Many members of the group were Hispanic, themselves, and were able to relate to the influence that culture has on their daily diet. The groups felt that if other Hispanics gave young Hispanic women diet modification information, that they might be more receptive to adopting heart-healthy alternatives despite cultural influence. After participating in the educational intervention, members of the group expressed a belief that the rate of heart disease in Hispanic women could decline if there were accessible opportunities for screening and education.

The second common theme to emerge was in response to the benefits of heart disease screening for Hispanic women in the community as it related to the progression of coronary disease. The groups recognized that as EMTs they are accustomed to immediate gratification when they intervene. The groups felt that the benefit of a heart disease education and screening campaign for Hispanic woman would not be recognized for some time. One member, Sarah, stated, “Say we provided this service to young Hispanic women. I guess it would take a while to see if people really stick with it. In twenty or thirty years, will there be less women having heart attacks or strokes?” Collectively, the groups felt that screening and prevention education would be very new experience for them, since they would be unlikely to see any immediate results, but they also agreed it would be valuable.

This series of discussions led to a question about the perceived barriers that such a program might face if widespread implementation was carried out. The groups were asked, “What barriers do you perceive in implementing a heart disease screening program for Hispanic women by EMS personnel?” A universal premise permeated

through the focus groups. Participants felt that EMTs saw the value in such a program, but most did not want any added workload. Focus group members near retirement age felt that EMTs should stick with basic emergency care, and everything else should be referred to doctors. There was some debate over this within all focus groups. Younger participants in the group felt that health care in the United States is changing and as deliverers of care, the role of the EMT should adapt as well. Despite the differences within the group on this topic, the consensus felt that EMTs should be compensated for the added responsibility of providing heart disease screening within the community.

At this stage, members of the focus groups had more questions than actual responses. They were concerned about the possibility of a large demand for heart disease screening within community fire stations. Some members asked, “Would this only be implemented during particular hours of the day like blood pressure checks?” and “How expensive is it to maintain this program?” Each of the barriers recognized related to implementation of heart disease screening, an educational campaign for the community, and/or not participating in the actual course themselves. Major obstacles mentioned were increased workload and pay. These themes pervaded as the educational intervention introduced during Phase 2 occurred at a time of massive pay cuts within participants’ fire departments. The group recognized that at the time, morale was quite low, which presented an inopportune time to introduce the potential for more work at no additional pay.

At the closing of focus groups sessions, participants were asked, “What would you like to see done differently in the future in regards to educating EMS personnel about heart disease screening?” As a group, participants felt that if EMTs took a more active role in health screening and disease prevention, it should be incorporated as a

part of EMT curricula. All participants recognized the value of health disease screening and prevention but felt that the traditional EMT education had not prepared them sufficiently to provide community education. Participants felt that practicing EMTs would need continuing educational courses, such as the Nurse Practitioner Implemented Curriculum for Heart Disease Screening and Prevention in Hispanic Women, to feel competent in providing such a service.

Phase 3 had a planned duration of 150 hours. However, since it was conducted off fire station grounds and on participant's personal time, scheduling of each group proved to be an arduous task. Even with scheduling conflicts, the Phase 3 focus group sessions of were completed in 50 hours, and this did not include review of the notes and analysis of the discussion for common themes among the groups. At the completion of this phase, thirty hours were consumed in visiting the organizations that contributed to the study. Aside for monetary contributions, there were contributions in the form of brochures from a local heart organization.

### **Implications to Nursing**

#### **Practice**

The findings of this project confirm that NPs are able to educate EMS providers who can provide continual screening and education opportunities in most Hispanic communities. Health promotion continues to be the mainstay for NP practice. The practice doctorate in nursing will be an integral link for advanced practice nurses and the future of nursing practice. This project, which incorporates the scientific foundations of advanced nursing practice, can serve as a blueprint for future studies.

Health promotion requires the highest level of nursing practice. In a leadership role of nursing, the NP is required to sustain therapeutic relationships with

other professionals that help facilitate optimal care and patient outcomes (AACN, 2006). The role of the NP is evolving into a position that guides all health disciplines to a nursing model rooted in disease prevention. Nursing practice also requires interventions that are diverse and based on nursing and non-nursing sciences to guide not only individuals but groups through complex health situations (AACN, 2006). The implications of practice of this study are at the forefront of nursing's future, as NPs will take a more assertive role within communities confronting health care issues that involve fiscal responsibility and policy changes as well.

