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Awareness, Education, and Prevention of Chronic Kidney Disease in the Older Adult

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The University of Southern Mississippi

Awareness, Education, and Prevention of Chronic Kidney Disease in the Older Adult

by

Torrel Bridges

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Submitted to the Honors College of
The University of Southern Mississippi
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of the Requirement for the Degree of
Bachelor of Science
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Abstract

Chronic kidney disease (CKD) has become a major issue in our nation. Many of our neighbors, family, and friends have concerns and a call for our attention is necessary. CKD does not have a specific target, but individuals with diseases such as diabetes mellitus, cardiovascular disease, and obesity are all at increased risk. Adults older than 65 years of age are especially at increased risk for developing CKD due to decrease in kidney function and other physiologic changes. In light of this, awareness, education, and prevention of CKD in the older adult population is important.

The number of older individuals with a diagnosis from CKD is increasing, putting these older adults at risk for other chronic diseases and death. To address this issue, a sample of the older adults in central and northern Mississippi were given a survey to assess the number of older adults that were aware of CKD, its psychological and physical effects, and disease prevention. Approximately seventy older adults in central and northern Mississippi were given a survey to obtain data related to CKD awareness, education, and prevention.

Key Words: Chronic kidney disease, geriatric population, co-morbid diseases, sample, CKD awareness

Dedication

Patricia B. Denson

Thank you for challenging me to explore issues that are harming many close family members and friends in our society. Although you are not here with me physically, your unwavering love and support has inspired me to help others become aware of chronic kidney disease. May you rest in peace.

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List of Abbreviations

CKD	Chronic Kidney Disease
DM	Diabetes Mellitus
U.S.	United States
GFR	Glomerular Filtration Rate
mL/min	milliliters per minute
BUN	Blood Urea Nitrogen
ESRD	End Stage Renal Disease
KEEP	Kidney Early Evaluation Program
NSAIDs	Non-steroidal anti-inflammatory drugs

Chapter I:

Introduction

For decades, chronic kidney disease (CKD) has affected a large portion of the older adult population. With the rise in the older adult population, the incidence and prevalence of CKD will subsequently increase as older adults are diagnosed with chronic medical conditions such as diabetes mellitus (DM) Type II, cardiovascular disease, and obesity (Go, A., McCulloch C., & Fan, D. 2004). This will have a direct influence on the need to ensure that this population has the knowledge regarding awareness, education, and prevention of CKD.

CKD is a chronic and progressive illness, usually resulting from uncontrolled hypertension, DM Type II, and cardiovascular disease. Additional etiology includes the age related physiological changes such as decreased function in the kidneys, heart, and liver. Furthermore, older adults can be at risk for CKD due to decreased awareness and a knowledge deficit regarding CKD.

To conduct this study, older adults met certain criteria and participated in all facets of the study. This included a three step process, beginning with a pre-test to assess their knowledge, an educational seminar on CKD, followed by a post-test to re-assess their knowledge. This information was used to determine if there was a change in test scores from pre-test to post-test and determine if community-based education is needed for older adults about CKD.

Chapter II:

Review of the Literature

This section contains a review of the literature related to CKD. This includes but is not limited to demographics of the older adult, pathophysiology of CKD, co-morbid conditions associated with CKD, and awareness of CKD in the general population and in the older adult.

Demographics of the Older Adult

According to the United States Department of Health and Human Service (2011) older adults are identified as individuals 65 years or older. Categories of the older adult include younger old (65-75), older old (75-85), and centenarians (those adults over 100 years of age).

According to the United States Census Bureau (2010), the number of individuals 65 years and older has increased tenfold. In 1900, 3.1 million adults 65 years of age and older comprised the U.S. (United States) population compared to 40.3 million in 2010. In 1900, individuals 65 years and older accounted for 4.1% of the population in the U.S., and represented 13% of the population in 2010. Table 1 depicts individuals in the U.S. population that are 65 years and older and the percentage of United States population from 1900 to 2010.

Table 1

United States Population: 65 Years of Age and Older

Year Population	65 years of age (millions)	Percentage of U. S.
1900	3.1	4.1
1935	7.8	6.1
1940	9.0	6.8
1950	12.7	8.1
1960	17.2	9.2
1970	20.9	9.9
1980	26.1	11.3
1990	31.9	12.6
2000	34.9	12.4
2010	40.3	13.0

Adapted From “The Older Population: 2010,” by the United States Census Bureau, http://www.census.gov/newsroom/releases/archives/news_conferences/2006-03-09_appendix.html. Adapted from “Projected Future Growth of the Older Population,” by the United States Department of Health and Human Services Administration on Aging, http://www.aoa.gov/AoARoot/Aging_Statistics/future_growth/future_growth.aspx#age.

