2017

Women and Coronary Artery Disease

Gwendolyn Yvonne Stancell-Smith
Walden University

Walden University

College of Health Sciences

This is to certify that the doctoral study by

Gwendolyn Stancell-Smith

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Oscar Lee, Committee Chairperson, Health Services Faculty
Dr. Robert McWhirt, Committee Member, Health Services Faculty
Dr. Jonas Nguh, University Reviewer, Health Services Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2017

Abstract

Women and Coronary Artery Disease

by

Gwendolyn Y. Stancell-Smith

MSN-Ed, Walden University, 2013

BSN, Point Loma Nazarene University, 1994

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

February 2017

Abstract

Heart disease, including coronary artery disease, affects approximately 42 million women in the United States. Many of those affected are not aware they have the condition. Contributing to the problem is the fact that women are more likely than men to be misdiagnosed and undertreated for heart disease. Morbidity and mortality are high in women affected by heart disease, making the problem important to address. The purpose of this project was to understand the coronary artery or heart disease risk and the treatment for the condition provided for 31 participants at a cardiology service in the Northeast U.S. The project question focused on understanding how coronary artery disease manifest in women and the gender differences in treatment for men and women. A descriptive case design was used by gathering data from patient risk profiles and treatments. Participants were males and females aged between 30 and 80.   Qualitative data were obtained through cardiology staff interviews and existing literature. The data were subjected to a content analysis to identify emergent themes. Findings indicated that the women experienced different cardiac symptoms to men, and these differences translated to misdiagnosis and resulting treatment ineffectiveness. This project contributes to social change through raising awareness of the gender differences in heart disease presentation so that providers can recognize and treat the condition effectively.

Women and Coronary Artery Disease

by

Gwendolyn Y. Stancell-Smith

MSN, Walden University, 2013

BSN, Point Loma Nazarene University, 1994

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

February 2017

Dedication

My mother, Thora Y. Stancell, and my late father, Woodrow W. Stancell, are the inspiration for completing the doctoral program. They worked effortlessly and endured many trials in order for me to have an education.   .

Acknowledgements

I want to thank God the father up above for showing me mercy and grace. I thank all of my instructors who have guided my path. Thank you to all of my classmates for this journey. I thank my love and boyfriend, Eric D. Carter, for proof reading my work and helping to solve IT problems.

Table of Contents

List of Tables

List of Figures

Section 1: Introduction of the Problem

Background

Heart disease is a condition in which the major blood vessels to the heart are blocked or narrowed. It is also referred to as cardiovascular disease. Heart disease can eventually lead to an individual experiencing a heart attack, stroke, or angina pain. There are several other heart disorders that can have adverse reactions on the heart muscle, heart rate, and heart valves leading to coronary heart disease. Lifestyles void of cigarette smoking and alcohol usage that includes a balanced diet and exercise on a regular basis may help to prevent heart disease.

In the United States, over 40 million women are living with cardiovascular disease; most are not aware of having the disease. Health practitioners are beginning to acknowledge the widespread of cardiovascular disease in women, though heart disease over the decades has only been linked to men. Over 400 million women die from heart disease in the United Stated yearly. The impact of heart disease is affecting women globally, and is being recognized as the focal cause of death. There have been a few studies to examine cardiovascular disease in women; the clinical trials that have been performed only represent 30% of women in the population, (Jouria, 2015). Diagnosing of heart disease and treatment modalities use in women are sublime, compared to men. Medications used to treat heart disease in women, may cause a different chemical reaction that is less desirable, (Jouria, 2015). Furthermore, Jouria (2015, p.13), states,

About one in three women (34.9%) in the United States have some kind of cardiovascular problem. Approximately, one in seven women dies of a cardiovascular disease, whereas one in four women dies of cancer. Though age-based mortality rates of

cardiovascular disease is higher in men, the total number of cardiovascular-related deaths has been higher in women over the past 20 years, mainly because of a longer life expectancy and a larger population of older women.

Evidence-based guidelines to prevent heart disease specifically in women were established by the American Heart Association in 2011 and updated in 2012. According to Jouria (2015), evidence based practice has been the key to providing optimum care, but now it has advanced to how preventative measures effect overall quality of care and cost.

There are certain risk factors and comorbidities relating to developing heart disease. The risk factors are obesity, lack of exercise, diabetes, and hypertension. However, aspects of population diversity beyond the known classifications of race, ethnicity, and demographic location can affect the development of heart disease, how it is treated and the quality of care provided. Other such important factors are literacy skills, age, culture, socioeconomic status, religion, disability status, and occupation (Jouria, 2015).

In order for the heart to properly function, oxygen rich blood must supply the heart muscle. Coronary artery disease is a disease that prevents this from occurring, as plaque builds up inside of the coronary arteries. According to Jouria (2015), atherosclerosis is the condition that occurs, when plaque lines the walls of arteries, causing them to harden. This process can occur over several years. Due to sclerosis of the arteries from plaque buildup, there is less oxygen rich blood to perfuse the heart.

Heart attacks can occur when the plaque within the coronary vessels dislodge, leading to the formation of a blood clot. When the flow of blood is blocked to any area

of the heart, the muscle can die. Heart attacks are considered a medical emergency. Swift intervention is needed to prevent death.

   High blood pressure can cause hypertensive heart disease. When the walls of the heart are thickened, it causes the load of the heart to work less efficiently and harder. This leads to developing coronary artery disease and heart failure. High blood pressure increases morbidity and mortality.

   A heart that does not beat properly or is weak can lead to the development of a cardiomyopathy. Many types of cardiomyopathies exist. Depending on what type of cardiomyopathy a person may exhibit, it will affect the heart's functioning capacity. Cardiomyopathy affects the way blood is pump from the heart to the rest of the body. The heart muscle is diseased. The most common type of cardiomyopathy is dilated cardiomyopathy. This type of cardiomyopathy weakens the walls of the heart, and affects the heart chambers. It is also considered idiopathic cardiomyopathy, because it remains unknown why it occurs. When there are blocked arteries, and narrowing of the heart vessels, oxygen cannot reach the heart muscle adequately; this is referred to as ischemic cardiomyopathy. When the chambers of the heart cannot properly fill with blood, and the heart is unable to stretch appropriately, this is called restrictive cardiomyopathy. Thickening of the heart walls is referred to as hypertrophic cardiomyopathy. This type of cardiomyopathy can affect people of any age group.

   Problems can occur with the valves of the heart. There are four valves to the heart: the aortic, pulmonic, mitral, and tricuspid valves. Every time the heart beats there is a small piece of tissue, similar to a flap that opens and closes. The flap serves the purpose of closing off blood flow or allowing blood flow to enter through the valves and

into the chambers of the heart as well as the rest of the body. A person can experience

shortness of breath, chest pain, swollen lower extremities, and tiredness. The cause can

be the insufficiency of the heart valves operating. Heart valves make sure that blood flow

is unidirectional, and blood does not flow backwards. A heart valve may not close

tightly, where there is blood leaking backwards through the valve; this is called

regurgitation. Stenosis of a valve can occur when the valve does not open up enough,

and the flow of blood is blocked.

Statement of the Problem

The disease burden of coronary artery disease for women has been overlooked. The affects of coronary artery disease is distinct in men and women. Cardiovascular disease (CVD) in women manifests on a level completely opposite to disease processes, and clinical appearances routinely observed in men. This makes the diagnosing of CVD in women much harder to distinguish, and leaves women susceptible to not receiving the correct desirable intervention. Women are more likely to experience disability, or worse death from CVD. Research specific to differences of coronary artery disease, based off of gender, is bringing to light, that CVD in women needs more investigating, (Aziz, 2014).

Women, who have the condition known as atherosclerosis, are more prone to developing blood clots. Women can present with no evidence of the coronary arteries being blocked, but can still have ischemia. The inner lining of the blood vessels can be affected, where there is dysfunctioning of the endothelial cells that can cause either vasodilation, or vasoconstriction responses. Women can experience small vessel disease, where the small vessels of the heart are damaged, causing angina pain to be experienced, (Aziz, 2014).

Purpose of the Study

The purpose of this study is to determine why heart disease differs in men and women. It is an important factor to note that women have smaller hearts than men; specifically the right ventricle. The pumping mechanism of the right side of the heart is crucial for optimal functioning. According to the American Heart Association's movement titled, Go Red for Women (2016), they identified that there are several conditions linked to the functioning of the right side of the heart in women; specific lung diseases such as sleep apnea, pulmonary hypertension, and chronic obstructive pulmonary disease. The right ventricle of a woman's heart is smaller than a man's right ventricle. The inability of the right ventricle to sufficiently pump blood to the lungs, in order to pick up oxygen, causes the right ventricle to enlarge. According to Mercuro et al (2010),

Gender differences in the cardiovascular system and sex diversity in genetic susceptibility to CVD were recognized and appreciated only recently. Men are born with XY chromosomes, and women are born with XX chromosomes. Men and women differ from every cell and molecule from each other. Every cell is sexually differentiated and there exist postpuberal differences between male and female cardiovascular systems (p.207).

The strength of the study is its aim to raise awareness of how coronary artery disease affects women and treatment modalities specific for women in combating the disease. The study will not be able to stop women from being misdiagnosed, undertreated, and misrepresented concerning coronary artery disease. Women tend to wait too long in seeking any care professionally, and their condition can already be in an advanced phase, (Mercuro et al, 2010).

Project Questions

For the purpose of this study the following questions are addressed:

1: How does coronary artery disease present in women compared to men?

2: What are the differences between coronary artery disease treatments for

women compared to men?

Definition of Terms

Coronary artery disease (CAD), according to the Mayo Clinic (2015), "develops

when the major blood vessels that supply your heart with blood, oxygen, and nutrients

(coronary arteries) become damaged or diseased. Cholesterol containing deposits

(plaque) in your arteries and inflammation are usually, to blame for coronary artery

disease" (p.1). A heart attack can occur if the coronary arteries are completely blocked.

An individual can experience chest pain and shortness of breath if there is a decrease in

blood flow to the heart muscle, caused by narrowed coronary arteries (Mayo Clinic,

2015).

Low density lipoproteins (LDL), according to the Centers for Disease Control and

Prevention (2015b), "make up the majority of the body's cholesterol. LDL is known

as'bad' cholesterol because having high levels can lead to plaque buildup in the arteries

and results in heart disease and stroke" (p.1).

Coronary heart disease (CHD), according to the National Heart, Lung, and Blood

Institute (2016), "is a disease in which a waxy substance called plaque builds up inside

the coronary arteries. The condition is called atherosclerosis" (p.1).

Dietary approaches to stop hypertension (DASH), according to the National

Heart, Lung, and Blood Institute (NHLBI) (2016), "DASH is a flexible and balanced

eating plan that helps creates a heart healthy eating style for life. The DASH eating plan requires no special foods and instead provides daily and weekly nutritional goals" (p.1). A well rounded DASH diet includes incorporating lean meats instead of fatty meats, and limiting soft drinks that are sweetened with sugar, and sweet treats. The DASH diet should include healthy fats, and low fat dairy products. Whole grains, fruits, and vegetables should be included in the DASH diet. Foods high in saturated fat should be limited (NHLBI, 2016).

Intima-media thickness (IMT), according to Simova (2015), "is a marker of subclinical atherosclerosis (asymptomatic organ damage) and should be evaluated in every asymptomatic adult or hypertensive patient at moderate risk for cardiovascular disease. Intima-media thickness values of more than 0.9mm (ESC) or over the 75th percentile (ASE) should be considered abnormal" (p.1). The two inner most layers of an artery are measured for thickness.

Systolic blood pressure (SBP), according to Medicine Net (2016), "is specifically the maximum arterial pressure during contraction of the left ventricle of the heart" (p.1). The top number is systolic for a blood pressure reading. The bottom number is diastolic blood pressure (DBP). It occurs when the heart muscle is relaxing between beats.

Theoretical Framework

The Betty Neuman Systems model is the framework used to guide this study. It conceptualizes a total body approach and is flexible in rapidly changing situations. The model helps with identifying stressors. Stressors can be physiological, psychological, developmental, sociocultural, and spiritual. In correlation with the identified problem of coronary artery disease, the Betty Neuman Systems model can play a vital role with the

implementation of interventions to rectify identified stressors. Patient stress level is of concern when certain procedures needed to correct a malfunctioning heart such as cardiac catheterization, oblation surgery, or coronary artery bypass graft surgery. According to Parvan, Zamanzadih, Dizaji, Shabestari, and Safaie (2013),

> Neuman's system model states that patients are an open system constantly interacting with their environment. To ensure that the special needs of the patient are identified, this open system needs to have two-way communication at any time and a thorough assessment of the patient includes looking at all patient's psychological, social, cultural, emotional, developmental, and religious variables. Internal and external factors that interact with the client system are part of the environment. The intrapersonal environment is the internal environment that includes influences within the system. The external environment includes interpersonal and extra personal factors. Stressors in the intrapersonal, interpersonal, and extra personal environment can influence the potential or actual reaction in the system, therefore, the main purpose of nursing is assessing the client to gain system stability through the attainment, retention, and maintenance of optimal health, and it is the nurse that creates a link among the client, environment, health and leads to the stability of the system (p.24-25).