### **Education**

The curriculum created in this project to educate EMS providers regarding heart disease prevention and screening proved to make a statistically significant difference in acquired knowledge as evidenced by pre and posttest scores. This curriculum will be made available for NPs who wish to utilize it in educational campaigns involving CVD. In the design of any curriculum, the target audience should be considered. The NP-developed curriculum of this study was based on current screening guidelines. It can be utilized to educate EMS personnel, nurses, and non-nursing healthcare providers about community heart disease screening and education strategies for Hispanic women. Moreover, as defined by the American Association of Colleges of Nursing (2006), practice directed NPs should strive for inter-professional collaboration for improving patient and population health outcomes. NPs will collaborate with other health professionals primarily by educating them within the model that is exclusive to nursing.

### **Research**

The findings of this study reveal promising data for the future of health promotion within US communities. Still, the chance for more research involving the

use of NPs to educate community healthcare providers exists. Furthermore, data should be collected to quantify the impact of heart disease screening and promotion activities for Hispanic women as a result of interventions performed by NP trained healthcare providers. Additional data collection will be required to help investigate the effectiveness of health promotion activities directed at the municipal level. The implications for research in this study disclose that although we have exposed the potential of an untapped resource in EMTs, NPs face challenges to provide data from ongoing research that link our interventions with positive health outcomes. The data collected in this project have been assessed with analytical methods for evidence-based practice. In future studies the NP will be required to act as a practice specialist in generating research, collecting data and utilizing information technology that is all geared towards improving health outcomes.

### **Social Policy**

The advantage for NPs who promote health in communities is the potential for influencing social policy. In this study, awareness by government policy makers must begin at the municipal level, and it is through community response that such a program will gain the watchful eye of policy makers. NPs are at the frontline of seeing practice in evidence. The role of NPs in future phases will be to roll out health promotion programs that can stimulate health policy changes that fund disease prevention and health promotion programs at the community level. This study clearly illustrated the role of health promotion in its aims to advocate for social justice, the nursing profession and equitable availability of health care opportunity within communities. NPs who strive to influence policymakers will need to take leadership roles such as the one exhibited in this study to actively participate with influential policy makers.

## **Future Considerations**

It is projected that practice implications as they relate to the health of Hispanic women will become more evident in future phases of this study. Plans for Phase 4 include documenting health outcomes of Hispanic women who seek cardiac screening in the community by NP-trained EMS providers. The learning experiences of Phases 1 through 3 will provide the foundation for planning Phase 4. The reality of the organizational culture within EMS and the commonalities touched upon during focus groups will require critical attention if such a program is expected to succeed over the long-term.

The overwhelming attraction for policy makers will be the response from the community. The most valid effects of such a community program must be evaluated longitudinally over years and even decades, as the progression of cardiovascular disease is slow. In order to promote policy change in the interim, the response from the community shall be measured to help quantify the community's desire for health promotion and disease prevention. It will be the role of the advanced practice nurse to raise such issues within the circles of policymakers who can facilitate change within our current health model.

## **Summary**

Over the course of several months, three phases of this project were completed. This included the development of a heart disease screening educational program based on existing guidelines. This course was then implemented with a group of EMS providers who serve a large Hispanic community. Data was collected in a pre and posttest design, which exposed the value of NPs implementing such a course in their respective communities throughout the US. The findings revealed a statistical difference between pre and post-educational intervention knowledge



assessments. The assessment of knowledge was based on scores from an existing CVD knowledge assessment tool for women.

**Study limitations.** Although the educational intervention proved to make a difference, there were study limitations. One limitation related to the brief interval between pre and post-educational intervention exams. This study should be replicated with a wider time span between exams. The knowledge assessment tool originally designed for non-healthcare providers appeared too easy for participants of this particular study. Despite the fact that EMTs have no formal education in heart disease prevention or screening techniques, results revealed in a histogram exposed scores that were skewed to the left. Thus, the opportunity exists to design a CVD knowledge assessment tool that measures the competency of health care providers who have not been formally educated in CVD prevention.

**Lessons learned.** Kolb's theory, the theoretical framework of the study, proved to be an exemplary model. Data findings supported the notion that previous experiences can simply be reformatted to develop new knowledge. Feedback throughout the course by participants supported the educational theory as experiences in dealing with cardiac emergencies were related to the progression of coronary disease. This led to an understanding of interventions that could be implemented in the Hispanic community to promote heart-healthy living in women.

