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Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States

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Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with
Diabetes in a Rural Community in Southeastern United States

by

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Abstract

Diabetes and heart disease are chronic illnesses affecting many lives in the United States.

Both diseases have complications, and when coupled together, the mortality rate and risk

of complications increase. Heart disease is the leading cause of death in most countries

across the world, and the majority of individuals diagnosed with diabetes die of a heart

disease complication. Literature review reveals a plethora of research regarding the

relationship between diabetes and heart disease, but limited research was found regarding

health disparities with diabetes and heart disease awareness. No research was found

assessing the knowledge base regarding diabetes and heart disease among the uninsured

and insured populations. This research study tested the following hypothesis: The

knowledge of major risk factors for the development of cardiovascular disease among

uninsured diabetics is less than the knowledge of those risk factors in individuals who are

insured. A descriptive survey, guided by Nola Pender's Health Promotion Model and

utilizing the Heart Disease Fact Questionnaire, was conducted using a convenience

sample of uninsured and insured persons with Type 2 diabetes. The results indicated that

the uninsured population had higher scores on the questionnaire, but there was no

statistically significant difference in the knowledge level of heart disease between the two

groups. The implications for this study have the potential to render further research in

nursing regarding diabetes, heart disease, and health disparities.

Keywords: diabetes, heart disease, uninsured, insured

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TABLE OF CONTENTS

List of Figures

List of Tables

CHAPTER I

Introduction

Statement of Problem

With the emergence of the Affordable Care Act, health care in the United States

(US) has changed. Health insurance is now available to individuals who previously did

not have it, and healthcare organizations are now reimbursed based on quality outcomes

(Shoemaker, 2011). Chronic disease management is now essential to improving the

health of communities across the country, as well as financial survival of hospitals and

other providers. Two significant chronic diseases in the United States are diabetes and

cardiovascular disease. Diabetes affects approximately 24 million people in the United

States (Zhao et al., 2014). Cardiovascular disease is the leading cause of death in most

countries across the world (Jones & Greene, 2013). Many studies regarding diabetes

have focused on cardiovascular disease (Preis et al., 2013). This is largely due to the fact

that more than 70% of Type 2 diabetics die of cardiovascular disease (Zhao et al., 2014).

It has been consistently shown in various studies that people with diabetes are more likely

to develop cardiovascular disease, and their heart disease is more extensive than other

individuals with heart disease who are not diabetic (Wagner, Lacey, Chyun, & Abbott,

2004). This information suggests that education on heart disease, how to prevent it and

how to manage it, is imperative for individuals with diabetes.

Purpose of the Study

The purpose of this research study, Knowledge of the Risks of Heart Disease in

Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern

United States, was to first determine the knowledge of cardiovascular disease risk factors

among both groups, and secondly, determine if there was a difference in the knowledge level of the two groups. Disease management programs are being implemented among healthcare organizations across the world to impact chronic illnesses and reduce cost (Bruin, Heijink, Lemmens, Struijs, & Baan, 2011). Many studies have been identified exploring diabetes, heart disease, and the relationship between the two. The findings may give insight into the need for a disease management program focusing on education of cardiovascular disease risk factors for the two populations, or if heart disease education should be incorporated into routine diabetes education.

Background and Need

The need for an examination of the knowledge of cardiovascular disease risk factors among diabetics was identified based on the awareness of the increased risk of heart disease for diabetics. Improving community health is a strategic initiative and focus for many healthcare organizations. Because diabetes and heart disease are major health problems across the country, exploring the knowledge of risk factors among the diabetic population in the community could lead to effective health promotion and prevention programs. Self–management and education are critical elements for individuals with diabetes, and are necessary to prevent and manage complications of the disease. In 2012, a national survey revealed that only 15% of the diabetics in the US below the age of 65 were uninsured (Casagrande & Cowie, 2012). This small portion of the diabetic population can potentially cost healthcare more than the entire population together if complications develop. Uninsured people with diabetes are six times more likely to not have needed healthcare than those who are insured, and lack of health insurance is a barrier to receiving routine, preventive care (Casagrande & Cowie, 2012). According to

Zhuo, Zhang, and Hoerger (2013), the one-time cost of cardiac arrest or a myocardial infarction in a person with diabetes is estimated at $42,662. These facts further indicate the need to examine the knowledge of heart disease risk factors among diabetics and identify any disparities and needed education in the community.

Conceptual Framework

Nola Pender's Health Promotion Model was used as the framework for this study. The model focuses on explaining health promoting behaviors using a wellness orientation (Polit & Beck, 2012). According to this framework, health promotion is comprised of activities directed toward developing resources that maintain or enhance a person's well-being (Polit & Beck, 2012). Pender's model is based on competence as opposed to fear or threat as a source of motivation for health promotion (Pender, Murdaugh, & Parsons, 2006). This model focuses on health promotion and is used widely in the community health setting. According to Pender, if a person perceives the benefit of an action, he or she is more likely to engage in that action. One assumption of Pender's Health Promotion Model is that individuals have the capacity for reflective self-awareness, and they can assess their own competencies (Pender, Murdaugh, & Parsons, 2002). Pender's model focuses on three main areas. Those areas are as follows: individual characteristics and experiences; behavior-specific cognitions and affect; and behavior outcomes (Pender, et al., 2002). The theory also has four main assumptions. Those assumptions are as follows: individuals seek to actively regulate their own behavior; individuals interact with their environment to transform it and themselves over time; health professionals make up a part of the interpersonal environment, causing influence on persons throughout their lifespan; and self-initiated change is essential to behavior changes (Pender et al., 2002).

This study is linked to the model's three main ideas and the assumption that health professionals constitute a part of the interpersonal environment creating influence during a patient's lifespan (Figure 1). Individual characteristics and experiences are essential to identifying if there is a difference in the knowledge level of uninsured and insured diabetics. Behavior-specific cognitions and effect involve a logical process of collecting data to analyze if further interventions are needed. This was done by using the Heart Disease Fact Questionnaire to assess knowledge of the two sample populations. Lastly, assessment of findings will promote health and self-efficacy, which lead to improved community health. Assessing the knowledge of heart disease risk factors among uninsured and insured persons with diabetes enabled an assessment of the competencies of both populations regarding their disease process, and it also gave insight to any health disparities needing further evaluation in the community. Pender's model may be used to develop health promotion activities for this community.