Primary prevention, secondary prevention, and tertiary prevention are all major factors in preventing cardiovascular disease in women. Primary prevention helps in changing a person's behavior, and reducing their risks to specific diseases. Secondary prevention involves controlling the progression of the disease. Through screening practices, there is detection of the underlying pathology changes affecting a person's health. Tertiary prevention provides a treatment plan to deal with the disease processes,

and the impact it has on the individual. It is hoped to aid in sustaining quality of life. The goal of primary prevention is to reduce risks through life style changes, and modify behaviors, that could lead to developing a disease. Diagnostic testing and screening of many health problems, can detect if a person has developed a health related issue. Through secondary prevention, the goal is to slow down further advancement of the disease, through cutting edge interventions. Tertiary prevention promotes managing not only the illness of the individual, but also how the person is coping physically, mentally, and socially, (The Association of Faculties of Medicine of Canada, 2015).

Evidence-Based Significance of the Problem

Heart disease is the major cause of mortality for women in the United States. According to the Centers for Disease Control and Prevention (2016), "heart disease is the cause of death for women in the United States, killing 289,758 women in 2013-that's about 1 in every 4 female deaths. Almost two thirds (64%) of women who die suddenly of coronary heart disease have no previous symptoms" (p.1).

Social Determinants

It has been projected that by the year 2030, cardiovascular disease will be the leading cause of death in the United States. According to Havranek et al. (2015), "the prevalence of CVD in the United States is expected to rise 10% between 2010 and 2030. This change in the trajectory of cardiovascular burden is the result not only of an aging population but also of a dramatic rise over the past 25 years in obesity, hypertension, diabetes mellitus, and physical inactivity that accompany weight gain" (p.873). Furthermore, "social determinants of health are the circumstances in which people are

born, grow, live, work, and age, and the systems put in place to deal with illness"

(Havranek et al., 2015, p.874).

Economic Factors

Economic factors relating to cardiovascular disease is part of a system with many layers. Regardless if an individual is of wealth, or low socioeconomic status, cardiovascular disease does not discriminate. It does not matter what a person's sexual orientation is, race, education level, culture, or demographics. Economic factors relating to socioeconomic position is based on certain positions individuals hold in society, and the influence of having the means to control resources. The rich can use their influence to control the political arena, by seeking to change policies in their own favor, and acquire resources, that further alienate the disadvantage. Cardiovascular risk factors are deemed to be increased for poorly educated individuals, (Havranek et al., 2015).

Implications for Social Change in Nursing Practice

The field of nursing keeps evolving. Leaders are emerging in the nursing field and the impact of nurses can be felt in all settings and disciplines. Through secondary intervention, nurses play a pivotal role in ensuring patients are educated on acute and chronic conditions, and promoting ways to maintain optimal health. Nurses have moved from beyond the bedside and have branched out to form collaborative bonds with other members of the interdisciplinary team. The field of nursing is not only about providing care for the ill. In the 21st century, nurses are responding to issues that involve business, technology, domestic, and global problems. Nurses are seeking advanced practice positions, to further expand the roles of what nurses can do; whether it is exacting policy, or publishing a paper, (Tiffin, 2012).

Summary of the Practice Problem and the Project

Little attention is paid to cardiovascular disease in women by practicing health care professional and patients. Most women consider cancer as a grave concern and investigational studies have only focused on men. The project is aimed to inform consumers and healthcare professionals about heart disease in women, the symptoms experienced, diagnosis, and interventions. It is imperative that women learn to become more in tune with their bodies, to help recognize when something is wrong. It remains an ongoing struggle for health professionals, to take the issue seriously, of women having a heart attack, because of the misconceptions differing in cardiac events among genders. Education is the only way to spread the news about cardiovascular disease in women. Health professionals have an obligation to engage others in fighting heart disease. Everyone has a voice to be heard, and all people have a right to advocate for their health. Women need sustainable treatments and guidelines. Regardless of a women's age, she is susceptible to developing heart disease. The risk is higher, if heart disease already runs in the family. There is new research suggesting if women had complications during pregnancy with hypertension or diabetes, their children may be prone to developing heart disease subsequently.

Section 2: Review of Literature

Introduction

The projects goal is to help consumers and health professionals identify signs and symptoms of coronary artery disease in women, so appropriate treatment interventions can be implemented. The purpose of the literature review is to analyze data from different nursing journals and publications looking for approaches of treating coronary artery disease in men and women, and learning if there are noticeable differences in the management and treatment between the genders. A literature review of journal articles was conducted. Findings produced results on topics such as heart disease in women, gender differences in men and women with coronary artery disease, and cardiovascular disease in women. .

Articles pertained to identifying differences in men and women with coronary artery disease were chosen and studies representing patient populations of individuals affected by coronary artery disease. The goal of the review is to raise awareness for consumers and healthcare providers to educate women on their risk factors for developing coronary artery disease, heart disease consequences and treatment options.

The following databases were researched for information: CINAHL plus with full text, Cochrane, ProQuest Nursing & Allied Health Source, Medline with full text, and Google Scholar. The following sources were used to identify coronary artery disease in women. The literature was published between 2008 and 2014.

1.   Cardiovascular Diagnosis & Therapy (2012)

2.   Circulation (2014)

3.   Clinical and Investigative Medicine (2014)

4. International Journal of Medicine (2014)

5. Iranian Journal of Critical Care Nursing (2010)

6. Journal of the American Medical Association (2008)

7. National Heart, Lung, and Blood Institute (2010)

8. New England Journal of Medicine (2014)

9. Nurse Prescribing (2013)

10. Nursing Research and Practice (2013)

Coronary Artery Disease and Gender Differences

Women are underrepresented when it comes to identifying cardiovascular risk factors. Cardiovascular disease develops a decade later in women. According to Maas & Appelman (2010), "cardiovascular disease develops 7 to 10 years later in women than in men and is still the major cause of death in women. The risk of heart disease in women is often underestimated against cardiovascular disease. The under-recognition of heart disease and differences in clinical presentation in women leads to less aggressive treatment strategies and a lower representation of women in clinical trials" (p.598).

It is imperative for clinicians to recognize the differences in men and women's hearts. According to Jouria (2014), researchers from the University of Columbia and New York Presbyterian Hospital reported the following:

While the area of study is somewhat new, it is a fact that women have smaller hearts and arteries than men. It has been reported that women have different internal rhythm, which in general, causes a woman's heart to beat faster than a man's heart. These researchers also believe that a woman's heart may take longer to relax after each beat. Additionally, some surgeons have hypothesized that

women have a 50% higher chance of dying during heart surgery compared with men and this may be due to the fundamental difference in the way a woman's heart works (p.14).

Unlike men, women who experience their first myocardial infarction tend to die after the attack versus a man. According to Jouria (2014), "approximately 25% of men die within a year after their first myocardial infarction compared with 38% of women. Women are also approximately twice as likely to experience a second myocardial infarction within 6 years of the first myocardial infarction. Additionally, women are approximately twice as likely as men to die after bypass surgery" (p.14).

Women with high cholesterol and triglyceride levels, are at risk of coronary disease in comparison to women with low density lipoproteins. A study called the Women's Ischemia Syndrome Evaluation (WISE) highlighted that many women have undergone diagnostic tests, such as stress testing, and angiograms. These tests did not pick up on issues, that women had significant blockages in their coronary arteries. The diagnostic test appeared to be normal. Women were symptomatic, experiencing chest pain. There are new test, which involves the use of ultrasounds, which can detect problems missed from angiograms. There have been problems trying to accurately pinpoint how a cardiac catheterization may show blood flow issues or myocardial ischemia, but stress testing yields no answers to a woman's complaints of dyspnea or angina pain.

Section 3: Methodology

Project Design

The project design was a descriptive case series study. The face sheets of thirty-one patients were obtained; they present a description of the patients' health complaints. The goal was to compare the male and female patients in the cardiology department presenting with angina pain to those without chest pain but other physical complaints, discovering how particular interventions are decided upon for these individuals. Are the male patients undergoing invasive procedures, while the female patients are receiving more non-invasive modalities to diagnose coronary artery disease? The data was collected quantitatively from the electronic medical record. Qualitative data were retrieved from the cardiology staff asking the patients' questions. Variables considered in the project are gender, obesity, hypertension, diabetes mellitus, elevated blood cholesterol, excessive coffee intake, smoking, and alcohol intake. The theory to guide the study was Betty Neuman's system model because it is a holistic model that is evidence-based and culturally sensitive to real world phenomena. The models possible predictions for results are stronger assessments for identifying symptoms in diagnosing and managing coronary artery disease in women.

Participants

The participants were 31 cardiology patients ranging in age from 30-80. Twenty-two were female and nine were male. The patients are regularly seen by the cardiology department at two large hospitals in the Northeast. The cardiology staff receives consults from other physicians to evaluate patients. It is routine to obtain the patient's vital signs, during office visits. An EKG is done to attain baseline information of what may be going

on with the heart. The cardiologist or nurse practitioner asks the patients a battery of questions, trying to get to the root cause of their health complaints. The cardiologist develops a plan of action that requires further investigation of the patient's chest pain or syncope events. The patients' cardiac risks and patterns in disease processes are identified. Interventions adhere to clinical practice guidelines for individuals with cardiovascular disease, and include engaging the patient in self-care modalities, such as monitoring of symptoms, medication adherence, and diet restrictions. Interventions will hopefully help individuals manage and live with chronic illnesses to increase their quality of life.

Materials

Noninvasive testing was conducted to obtain an electrocardiogram (EKG), an echocardiogram (ECHO), stress testing, and wearing of a holter monitor.

Sampling

The purposive sample of clients was chosen by the preceptor. Participants included 31 clients treated for heart disease from two hospital cardiology services in the Northeast. Both men and women aged between 30 and 80 were included in the sample. Challenges presented were not having full access to clients' medical records due to not being an employee of the clinical site.

Instrumentation

The instruments that were used in the study were electronic medical records and staff talking to patients to acquire data. It was hoped that these instruments would assist in answering the project questions.

Instrument #1 Electronic Medical Records

The electronic medical record (EMR) takes the place of a paper chart. It provides a compilation of clinical data and medical history for patients under a provider's practice. The electronic medical record is used for diagnosing and treatment. According to Health IT (2014), the electronic medical record is more beneficial than paper charts for the following reasons:

It allows providers to track data over time, identify patients who are due for preventive visits and screenings, monitor how patients measure up to certain parameters, such as vaccinations and blood pressure readings, and improve overall quality of care in a practice. The information stored in EMR's is not easily shared with providers outside of a practice. A patient's record might even have to be printed out and delivered my mail to specialists and other members of the care team (p.1).

This instrument is the main source of information for the study. It provides background history of the patient and a possible treatment plan. The reliability and validity of the electronic health record needs more research. There have been empirical studies on the electronic medical record for accuracy and completeness of data since the year 2004. According to Chan, Weiner, and Fowles (2010), "the diversity among the studies made it hard to draw concrete conclusions. Further research is needed to develop an evidence base to support the use of the electronic health record data in quality measurement focusing particularly on data attributes vital to quality measurement, such as granularity, timeliness, and comparability" (p.1).

Instrument #2 Interviews

Interviews are a means of obtaining qualitative data to attain the meaning and story behind what is being presented by individuals. Interviews are a more personal way of responding to others. According to Valenzuela and Shrivastava,(2008)

Interviews are completed by the interviewer based on what the respondent says. Interviews are a far more personal form of research than questionnaires. In the personal interview, the interviewer works directly with the respondent. Unlike with mail surveys, the interviewer has the opportunity to probe or ask follow up questions. Interviews are generally easier for respondents, especially if what are sought are opinions or impressions. Interviews are time consuming and they are resource intensive. The interviewer is considered a part of the measurement instrument and has to be well trained in how to respond to any contingency (p.3).

Instrument #3 The United States Census

The United States (U.S.) Census provides data pertaining to all the residents in the United States and the economy. The Census Bureau operates under two U.S. codes: Title 13 and Title 26. The mission of the U.S. Census is to protect the nation's people through confidentiality, privacy, and sharing of work and skills globally. According to the United States Census (2015), the goal is to "provide the best mix of timeliness, relevancy, quality and cost for the data collected and services" (p.1). The United States Census has ongoing quality assurance programs to measure the validity and reliability of the data.

Instrument #4 The Centers for Disease Control and Prevention

The Centers for Disease Control and Prevention (CDC) has a host of departments including data and statistics, diseases and conditions, traveler's health, CDC jobs, as well as vaccines and immunizations. The CDC is a federal agency and considered the top health institute for the United States. Reliability and validity is not totally forth coming. According to Williams et al. (2009) "CDC reviewers acknowledge that reliability may sometimes have to be sacrificed for validity, especially in community-wide interventions, if they are to be ecologically valid" (p.222). The CDC recruits experts from the medical profession and other fields to provide citizens with the necessary education to impact and fight against diseases, promote health, provide protection from injury and disability, and prepare for threats that can harm communities, plus populations nationally and globally.