Qualitative data obtained from focus groups revealed positive and negative commonalities about the educational intervention. While most participants voiced a belief in the value of promoting the cardiovascular health of Hispanic women, barriers to implementing such a program were also voiced. First, implementing such a program into the community was perceived as a barrier. Second, there was contention regarding the EMS role; many older EMS participants believed doctors should be

responsible for health promotion. Thus, these barriers should be considered prior to utilizing EMS providers in any community heart disease screening program.

In a potential continuance of this study, Phase 4 should include a pilot study implementing the screening with women in a Hispanic community. Trained providers could provide heart disease screening and education from their experiential knowledge and knowledge gained during Phase 2. The Hispanic women receiving the screening would function as study participants. Variables that included the degree of follow-up with health care providers post- screening, as well lifestyle modifications, would be measured, and demographic data about Hispanic women would be collected, specifically as it related to the assessment of any health benefits to those in varied age groups. Demographic data on EMS providers would also be collected to better understand the educational needs of this select health care worker population.

There is great opportunity and great need for more research involving NPs and health promotion at the community level. In this study, one such opportunity regarding an NP- initiated heart disease educational program for health care providers was implemented. Future studies to improve upon this educational program and reduce associated barriers will be challenging, but certainly worth it, if we are to improve healthcare delivery to Hispanic women.

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OFFICE OF THE PROVOST  
INSTITUTIONAL REVIEW BOARD

Research with Human Subjects  
Protocol Review

Date: June 29, 2010

Protocol Number: 100622  
Title: A Nurse Practitioner Initiated Educational Program for  
Community-Based Health Care providers to Screen for Heart  
Disease in Hispanic Women

Approval Date: 6/21/10

Name: Mr. Robert Hevia  
Address: 17335 SW 282 Street  
Miami, FL 33030

Sponsor: Andra Hanlon, PhD  
School: School of Nursing

Dear Mr. Hevia

On behalf of the Barry University Institutional Review Board (IRB), I have verified that the specific changes requested by the IRB have been made. Therefore, I have granted final approval for this study as exempt from further review. Enclosed is the Consent Cover letter with the IRB stamp. Please use this letter when collecting your data.

As principal investigator of this protocol, it is your responsibility to make sure that this study is conducted as approved by the IRB. Any modifications to the protocol or consent form, initiated by you or by the sponsor, will require prior approval, which you may request by completing a protocol modification form.

It is a condition of this approval that you report promptly to the IRB any serious, unanticipated adverse events experienced by participants in the course of this research, whether or not they are directly related to the study protocol. These adverse events include, but may not be limited to, any experience that is fatal or immediately life-threatening, is permanently disabling, requires (or prolongs) inpatient hospitalization, or is a congenital anomaly cancer or overdose.

The approval granted expires on June 17, 2011. Should you wish to maintain this protocol in an active status beyond that date, you will need to provide the IRB with an IRB Application for Continuing Review (Progress Report) summarizing study results to date.



If you have questions about these procedures, or need any additional assistance from the IRB, please call the IRB point of contact, Mrs. Barbara Cook at (305)899-3020 or send an e-mail to [dparkhurst@mail.barry.edu](mailto:dparkhurst@mail.barry.edu) . Finally, please review your professional liability insurance to make sure your coverage includes the activities in this study.

Sincerely,



Doreen C. Parkhurst, M.D., FACEP  
Chair, Institutional Review Board  
Associate Dean, SGMS  
Program Director, PA Program  
Barry University  
Box SGMS  
11300 NE 2nd Avenue  
Miami Shores, FL 33161

Enc: Consent Letter  
Cc: Andra Hanlon, PhD

.....  
Note: The investigator will be solely responsible and strictly accountable for any deviation from or failure to follow the research protocol as approved and will hold Barry University harmless from all claims against it arising from said deviation or failure.

Date: JUN 29 2010

Signature

*James C. Parham, MD, FACEP*

Appendix B- Barry University Consent Form

Dear Research Participant:

Your participation in a research project is requested. The title of the study is: A Nurse Practitioner Initiated Educational Program for Health Care Providers Who Can Screen for Heart Disease in Hispanic Women. The research is being conducted by Robert Hevia, a doctoral student in the Nursing department at Barry University, and is seeking information that will be useful in the field of community health screening and education. The aims of the research are to examine ways to educate EMS providers in regards to heart disease prevention in Hispanic women.