CTE Diagram

Nola Pender's Health Promotion Model

<u>Main Areas/Concepts</u>

Individual characteristics
and experiences

Behavior specific
cognitions and affect

Behavioral
outcome

Individual demographics
of patients and their
background as collected
by the nurse

Nurse assessment and
interventions assist
perceived benefit,
self-efficacy and health
promotion

Information collected from
assessment tools regarding knowledge of
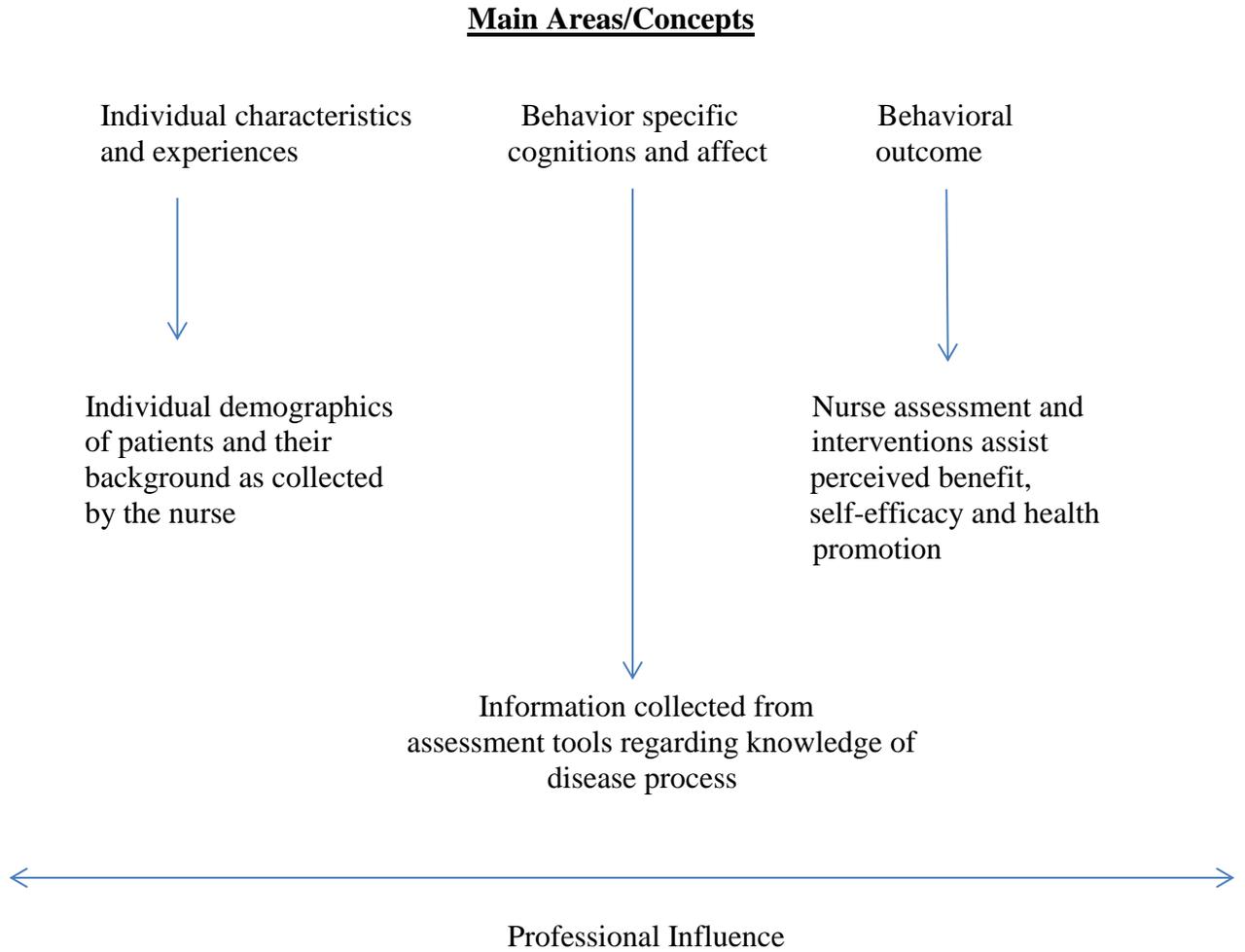disease process

Professional Influence

Figure 1. CTE Diagram, Nola Pender's Health Promotion Model

Hypothesis

The hypothesis for this research study was as follows: The knowledge of major risk factors for the development of cardiovascular disease among uninsured diabetics is less than the knowledge of those risk factors in individuals who are insured.

Research Question

The research question for this study was the following: Is there a difference in the knowledge of major risk factors for the development of cardiovascular disease among uninsured diabetics and insured diabetics?

Summary

This research study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, is relevant and significant to the nursing profession. Gaining knowledge of health disparities and needed diabetes education has implications for clinical nursing. The results will give clinical nurses insight into any changes needed in diabetes education, and if a specific population requires more attention in regard to knowledge of heart disease. Nola Pender's Health Promotion Model provided a framework to increase self-awareness of two chronic diseases and their relationship to each other.

CHAPTER II

Literature Review

Diabetes and heart disease are two leading chronic diseases in the United States. Persons with diabetes are at an increased risk of developing heart disease. This research study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, was conducted to examine if there was a difference in the awareness of heart disease risks in uninsured and insured persons with Type 2 Diabetes.

Review of the Literature

A literature review was conducted initially to establish what research had already been done concerning diabetes and cardiovascular disease risk factors. The limits placed on the search were peer-reviewed journals, English language, and a ten year time span (2004-2014). The Cumulative Index for Nursing and Allied Health Literature (CINAHL) database was used to complete the literature review. The search was initially generated for articles containing diabetes and heart disease. Due to the excessive amount of articles generated, the search was subdivided into the following categories; Diabetes and Heart Disease Risk Factors, Diabetes and Uninsured, and Diabetes and Insured.

Diabetes and Heart Disease Risk Factors

Zhao et al. (2014) conducted a quantitative study to determine if there was an association between glucose lowering and coronary heart disease risk among persons with diabetes, and the mean follow-up was six years. In this study, Hemoglobin A1c levels were compared at baseline and during follow up among 17,510 African Americans and 12,592 Caucasian patients (Zhao et al., 2014). The results of the study identified that

each one percentage increase of Hemoglobin A1c was associated with a greater increase in coronary heart disease in both populations (Zhao et al., 2014). The study concluded that there was a graded positive association between Hemoglobin A1c at baseline and during follow-up with coronary heart disease risk (Zhao et al., 2014). A limitation of the study was cited as lacking a representative sample of the entire population (Zhao et al., 2014). The participants received healthcare from a public hospital, so the study did have implications for low income individuals (Zhao et al., 2014).