Instrument #5 Current Population Survey

The current population survey is the number one source of labor force statistics for the population. This survey offers quantitative data and is conducted by the United States Census Bureau for the Bureau of Labor Statistics. According to the Bureau of Labor Statistics (2015), "the current population survey (CPS) is a monthly survey of households conducted by the Bureau of Census for the Bureau of Labor Statistics. It provides a comprehensive body of data on the labor force, employment, unemployment, persons not in the labor force, hours of work, earnings, and other demographic and labor force characteristics.

Instrument #6 Townsend Deprivation Scores

The Townsend Deprivation Scores was developed in the mid 1980s by a professor named Peter Townsend. The primary focus is on material deprivation. According to the University of Southampton School of Geography (2008), "the Townsend index is an area-based measure and can be constructed for any geographical area for which census data are available. It has served both as a general measure of deprivation for academic studies of health care needs, educational achievement, and crime and also as an input to various resource allocation mechanisms intended to target resources to areas of greatest social need" (p.1). There are four basic census variables (households without a car, overcrowded households, households not owner-occupied, persons unemployed). These variables are divided by suitable household or person counts, which then yield a percentage score (University of Southampton School of Geography, 2008).

Data Collection and Analysis Procedures

The general plan for how data were collected was through the electronic medical record, direct observation of procedures, and cardiology staff inquiring about the patients' status. Data were provided to the student for content analysis of the 31 cases.

Protection of Human Rights

The confidentiality of patient face sheet information has not been compromised. The face sheets were kept in a secured binder with all identifiable demographics removed, and stored in my home office. The face sheets were returned to Mercy Hospital of Philadelphia and given to a clinical preceptor for shredding on September 24, 2015. No identifiable information has been attributed to the patients. The process of observing patients in the cardiology department undergoing assessments, procedures, discussing

medical history, and providing educational material involves minimal risk to human subjects. Minimal risk is defined is defined by the National Institute of Health (2015), as a common rule to be that the probability and magnitude of harm or discomfort anticipated in the project are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examination or testing. Most risk encountered by participants in projects fall into the following categories: physical, psychological, social, legal, and economics.

Descriptive Studies

Descriptive Studies help to describe patterns in disease, and relationships among variables such as to person, time, and place. Descriptive studies provide information about populations or groups affected by disease. It also establishes determinants for risk factors in decreasing disease.

Case Series

Case series is an outcome of interest. The project's outcome of interest is coronary artery disease. Limitations of case series is that it cannot provide test validity statistical associations. Advantages of case series help to develop new hypothesis.

Significance of the Study

Understanding the differences between how men and women are affected by heart disease will affect future projects. Identifying the signs and symptoms of heart disease in women, will hopefully lead to early diagnosing of coronary artery disease. Women need to participate in more clinical studies on heart disease, to ensure gender specific treatments, and obtain rationales through quantitative data, and surveillance.

Moreover, Aziz suggest (2014) that, the only way to fully understand coronary artery disease (CAD) in women, is to have research conducted, that is based off of gender. The first line of prevention of CAD in women, involves behavior modification of being physically active, managing high blood pressure, decreasing tobacco, and consuming less alcohol. Taking a baby aspirin daily, can help minimize the formation of blood clots, which can block an artery. The use of hormone replacement therapy in treating CAD is not well established; more research is needed. Women are at an increased risk of having a heart attack or stroke, when the amino acid called homocysteine is elevated. This amino acid is responsible for protein metabolism. The use of folic acid may provide some benefit in decreasing homocysteine levels. Women with high levels of cholesterol, may benefit by incorporating fish oils in their diet, such as Omega-3 fatty acid. Randomized controlled trials on the use of antioxidant supplements, in managing CAD, showed not benefits.

Over the years, there have been several crusades, promoting heart health initiatives for women. One of the main problems women face is not being informed by their primary practitioners, that they possibly have more than one risk factor, for developing heart disease. Most women at their doctor's office visit, have their weight taken. They are possibly informed, that they should shed a few pounds, and that is basically it. No wonder why many women have no idea, to have their hearts examined. Practitioners must be vigilant to continuously monitor patients' blood pressure, cholesterol levels, and blood sugars (CardioSmart, 2016).

Section 4: Findings, Discussion, and Implications

Case Scenarios

Thirty-one patients were asked impact questions by the cardiology staff in order to evaluate their risk assessment. The questions asked of patients included: 1) Have you ever experienced a heart attack? 2) Do you have a history of cardiomyopathy? 3) Does your mother, father, or siblings have a history of heart disease? 4) Have you ever experienced a stroke? 5) Do you smoke cigarettes? 6) Do you drink alcoholic beverages? 7) Do you limit salt in your diet? 8) Do you exercise? 9) What is the nature of your visit to the office? The patients will be referred to as patient A through patient Z; patient AA through EE. Risk profiles are presented for each of the patients.

Patient A: Patient is a 59-year-old female who presents for risk of stratification for upcoming lung cancer surgery. The patient complains of chest discomfort. The patient describes the pain as tightness. There are no significant aggravating factors. The patient states nothing seems to relieve the pain. The discomfort occurs at rest, at night, and more frequently with movement. The patient's risk factors are diabetes, hypertension, and smoking. The patient has an EKG test. The rhythm is sinus with undetermined age septal myocardial infarction. The patient will undergo a myocardial perfusion study/Bruce protocol and 2 D Echocardiogram. Patient states a family history of heart disease.

Patient B: Patient is a 31-year-old female who presents with left heart failure due to peripartum cardiomyopathy, postpartum condition, or complications. The patient's heart failure is NYHA classification I, AHA/ACC Stage C (New York Heart Association/American Heart Association/American College of Cardiology). Stage C

refers to patients who have developed clinical heart failure. Risk factors are former tobacco usage. The patient is wearing a LIFE vest in the event that an arrhythmia is detected. The LIFE vest has a defibrillator implanted inside. There is no family history of heart disease.

Patient C: Patient is a 63-year-old female who presents for congestive heart failure, pulmonary hypertension, hypertension, and hyperlipidemia. The patient recently experienced a hypoxemia episode. The patient is on home therapy of 2 liters of oxygen via nasal cannula. The patient wears a CPAP machine at night for obstructive sleep apnea. Risk factors are hypertension and diabetes. The patient will have an EKG and echocardiogram performed.

Patient D: Patient is an 84-year-old female being evaluated for syncope. The patient complains of feelings of light headedness. The patient states symptoms began 4 months ago. The symptoms usually occur after standing (from sitting). The symptoms are relieved by sitting. The patient does not report a history of alcoholism. The patient has a history of coronary artery disease, fatigue, headaches, ischemic cardiomyopathy, myocardial infarction, seizures, stroke and visual changes. The patient has a past history of hypertension, hyperlipidemia, and gastroesophageal reflux disease, arthrocentesis of the right knee joint, cholecystectomy, and hysterectomy. The patient denies orthopnea, dyspnea on exertion, or edema. The patient denies claudication. The patient has no symptoms attributable to valvular heart disease. The patient will have a 2 D echocardiogram, and an ankle-brachial index will be performed.

Patient E: Patient is a 45-year-old female. Presents with chest pain and hypertension. The patient complains of chest discomfort. The discomfort is located in

the substernal area and radiates to the left arm. The patient describes the pain as sharp and tightness. The discomfort occurs at rest. Pain starts in the left arm and radiates to the chest and lasts for one minute. The patient has a strong history of coronary artery disease. The patient has high blood pressure, high salt intake, and obesity. Negative symptoms include dyspnea, headache, nausea, tinnitus, transient weakness, visual disturbances, vomiting, and diaphoresis. The patient will have a myocardial perfusion study performed with Bruce protocol. The patient is scheduled for a 2 D echocardiogram and is advised to follow a low-salt and low-fat diet.

Patient F: The patient is a 74-year-old female. The patient complains of chest discomfort located in the epigastric area. The pain does not radiate. The patient describes the pain as pressure and states that walking makes it worse. The pain is relieved with rest. The discomfort occurs with exertion and the patient states having two episodes in the last month. The patient has hypertension. Comorbid conditions include diabetes mellitus. Pertinent negative symptoms include diaphoresis, nausea, dyspnea, and transient weakness. The patient also has dyslipidemia and states being a former tobacco user of ten cigarettes per day. The patient is scheduled for a 2 D echocardiogram with color flow Doppler. Diet issues discussed with the patient; a stress test for myocardial perfusion using Bruce protocol is planned.

Patient G: The patient is a 51-year-old female who presents with chest pain, CAD, and hypertension. The patient states having chest discomfort that is located in the substernal area. The patient describes the pain as tightness and states exertion makes it worse. The pain is relieved with rest. The patient has a history of hypertension and medications are an ACE inhibitor Lisinopril 40mg, aspirin therapy, and a Beta Blocker

Atenolol 25mg. The patient is scheduled for a myocardial perfusion study with Dipyridamole protocol. The patient will have a left and right cardiac catheterization performed. The patient is advised to follow a low-fat and low-salt diet.

Patient H: The patient is a 57-year-old female presenting with cardiomyopathy, hypertension, and hyperlipidemia. The patient states that she has had multiple cardiac work ups including echocardiograms, stress test, and cardiac catheterization. The patient states that she has been informed that her heart is weak. There are no complaints of chest discomfort. The patient uses a walker to assist with ambulation. The patient states that inactivity led to obesity and depression. The patient will have a persantine stress test performed. The patient is being screened for hypertension. Denies alcohol and use of tobacco.

Patient I: The patient is a 43-year-old female who presents with cardiomyopathy and is trying to obtain surgery clearance. The patient had an echocardiogram performed and was diagnosed by one of the cardiologist as having severe cardiomyopathy. The patient has dyspnea on exertion and is only able to walk one flight up the stairs despite her young age. Patient denies chest pain or discomfort. Patient states that she sometimes has intermittent lower extremity edema. The surgery clearance is needed for the patient to undergo a dilation and curettage test (D&C) as well as hysteroscopy. The cardiologist decided to delay the patient's surgery for now and perform an extensive cardiac work up to evaluate why the patient has severe cardiomyopathy. Patient is a smoker of cigarettes and states she is trying to decrease usage of the product. The patient is counseled on incorporating a low-fat diet.

Patient J: The patient is a 54-year-old female who presents with A Fib, hypertension, and congestive heart failure. The patient has paroxysomal atrial fibrillation. Her symptoms with the arrhythmias have included palpitations. The CHADS2 recommendation scoring is incomplete. The patient's last known ejection fraction was 0.30. The patient's comorbid conditions include hypertension and heart failure. The patient experiences chest pain, claudication, confusion, diaphoresis, epistaxis, fatigue, headache, hematuria, nausea, tinnitus, transient weakness, visual disturbances, and vomiting. The patient has a dependence on opioids. The patient has an implantable chest wall device. The patient will have the device removed from the chest wall. The patient would like the device removed because it is irritating and no episodes of heart arrhythmias have occurred. The patient has a history of chronic systolic heart failure and benign essential hypertension. Laboratory work will be ordered for the patient; BMP, CBC, PT, and PTT. The patient is advised to follow a low-sodium diet. The plan for the patient will involve having a 2 D echocardiogram and a falls risk screening.

Patient K: The patient is a 69-year-old female who presents to the cardiology department for valve clinic evaluation. The valve team includes the cardiothoracic surgeon, valve coordinator, nurse practitioner, and cardiology staff. The patient has valvular heart disease. The patient complains of dyspnea on exertion, feeling tired, and lightheadedness on exertion. Patient denies any syncopal events. The patient is being evaluated for shortness of breath and states that her inability to get air into the lungs is compromised further after the climbing of one flight of stairs. Relieving factors include rest. The patient is scheduled for a pulmonary consult. Patient has sleep apnea and is

encouraged to be compliant with CPAP machine. The patient continues to smoke cigarettes. She is counseled on tobacco cessation and is advised to follow a low-sodium diet because of a history of benign essential hypertension. The patient is well controlled on medical therapy. The patient has a psychological consult to discuss anxiety; it has been recommended for the patient to take Buspirone medication.

Patient L: The patient is a 32-year-old who presents with an abnormal electrocardiogram (ECG) and needs surgery clearance for bariatric treatment. The patient is morbidly obese; they are advised to follow a low-fat diet. The ECG is nonspecific showing abnormalities in the ST and T wave segments. The patient needs further cardiac evaluation. Stress test using Bruce protocol is ordered along with a stress echocardiogram.

Patient M: Patient is a 55-year-old female who recently had a transthoracic echocardiogram. The findings show global left ventricular wall motion and that contractility is normal. The ejection fraction is estimated at 50-55%. There is evidence of moderate pulmonary hypertension. The right ventricular systolic pressure is calculated at 44mmHg. There is mild tricuspid regurgitation. The patient had bariatric surgery in March of 2014; past weight was 292lbs and current weight is 164lbs.