In accordance with these aims, the following procedures will be used: participation in an educational course as well as pre and post-test and focus group. We anticipate the number of participants to be one hundred. If you decide to participate in this research, you will be asked to do the following: participate as a student in an educational course, complete a pre-test prior to the course, a post-test at the conclusion and participate in a focus group consisting of five to seven participants. The total participation of the educational phase will require approximately six hours of attendance. The focus group will be considered an unstructured group interview. Your total participation in the focus group will require approximately two hours of attendance. The group interview will be audiotape recorded and you will choose a pseudonym during the interview. The principle investigator will transcribe the audiotapes.

Your consent to be a research participant is strictly voluntary and should you decline to participate or should you choose to drop out at any time during the study, there will be no adverse effects on your employment. There is a remote possibility that participants may experience slight psychological discomfort associated with the topic of heart disease prevention and screening in Hispanic women but the risk is not greater than normally encountered in everyday life. There are no direct benefits to participation in the study.

As a research participant, information you provide will be kept anonymous, that is, no names or other identifiers will be collected on any of the instruments used. Data will be stored in a locked cabinet in the researcher's home. By completing and returning this consent you have shown your agreement to participate in the study. The signed consent forms will be kept in a locked cabinet in the researcher's home separate from the data.

If you have any questions or concerns regarding the study or your participation in the study, you may contact me, Robert Hevia, at (305) 323-3745, my project chairperson, Dr. Hanlon at (305) 899-3800, or the Institutional Review Board point of contact, Barbara Cook, at (305) 899-3020.

Sincerely,

*Robert Hevia, MSN, ARNP, NP-C*

Voluntary Consent

I acknowledge that I have been informed of the nature and purposes of this experiment by Robert Hevia and that I have read and understand the information presented above, and that I have received a copy of this form for my records. I give my voluntary consent to participate in this experiment.

\_\_\_\_\_  
*Signature of Participant*

\_\_\_\_\_  
*Date*

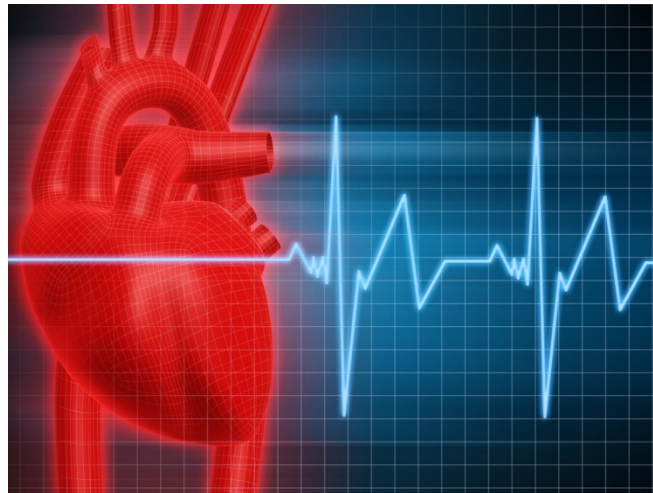
\_\_\_\_\_  
*Researcher*

\_\_\_\_\_  
*Date*

## Appendix C

### Recruitment Flyer

# Heart Disease Class



This is a volunteer opportunity for Emergency Medical Service (EMS) providers who wish to participate in a research study. The study aims to examine ways to educate EMS providers in regards to heart disease prevention in Hispanic women.

If you are an EMS provider and are interested in becoming a participant involved with this study, please e-mail your contact information to:

[SCREENFORHEARTDISEASE@gmail.com](mailto:SCREENFORHEARTDISEASE@gmail.com)