Wong, Patao, Malik, and Iloeje (2014) conducted a study to examine the potential impact of heart disease risk factor control within persons with diabetes in the United States. The risk factors were smoking, Hemoglobin A1c levels, blood pressure, total cholesterol, and high-density lipoprotein cholesterol levels (Wong et al., 2014). The participants were all adults 30 years or older with Type 2 diabetes, and they were also diagnosed with diabetes at 30 years or older. The participants were obtained using the cross-sectional National Health and Nutrition Examination Survey from 2007-2012 (Wong et al., 2014). The participants were restricted to only individuals with available demographics for age, gender, blood pressure, Hemoglobin A1c, high-density lipoprotein levels, and triglyceride levels (Wong et al., 2014). The participants also did not have a history of any known cardiovascular disease (Wong et al., 2014). The study utilized the United Kingdom Prospective Diabetes Study (UKPDS) Risk Engine to examine the impact of controlling smoking, Hemoglobin A1c, systolic blood pressure, total cholesterol, and high-density lipoprotein levels of individuals not already at controlled levels (Wong et al., 2014). Risk factor control was defined by three categories: All to goal, nominal control, and aggressive control (Wong, et al., 2014). All to goal was

defined as smoking cessation and all other risk factor levels to minimum goal levels as outlined by the American Diabetes Association (Wong et al., 2014). Nominal control was to stop smoking, reduce Hemoglobin A1c levels by 1%, reduce systolic blood pressure by 10%, a 10% reduction in high-density lipoprotein levels, and a 25% reduction in total cholesterol (Wong et al., 2014). Aggressive control was defined as smoking cessation, a 2% reduction in Hemoglobin A1c, a 20% reduction in systolic blood pressure, a 20% increase in high-density lipoprotein levels, and a 50% reduction in total cholesterol (Wong et. al, 2014). The study examined the statistical control impact of the three categories (Wong et. al, 2014). Preventable cardiovascular events were calculated by taking the difference between the numbers of estimated events from the number of events if the risk factors were controlled versus the levels presented at the beginning of the study (Wong et al., 2014). The results estimated that when controlling for all risk factors to goal levels, the 10-year heart disease risk was reduced from 16.5% to 10.2%, and this reduction would also decrease the number of cardiac related events among the population by 38.3% (Wong et al., 2014).

Researchers Patnaik, Pattnaik, Ghosh, Sahoo, and Sahu (2013) performed a hospital based cross sectional study to assess the awareness of diabetic patients about risk factors of coronary heart disease. The study was conducted over two months, and a convenience sample of 200 people with diabetes was used (Patnaik et al., 2013). All participants were 20 years of age or older, on a diabetes treatment regimen for at least three months, and did not have gestational diabetes or psychiatric disorders (Patnaik et al., 2013). The participants were given a pretested questionnaire, and a detailed clinical history was obtained (Patnaik et al., 2013). The questionnaire used was not identified.

After the results from the questionnaire were interpreted, it was concluded that only 24.5% of the patients had a fasting blood sugar less than 110 mg%, 66% were obese, and 41% had hypertension (Patnaik et al., 2013). Awareness of coronary heart disease risk factors was very low among this sample group. This was demonstrated in reporting that 68.5% of the population was not aware that having diabetes increased their risk of coronary heart disease, 55% did not know that regular exercise protected against cardiovascular disease development, and 46.5% were not aware that obesity increased the risk of cardiovascular disease (Patnaik et al., 2013).

Chyun et al. (2006) identified in their study that typical diabetes education focused solely on glucose control, and coronary heart disease prevention was lacking in primary care. Awareness of the association between glucose control and coronary heart disease risk reduction is needed to improve diabetes and heart disease risk factors, which in turn would reduce the burden of heart disease (Chyun et al., 2006). The purpose of this descriptive study was to describe attainment of glucose and coronary heart disease risk factor goals and to identify factors that were associated with successful goal achievement (Chyun et al., 2006). One hundred ten subjects with Type 2 diabetes were surveyed. Forty-five percent of the participants had Hemoglobin A1c levels greater than or equal to 7%, and 46%-79% of these participants were not meeting their goals for coronary heart disease risk reduction (Chyun et al., 2006). This percentage variation was due to a variety of individual factors and illness related factors (Chyun et al., 2006). Individual factors included younger age, personal beliefs regarding lifestyle changes, anxiety levels, and depression levels (Chyun et al., 2006). Illness related factors were associated with blood pressure and cholesterol levels, and if the participants were taking

certain medications, such as thiazide diuretics, which often worsen glycemic control (Chyun et al., 2006).

Knowledge of diabetes was assessed using the Diabetes Knowledge Test, a 21-item multiple choice questionnaire (Chyun et al., 2006). Knowledge of the risk of heart disease was measured using the Heart Disease Fact Questionnaire, a 25-item, true/false questionnaire designed for persons with diabetes (Chyun et al., 2006). Personal beliefs regarding lifestyle changes were assessed using the Personal Model Treatment Effectiveness Scale, a five-point Likert scale tool, with 11 items (Chyun et al., 2006). Anxiety was measured by the Crown-Crisp index, a 48-item self-rated scale, and depressive symptoms were measured using the Center for Epidemiologic Studies-Depression Scale (Chyun et al., 2006). This tool consists of 20 items, which are rated from zero to three according to frequency (Chyun et al., 2006).

The study concluded that knowledge of diabetes and knowledge of heart disease were not correlated with one another, which suggested that high levels of diabetes knowledge did not indicate high levels of coronary heart disease risk factor knowledge (Chyun et al., 2006). The researchers identified the need for further interventions to educate on the influences of heart disease risk reduction behaviors among diabetics in order to reduce the burden of coronary heart disease in the Type 2 diabetics (Chyun et al., 2006).

McCollum, Ellis, Morrato, and Sullivan (2006) conducted a retrospective study to estimate the national prevalence of heart disease risk factors among adults in the US with diabetes. Data from the Medical Expenditure Panel Survey from 2000 and 2002 was utilized in this study (McCollum et al., 2006). The authors noted that because the data

was obtained from a national survey, the results represented the US diabetic population

(McCollum et al., 2006). The results of this study revealed the prevalence of two or more

risk factors for heart disease was significantly higher for adults with diabetes than those

without diabetes (McCollum et al., 2006). The researchers concluded that healthcare

providers should educate persons with diabetes on the risks of heart disease and also

aggressively treat modifiable risk factors in order to prevent heart related complications

(McCollum et al., 2006).