Patient N: The patient is a 69-year-old female who presents with palpitations and hypertension. Comorbid conditions include diabetes mellitus. Associated symptoms include irregular heartbeat. Pertinent negatives include chest pain, claudication, confusion, diaphoresis, dyspnea, epistaxis, fatigue, headache, hematuria, nausea, tinnitus, transient weakness, tremor, visual disturbances, and vomiting. There is a family history of CAD. The patient has benign essential hypertension that is inadequately controlled.

Cardiologist will add 60mg Diltiazem for AM and 240 mg Diltiazem at mid-day. A 2 D w/CFD echocardiogram ejection fraction will be performed. The patient is advised to follow a low-sodium diet.

Patient O: The patient is a 49-year-old female who presents for a follow-up appointment for pulmonary hypertension. The patient is a former tobacco user. The patient had an echocardiogram performed. The findings showed mild mitral regurgitation. The pulmonologist performed a pulmonary function test; findings showed small vessel disease. The patient is a bariatric candidate. The patient is advised to exercise and adopt healthy food choices. The patient will see a cardiologist in 6 months.

Patient P: The patient is a 72-year-old female who presents with dyspnea and hypertension. For a couple of months the patient has been experiencing shortness of breath and fatigue. Pertinent negative findings include anxiety, chest pressure, stridor, and substernal chest pain. The patient states feeling very short of breath after walking one block. During a physical examination, it was discovered that the patient has a murmur. The patient is scheduled for a 2 D w/CFD echocardiogram before next visit with the cardiologist. ECG findings show T wave inversions in anteroseptal leads with symptoms of dyspnea. Lexiscan myocardial perfusion imaging (MPI) will also be performed before the next cardiology visit. The patient has chronic obesity. The patient is advised to follow a low-fat and low-sodium diet. No changes to medications.

Patient Q: The patient is a 73-year-old female who presents with shortness of breath and abnormal EKG. The patient had a myocardial perfusion imaging test performed after radiology administered intravenous of 10.1 mCi Tc 99m SESTAMIBI prior to the resting images, and 30.2 mCi Tc 99m SESTAMIBI prior to the stress images.

Finding show there is no fixed transient perfusion defects. Gated wall motion images were performed with patient in post stress state. Left ventricular ejection fraction was 80%. End-diastolic volume was 53ml. End-systolic volume was 10ml. There were no regional wall motion abnormalities. The patient was tested utilizing IV Dipyridamole protocol. The patient was given by radiology, 51.8 mg of Dipyridamole diluted in 20.6 cc of normal saline. The solution was given intravenously slowly over 4 minutes. Initial blood pressure was 124/76. Final blood pressure was 120/70. EKG showed no suspicious ST changes. The study was reviewed with the attending radiologist.

Patient R: The patient is a 78-year-old female who presents for a follow-up appointment for CAD. The patient initially presented with acute coronary syndrome. The patient presented with shortness of breath and shortness of breath on exertion. The patient is currently on the following: ACE inhibitor Quinapril 40mg, aspirin and other anti-thrombotics, Beta Blocker carvedilol 3.125mg for left ventricular systolic dysfunction (LVSD), and lipid lowering Simvastatin 20mg. The patient rates shortness of breath as moderate to severe. The patient qualifies the shortness of breath as inability to get air into the lungs. The symptoms worsen with normal routine activities, such as walking, bathing, eating, and dressing. Relieving factor includes rest. The patient will receive full cardiac work up: coronary computed tomography angiogram, pulmonary function test, and ambulatory pulse oximetry. The patient has multivessel CAD. The patient is advised to follow a low-fat diet. The patient has benign essential hypertension. Referral to pulmonary medicine for pulmonary functions test and diffusion capacity. The patient has chronic obesity. No changes to medications. Cardiology to discuss benefits and risks of having a coronary artery bypass graft performed (CABG).

Patient S: The patient is a 66-year-old female with chest pain and hypertension. The patient complains of chest discomfort in the substernal area. It radiates to the left arm and under the left breast. The patient describes the pain as pressure and states meals makes it worse and lasts for a few seconds. Pertinent negative symptoms include diaphoresis, dyspnea, and nausea. The patient is counseled on a low-salt and low-fat diet. The patient is encouraged to exercise; patient has chronic obesity. Before the next visit with the cardiologist, the patient is scheduled to have a 2 D w/CFD echocardiogram and a myocardial perfusion study with Dipridamole protocol. The patient also counseled on how to take blood pressure with digital cuff and keep a blood pressure diary.

Patient T: The patient is a 65-year female who presents for surgery clearance for bariatric treatment. The patient is being considered for gastric bypass surgery. The patient does not have any active cardiac conditions such as unstable angina, recent myocardial infarction, decompensated heart failure, significant valvular disease, or significant arrhythmias. The patient walks with a walker and has musculoskeletal complaints. The patient has hypertension and chronic obesity. EKG is suggestive of possible septal infarct. The plan is for the patient to have a 2 D echocardiogram and nuclear stress test with Dipyridamole MPI before the next visit with the cardiologist. The patient is encouraged to exercise and counseled on lifestyle education regarding diet.

Patient U: The patient is a 58-year-old female who presents for evaluation for CAD. The patient recently had an acute myocardial infarction. The patient is being evaluated for systolic heart failure due to other specified forms of chronic ischemic heart disease. Pertinent negative symptoms include chest pain, claudication, smoking, confusion, diaphoresis, epistaxis, and headaches. The patient states chest pain is

moderate and occurs daily. Discomfort is located in the precordial area and radiates to the left arm. The patient undergone a procedure to help treat the narrowing of the coronary arteries, called percutaneous coronary intervention. The anticoagulant medication Brilinta was instrumented.. The patient ejection fraction is 35% and meets the criteria for a primary prevention implantable chest device (ICD). The patient is scheduled for further cardiac evaluation. Coronary angiography findings show coronary atherosclerosis of naïve coronary artery. The patient is advised to follow a low-fat and low-salt diet. The patient continues to smoke and is counseled on tobacco cessation. The patient is scheduled for a myocardial perfusion study test using Bruce protocol. The patient is also scheduled for a 2 D echocardiogram. The patient has benign essential hypertension and is adequately controlled on ACE inhibitor lisinopril 5mg, and Beta Blocker carvedilol 12.5mg for LVSD.

Patient V: The patient is a 79-year-old female with risk factors of peripheral vascular disease, dyslipidemia, hypertension, and tobacco usage. The patient had an acute myocardial infarction two years ago with ST elevation (STEMI). A cardiac catheterization was performed and a stent was placed by cardiology. The patient has a large severe perfusion defect in the lateral wall, extending partly into the inferior and anterior walls of the heart with near complete reversibility at rest with moderate hypokinesis of the anterolateral walls. ECG shows ST ischemic changes.

Patient W: The patient is a 55-year-old male who presents with complaints of weakness. The patient experiences centrally located chest discomfort that radiates to his left jaw and arm. He states his symptoms of weakness are localized to his left side of his body. The patient has had a stroke in the past. The patient takes a sublingual

nitroglycerin tablet for his chest discomfort. The patient has an implantable chest device (ICD) and denies any recent discharge from the device. The patient has a past medical history of ventricular tachycardia arrest leading to the implantation of his Biotronik ICD which is a single-chamber device. The patient has a history of pulmonary embolism as well as prostate cancer. The patient states he has been treated in the past with chemotherapy for several months. The prostate cancer has returned and now he has a chemotherapeutic implant. There is no history of hypertension or myocardial infarction. The patient has had a cardiac catheterization in the past with no intervention. There is a history of dyslipidemia. The patient has a Greenfield filter placed for an implantable cardioverter defibrillator. The patient does not smoke, drink, or indulge in illicit drug use; he has quit abusing cocaine. The patient states having a family history of coronary artery disease. The patient is scheduled for a 2 D echocardiogram and pharmacologic stress testing. ICD will be interrogated.

Patient X: The patient is an 81-year-old male presenting with coronary artery disease and hypertension. The patient experienced an acute myocardial infarction. Risk factors are diabetes, hypertension, and dyslipidemia. An echocardiogram and EKG is performed. EKG shows pre-ventricular contractions and sinus bradycardia. The patient had an undetermined age anteroseptal myocardial infarction. The patient has multi-vessel coronary artery disease. He is not a candidate for coronary artery bypass graft (CABG). The patient is to wear a LIFE vest until left ventricular systolic function is evaluated.

Patient Y: The patient is a 61-year-old male presenting with respiratory and throat pain. The patient complains of shortness of breath and sore throat for a couple of hours. The patient states having a mold problem in the home. Patient states, "I cannot

breathe." The pulse oximetry on room air was 18. Patient has a past medical history of diabetes, hypertension, reflux disease, diabetic neuropathy, and human immunodeficiency virus. The patient is morbidly obese. The patient has obstructive sleep apnea but does not wear a mask stating he is claustrophobic. The patient denies smoking and consuming alcohol but does admit to using marijuana. The patient states no family history of early coronary artery disease. The patient had a cardiac catheterization last year. The patient is to be evaluated by the pulmonology department, and have a CAT scan of the chest.

Patient Z: The patient is a 53-year-old male presenting with an abnormal EKG. Patient has risk factors of hypertension, obesity, and tobacco use. The patient had a recent stroke with left side weakness; walks with a cane. EKG shows mild depressed left ventricular function and T wave inversion in inferior and lateral leads. The patient states that in 2009 a cardiac catheterization was performed after experiencing a myocardial infarction. The patient will have a myocardial perfusion study performed with Dipyridamole protocol.

Patient AA: The patient is a 50-year-old male who left the hospital against medical advice (AMA) but was readmitted the next day after collapsing when walking for one block. The patient is in detox treatment for heroin abuse. A medic brought the patient to the emergency room; he was then transferred to the critical care unit. The patient went into cardiogenic shock and suffered a non ST elevated myocardial infarction (NSTEMI). The patient presented with pulseless electrical activity (PEA) but eventually there was return of spontaneous circulation (ROSC). The patient was stabilized and sent for a cardiac catheterization the following day. Findings reveal that the left anterior

descending artery is blocked and not amenable to intervention. The patient was scheduled for ICD placement but left again AMA.

Patient BB: The patient is a 66-year-old male who needs a consultation for risk stratification for endoscopy. The patient was admitted to the facility for gastrointestinal bleeding. The patient has a history of hypertension, chronic renal insufficiency, and is dialysis dependent. He also has a history of diabetes, paroxysmal atrial fibrillation, and depressive cardiomyopathy with ejection fraction known to be around 10 %. The patient has a history of coronary artery disease but has not required percutaneous intervention. The patient has no family history of early CAD. While the patient was hospitalized, he was treated for septic shock as a result of ischemic bowel. He has undergone partial small bowel resection. Echocardiogram reveals aortic stenosis. The patient has a remote smoking history; denies the use of alcohol or indulge in illicit drugs. The patient has an implantable chest device called Boston Scientific Biventricular implantable cardioverter-defibrillator. Cardiology suggests that the patient is a low risk for endoscopy procedure but should be guarded against hypotension during sedation considering his aortic stenosis.

Patient CC: The patient is a 59-year-old male who presents to the facility after having an argument with someone the same day. The patient states having chest pain, and shortness of breath along with palpitations. He also states feeling dizzy but has not lost consciousness. Developed tingling and numbness on right side of face and right upper extremity. The patient has a medical history of diabetes mellitus, hypertension, chronic obstructive pulmonary disease (COPD), peripheral neuropathy, and cerebral vascular accident (CVA). The patient has a loop monitor implanted for arrhythmias.

There is a family history of diabetes mellitus. Admits to smoking cigarettes and uses cocaine recreationally. Plan of action for patient is to rule out a stroke relating to right side numbness, monitor chest pain related to emotional stress, and manage chronic problems of diabetes mellitus and COPD.

Patient DD: The patient is a 56-year-old male who presents with cardiomyopathy, congestive heart failure, and hypertension. The patient was seen by cardiology for chronic systolic heart failure due to other primary cardiomyopathies. The patient's heart failure is NYHA classification I, AHA/ACC Stage C. The patient is currently on the following: ACE inhibitor lisinopril 20mg, Beta Blocker Therapy for LVSD carvedilol 25 mg, loop diuretic furosemide 40mg, and warfarin Coumadin 5mg. The patient has a history of hypertension and dyslipidemia including comorbid conditions of heart failure and stroke. The patient's ejection fraction is 35%. Scheduled for a 2 D w/CFD echocardiogram, ejection fraction, and myocardial perfusion study with Bruce protocol. The patient is advised to follow a low-salt diet and to cease smoking. The patient is given educational material on congestive heart failure.