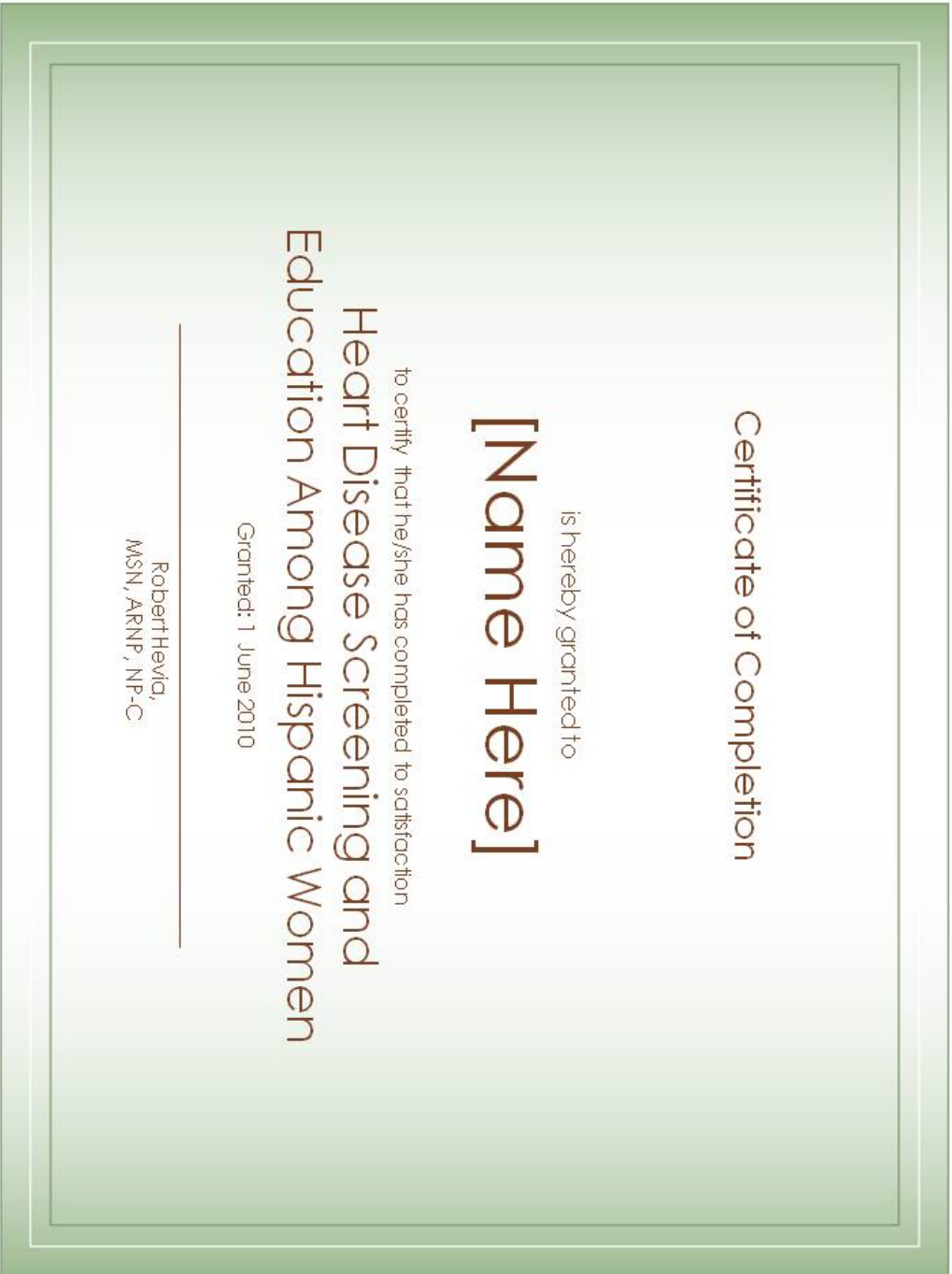
## Appendix D

### Topical Outline and Course Schedule

- Hour One
  - Overview
  - Course Objectives
  - Blood pressure
  - Tobacco use
  
- Hour Two
  - Lipids
  - Diabetes
  - Nutrition
  
- Hour Three
  - Physical activity
  - Weight
  - Identify abnormal values during a health screening
  
- Hour Four
  - Compute a Framingham heart risk score based on assessment findings
  - Explain the findings of evidence based research in regards it heart disease and women, specifically the Women’s Health Initiative study
  - List resources for Hispanic women based in assessment findings
  
- Hour Five
  - Post-test
  
- Hour Six
  - NP offered risk assessment to participants

**Appendix E**

Certificate of Course Completion



Certificate of Completion

is hereby granted to

[Name Here]

to certify that he/she has completed to satisfaction

Heart Disease Screening and  
Education Among Hispanic Women

Granted: 1 June 2010

---

Robert Hevia,  
MSN, ARNP, NP-C

## Appendix F

### Coronary Heart Disease in Women Knowledge Test

Direction: Circle one best answer.

1. Heart disease related to heart artery blockages develops \_\_\_\_\_ and can easily go undetected.
  - a. fast overnight.
  - b. fast over weeks.
  - c. slowly over months.
  - d. slowly over many years.
  