Diabetes and Uninsured

From January 1, 2011 to April 1, 2012, a study in a volunteer-run free clinic for

uninsured patients was performed to assess whether Type 2 diabetes care for the

uninsured was comparable to care provided to insured persons with diabetes (Eldakroury,

Olivera, Bicki, Martin, & De Groot, 2013). The researchers utilized a retrospective chart

review, and the sample size consisted of 33 active patients with diabetes (Eldakroury et

al., 2013). The values recorded were Hemoglobin A1c, blood pressure, fasting lipid

panel, body mass index (BMI), urine microalbumin, and creatinine levels. The results

were then compared to the results from six similar studies that used insured persons with

diabetes as the sample population (Eldakroury et al., 2013). The results revealed that

hypertension control in this uninsured group was comparable to the studies involving the

insured, but cholesterol levels in the uninsured were better than the results from the

insured population (Eldakroury et al., 2013). The average Hemoglobin A1c was 8.4,

which was lower than some of the compared studies, and frequency of appointments was

within the range of the other studies (Eldakroury et al., 2013). Podiatry and

ophthalmology referrals were not within the recommended range (Eldakroury et al.,

2013). The study concluded that free clinics can provide quality diabetes management to the uninsured, and effective management of the disease can reduce the risk of diabetes-related morbidity and mortality (Eldakroury et al., 2013). The researchers also recognized that a limitation of the study was small population size, and named this as a barrier to assessing any major differences between the clinic care and comparators (Eldakroury et al., 2013).

Belue, Figaro, Peterson, Wilds, and William (2013) performed a study to evaluate the effectiveness of a diabetes management program at a Federally Qualified Community Health Center (FQCHC) for uninsured patients. A two year program was implemented which offered uninsured diabetics a comprehensive management program to include support in nutrition education, exercise, counseling, podiatry, ophthalmology, dental, and prescription services (Belue et al., 2013). The goal of the program was to reduce Hemoglobin A1c levels by 5% from baseline and to achieve levels less than 7% (Belue et al., 2013). All participants were uninsured for at least 20 months prior to the beginning of the study, and the services of the program were explained to all willing participants who met the criteria (Belue et al., 2013). "Descriptive statistics were used to assess demographic and health service utilization variables. *T*- Tests were conducted to assess relationships between Hemoglobin A1c and service utilization" (Belue et al., 2013, p. 5). One hundred eighty-nine patients participated in the study, and the results were as follows: 14% received dental services, 27% received podiatry services, 62% received needed diabetic medications, 15% exercised, and only 28% ended the program with a hemoglobin A1c less than 7%, which was a decrease from the 38% who were controlled at the beginning of the program (Belue et al., 2013). Factors cited as reasons for

intervention failure were the needs and the relative geographic transience of low socioeconomic status individuals and lack of additional services (Belue et al., 2013). The study concluded that the uninsured population had several barriers that prevented diabetes control, despite a comprehensive management program. Among those barriers, low income, lack of resources, and overall poor health were cited (Belue et al., 2013).

Researchers Shaw, Killeen, Sullivan, and Bowman (2011) examined the accessibility, availability, and quality of diabetes self-management education for uninsured and underinsured adults. This study utilized a descriptive needs assessment by conducting face-to-face interviews with 22 healthcare providers (Shaw et al., 2011). The study revealed that of the uninsured population, only 4% received the American Diabetes Association's standards of care from their healthcare providers, and the uninsured did not receive an adequate amount of education needed for successful diabetes self-management (Shaw et al., 2011).

McWilliams, Meara, Zaslavsky, and Ayanian (2007) analyzed data from the Health and Retirement Study to compare Medicare spending for beneficiaries 65 to 74 years of age who were previously insured with those who were not insured prior to receiving Medicare. After the results were analyzed, it was relayed that Medicare spending was significantly higher for patients who did not have insurance prior to receiving Medicare than for those who were privately insured before qualifying for Medicare (McWilliams et al., 2007). Likewise, inpatient spending after receiving Medicare was greater for those previously uninsured patients with a diagnosis of heart disease and diabetes (McWilliams et al., 2007). This study suggested that providing insurance coverage to individuals prior to reaching the required age for Medicare may

reduce healthcare costs by preventing complications from chronic diseases that develop in younger years due to lack of medical care.

Diabetes and Insured

Casagrande and Cowie (2012) used results from the National Health and Nutrition Examination Survey, a cross-sectional interview conducted annually in the US since 1957, to compare health insurance coverage and type of coverage for adults with and without diabetes. The results reported that 85% of diabetics age 18-64 had health insurance, and 100% of people with diabetes age 65 and over had health insurance. Of those adults less than 65 years old, 13.6% had Medicare, 58.3% had private insurance, 19.4% had Medicaid, and 4.0% had military benefits (Casagrande & Cowie, 2012). This study did not elaborate on any trends other than insurance coverage. At the time of this study, uninsured diabetics age 18-64 represented two million adults, approximately 5% of the total uninsured population (Casagrande & Cowie, 2012). This number poses a financial burden on healthcare due to the cost of diabetes care (Casagrande & Cowie, 2012). The authors concluded that since persons with diabetes need routine care to prevent serious illness, lack of health insurance for this population is a vast public health concern (Casagrande & Cowie, 2012).

Gregg et al. (2010) conducted a multicenter longitudinal study to examine the frequency and correlates of long-term gaps in diabetes care among insured patients. The gaps were defined as persistent failure to seek and obtain the recommended preventive care for diabetes over a three year time span (Gregg et al., 2010). Ten health plans were used to collect data on patients' socioeconomic status, access to care, social support, mental and physical health, and diabetes preventive care (Gregg et al., 2010). This study

concluded that gaps in diabetes care are common among insured patients, and income, age, length of illness comorbidities, medications, and health behaviors affect vulnerability to those gaps in care (Gregg et al., 2010). The services were Hemoglobin A1c monitoring, cholesterol testing, albuminuria testing, podiatry exams, and eye exams (Gregg et al., 2010). Of the 8,392 participants, 70% had no persistent gaps over the three year study; however, 22% had a persistent gap in one service, 6% had a gap in two services, and 2% had a gap in three or more services (Gregg et al., 2010). Among the most common gaps, lipid testing gap was 11.6%, albuminuria testing had a service gap of 9.7%, and eye exam gaps were 9% (Gregg et al., 2010). Service gaps were higher for younger persons, persons with low income, employed persons, smokers, and lean persons (Gregg et al, 2010).