Patient EE: The patient is a 58-year-old male with past medical history of hypertension, dilated cardiomyopathy with left ventricular ejection fraction of 26%, and saddle embolus/bilateral pulmonary emboli. The patient has a massive CVA and has undergone extensive physical therapy. Admitted to facility for atypical chest pain and shortness of breath. Ventilation/perfusion scan (VQ) showed recurrent pulmonary embolism. A pulmonologist was consulted and the patient was admitted as an inpatient to the facility. The patient was started on a heparin drip and Coumadin. The patient is

clinically stable with an international normalized ration (INR) of 2.5. The patient will be discharged to home with physical therapy.

Discussion of Findings

By the year 2030, it is estimated that the cost of caring for a person with the medical conditions of stroke, heart failure, high blood pressure, heart disease, and other forms of cardiovascular disease, will be well over $800 billion. The populations most affected by the burden of disease, disability, and barriers to healthcare, are minority communities, and those of low socioeconomic status (Heidenreich et al, 2011).

The risk profiles for each patients had one or more risk factors for diabetes, hypertension, smoking, and dyslipidemia, A few patients abused illegal drugs; specifically cocaine, heroin and marijuana.

Women who may experience having a heart attack, have symptoms that are unconventional. Some women may not have any symptoms, while others may have lower back pain, nausea, vomiting, jaw pain, extreme tiredness, a full feeling, and angina pain. So many women are dying on a yearly basis from heart attacks, which never had any warnings.

Upon experiencing a stroke, there may be noticeable asymmetry of the face, slurred speech, difficulty moving extremities, difficulty speaking or comprehending, trouble breathing, loss of motor functions, the worse possible headache, blurred vision, or passing out.

The cardiology practitioners at Mercy Hospital of Philadelphia manage and sustain many patients with medication regimens. Beta blockers, Ace-inhibitors, anticoagulant therapy and diuretics, all play a crucial role in managing heart disease.

A study was conducted in France in August 2015 discussing deprivation in relation to individuals having a higher morbidity and mortality due to inequalities in healthcare. The study combined three measurements of deprivation (EPICES Scores, Townsend Index, and Carstairs Index), to compare social characteristics, indicators of morbidity, health-care use and mortality, and specific causes of death. According to Labbe et al. (2015),

> The Pearson correlation coefficients were calculated to assess the reliability of the EPICES score. The association between deprivation and mortality was assesses by comparison of the standardized mortality ratio (SMR) between the most and least deprived districts. The results of the study showed EPICES scores are strongly correlated with the Townsend and Carstairs Indexes and with the health indicators measured. SMR increased with deprivation, and the higher the deprivation the higher the SMR for all-cause mortality, premature, and avoidable deaths and for most specific-causes of death. Deprivation is a determinant factor that should be considered systematically by health policy makers and health-care providers (p.604).

There are new updated guidelines for primary prevention of stroke. In the United States, over 700,000 individuals are affected by stroke. Many people are left with severe neurological deficits, motor impairments, and sensory deficits. Individuals who are 65 years of age or older, may need help with managing every aspect of their lives, after suffering a debilitating stroke. Close to 70% of strokes are first time events. Strokes can be hemorrhagic, where a blood vessel may burst, or there is leaking of blood from the vessel. Strokes can also be ischemic, where a blood vessel is blocked with calcium

buildup. The use of a stroke risk calculator may provide valuable information, in hopes of preventing a stroke. Nearly 80% of strokes are preventable.

Health practitioners should consider screening tools, such as carotid artery testing, along with peripheral, arterial, and venous systems testing, for those individuals who have parents, siblings, grandparents, aunts or uncles, who have experienced a stroke. Exercise is beneficial to stroke prevention; at least 30 minutes of physical activity a day. The stroke risk calculator is a tool to predict a person having a stroke within 10 years. It is used for people within the age groups of 55-85. The risk calculator ask questions pertaining to gender, race, total cholesterol values, high density lipoprotein values, systolic and diastolic blood pressure readings, and treatments for high blood pressure. Other questions involve asking if the person is a diabetic, and a smoker.

Statins and aspirin therapy are used for primary prevention of strokes. These medications can cause side effects, and the use of them must benefit the person, and outweigh harm. The use of the vitamin Niacin may raise the good cholesterol levels, but stroke prevention has not been validated with this vitamin. The vitamin Folic Acid supplementation may be effective in preventing strokes.

Uncontrolled high blood pressure can lead to high volumes of blood coursing through and hitting the sides of the artery walls. Maintaining a systolic pressure below 140mmHg and a diastolic pressure below 90 is ideal, along with implementation of antihypertensive medications. Teaching patients how to monitor their blood pressure is beneficial. A home blood pressure monitor, will help patients track their numbers.

Obesity places a great burden on the body. Obesity increases stroke risk, despite a individual having other known risk factors for cardiovascular disease. Weight reduction will help decrease blood glucose levels, and blood pressure.

There are three new anticoagulant medications on the market to treat strokes and heart attacks. Pradaxa (Dabigatran), Xarelto (Rivaroxaban), and Eliquis (Apixaban), all are used to prevent strokes and blood clots in people that have atrial fibrillation, which is not caused by a heart valve problem. Pradaxa comes with risks of possibly causing a heart attack, and intestinal bleeding.

The Cotswold Heritage and Detecting Society (CHA2Ds2-Vasc), have developed a scoring system for people with conditions such as congestive heart failure, hypertension, and diabetes. The person's age is factored into the scoring. The results of the scoring, can predict a person's risk of having a stroke, from non-rheumatic atrial fibrillation, causing a thromboembolic stroke, and dangerous heart rhythms.

The CHA2Ds2-Vasc score will determine if a patient should receive aspirin or other anticoagulant medications. The recommended dose of aspirin therapy is 81mg daily. Individuals who have the medical condition sickle cell anemia, and are at risk for having a stroke, a noninvasive ultrasound called a transcranial doppler can be incorporated. The ultrasound can measure how fast blood flows in the brain. Patients who have a history of blood clots, and mitral valve stenosis are candidates for receiving anticoagulant therapy. Aspirin therapy is beneficial for individuals with artificial heart valves, to prevent strokes. Patients with a certain percentage of having a blocked carotid artery, but does not experience any complications or symptoms, are candidates for aspirin

and statin management. The older people advance in age, the more prone they become to experiencing a stroke.

Women that suffer from migraines with auras, are at an increase risk for having a stroke. Women should not smoke, who have migraines. If sexually active, these women need to switch to a contraceptive method, other than oral contraceptives (Anderson and Vega, 2015).

Disease monitoring of the heart involved performing several test; electrocardiogram (EKG), echocardiogram, stress testing, and cardiac catheterization. The EKG provides results of how the heart's electrical conduction system is functioning. The heart's rhythm can be measured. A baseline EKG is usually obtained on patients with complaints of chest pain or heart palpitation. Further investigation of the heart vessels and structures, may warrant the use of a test called an echocardiogram. The heart's action can be displayed, from the ultrasound waves that are produced. A transesophageal echocardiogram (TEE), is another type of echocardiogram. The patient is sedated for this procedure. Medication is administered intravenously. A bite block is placed in the mouth, and a lubricated thin tube, called an endoscope, is passed down the esophagus to the stomach. The endoscope has an ultrasound transducer attached, where pictures of the heart and arteries can be taken.

Health practitioners may want to see how the heart operates under stress. Physical activity of walking on a treadmill, will provide the heart's rate and rhythm, while the blood pressure, and respiratory rate are also monitored. The test can reveal heart problems, which may not be noticeable with other diagnostic test. Exercising on a treadmill, may prove to be too much for some people. Another way to stress the heart, is

with the use of chemical agents that will make the heart pump and beat fast, as if the person is actually physically exercising. The pharmacologic agent normally used for the test is called Persantine. This agent is administered intravenously with an isotope, which highlights the damaged areas of the heart by radiography. Coronary artery disease can be diagnosed with stress testing.

If plaque is blocking an artery, or if the artery is narrowed, a cardiac catheterization test can definitively show what blood vessels of the heart are blocked. A cardiac catheterization can be performed, when a person is acutely experiencing a myocardial infarction. Cardiac catheterization, along with angioplasty, can be performed to unblock clogged arteries (Jouria, 2015).

Implications

Policy: Heart disease and stroke are two preventable diseases. Five years ago, the Centers for Disease Control and Prevention initiated a public health response action plan to strategize preventing heart attacks and strokes.

Practice: Nurses are skilled and proficient to lead and manage CVD in the community, hospital settings, and outpatient clinics. Nurses understand the diversity of populations based on literacy, sociodemographics, ethnicity, race, and culture. Advanced practice nurses with the assistance of using a cardiovascular risk assessment tool for women can help with implementing education and counseling to women regarding maintaining a healthy weight, smoking cessation, physical exercise, stable blood pressure and cholesterol levels, improved diet, managing stress and mood, as interventions for managing coronary artery disease. The cardiologist and advanced practice nurse screens patients, and provides education and counseling. Upon identifying the patients' risks,

tests are scheduled that may include a physical stress test, wearing a Holter monitor for 48 hours, and having an echocardiogram performed. Once information from these test are received, the cardiology staff can determine if medication management or invasive testing is warranted. The cardiologist and nurse practitioner schedule follow-up appointments after 6 months and make routine telephone calls to patients. Patients that are on warfarin anticoagulant therapy will have their INR results discussed and levels adjusted as needed. Patients can always call the cardiology office with questions and concerns, or if they need to be seen sooner than a regular scheduled appointment.

Project: The Agency for Healthcare Research and Quality supports a research program on cardiovascular disease and chronic illness in women.

Social Change: Social change helps to shape our development, growth, and identity. Health and society are intertwined. Regardless of race, color, or creed, all human beings have the right to receive health care. Medical, political, and cultural factors must be weighed. A diverse work force is needed to manage the health needs of a diverse population.

Project Strengths and Limitations

Strengths of the project included patients having similar risk factors. Management of care involved medication management along with certain procedural tests to check the functioning of the heart.

Limitations cannot establish cause and effect with qualitative data.

Recommendations for remediation of limitations in future work will involve having more women participate in clinical trials. A gender analysis can be performed to address specific risk factors and treatment modalities catered to women's needs.

Analysis of Self

As a scholar Learning is fundamental and constantly evolving. Through education, competencies, and specializations, there is a sense of being well versed in the subject matter, in order to lead, direct, and provide education to others.

As a practitioner the tools have been received to practice the art and science of nursing proficiently, and further pursue the gaining of knowledge through research.

As a project developer There has been engagement to learn how to take a concept and potentially build on it, until it becomes an idea put into motion. Having a clear purpose of goals to make a project come into fruition, involves planning, and decision making. Knowing where to consult for resources is beneficial.

Future professional development of the project will involve having key stakeholders participate in random controlled clinical trials, along with expert researchers and clinicians. Local, state, and national government need to be involvement so the healthcare agenda of women with coronary artery disease can be addressed and policy exacted.

Section 5: Scholarly Product for Dissemination

A deeper understanding has been achieved regarding the specific signs and symptoms of coronary artery disease in women. Through scholarly rigor, existing data on coronary artery disease has been interpreted and new findings presented. Dissemination of the project for nursing knowledge is crucial for advanced practice nurses. It is hoped the project will communicate issues pertaining to coronary artery disease in women to health professionals, interdisciplinary teams, policy makers, and the media . Publication is a means of making information known about an issue. The project has devised a strategy to raise community awareness on the subject. Educating the community through public events can help women understand symptoms associated with CAD and obtain the necessary treatment. To reach the masses, information can be disseminated through church bulletins, fitness centers, businesses, and at places of employment (specifically, the coffee break room). According to Jouria (2015),

> A meta-analysis of presenting cardiovascular symptoms in women and men was performed to determine whether sex-based differences in presentation were significant enough to warrant public health messages targeted specifically toward women and men. The analysis found that across studies, lack of chest pain or discomfort was more commonly noted in women than in men. However, the studies examined lacked standardized data collection and symptom reporting; therefore, the authors concluded that sex-based differences were not significant to prompt changing public health messages (p.38).

Summary

Outcomes of treatments for women with coronary artery disease will be better understood when there is a large population of women to partake in clinical trials. A meta-analysis of literature can be scrutinized to determine the best course of action in treatment interventions. According to Jouria (2015), "some new research currently underway and new steps being taken for cardiovascular disease prevention and treatment include the use of cancer drugs to treat pulmonary hypertension, gene-therapy for use in the development of ventricular assist devices, clinical trials of the TransMedics Organ Care System, which is a device designed to keep the heart beating while it is en route for transplantation. This results in better preservation of the donor heart" (p.36).

According to Wenger (2012), "based on research studies, emerging data have highlighted important sex differences in the pathophysiology and clinical presentation of CHD in women and sex disparities in preventive interventions and diagnostic strategies, in management of acute coronary syndromes, and in the response to therapies, with consequent adverse outcomes of CHD in women. Underuse of guideline-based preventive and therapeutic strategies for women substantially contributes to their less favorable CHD outcomes, but the spectrum of sex-based differences likely reflect both biology and bias" (p.605). The Institute of Medicine has conducted investigations between 2001 and 2011 to evaluate sex-based differences in relation to disease processes and putting it into evidence-based practice (Wenger, 2012).