2. Obesity \_\_\_\_\_
  - a. may cause heart disease.
  - b. may prevent heart disease.
  - c. has no effect on heart disease.
  - d. may make the heart become stronger.
  
3. Which statement is true regarding symptoms of a heart pain or heart attack?
  - a. Chest pain may be a symptom of heart pain or heart attack.
  - b. Chest tightness may be a symptom of heart pain or heart attack.
  - c. Unusual fatigue may be a symptom of a heart pain or heart attack.
  - d. All of the above.
  
4. Which statement best describes menopause and heart disease related to clogged heart artery?
  - a. Women are less likely to get heart disease after menopause than before.
  - b. Women are more likely to get heart disease after menopause than before.
  - c. Menopause does not increase or decrease the risk of heart disease in women.
  - d. There is evidence that women are less likely to get heart disease after menopause than before.
  
5. Which statement is true regarding heart attack and stroke in women?
  - a. African American women are more likely than white women to die from a heart attack or stroke.
  - b. African American women are less likely than white women to die from a heart attack or stroke.
  - c. African American and white women have the same chance of dying from a heart attack or stroke.
  - d. African women are more likely to have heart attack than stroke and white women are more likely to suffer from stroke than heart attack.
  
6. High \_\_\_\_\_ may cause heart artery blockages.
  - a. cholesterol

- b. zinc
- c. iron
- d. calcium

7. Symptoms of heart pain or heart attack may include\_\_\_\_\_
- a. neck, shoulder or arm pain.
  - b. back pain.
  - c. dizziness
  - d. all of the above.**
8. Which statement is true regarding heart disease from clogged heart artery in women and men?
- a. Women and men become seriously ill or die equally once they are diagnosed or identified as having heart disease.
  - b. Once women are diagnosed or identified as having heart disease, they are less likely than men to become seriously ill or die.
  - c. Once women are diagnosed or identified as having heart disease, they are more likely than men to become seriously ill or die.
  - d. Clogged heart artery is more common in women and more serious in men.
9. What is the effect of stress on heart disease?
- a. Stress has no effect on heart disease.
  - b. Stress may prevent heart disease.
  - c. Stress may cause heart disease.
  - d. It has no proof that stress has no effect on heart disease.
10. Which statement is true regarding prevention of heart disease and clogged heart artery in women?
- a. Vitamin supplement prevents heart disease.
  - b. Reducing dietary salt may cause high blood pressure and heart disease.
  - c. There is no evidence that hormone therapy or replacement prevents heart disease.
  - d. All of the above.
11. What is the relationship between high blood pressure and heart disease?
- a. High blood pressure will make the heart stronger and able to endure more stress.
  - b. High blood pressure may prevent heart disease.
  - c. High blood pressure has no effect on heart disease.
  - d. High blood pressure may cause heart disease.**
12. Which statement best describes the relationship between heart disease and stroke?
- a. It is true that some forms of heart disease may result in stroke.**
  - b. It is false that some forms of heart disease may result in stroke.
  - c. It is not certain whether heart disease may result in stroke.
  - d. Heart disease never causes stroke.
13. What is the effect of dietary fat on heart disease?



- a. A high fat diet may prevent heart disease.
  - b. A high fat diet may cause clogged heart artery.**
  - c. A high fat diet does not affect heart disease.
  - d. A low fat diet may cause clogged heart artery.
14. Which statement is true about the effect of alcohol on heart disease?
- a. Moderate alcohol use (1-2 drinks per day) may cause heart disease.
  - b. Moderate alcohol use (1-2 drinks per day) may prevent heart disease.**
  - c. The effect of alcohol in preventing heart disease increases as the amount of alcohol use increases.
  - d. There is no evidence that moderate alcohol use (1-2 drinks per day) may prevent heart disease.
15. Smoking may cause\_\_\_\_\_
- a. high blood pressure.
  - b. heart valve leakages.
  - c. heart artery blockages.**
  - d. inflammation of heart muscle.
16. What is the relationship between female hormone and heart disease in women?
- a. High level of some female hormone may cause heart disease in women.
  - b. Low level of some female hormone may increase heart artery blockages in women.**
  - c. Low level of some female hormone may prevent heart disease in women.
  - d. Level of some female hormone has no effect on heart disease in women.
17. Which statement is true regarding the effect of race on heart disease in women?
- a. The chance of getting heart disease is equal in African American and white women.
  - b. African American women are less likely to have heart disease than white women.
  - c. African American women are more likely to have heart disease than white women.**
  - d. Both white and African American women rarely have heart disease.
18. How does dietary cholesterol affect heart disease?
- a. Reducing dietary cholesterol does not affect heart disease.
  - b. Reducing dietary cholesterol may make the heart become smaller.
  - c. Reducing dietary cholesterol may prevent clogged heart artery.**
  - d. Reducing dietary cholesterol may cause heart disease.
19. Which statement is true regarding exercise and heart disease?
- a. Excessive exercise may weaken heart muscle.
  - b. Routine exercise may prevent heart disease.**
  - c. A sedentary lifestyle may prevent heart disease.
  - d. The benefit of exercise on the prevention of heart disease is not conclusive so it is not important for me to start a routine exercise program.
20. Symptoms of heart pain or heart attack may include\_\_\_\_\_
- a. shortness of breath.
  - b. sweating.