Life Expectancy

Older adults currently comprise approximately 13% of the population in the U.S. According to the Centers for Disease Control and Prevention (1999), life expectancy in 1900 was 46.3 years of age for men and 48.3 years of age for women. Since then, there has been a growing number of older adults with a life expectancy at birth of 76.2 years for men and 81.1 for women (Centers for Disease Control and Prevention, 2010). Recent

data showed that in 2009 the average life expectancy for men 65 and older was 82.6 and 85.3 for females. Life expectancy for males 75 years of age and older was 86 and 87.9 for females.

According to United States Department of Health and Human Services (U.S. DHHS, 2011) there has been an increase in life expectancy from the early 1900s to 2009. From 1900 to 2009 there was an increase in life expectancy by 30 years for men and approximately 32 years for women. Table 2 outlines the remaining life expectancy for males and females 65 years of age and 75 years of age between 1900 and 2009.

Table 2

Remaining Life Expectancy

Year	At birth	At 65 years of age	At 75 years of age
1900	Male – 46.3 Female – 48.3	N/A*	N/A*
1950	Male – 65.6 Female – 71.7	Male (Male (+12.8) = 77.8 Female (+15.0)= 80.0	N/A* N/A*
1960	Male – 66.6 Female – 73.1	Male (+12.8) =77.8 Female (+15.8)= 80.8	N/A*
1970	Male – 67.1 Female – 74.7	Male (+13.1)= 78.1 Female (+17.0)= 82.0	N/A*
1980	Male – 70.0 Female- 77.4	Male (+14.1)= 79.1 Female (+18.3)= 83.3	Male (+8.8)= 83.8 Female (+11.5)= 86.5
1990	Male – 71.8 Female- 78.8	Male (+15.1)= 80.1 Female (18.9)= 83.9	Male (+9.4)= 84.4 Female (+12.0)= 87.0

Table 2 (continued)

Year	At birth	At 65 years of age	At 75 years of age
2000	Male – 74.1	Male (+16.0)= 81.0	Male (+9.8)= 84.8
	Female – 79.3	Female (+19.0)= 84.0	Female (+11.8)= 86.8
2009	Male – 76.0	Male (+17.6)= 82.6	Male (+11.0)= 86.0
	Female – 80.9	Female (+20.3)= 85.3	Female (+12.9)= 87.9

Adapted From the Centers for Disease Control and Prevention, <http://www.cdc.gov/nchs/fastats/lifexpec.htm>. Copyright 2011 by the Centers for Disease Control and Prevention.

Top Ten Causes of Death

The Centers for Disease and Control and Prevention (2010) listed the top three causes of death in 1900 as pneumonia or influenza, tuberculosis, and gastrointestinal infections. In contrast, the top three causes of death in 2010 were heart disease, cancer, and noninfectious airway diseases. Table 3 three describes the ten leading causes of death for 1900 and 2010.

Table 3

Ten leading causes of death: 1900 and 2010

Rank	1900 (per 100,000 deaths)	2010 (per 100,000 deaths)
1	Pneumonia or Influenza (202.2)	Heart disease (192.9)
2	Tuberculosis (194.4)	Cancer (185.9)
3	Gastrointestinal infections (142.7)	Noninfectious Airway Diseases (44.6)
4	Heart Disease (137.4)	Cerebrovascular Disease (41.8)

Table 3 (continued)

Rank	1900 (per 100,000 deaths)	2010 (per 100,000 deaths)
5	Cerebrovascular Disease (106.9)	Accidents (38.2)
6	Nephropathies (88.6)	Alzheimer's Disease (27.0)
7	Accidents (72.3)	Diabetes Mellitus (22.3)
8	Cancer (64.0)	Nephropathies (16.3)
9	Senility (50.2)	Pneumonia or Influenza (16.2)
10	Diphtheria (40.3)	Suicide (12.2)

From "Deaths and Mortality," by the Centers for Disease Control and Prevention, <http://www.cdc.gov/nchs/fastats/death.htm>. From Burden of Disease and the Changing Task of Medicine," by D. S. Jones & J. A. Green, 2012, New England Journal of Medicine, 366, pp. 2333-2338.