It has long been thought that coronary artery disease only affects men. This is based on numerous clinical studies being performed only on men. New studies on the disease show how risk factors affect both genders differently. Millions of women die

each year from coronary artery disease. Many women that have succumbed to the effects

of the disease have never showed any previous symptoms. In the United States,

cardiovascular disease is the leading cause of death for women. Clinical trials have

shown that women have specific risk factors related to autoimmune disorders, such as

pregnancy and microvascular disease. For this reason, coronary artery disease should be

managed differently in women. Women who suffer from autoimmune disorders such as

lupus, rheumatoid arthritis, and other inflammatory disorders tend to develop

atherosclerosis at an accelerated rate. Illness and death rises, due to adverse cardiac

events. Atherosclerosis is a disease in which plaque lines an artery. Women who

develop this disease are prone to blood clot formation. Women who smoke are at risk of

developing coronary disease. The use of oral contraceptives increases the risk of deep

vein thrombosis. Hormonal replacement therapy should not be used in primary and

secondary prevention of coronary artery disease. Older women who become pregnant

may experience acute coronary syndrome, which places mother and baby at high risk of

death due to myocardial ischemia. With myocardial ischemia, the blood flow to the heart

is lessened, or there is complete blockage of the coronary arteries, leading to decreased

oxygen perfusion to the body. Acute coronary syndrome houses several disorders that

can reduce blood flow to the heart, for example unstable angina and myocardial

infarction (Durante & Bronzato, 2015).

The risk profiles of the 31 cardiology patients used for the project showed all of

them had a history of smoking tobacco, high cholesterol levels, high blood pressure, and

hyperlipidemia, which are high levels of fats in the blood. A few of the patients used

illicit drugs, specifically cocaine, heroin, and marijuana. Many of the patients had

damage to the heart muscle, heart valves, or coronary arteries. Twenty-two of the patients were female, and nine were men.

There are two blood chemistry tests that show better results for women, to indicate ischemic changes. B-type natriuretic peptide (BNP) is secreted from the lower chamber of the heart, which are the ventricles. If pressure changes in the heart vessels, it signifies heart failure. C-reactive protein (CRP) is another test. The liver produces this protein in response to injury of the heart.

The field of nursing's impact on outcomes with women with coronary artery disease is primary prevention and management of coronary artery disease. For the purpose of the study, a risk assessment evaluation tool was utilized. The tool helps to determine the ten-year risk of an individual developing heart disease, progressing to possibly experiencing a heart attack, stroke, or worse death. There are several risk factors that cardiologist use, to determine a person's risk profile for heart disease. These risks include a family history of heart disease, smoking tobacco, consuming alcoholic beverages, obesity, lack of exercise, use of illicit drugs, having high blood pressure, high cholesterol levels, and an unhealthy diet. These risk factors can be improved and changed by modifying one's lifestyle and incorporating new habits that lead to maintaining optimal health. Age, race, and gender are all risk factors for heart disease that cannot be changed.

The risk assessment tool asks a series of questions to try and predict the probability of a person having a heart attack. The questions center on the person's age, sex, and smoking history, family history of heart disease, total cholesterol, and high-density lipoprotein (HDL) values. The individual is asked if they take medicine to treat high blood pressure, and if they know the value of the systolic blood pressure that is most current. Each question receives a number that is based on the National Cholesterol Education Program. The scores range from low risk, intermediate risk, and highest risk. A risk score of less than 10% shows a decreased chance of dying from heart disease in the next ten years, or having a heart attack. An intermediate risk score shows a 10%-20% chance that an individual will die in the next ten years from coronary artery disease, or experience a myocardial infarction. The highest risk score is greater than a 20% risk of having a heart attack, or dying from heart disease (Cleveland Clinic, 2016).

Over sixty years ago, there was a study conducted in a suburban city in Massachusetts called Framingham. Scientist recruited residents for the Framingham Heart Study. The participants ranged in age from 30-50, and ethnicity was Caucasian. During the turn of the 20th century, cardiovascular disease was on the rise, and scientist wanted to know why this was occurring. The participants did not have heart disease at the time of the study, and were followed for over 40 years to see who from the list of participants developed cardiovascular disease. The men and women who participated in the study totaled close to over five thousand individuals. The scientist worked for an organization called the National Heart Institute.

The first published data identifying risk factors for developing coronary artery disease came from the Framingham Heart Study. Moving forward to the 21st century, the National Heart Institute is now known as the National Heart, Lung, and Blood Institute (Framington.org, 2015).   A new generation is participating in the Framingham Heart Study. These new cohorts of recruits are the children and grandchildren of the original recruits of the study. Research is still going on, and other health problems are being investigated. There are modern technologies that exist today, such as stress tests, CAT scans, and echocardiograms to help with diagnosing heart problems. The Framingham Heart Study is utilizing this technology in their studies to further investigate heart related issues.

Princeton New Jersey Longevity Center offers advanced technology, such as full body scans, which can locate calcium deposit build up in an artery. The imaging of the full body scan can also discover aneurysms, heart disease, cancers, as well as vascular diseases. The Princeton Longevity Center is also optimizing the use of high definition heart scans and virtual catheterization (Princeton Longevity Center, 2016).

Advanced practice nurses are managing patients with multiple risk factors for many health problems, and are taking on provider roles to increase the quality of care for patients. Many patients are receiving interventions with drug therapy. Low dose baby aspirin provides anticoagulant therapy by thinning the blood to decrease the clots. Beta-blocker medications are used to control high blood pressure. Statin medications help to reduce cholesterol levels. Diuretic medication helps the kidneys to rid the body of extra salt and water. Ace inhibitor medications help to lower the blood pressure by dilating the blood vessels.

In conclusion, many women are still not aware of the effects of coronary artery disease. Hopefully in the future, more studies will be conducted on gender differences in heart disease, and more women will voluntarily participate in clinical trials; this will empower women to become advocates for their own health.

Cardiovascular Disease in Women Chart

Appendix	Design and Purpose	Population (*N*)	Intervention/Interpretation	Findings
Oliver-McNeil, S., Artinian, N. & Beaumont, W. (2002). Women's Perceptions of Personal Cardiovascular Risk and Their Risk-Reducing Behaviors. *American Journal of Critical Care, 11,* 221-227.	Descriptive study conducted at a 925-bed teaching hospital to describe perceptions of cardiovascular risk factors and risk-reducing behaviors among women patients newly diagnosed with cardiovascular disease.	33 women > 18 years or older with CAD diagnosed with angiographic findings or confirmation of a MI within the preceding 7 days Mentally competent as evidences by living independently in the community, no prior history o Cad and able to read and write english	SPSS descriptive statistics were used to analyze all study variables and the research questions.	This study concluded that women included had limited awareness of their personal risk limiting their ability to participate in CHD prevention Documented risk factor in medical records did not correlate with patients perceived risks, however did correlate with the AHA cardiovascular risk factors excluding body mass index and life stress Despite 93% of participants knew they had some risk for CAD, they were unaware they had multiple risk factors or the impact these risks held for their overall health There was no identified relationship between risk identification and risk-reducing behaviors.
Mosca, L., Mochari, H., Christian, A., Berra, K., Taubert, K., Mills, T., et al. (2006). National Study of Women's Awareness, Preventive Action, and Barriers to Cardiovascular Health. *Circulation, 113,* 525-534.	A meta-analysis study conducted through surveys to determine the current knowledge of cardiovascular disease in public women.	1485 women >25 years of age completed the survey. A total of 18905 calls were made to include the number of volunteer participants.	.Statistical analysis of the data was completed using SPSS. Logistic regression models were used to determine knowledge of variables. X2 analysis was used to determine the association of perceived risk and defined risk.	55% correctly identified CVD as the leading cause of death compared with 30% in 1997 (*P*<0.05) 63.1% of cited CVD as the leading cause of death in men. Awareness among women who considered themselves at an increased risk (moderate or high) was higher then women who perceived themselves to be at a lower risk (59.4% vs 60.9% vs 49.0%) 81% of women said they had heard or read about the prevalence of heart disease in the past 12 months. These women were more likely to be aware of CVD as the leading cause of death in women (68.9% vs 51.2%; *P*<0.0001) 88% confirmed they had yearly checkups with their healthcare provider. 54% said their healthcare provider discussed their risk factors for CVD. Overall statistics showed the women who were more aware of the risks for CVD

				deemed themselves at a moderate to high risk level. These women were more proactive in decreasing their risk factors then those women who considered themselves at low risk.
Weiss, A. (2009). Cardiovascular Disease in Women. *Primary Care Clinic Office, 36,* 73-102.	This descriptive study was conducted to discern the gender specific differences in the physiology, presentation of symptoms' and treatment of cardiovascular disease			CVD affects women disproportionately then it does men as it is diagnosed less frequently, treated less effectively, and carries a higher mortality rate in women. Today CVD affects 42.1 million women (36.6% of the female population) and accounts for 41.3% of all deaths of American women. The cost of healthcare for CVD in 2005 was projected at $394 billion: $242 billion in direct healthcare costs and $152 billion in lost production and wages. The lifetime risk for CVD in 2 in 3 for men and 1 in 2 for women. Annual rates of first major CVD event for women track those of men but are delayed by 10 years. In persons younger the 75 years of age, more CVD events occur in men because of CHD than women, whereas more CHF events occur in women than men. There are less "common" presentation symptoms of CVD/CAD in women than in men which often lead to a misdiagnosis. The lifetime risk of dying from a stroke is twice that of men (16% vs 8%) Two thirds of sudden deaths in women occurred in women without and history of symptoms whereas only 50% of men were similarly affected. Women have a higher incidence of death in the first year after a heart attack then men (38% compared to 25%), twice as likely as men to die after bypass surgery, a higher rates of disability due to heart failure within 6 years after a MI (46% to 22%)
Vaid, I, Wigington, C., Borbely, D., Ferry, P. &	This open cohort study design assesses and	WISEWOMAN began in 1993 to	The current (4th) phase of WISEWOMAN	Women with low income endure a disproportionate

Manheim, D. (2011). WISEWOMAN: Addressing the Needs of Women at High Risk for Cardiovascular Disease. *Journal of Women's Health, 20*(7); 977-982.	discusses the finding of the WISEWOMAN study program.	extend preventative health services offered to women who participated in the National Breast and Cervical Cancer Early Detection Program (NBCCEDP).	supports grantees in developing partnerships that will bring about policy, environment, and system changes in efforts to support heart healthy behaviors.	impact of the burden of CVD resulting from limited access to healthcare resulting from being uninsured or limited financial means.
Wenger, N. (2012). Women and Coronary Heart Disease: A Century After Harrick:Understudied, Underdiagnosed and Undertreated. *Circulation, 126*, 604-611.	A primary study of descriptive design to discuss the current status of studies of CHD in women from 1992-2012 including the challenges met with these studies and the proposed treatment outcomes hypothesized.			Lack of public awareness of CHD in women in risk determination, symptom presentation, screening techniques, diagnostic procedures, and sex disparities in application of evidence based therapies contribute to poor CHD outcomes. Despite CVD burden, women remain unrepresented in clinical and are at a disadvantage by absence of sex –specific analysis.
Mosca, L., Linfante, A., Benjamin, E., Berra, K., Hayes, S., Walsh, B., et al. (2005). National Study of Physician Awareness and Adherence to Cardiovascular Disease Prevention Guidelines. *Circulation, 111*, 499-510.	Online cross-sectional survey including case studies to assess knowledge of screening, preventative and interceptive therapies and tools	500 randomly selected physicians (300 primary care, 100 OB/GYN, 100 cardiologists) drawn from the J. Reckner Associated database	Descriptive statistics of physician practices and preventative recommendations were presented as proportions	Physician awareness of 3 national CVD prevention guidelines (NCEP ATP III, JNC 7 and AHA) differed by specialty of practice Physician recommendations about lifestyle interventions, supplements, and aspirin therapy were sub optimal among low-risk patients across the specialties Supplements were more highly recommended among the mid to high risk populations Results for correctly identifying risks for patient populations considering gender difference were similar across the specialties. Women risks were identified less often than that of males. Women were also more likely to be assigned to a low risk category despite being a similar calculated risk as men
Mochari-Greenberger, H., Mills, T., Simpson, S. & Mosca, L. (2010). Knowledge, Preventive Action, Barriers to Cardiovascular Disease Prevention by Race and Ethnicity in Women; An American Heart Association National Survey. *Journal of Women's Health, 19(7)*: 1243-1249.	Survey using standardized questionnaire about knowledge of healthy risk factor levels, preventative actions and barriers to preventative actions. The purpose of this study was to assess differences in CVD knowledge, preventative actions, and barriers to prevention by racial/ethical group in a nationally representative	1008 women >25 years of age with at least one person living in their household or one person not living in their household for whom they made healthcare decisions for	Descriptive statistics of respondents' characteristics, knowledge level, preventative actions and barriers to these actions were evaluated between the ethnic groups.	Knowledge that CHD is the leading cause of death varied by racial/ethnic groups which were independent of age, marital status, education, employment, income level or having children Hispanic populations was more likely to be unaware of the correlation between blood pressure and CVD