- c. nausea.
  - d. all of the above.
21. Which statement is true about the effect of red meat on heart disease?
- a. Reducing dietary red meat may prevent heart artery blockages.
  - b. Reducing dietary red meat may cause heart artery blockages.
  - c. Reducing dietary red meat does not affect heart disease.
  - d. Reducing dietary red meat may weaken your heart.
22. Which statement best describes the effect of family history on heart disease?
- a. A family history of heart disease from clogged heart artery does not affect your risk of getting heart disease.
  - b. A family history of heart disease from clogged heart artery may increase your risk of getting heart disease.
  - c. A family history of heart disease from clogged heart artery may decrease your risk of getting heart disease.
  - d. There is no evidence that a family history of heart disease from clogged heart artery may increase your risk of getting heart disease.
23. What is the relationship between diabetes and heart disease?
- a. Heart disease is not related to diabetes.
  - b. Diabetes may increase the chance of having a heart attack.
  - c. Diabetes may prevent heart disease.
  - d. Diabetes makes the heart heal faster after a heart attack.
24. A risk factor of heart disease related to clog heart artery that cannot be changed is
- 
- a. smoking.
  - b. heredity.
  - c. obesity.
  - d. high blood pressure.
25. What is the leading cause of health care problems and death in women?
- a. Heart disease and stroke.
  - b. Breast cancer.
  - c. Diabetes.
  - d. Obesity.

## Appendix G

### Framingham Risk

<b>Men</b>	
<b>Estimate of 10-Year Risk for Men</b>	
(Framingham Point Scores)	
Age	Points
20-34	-9
35-39	-4
40-44	0
45-49	3
50-54	6
55-59	8
60-64	10
65-69	11
70-74	12
75-79	13

Total Cholesterol	Points				
	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
<160	0	0	0	0	0
160-199	4	3	2	1	0
200-239	7	5	3	1	0
240-279	9	6	4	2	1
≥280	11	8	5	3	1

	Points				
	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
Nonsmoker	0	0	0	0	0
Smoker	8	5	3	1	1

HDL (mg/dL)	Points
≥60	-1
50-59	0
40-49	1
<40	2

Systolic BP (mmHg)	If Untreated	If Treated
<120	0	0
120-129	0	1
130-139	1	2
140-159	1	2
≥160	2	3

Point Total	10-Year Risk %
<0	< 1
0	1
1	1
2	1
3	1
4	1
5	2
6	2
7	3
8	4
9	5
10	6
11	8
12	10
13	12
14	16
15	20
16	25
≥17	≥ 30

**10-Year risk \_\_\_\_\_%**

<b>Women</b>	
<b>Estimate of 10-Year Risk for Women</b>	
(Framingham Point Scores)	
Age	Points
20-34	-7
35-39	-3
40-44	0
45-49	3
50-54	6
55-59	8
60-64	10
65-69	12
70-74	14
75-79	16

Total Cholesterol	Points				
	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
<160	0	0	0	0	0
160-199	4	3	2	1	1
200-239	8	6	4	2	1
240-279	11	8	5	3	2
≥280	13	10	7	4	2

	Points				
	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
Nonsmoker	0	0	0	0	0
Smoker	9	7	4	2	1

HDL (mg/dL)	Points
≥60	-1
50-59	0
40-49	1
<40	2

Systolic BP (mmHg)	If Untreated	If Treated
<120	0	0
120-129	1	3
130-139	2	4
140-159	3	5
≥160	4	6