Summary

Limited research was found specifically for cardiovascular disease risk factors and the insured population, and likewise, no research was found comparing the knowledge level of those risk factors between the two groups. As shown by the research, cardiovascular disease is a major concern for persons with diabetes. Several studies compared the levels of care received by uninsured and insured diabetics, and some disparities were identified. Since persons with diabetes are at an increased risk for cardiovascular disease, and complications from cardiovascular disease are more severe and costly in persons with diabetes, more research is needed to evaluate the knowledge of these risk factors among this population. With the known disparities present for the uninsured versus the insured in acquiring healthcare, it is also reasonable to assess for disparities in knowledge of disease specific risks.

CHAPTER III

Methodology

Diabetes and heart disease are two leading chronic diseases in the United States. Persons with diabetes are at an increased risk of developing heart disease. This research study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, was conducted to examine if there was a difference in the awareness of heart disease risks in uninsured and insured persons with Type 2 Diabetes.

Setting

The setting for this descriptive, quantitative research study consisted of a non-profit agency in a rural community in South Carolina and a hospital located in the same community. The non-profit agency is a free-standing office that serves uninsured clients in the community who are at or below 150% Federal Poverty Level and it is a department of the hospital used in the study. The hospital is one of the largest employers in the community, and is non-profit. The hospital is a free-standing facility, and it is one of two inpatient acute care facilities within the hospital system.

Sample Population

A convenience sample was used for this study. The uninsured participants were clients of the non-profit agency of the hospital. Permission to utilize these clients was obtained from the agency director prior to the study. The researcher recruited 15 clients of the agency with Type 2 diabetes. Participants were screened for diabetes by using the agency's electronic records as well as prescreening assessments obtained with newly enrolled clients. All participants had Type 2 diabetes, were English speaking, and were

18 years or older. The only medical history obtained in the initial query was a diabetes diagnosis. Participants were not screened for an existing cardiovascular disease diagnosis. All scheduled appointments for one week were screened by the researcher for a diagnosis of Type 2 diabetes. The clients were approached by the researcher while waiting in the lobby of the agency for their appointment. The cover letter was given to the client and explained by the researcher. Any questions were answered. The clients then were given the opportunity to complete the survey if they desired to do so. No identifying information was obtained, and the clients returned the completed surveys to the researcher with their age, race, highest level of education, and sex. The surveys were sealed and kept secured in a locked box in the researcher's office. This process continued until the target sample of 15 was met. Data was collected for the uninsured population for three days.

The insured participants were recruited from the same hospital, and they were employees of the organization with a diagnosis of Type 2 diabetes. Permission was given to the researcher to recruit participants from four nonclinical departments within the hospital system. Those areas were transportation, environmental services, food services, and security. Permission was obtained from management prior to distributing the surveys. The participants for this population were 18 years of age or older and English speaking. Diabetes was the only health condition screened. No other comorbidities were documented. Surveys were distributed to the transportation department and environmental services employees first. Ten surveys were left in each department with cover letters. The transportation department had 10 completed surveys within 24 hours, and these surveys were sealed and picked up by the researcher from the department.

Environmental services had eight completed surveys after 72 hours. The surveys were also sealed and picked up by the researcher. A total of 20 insured surveys were completed during the first week of data collection. The other two approved departments were not surveyed due to the target sample size being met.

Instruments/Methods of Measurement

The Heart Disease Fact Questionnaire was used to measure the knowledge of major risk factors for the development of cardiovascular disease among the sample (Appendix A). The tool is a 25-item true/false questionnaire readable to an average 13-year old. It demonstrates adequate internal consistency, and shows good content and face validity, as evidenced by a study using volunteers from three American Diabetes Associations Diabetes Expos in the northeast of the United States (Wagner et al., 2004). Four sets of analyses were used in the development of the tool (Wagner et al., 2004). Flesch-Kincaid reading level revealed the tool was readable to a 13 year old, and the reading ease was 62% (Wagner et al., 2004). The questionnaire also had a Kuder-Richardson-20 internal consistency coefficient of 0.77, (Wagner et al., 2004). The questionnaire items were chosen using p-values and corrected item-total correlations (Wagner et al., 2004). A demographic survey was developed by the researcher for data collection pertaining to the participant's age, race, highest level of education, and sex (Appendix B). Permission to use the tool was obtained from Dr. Julie Wagner, the developer.

Ethical Considerations

This research study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, was

approved by the Nursing Research Council of the hospital, the Institutional Review Board (IRB) of the hospital, as well as the IRB of the universtiy. No data was collected prior to receiving both approvals. The director of the non-profit agency gave consent to utilize the agency as a site and to use clients of the agency. Permission was obtained from the department managers of the employees used for the insured participants. The survey's purpose, its voluntary nature, and informed consent were explained to each participant via a cover letter. The surveys were anonymous, and no identifiers were collected. Consent was assumed by survey completion. Individuals who did not speak English were excluded from survey participation. No incentives were given for survey completion, and there were no risks identified with participating in the study.

Data Collection

The researcher distributed the Heart Disease Fact Questionnaire and demographic surveys to uninsured clients present at the non-profit agency's office and to employees of transportation and environmental services departments within the hospital. Surveys were distributed and collected in person at the non-profit agency for three days. The surveys were completed by the participants in the lobby, and this investigator collected the surveys in sealed envelopes immediately upon completion. The surveys distributed to the insured participants within the hospital were left in the participating departments. The investigator checked the status of completed surveys with each department daily. The surveys left in the transportation department were completed, sealed in an envelope, and collected one day after distribution. The surveys distributed to the environmental services department were completed, sealed, and collected three days after distribution.

Data Analysis

The data from the surveys was entered into Statistical Package for the Social Sciences (SPSS) version 22 by the researcher using a personal computer. Descriptive statistics were computed on the questionnaire scores. The possible scores ranged from 0 to 25. One point was given for each correct answer. No points were given for incorrect answers or answers of "I don't know". An independent samples t-test was used to interpret the data. The mean and standard deviation were reported between the two groups' test scores, and the significance was determined for a p-value <0.05. Descriptive statistics were also collected on the participant's demographic data.

Summary

This research study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, aimed to determine if there was a difference in the knowledge level of heart disease between uninsured and insured diabetics. The study also aimed to determine if the hypothesis, insured persons with diabetes have a greater knowledge of the risks of heart disease than uninsured persons with diabetes, was supported. Data was collected, and the findings were analyzed.