	sample of women.			Blacks and Hispanics were less likely than Caucasian/other groups to be aware that lipid levels were in correlation with the risk of CVD Race/ethnicity was not associated with the risk of increased fasting blood glucose levels in relation to CVD, although those respondents with <4 years of college education were 25% less likely to know optimal fasting blood glucose level
Heidenreich, P., Trogdon, J., Khavjou, O., Butler, J., Dracup, K., Ezekowitz, M., et al. (2011). Forecasting the Future of Cardiovascular Disease in the United States: A Policy Statement From the American Heart Association. *Circulation, 123,* 933-944.	A case study using primary, secondary studies randomized and controlled studies to forecast the future costs and national effects needs for treating cardiovascular disease from the year 2010 – 2030.			CVD is responsible for 17% of national health care expenditures and expected to increase as the population ages. By 2030 – 40.5% of the US population is predicted to have some form of CVD. People >65 years of age is determined to have a higher prevalence of CVD, and this population segment is expected to grow significantly over the next two decades. Between the years of 2010-2030, projected healthcare costs for treating CVD is forecasted to triple from $273 billion/year to $818 billion/year. Indirect costs such as lost wages due to CVD disease is projected to increase by 61% (from $172 billion in 2010 to $276 billion in 2030.
Shaw, L., Bugiardini, R. & Merz, N. (2009). Women and Ischemic Heart Disease. *Journal of the American College of Cardiology, 54*(17): 1561-1575.	This study was a cross-sectional design conducted to evaluate the authors given hypothesis that women experience more adverse outcomes compared with men in the treatment of CAD because obstructive CAD remains the current focus of therapeutic strategies.			Cardiac death remains the leading cause of death in women of all ages. Women have less anatomical obstructive CAD yet greater rates of myocardial ischemia and mortality compared with similarly aged males. Contributing factors to higher female ischemic cardiac rates include abnormal coronary reactivity, microvascularization dysfunction, and plaque erosion, and distal microembolization . A greater proportion of women die from sudden cardiac death prior to arrival at the hospital (52%

				compared with 42% of men).
				More than 80% of midlife women have 1 or more traditional cardiac risk factors.
				Over half of symptomatic women without obstructive CAD continue to have symptoms and undergo multiple hospitalizations and testing which result in diagnostic and therapeutic uncertainty.
Gleeson, D. & Crabbe, D. (2009). Emerging Concepts in Cardiovascular Disease Risk Assessment: Where do Women Fit In? *American Academy of Nurse Practitioners, 21,* 480-487.	The purpose of this review of literature was to determine and highlight the limitations in the assessment of women and discuss the current information in the process of assessment of risk factors in the female patient population, the pitfalls of these processes and the role these risk factors play in CVD.			Use of oral contraceptives in conjunction with smoking is associated with a significant risk of developing thrombosis and CVD complications. The mortality among males with diabetes is twofold higher, and fourfold higher than the general population for CV illness. Women have a one in six chance of developing heart failure from hypertension etiology while men have a one in nine chance. Women have been observed to have more tendencies towards diastolic heart failure as opposed to systolic heart failure.
Douglas, P. & Poppas, A. (2012). Determinants and Management of Cardiovascular Risk in Women. *UpToDate.* Retrieved January 12, 2013 from www.uptodate.com	Literature review to identify the clinical presentation of heart disease and diagnostic testing considering gender differences.			Women with CHD are generally about 10 years older than men at the time of presentation which carries a greater burden of risk factors. Women are less likely than men to have typical angina (28% verses 55%) Silent myocardial infarctions were illustrated to be significantly higher in younger women than men (42% verses 30.7%). Incidence was noted to be higher in younger women then older women (41% verses 24%) A higher fraction of sudden deaths in women verses men occurred in the absence of prior CHD (63% verses 44%) Many of the diagnostic testing statistics were considered by the authors to be less than accurate due to

				the underrepresentation by women as well as the older age of then women who were included.
Tamis-Holland, J., Lu, J., Bittner, V., Magee, M, Lopes, N., Adler, D., et al. (2011). Sex, Clinical Symptoms, and Angiographic Findings in Patients With Diabetes Mellitus and Coronary Artery Disease (from the Bypass Angioplasty Revascularization Investigation [BARI] 2Diabetes Trial). *American Journal of Cardiology, 107,* 980-985.	This study was of observational design of the results concerning the BARI (2D) study. The purpose of this study was to determine the relationship between symptoms and extent of CAD in patients with type 2 diabetes mellitus and known CAD enrolled in the Bypass Angioplasty Revascularization Investigation 2 Diabetes trial.	2,368 patients from 49 clinical sites were enrolled over a period of 50 months. Inclusion criteria was type 2 DM, documented CAD involving >1 coronary vessel treatable and no previous cardiovascular treatment interventions or documented or known kidney disease.	Baseline angiographies were assessed locally at clinical sites and sent to centralized core laboratory where it is analyzed for use in this study. Interpretation for inclusions in the study excluded 546 patients who were determined to not meet criteria.	Of the remaining 1,775 patients examined, 533 were women (representing 30% of total population inclusion). Women had less severe and significant CAD and less likely to have severe disease on coronary arteriogram as defined by multiple diseased LV regions (women vs men 0.59, p <0.0001) Women vs men with significant occluded lesions on angiography 29% vs 42%, p<0.001, Atypical symptomatic presentation: atypical angina 71% vs 58% p<0.001, Nausea 24% vs 11% p<0.001
Worrall-Carter, L., Ski, C., Scruth, E., Campbell, M. & Page, K. (2011). Systematic Review of Cardiovascular Disease in Women: Assessing the Risk. *Nursing Health and Sciences, 13,* 529.535.	Systemic review using primary, secondary randomized and controlled studies The purpose of the review was to examine the cardiovascular disease risk in women to increase awareness of sex specific symptoms presentation, and risk factors to improve clinical outcomes.	Women >18 years of age with at least one newly diagnosed or existing cardiovascular risk factor		INTERHEART study identified highest risk factors for myocardial infarction in women as diabetes mellitus and hypertension. It also identified hypertriglyceridemia as a known independent risk factor in women. Smoking was associated with a greater risk of AMI among women <45 years of age. The INTERHEART study concluded that 29% of AMI were a byproduct of smoking. DM was identified as having the greatest sex difference for developing CVD. Women with diabetes had a 3-4 fold increased risk of developing CVD. Most CVD risks in women are modifiable. A study by the Nurses Health Study concluded that women were able to decrease their risk of developing CVD by eliminating their modifiable risk factors and maintaining a moderate healthy lifestyle. Women we underrepresented in CVD prevention and treatment trails or sex differences were not accounted for. The mean percentage of women enrolled in these trials was 30% while only one-third of

				trials reported results by gender. This leads to treatment recommendations tailored towards results from a predominantly male population.
Matthew, K., Crawford, S., Chae, C., Everson-Rose, S., Sowers, M., Sternfield, B., et al. (2009) Are Changes in Cardiovascular Disease Risk Factors in Midlife Women Due to Chronological Aging or Menopausal Transition? *Journal of the American College of Cardiology, 54*(25), 2366-2373.	Longitudinal study over a timeframe of 10 years to examine whether changes in traditional and oval coronary heart disease risk factors are greater within a year of the final menstrual period, relative changes that occur before or after that interval, in a multiethnic cohort.	1054 women who had their FMP by the end of 9 years of follow up in SWAN (a longitudinal multisite, community based study)	The SWAN participants were questioned annually about health, lifestyle, and psychological factors. Anthropometric measurements and fasting blood draws were obtained at early follicular phase of the menstrual cycle at specific time intervals to allow a standardized hormonal milieu. The groups were divided into three time periods relative to FMP and the analytic sample was compared using chi-square and *t* tests.	Increases in total cholesterol and LDL were substantial around time of FMP No difference was noted within ethnicity and these changes only in baseline weight measurements The analysis shows no influence of FMP on blood pressure, insulin, glucose or inflammatory factors
Miller,V. & Best, P. (2009). Sex Differences in Cardiovascular Disease. *Cardiovascular Disease, 9*(3): 21-28.	Exploratory design intent on building groundwork of understanding the gender specific pathophysiology of cardiovascular disease in order to construct a risk assessment and treatment course tailored for women.		Effects of sex steroids on the factors contributing to cardiovascular disease were reviewed. Determine the participation rate in women in ongoing studies of CVD and how the representation of women are adequately or inadequate in current ongoing research.	The proposed hypothesis shows validated assessment tool specific for women which incorporates information and history about pregnancy, reproductive history, and hormone exposure, might improve cardiovascular risk stratification for targeting early intervention in women as they age. CVD falls into 3 general categories with regard to sex disparity: 1) conditions unique to one sex, 2) conditions which occur in both sexes but have unique presentations in each sex, 3) those which have disparate prevalence rates yet occur in both genders. Sex steroids affect all components of the vascular wall, heart, as well as blood elements which come in contact with luminal surfaces.
Finks, S. (2010). Cardiovascular Disease in Women. *Cardiology, 7*, 179-199.	The design of this study is of action research design. The purpose of this research was using both literature review, applying evidence based treatment guidelines and designing an optimal treatment options.			An estimated 66,000 more women than men die after acute myocardial infarction and intervention. Women also experience a higher mortality rate and poorer outcomes then men. Inflammatory markers indicating risk for CVD such as C-reactive protein

				(hsCRP) are higher at baseline in women than men. Women with diabetes are 3-7 times more at risk for developing or dying of CVD then women without diabetes. Premenopausal women have lower LDL and higher HDL levels then men whereas postmenopausal women experience elevated levels of LDL cholesterol and HDL levels continue to decline. A meta-analysis revealed a 37% increased risk of CVD events in women with higher concentrations of triglycerides then that in men which showed a 14% increased risk. Hypertension in women is associated with a 2.5 higher risk of cardiovascular death, MI, stroke and heart failure in women compared to a 1.6 increased risk in men with the same hypertension parameters.
Mosca, L., Manson, J., Sutherland, S., Langer, R., Manolio, T., & Barrett-Conner, E. (2009). Cardiovascular Disease in Women : A Statement for Healthcare Professionals From the American Heart Association. *Circulation*. Retrieved March 17, 2013 from www.circ.ahajournals.org/content/96/7/2468.full	Cross-sectional design study conducted to determine the public awareness and knowledge of CVD as well as risk factor awareness as well as primary, secondary and tertiary prevention strategies.		Descriptive statistics of respondents characteristics, awareness, and preventative barriers were conducted to present the findings in relations to population proportions	In evaluation of knowledge and awareness of leading cause of death among women, 55% correctly identified heart disease as the leading cause of death compared to 30% in 1997. 81% answered they had read, seen, or heard information regarding heart disease in the past 12 months. Tobacco use is attributed to 50% of myocardial infarctions among middle aged women. Approximately half of all deaths in persons with non-insulin dependent diabetes mellitus are due to heart disease. Hormone replacement therapy may indicate false ST depression. A meta analysis demonstrated a reduction of a second vascular event of 25 % by using aspirin therapy. Lipid lowering therapy provides beneficial therapy

				in women by decreasing hyperlipidemia and reducing mortality of women with CHD by >50%. Women were found to be less likely to enroll in rehabilitation then men (6.9% vs 13.3%) Women were less likely to undergo bypass surgery (20.4% vs 24.6%) then men. Incidence of stroke is higher in men (19%) then women, although women are more likely to die from a vascular occurrence (16% vs 8%).
Walsh, J. & Pignone, M. (2004). Drug Treatment of Hyperlipidemia in Women. *American Medical Association, 291,(18);* 2243-2252.	Literature review including 13 studies Studies that including gender differences, treatment duration of at least a year,	6 trials included 11435 women without CVD and using lipid lowering medications 8 trials included 8272 women with CVD and assessed the effects of lipid lowering medications	MEDLINE database was used Inclusions were 1) randomized clinical trials of outpatients with or without CVD, 2) treatment duration of at least a year, 3) classified the study as either primary (without prior CVD) or secondary (known CVD), 4) Provided data on women and the effect of lipid-lowing drug therapy	Use of lipid-lowering medications in women without CVD, there was a possible reduction in CHD events (RR, 0.80; 95% CI, 0.71 – 0.91) but not mortality. (RR, 0.95; 95%CI, 0.62 – 1.46) In women with known CVD or at high risk, use of antihyperlipidemia medications showed a reduction in CHD events and CHD associated mortality. (RR 0.74;95% CI, 0.62-1.68)
Xhyheri, B. & Bugiardini, R. (2010). Diagnosis and Treatment of Heart Disease; Are Women Different From Men? *Progress in Cardiovascular Disease, 53,* 227-236.	Literature review design which reviews current diagnostic and treatment options in reference to gender differences.			Aspirin therapy for CVD affects women differently than men. While it is more effective in preventing an MI in men (32%), it is more beneficial in preventing a stroke in women (17%). There is a lower level of preventative treatment of therapy in use of statins in women than men. Although the available literature concerning the use of ACE inhibitors in women in minimal, the research that is available shows a lower rate of effectiveness in women (22%) then men (37%) concerning recovery from a MI and treatment for CHF. The benefit of the use concerning clopidogrel in treatment following a CVD event was lower in women (7%) then in men (16%) while the risk of bleeding from the use of clopidogrel was greater in women (43%) then in men (22%)