Point Total	10-Year Risk %
< 9	< 1
9	1
10	1
11	1
12	1
13	2
14	2
15	3
16	4
17	5
18	6
19	8
20	11
21	14
22	17
23	22
24	27
≥25	≥ 30

**10-Year risk \_\_\_\_\_%**

## **Appendix H**

### Focus Group Questions

1. What do you think about all that you have learned in regards to EMS personnel screening for heart disease?
2. What benefit did you obtain in learning about heart disease screening for Hispanic women?
3. What is the benefit in providing heart disease screening for Hispanic women within the community?
4. What barriers do you perceive in implementing a heart disease screening program for Hispanic women by EMS personnel?
5. What would you like to see done differently in the future in regards to educating EMS personnel about heart disease screening?

## Appendix I

----- Forwarded message -----

From: **Joanne Thanavaro** <[jthanava@slu.edu](mailto:jthanava@slu.edu)>

Date: Thu, Mar 25, 2010 at 11:44 PM

Subject: Re: CHD Knowledge Tool

To: Robert Hevia <[robhevia@gmail.com](mailto:robhevia@gmail.com)>

Hi Robert,

I'm so glad you think my tool will be helpful to you with your DNP capstone. You have my permission to use the tool which I have attached. Please keep in touch and let me know about your findings.

Dr. Joni Thanavaro  
 DNP, APRN, ACNP-BC, ANP-BC, DCC  
 Associate Professor  
 Coordinator, Adult Nurse Practitioner Program  
 St. Louis University  
 School of Nursing  
 3525 Caroline Street  
 St. Louis, Mo. 63104

On Thu, Mar 25, 2010 at 9:44 PM, Robert Hevia <[robhevia@gmail.com](mailto:robhevia@gmail.com)> wrote:  
 Dr. Thanavaro,

Hi, my name is Robert Hevia and I'm a student in the DNP program at Barry University in Miami, Florida. As a nurse practitioner I work in private practice with an interventional cardiologist. I have an interest in heart disease promotion and more specifically for Hispanic women. My DNP capstone project entails creating a program to educate emergency medical service (EMS) providers about heart disease prevention directed at women. EMS providers do not typically offer screening or prevention but I believe they are an underused resource in our fight against heart disease in women. I feel that I can create a program for other NPs to take within their communities to educate an army of heart disease "screeners" who are accessible to the community on a daily basis.

So why am I telling you this? I think your CHD knowledge tool for women is awesome! And I'd like to use it in my project. Here is the twist, I would like to use it as an evaluation tool after an educational intervention to both male and female EMS providers. I am respectfully requesting permission to use your tool and am certainly willing to do analysis of validity in this new population. I think your tool will prove to be a great asset as an evaluation tool after an educational intervention. Please feel free to contact me at 305-323-3745 or by responding to this e-mail. Hope to hear from you soon.

# City of Miami



CARLOS A. MIGOYA  
City Manager

June 3, 2010

Robert Hevia  
17335 SW 282 Street  
Miami, Florida 33030

Barry University  
Members of the Institutional Review Board  
11300 NE 2 Avenue  
Miami Shores, FL 33161

Dear Honorable Members:

It is with great appreciation that I write to you on behalf of the City of Miami Department of Fire-Rescue to accept your very generous offer to donate your time and services to the Department of Fire-Rescue. Your Capstone Research project will provide a tremendous benefit to the citizens of Miami.

This letter serves as permission to conduct your capstone project research utilizing volunteers from this department as well as permission to use Fire Department classrooms for your project implementation and data collection. I also approve the flyer requesting participants which will be posted through our bulletin board system.

We look forward to working with Mr. Hevia on such a beneficial project both to our department and our citizens. If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

Maurice L. Kemp  
Miami Fire Chief

## VITA

Robert Hevia  
robhevia@gmail.com

Born in 1972, Miami, Florida

### **Education**

Doctor of Nursing Practice, Barry University	2010
Master of Science in Nursing, Barry University	2008
Bachelor of Science	2005

### **Certifications**

Family Nurse Practitioner, American Academy of Nurse Practitioners

### **Professional Experience**

Nurse Practitioner, Glenn J. Barquet MD, PA	2008-Present
Lecturer, University of Miami	2004-2007

### **Professional Memberships**

American Academy of Nurse Practitioners

Sigma Theta Tau, Nursing Honor Society

### **Awards**

Chancellor's Award, Nova Southeastern University	2005
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