CHAPTER IV

Results

This research study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, was conducted to examine the knowledge of heart disease risks among uninsured and insured diabetics in the sample population. The study was descriptive, and the Heart Disease Fact Questionnaire was used to test if a statistical difference existed between the two groups, and if the hypothesis, the knowledge of major risk factors for the development of cardiovascular disease among uninsured diabetics is less than the knowledge of those risk factors in individuals who are insured, was supported.

Sample Characteristics

A total of 35 survey packets were distributed. Fifteen survey packets were distributed and completed by the uninsured population. Twenty survey packets were distributed to the insured population, and 18 were completed and returned. The final sample size was n=33. The descriptive statistics for the sample were age, race, sex, and highest level of education. Of the 15 uninsured participants, seven were male, eight were female, eight were African American, and seven were Caucasian. The education demographics for the uninsured population were as follows: three had no high school diploma, three had a high school diploma, five had some college, and four had a college degree. The mean age for the uninsured population was 43 and the median age was 42. Of the 18 insured participants, five were male, 13 were female, 11 were African American, six were Caucasian, and one respondent did not answer this question. The education demographics for the insured population were as follows: one had no high

school diploma, 10 had a high school diploma, six had some college, and one had a

college degree.   The mean age for the insured population was 52 and the median age was

50. See Appendix C for sample population descriptive frequency tables.

Major Findings

This research study, Knowledge of the Risks of Heart Disease in Uninsured and

Insured Persons with Diabetes in a Rural Community in Southeastern Unites States, was

a two-fold study. Firstly, the study aimed to determine if insured persons with diabetes

had a greater knowledge of the risks of heart disease, and secondly, if the difference was

statistically significant. Mean, standard deviation, and independent-samples t-tests were

utilized to analyze the data collected for this research study.

The Heart Disease Fact Questionnaire had 25 questions. One point was given for

each correct answer for scores ranging from 0 to 25. The mean score for the insured

population was 17.2, and the mean score for the uninsured population was 19.1,

indicating that the uninsured population answered more questions correctly on average

than the insured population. (Table 1)

Table 1

Heart Disease Fact Questionnaire Mean Scores

Heart Disease Fact Questionnaire Mean Scores					
	Type of Insurance	N	Mean	Std. Deviation	Std. Error Mean
Test Score	Insured	18	17.1667	4.54067	1.07025
	Uninsured	15	19.1333	2.87518	.74237

An independent-samples t-test was used to examine statistically significant differences between insured and uninsured persons with diabetes in terms of their knowledge of heart disease risk factors. Levene's test for equality of variance suggested that equal variances could be assumed (p = 0.06). No significant difference (t (31) = 1.45, p = 0.16 (p > 0.05)) was found between the insured (mean = 17.2, standard deviation = 4.5) and the uninsured (mean = 19.1, standard deviation = 2.9) in terms of the test scores among the participants of both groups on the Heart Disease Fact Questionnaire. (Table 2)

Table 2

Comparison of Mean Statistics

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | 95% Confidence Interval of the Difference | |
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Test Score	Equal variances assumed	3.814	.060	-1.451	31	.157	-1.96667	1.35580	-4.73184	.79851
	Equal variances not assumed			-1.510	29.111	.142	-1.96667	1.30251	-4.63016	.69683

Summary

This research study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, was conducted to determine if there was a statistical difference among uninsured and insured diabetics in their knowledge of the risks of developing heart disease. The scores of both groups on the Heart Disease Fact Questionnaire were analyzed to examine if one group had more knowledge than the other, and if the difference was significant. Mean, standard deviation, and independent-samples t-test were used as the descriptive statistics.

CHAPTER V

Discussion

This research study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, was conducted to examine the following hypothesis: The knowledge of major risk factors for the development of cardiovascular disease among uninsured diabetics is less than the knowledge of those risk factors in individuals who are insured. Diabetes and heart disease are two major chronic illnesses in the United States. Both conditions are costly to the healthcare industry, and individuals with diabetes are at greater risk of developing heart disease and experiencing complications. Determining if there is a difference in the knowledge of heart disease risk factors among insured and uninsured persons with diabetes can lead to identifying health disparities and areas for improvement in diabetes education.

Implication of Findings

The results of this study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, did not support the hypothesis. The mean score of the insured population on the Heart Disease Fact Questionnaire was 17.2, and the standard deviation was 4.5. The mean score of the uninsured population on the questionnaire was 19.1, and the standard deviation was 2.9. Although the uninsured population had a higher mean score, the independent-samples t-test did not demonstrate a statistical difference in the test scores of the two groups with a p-value of 0.16 ($p > 0.05$). These findings suggest that, statistically, there are no significant differences in the knowledge of heart disease risk

factors among uninsured and insured persons with diabetes. Previous studies using the same questionnaire found disparities among groups based on other demographics, such as race and ethnicity, but no similar studies comparing uninsured and insured were found.

Application to Conceptual Framework

The conceptual framework that guided this study was Nola Pender's Health Promotion Model. This conceptual framework was appropriate for the study; however, the study only gives preliminary information, and in order to implement all of the concepts of the model, further interventions are needed. Individual characteristics of the participants were collected, but the only characteristics analyzed in this study were the presence or absence of health insurance. The scores gave insight into the participant's cognitive awareness of their illness and possible complications. In order to obtain a desired behavioral outcome, which typically is health promotion, the study would have to be more specific in regards to what behaviors should be modified, and further interventions with the target populations would be required. The study did not identify a significant difference in the knowledge of the sample groups, and therefore, it did not prompt further health promotion activities. Further study to identify specific areas of knowledge deficit is needed.

Limitations

This study had several limitations. Due to time constraints, the sample population was limited in size and diversity. The surveys were only completed by two races, and the sample sizes were relatively small (n = 15, n = 18). The surveys were also completed by uninsured participants receiving interventions from a non-profit agency staffed with registered nurses and insured participants working for a healthcare facility. This may

have contributed to the participant's having more knowledge of diabetes and heart disease, and as such, the results may lack generalizability to other uninsured and insured individuals in the same community. The study was also limited in that it did not assess for other comorbidities of the participants, or if the participants currently had a heart disease diagnosis. A current diagnosis could explain higher levels of knowledge regarding risk factors.