				The benefits of B-blockers were shown in some trials to be more effective in women (31%) then in men (5%)
Ahmed, W., Tully, P., Knight, J. & Baker, R. (2011). Female Sex as an Independent Predictor of Morbidity and Survival After Isolated Coronary Artery Bypass Grafting. The Annuls of Thoracic Surgery, 92(1); 59-67.	Case study design that sought to determine whether female sex was an independent risk factor for combined in-hospital morbidity, mortality, and long term survival after coronary artery bypass grafting (CABG).	Data was collected for 1,114 women and 3,628 men who underwent coronary bypass grafting between January 1 1996 and December 31 2004 with a median follow up of 7.9 years.	Surgical coronary artery bypass grafting and in hospital rehabilitation	The female sex was associated with being an increased risk factor in undergoing a CABG (adjusted odds ratio 1.29; 95% CI, 1.04 to 1.59, p = 0.02). Adjusted survival mode showed female sex was associated with cardiac mortality (hazard ratio 1.28; 95% CI, 0.96 to 1.73; p = 0.10) Females were older with lower body surface area and more significant comorbid conditions then did males (p<0.05)

Classification of Coronary Artery Disease

TABLE 1. Classification of CAD risk in women

Risk Status	Criteria
High risk (≥1 high-risk state)	• Clinically manifest CHD • Clinically manifest cerebrovascular disease • Clinically manifest peripheral arterial disease • Abdominal aortic aneurysm • End-stage or chronic kidney disease • Diabetes mellitus • 10-year predicted CAD risk >10%
At risk (>1 risk factor)	• Cigarette smoking • SBP >120 mm Hg, DBP >80 mm Hg, or treated hypertension • Total cholesterol >200 mg/dl, HDL-C <50 mg/dl, or treated for dyslipidemia • Obesity, particularly central adiposity • Poor diet • Physical inactivity • Family history of premature CAD occurring in first-degree relatives in men <55 years of age or in women <65 years of age • Metabolic syndrome • Evidence of advanced subclinical atherosclerosis (e.g., coronary calcification, carotid plaque, or thickened IMT) • Poor exercise capacity on treadmill test and/or abnormal heart rate recovery after stopping exercise • Systemic autoimmune collagen-vascular disease (e.g., lupus or rheumatoid arthritis) • History of pre-eclampsia, gestational diabetes, or pregnancy-induced hypertension
Ideal coronary artery health (all of these)	• Total cholesterol <200 mg/dl (untreated) • BP <120/<80 mm Hg (untreated) • Fasting blood glucose <100 mg/dl (untreated) • Body mass index <25 kg/m^2 • Abstinence from smoking • Healthy (DASH-like) diet

CAD, coronary artery disease; CHD, coronary heart disease; DASH, Dietary Approaches to Stop Hypertension; DBP, diastolic blood pressure; HDL-C, high-density lipoprotein cholesterol; IMT, intima-media thickness; SBP, systolic blood pressure.
Adapted, with permission, from Mosca et al. [27].

Sharma, K., & Gulati, M. (2013). Coronary artery disease in women: A 2013

Update. *http://world-heart-federation.org/fileadmin/user_upload/images/grfw-*

material/CADwomen.pdf

Heart and Coronary Artery Figure

Figure A is an overview of a heart and coronary artery showing damage (dead heart muscle) caused by a heart attack. Figure B is a cross-section of the coronary artery with plaque buildup and a blood clot resulting from plaque rupture.
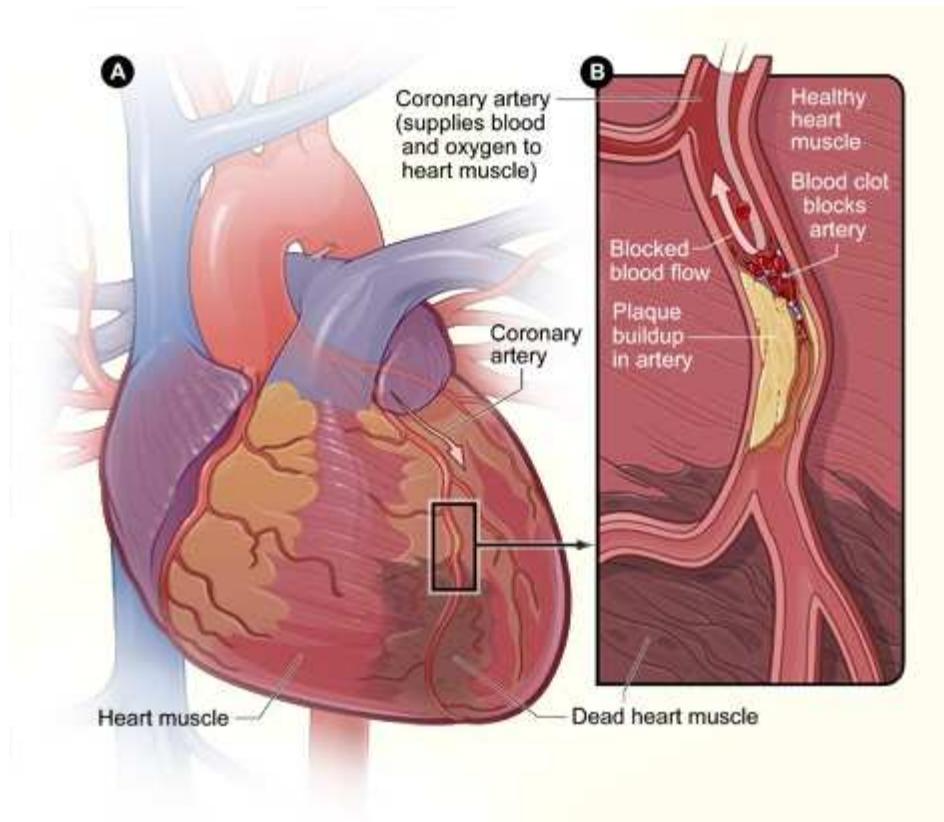
National Heart, Lung, and Blood Institute (2014). How does heart disease affect women?

http://www.nhlbi.nih.gov/sites/www.nhlbi.nih.gov/files/images_256

References

American Heart Association Go Red for Women (2016). Gender and heart disease.

Retrieved from http://www.goredforwomen.org

Anderson, P., & Vega, C.P. (2014). Updated guidelines available for primary prevention

of stroke. Medscape Nurses. Retrieved from http://www.medscape.org

Aziz, F. (2014). Coronary artery disease in women: An unsolved dilemma. Journal of

Clinical Medicine Research 6(2), 86-90. doi:dx.doi.org/10.14740/j0emr172500

CardioSmart (2016). Few women counseled about their risk for heart disease. *American

College of Cardiology*. Retrieved from http://cardiosmart.org

Centers for Disease Control and Prevention (2015a). Division for heart disease and stroke

prevention. Women and heart diseases fact sheet. Retrieved from

http://www.cdc.gov

Centers for Disease Control and Prevention (2013). Morbidity and mortality weekly

report. *Supplement 62*(3), 1-184. Retrieved from http://www.cdc.gov

Centers for Disease Control and Prevention (2015b). LDL and HDL: Bad and good

cholesterol. Retrieved from http://www.cdc.gov

Centers for Disease Control and Prevention (2016). Women and heart disease fact sheet.

Retrieved from http://www.cdc.gov

Cleveland Clinic (2016). Center for functional medicine. Retrieved from

http://my.clevelandclinic.org./services/center-for-functional-medicine

Cleveland Clinic (2016). Risk assessment tool. Retrieved from

http://my.clevelandclinic.org

Exum, K.S. (2013). Cardiovascular disease in women: The differences in genders. Southern Adventist University. Retrieved from http://knowledge.e.southern.edu

Framingham Heart Study a project of the National Heart, Lung, and Blood Institute and Boston University (2015). History of the Framingham Heart Study. Retrieved from http://www.framinghamheartstudy.org

Havranek, E.P., Mujahid, M.S., Barr, D.A., Blair, I.V., Cotton, M.S., Cruz-Flores, S., … Yancy, C.W. (2015). Social determinants of risk and outcomes for cardiovascular disease. *Circulation 132*(9). Retrieved from http://circ.ahajournals.org

Health IT (2014). What is an electronic medical record (EMR)? Retrieved from http://www.healthit.gov

Heidenreich, P.H., Trogdon, J., Khanjou, O., Butler, J., Dracup, K., Ezekowitz, M., et al (2011). Forecasting the future of cardiovascular disease in the United States. A policy statement from the American Heart Association. *Circulation 123*, 933-944. doi: 10.1161/CIR.0b013e31820a55f5

Jouria, J. (2015). Chapter 2: Cardiovascular diseases: The leading cause of death in women. Elite Continuing Education. Ormond Beach, Fl. Retrieved from http://nursing.elitecme.com

Labbe, E., Blanquet, M., Gerbaud, L., Poirier, G., Sass, C., Vendittelli, F., & Moulin, J.J. (2015). European Journal of Public Health 25(4), 604-9. doi: 10.1093/eurpub/cku231.

Maas, A.H.E.M., & Appelman, Y.E.A. (2010). Gender differences in coronary heart

　　disease. *Netherlands Heart Journal 18*(12), 598-602. Retrieved from

　　http://www.ncbi.nlm.nlh.gov/pmc/articles/pmc3018605/

Medicine Net (2016). Definition of systolic. Retrieved from

　　http://www.medicinenet.com

Mercuro, G., Deidda, M., Piras, A., Dessalvi, C.C., Maffeis, S., & Rosano, G.M. (2010).

　　Gender determinants of cardiovascular risk factors and diseases. *Journal of*

　　Cardiovascular Medicine (Hagerstown) 11(3), 207-20. doi:

　　10.2459/JCM.0b013e32833178ed

National Heart, Lung, and Blood Institute (2014). How does heart disease affect women?

　　Retrieved from http:// www.nhlbi.nih.gov/health/health-topics/topics/hdw

National Heart, Lung, and Blood Institute (2015). Risk assessment tool for estimating

　　your 10-year risk of having a heart attack. Retrieved from

　　http://cvdrisk.nhlbi.nih.gov

National Institute of Health (2015). Protecting human research participants training

　　course. Retrieved from http://hrp.nihtraining.com

National Heart, Lung, and Blood Institute (2016). Description of the Dash eating plan.

　　Retrieved from http://www.nhlbi.nih.gov

National Heart, Lung, and Blood Institute (2016). What is coronary heart disease?

　　Retrieved from http://nhlbi.nih.gov

Parvan, K., Zamanzadih, V., Dizaji, S.L., Shabestari, M.M., & Safaie, N. (2013).

    Patient's perception of stressors associated with coronary artery bypass surgery.

    Journal of Cardiovascular and Thoracic Research 5(3), 1-122. Retrieved from

    http://www.ncbi.nlm.nih.gov

Princeton Longevity Center (2016). Personalized preventive & executive health exams.

    Retrieved from http://www.princetonlongevitycenter.com

Simova, I. (2015). Intima-media thickness: Appropriate evaluation and proper

    measurement described. *European Society of Cardiology 13*(21), 1-18. Retrieved

    from http://www.escardio.org

Tiffin, C. (2012). Beyond the bedside: The changing role of today's nurses. Retrieved

    from http://www.huffingtonpost.com

The Association of Faculties of Medicine of Canada primer on population health. A

    virtual textbook on public health concepts for clinicians (2015). Part 1-thinking

    about health chapter 4: Basic concepts on prevention surveillance, and health

    promotion. Retrieved from http://phprimer.afmc.ca

United States Census (2015). What we do. Retrieved from http://www.census.gov

United States Department of Labor (2015). Bureau of labor statistics: Labor force

    statistics from the current population survey. Retrieved from http://www.bls.gov

University of Southampton School of Geography (2008). Geographical referencing

    learning resources Townsend Deprivation Index. Retrieved from

    http://www.geog.soton.ac.uk

Valenzuela, D., & Shrivastava, P. (2008). [PDF] Interview as a method for qualitative

research. Arizona State University. Retrieved from

http://www.public.asu.edu/~Kroel/.../Interview %20Fri

Wenger, N.K. (2012). Women and coronary heart disease a century after Herrick.

Understudied, underdiagnosed, and undertreated. *Circulation 126*, 604-611. doi :

10.1161CIRCULATIONAHA.111.086892

Willams, H., Bigby, M., Diepgen, T., Herxheimer, A., Naldi, L., & Rzany, B. (2009).

Evidence-based dermatology. John Wiley & Sons. Retrieved from

http://books.google.com/bookss?isbn