Implications for Nursing

The results of this research study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, may be significant to the current nursing profession. Chronic disease management is imperative to the healthcare industry. Nurses are responsible for being patient advocates as well as patient educators. Although the study did not reveal a statistical difference for uninsured and insured persons with diabetes in regard to knowledge of heart disease risk factors, the study provides knowledge of the relationship between both diseases, and it gives implications for further research regarding health disparities. The study may promote future nursing practice to research non-profit agencies providing care to individuals with chronic illnesses to determine if such programs produce better outcomes for under-served populations.

Recommendations

It is recommended that further research be conducted to assess the knowledge level of persons with diabetes regarding their risk factors with heart disease and other comorbidities. As a validated tool, the Heart Disease Fact Questionnaire should be employed more in clinical practice to assess the knowledge level of persons with diabetes

in relation to heart disease. This tool could give the clinician insight into the development of a care plan for a person with diabetes. It is also recommended to conduct research regarding the knowledge of heart disease among persons with diabetes on a larger scale.

Conclusion

This research study, Knowledge of the Risks of Heart Disease in Uninsured and Insured Persons with Diabetes in a Rural Community in Southeastern United States, concludes that there is no statistical difference in the knowledge level of heart disease risk factors among uninsured persons with diabetes and insured persons with diabetes. Based on these findings, the hypothesis was not supported. Diabetes and heart disease are major health problems in the United States; therefore, nurses would benefit from exploring this topic further. Other demographics may contribute to the knowledge level of persons with diabetes regarding heart disease and other chronic diseases. Ongoing research regarding diabetes and health disparities may result in findings to create evidence-based practice, which would improve outcomes for persons with diabetes and save healthcare dollars.

References

Belue, R.M., Figaro, K., Peterson, J., Wilds, C., & William, P. (2013). The diabetes

healthy outcomes program: Results of free health care for uninsured at a

Federally Qualified Community Health Center. *Journal of Primary Care &*

Community Health, 5 (1), 4-8.

Bruin, S., Heijink, R., Lemmens, L., Struijs, J., & Baan, C. (2011). Impact of disease

management programs on healthcare expenditures for patients with diabetes,

depression, heart failure, or chronic obstructive pulmonary disease: A systematic

review of the   literature. *Health Policy*, *101*(2), 105-121.

Casagrande, S., & Cowie, C. (2012). Health insurance coverage among people with and

without Diabetes in the US adult population. *Diabetes Care,* 35, 2243-2249.

Chyun, D., Lacey, K.O., Katten, D.M., Talley, S., Price, W.J., Davey, J.A., & Melkus,

G.D. (2006). Glucose and cardiac risk factor control in individuals with type 2

diabetes: Implications for patients and providers. *The Diabetes Educator,* 32 (6),

925-939.

Eldakroury, A., Olivera, E., Bicki, A., Martin, R.F., & De Groot, A.S. (2013). Adherence

to American Diabetes Association guidelines in a volunteer-run free clinic

for the uninsured: Better than standards achieved by clinics for insured

patients. *Rhode Island Medical Journal,* January.

Gregg, E., Karter, A., Gerzoff, R., Safford, M., Brown, A., Tseng, C., Waitzfielder, B.,

Herman, W., Mangione, C., Selby, J., Thompson, T., & Dudley, R.A.

(2010). Characteristics of insured patients with persistent gaps in

diabetes care services. *Medical Care,* 48 (1), 31-37.

Jones, D. S., & Greene, J. A. (2013). The decline and rise of coronary heart disease: Understanding public health catastrophism. *American Journal of Public Health*, *103*(7), 207-1218.

McCollum, M., Ellis, S.L., Morrato, E.H., & Sullivan, P.W. (2006). Prevalence of multiple cardiac risk factors in US adults with diabetes. *Current Medical Research and Opinion,22 (6),* 1031-1034.

McWilliams, J.M., Meara, E., Zaslavsky, A.M., & Ayanian, J.Z. (2007). Health of previously uninsured adults after acquiring Medicare coverage. *Journal of American Medical Association,* 298 (24), 2886-2894.

Patnaik, L., Pattnaik, S., Ghosh, T., Sahoo, A.K., & Sahu, T. (2013). Coronary heart disease risk factors among diabetic patients attending a tertiary care hospital: A cross- sectional study.*The Internet Journal of Epidemiology,* 11 (1).

Pender, N., Murdaugh, C., & Parsons, M. (2002). *Health Promotion in Nursing Practice*. Upper Saddle River, NJ: Prentice Hall.

Pender, N., Murdaugh, C., & Parsons, M. (2006). *Health Promotion in Nursing Practice*. Upper Saddle River: Prentice Hall.

Polit, D., & Beck, C. (2012). *Nursing research: Generating and assessing evidence for nursing practice.* New York, NY: Lippincott Williams & Wilkins.

Preis, S. R., Pencina, M., Mann, D., D'Agostino, R., Savage, P., & Fox, C. (2013). Early-adulthood cardiovascular disease risk factor profiles among individuals with and without diabetes in the framingham heart study. *Diabetes Care*, *36*, 1590-1596.

Shaw, K., Killeen, M., Sullivan, E., & Bowman, P. (2011). Disparities in diabetes self-management education for uninsured and underinsured adults. *The Diabetes Educator,* 37 (6), 813-819.

Shoemaker, P. (2011). What value-based purchasing means to your hospital. *Health Financial Management*.   Retrieved from http://www.ahd.com/news/HFM_CoveStory_ValueBasedPurchasing_2011_August.pdf

Wagner, J., Lacey, K., Abbott, G., deGroot, M., & Chyun, D. (2006). Knowledge of heart disease risk in a multicultural community sample of people with diabetes. *The Society of Behavioral Medicine,* 31(3), 224-230.

Wagner, J., Lacey, K., Chyun, D., & Abbott, G. (2004). Development of a questionnaire to measure heart disease risk knowledge in people with diabetes: The heart disease fact questionnaire. *Patient Education and Counseling*, *58*, 82-87.

Wong, N., Patao, C., Malik, S., & Iloeje, U. (2014). Preventable coronary heart disease events from control of cardiovascular risk factors in US adults with diabetes: Projections from utilizing the UKPDS risk engine. *American Journal of Cardiology,* 113, 1356-1361.

Zhao, W., Katzmarzyk, P., Horswell, R., Wang, Y., Johnson, J., & Hu, G. (2014). Hba1c and coronary heart disease risk among diabetic patients. *Diabetes Care*, *37*, 428-435.

Zhuo, X., Zhang, P., & Hoerger, T.J. (2013). Lifetime direct medical costs of treating type 2 diabetes and diabetic complications. *American Journal of Preventive Medicine,* 45 (3), 253-261.

Appendix A

Heart Disease Fact Questionnaire

These next questions ask about heart disease. Please circle true or false; if you are unsure about the correct answer, you may circle "I don't know".

1. A person always knows when they have heart disease:
      a. True   b. False   c. I don't know

2. If you have a family history of heart disease you are at risk for developing heart disease:
      a. True   b. False   c. I don't know

3. The older a person is, the greater their risk of having heart disease:

      a. True   b. False   c. I don't know

4. Smoking is a risk factor for heart disease:
      a. True   b. False   c. I don't know

5. A person who stops smoking will lower their risk of developing heart disease:
      a. True   b. False   c. I don't know

6. High blood pressure is a risk factor for heart disease:
      a. True   b. False   c. I don't know

7. Keeping blood pressure under control will reduce a person's risk for developing heart disease:
      a. True   b. False   c. I don't know

8. High cholesterol is a risk factor for developing heart disease:
      a. True   b. False   c. I don't know

9. Eating fatty foods does not affect blood cholesterol levels:
      a. True   b. False   c. I don't know

10. If your "good" cholesterol (HDL) is high you are at risk for heart disease:
      a. True   b. False   c. I don't know

11. If your "bad" cholesterol (LDL) is high you are at risk factor for heart disease:
      a. True   b. False   c. I don't know

12. Being overweight increases a person's risk for heart disease:
      a. True   b. False   c. I don't know

13. Regular physical activity will lower a person's chance of getting heart disease:
      a. True   b. False   c. I don't know

14. Only exercising at a gym or in an exercise class will help lower a person's chance of developing heart disease:
      a. True   b. False   c. I don't know

15. Walking and gardening are considered exercise that will help lower a person's chance of developing heart disease:
      a. True   b. False   c. I don't know

16. Diabetes is a risk factor for developing heart disease:
      a. True   b. False   c. I don't know

17. High blood sugar puts a strain on the heart:
      a. True   b. False   c. I don't know

18. If your blood sugar is high over several months it can cause your cholesterol level to go up and increase your risk of heart disease:
      a. True   b. False   c. I don't know

19. A person who has diabetes can reduce their risk of developing heart disease if they keep their blood sugar levels under control:
      a. True   b. False   c. I don't know

20. People with diabetes rarely have high cholesterol:
      a. True   b. False   c. I don't know

21. If a person has diabetes, keeping their cholesterol under control will help to lower their chance of developing heart disease:
      a. True   b. False   c. I don't know

22. People with diabetes tend to have low HDL (good) cholesterol:
      a. True   b. False   c. I don't know

23. A person who has diabetes can reduce their risk of developing heart disease if they keep their blood pressure under control:
      a. True   b. False   c. I don't know

24. A person who has diabetes can reduce their risk of developing heart disease if they keep their weight under control:
      a. True   b. False   c. I don't know

25. Men with diabetes have a higher risk of heart disease than women with diabetes:
      a. True   b. False   c. I don't know

Appendix B

Demographic Survey

PLEASE COMPLETE THE FOLLOWING

YOU MAY CHOOSE NOT TO ANSWER ANY OR ALL OF THESE QUESTIONS

1. **How old are you? _____**

2. **What race are you? _____**

3. **What is your highest level of education?**

   _____

4. **Are you male or female? _____**

PLEASE CONTINUE TO THE NEXT PAGE

AND COMPLETE THE QUESTIONNAIRE. IT

IS THE HEART DISEASE FACT

QUESTIONNAIRE.

Appendix C

Sample Population Descriptive Statistics

Sample Population (Insured)

		Sex			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	5	27.8	27.8	27.8
	Female	13	72.2	72.2	100.0
	Total	18	100.0	100.0	

		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	32.00	1	5.6	5.6	5.6
	33.00	1	5.6	5.6	11.1
	39.00	1	5.6	5.6	16.7
	40.00	2	11.1	11.1	27.8
	45.00	1	5.6	5.6	33.3
	48.00	1	5.6	5.6	38.9
	49.00	2	11.1	11.1	50.0
	51.00	1	5.6	5.6	55.6
	52.00	1	5.6	5.6	61.1
	56.00	1	5.6	5.6	66.7
	58.00	1	5.6	5.6	72.2
	62.00	1	5.6	5.6	77.8
	64.00	1	5.6	5.6	83.3
	67.00	1	5.6	5.6	88.9
	73.00	1	5.6	5.6	94.4
	78.00	1	5.6	5.6	100.0
	Total	18	100.0	100.0	

Race					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	African American	11	61.1	61.1	61.1
	Caucasian	6	33.3	33.3	94.4
	No Answer	1	5.6	5.6	100.0
	Total	18	100.0	100.0	

Education					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than HS Diploma	1	5.6	5.6	5.6
	HS Diploma	10	55.6	55.6	61.1
	Some College	6	33.3	33.3	94.4
	College Degree	1	5.6	5.6	100.0
	Total	18	100.0	100.0	

Sample Population (Uninsured)

Sex					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	7	46.7	46.7	46.7
	Female	8	53.3	53.3	100.0
	Total	15	100.0	100.0	

Age		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	29.00	1	6.7	6.7	6.7
	32.00	3	20.0	20.0	26.7
	38.00	1	6.7	6.7	33.3
	40.00	1	6.7	6.7	40.0
	41.00	1	6.7	6.7	46.7
	42.00	1	6.7	6.7	53.3
	43.00	1	6.7	6.7	60.0
	47.00	1	6.7	6.7	66.7
	49.00	1	6.7	6.7	73.3
	53.00	2	13.3	13.3	86.7
	60.00	1	6.7	6.7	93.3
	61.00	1	6.7	6.7	100.0
	Total	15	100.0	100.0	

Race		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	African American	8	53.3	53.3	53.3
	Caucasian	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

Education		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No HS Diploma	3	20.0	20.0	20.0
	HS Diploma	3	20.0	20.0	40.0
	Some College	5	33.3	33.3	73.3
	College Degree	4	26.7	26.7	100.0
	Total	15	100.0	100.0	

Mean Age of Sample Population (Insured)

Statistics		
Age		
N	Valid	18
	Missing	0
Mean		52.0000
Median		50.0000

Mean Age of Sample Population (Uninsured)

Statistics		
Age		
N	Valid	15
	Missing	0
Mean		43.4667
Median		42.0000