Some causes of death are preventable with education, immunizations, health screenings, and health promotion strategies (heart disease, DM Type II, and CKD). In 2011, the top ten leading causes of death were heart disease, cancer, chronic lower respiratory diseases, cerebrovascular disease, accidents, Alzheimer's disease, DM, pneumonia or influenza, nephropathies, and suicide. Although these medical conditions exist, advanced therapies can aid in slowing their progression. Of the top 10 causes of death in 2011; cardiovascular disease and DM Type II are the primary risk factors for development of CKD (U.S. Renal Data System {USRDS}, 2012).

According to the American Geriatric Society (2012) many older adults lives with chronic conditions such as hypertension, dementia, arthritis, DM Type II, atherosclerosis, congestive heart failure, and cerebrovascular disorders. Although CKD is not listed,

hypertension is one of the most frequent chronic conditions found among older adults placing them at higher risk for developing CKD.

What is CKD?

The National Kidney Foundation (2002) defined chronic kidney disease based on specific criteria:

- Kidney damage for greater than or equal to 3 months with or without decreased glomerular filtration rate (GFR) or
- GFR less than 60 mL/min (milliliters per minute) for greater than or equal to 3 months with or without kidney damage (National Kidney Foundation, 2012).

Kidney damage is defined as structural or functional abnormalities of the kidney or a large urinary tract infection causing a decrease in circulating blood to the kidney. (Smeltzer et al., 2010). Markers of damage include abnormalities in the composition of the blood, abnormalities in the composition of the urine, and abnormalities in imaging studies. The GFR measures the flow rate of filtered fluid through the kidney. Normal GFR rates are 90-120 mL/min (Smeltzer et al., 2010).

Causes of decreased GFR may be attributed to age related changes, unilateral nephrectomy, extracellular volume depletion, and system illnesses resulting in a decline in kidney perfusion (Counts et al., 2008). Extracellular volume depletion can decrease GFR due to fluid loss throughout the body leading to a decreased perfusion to the kidneys and decreased circulating volume. Systemic illnesses such as septic shock (massive

inflammation causes by a bacteria infection in the bloodstream) can affect all parts of the body and lead to multiple organ dysfunction syndrome that also has harmful affects on the kidneys. A unilateral nephrectomy (removal of one kidney) could cause a decrease in perfusion to the remaining kidney and a subsequent decrease in GFR (Counts et al., 2008).

The National Kidney Foundation (2002) identified five stages in CKD. Stage I is a normal or increased GFR with kidney damage. Kidney damage is manifested by markers such as proteinuria, abnormalities in imaging tests. An individual with State I CKD can presented with no symptoms or lab abnormalities indicative of kidney dysfunction. Stage II occurs when there is a decrease in GFR (60-89 mL/min) with evidence of kidney damage. Most individuals are asymptomatic, while others may have signs and symptoms (uremia, anemia, fluid retention) and lab abnormalities that indicate kidney dysfunction.

Stage III CKD is characterized by a decrease in the GFR (30-59 mL/min). During this stage, individuals may or may not have manifestations of kidney damage, but hypertension (elevated blood pressure levels) are usually present. Hypertension is defined as a systolic blood pressure greater than 140 mm Hg and a diastolic pressure greater than 90 mm Hg based on the average of two or more accurate blood pressure measurements taken during two or more contacts a health care provider (Chobanian et al., 2003). Table 4 describes blood pressure classification for adults 18 years and older.

Table 4

Classification of Blood Pressure for Adults Age 18 and Older

BP Classification	Systolic BP (mm Hg)		Diastolic BP (mm HG)
Normal	<120	And	<80
Prehypertension	120-139	Or	80-89
Stage 1	140-159	Or	90-99
Stage 2	≥160	Or	≥100

Adapted From the Seventh Report of the Joint Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. (2003). *Hypertension*, 42(6), 1206-1252.

Hypertension is one of the most common and prevalent cardiovascular conditions among the older adult (Ostchega et al., 2007). Although some older adults are not diagnosed with hypertension, monitoring and screening could help reduce their risk of developing CKD. The higher an individual's blood pressure, the greater the risks are for heart attack, heart failure, cerebral vascular accidents, and kidney disease (Ostchega et al., 2007).

Other physiologic indicators of CKD include erythropoietin-deficient anemia (decreased hemoglobin and hematocrit levels), elevated phosphorus, and potassium levels. In addition, calcium levels are below normal limits due to a lack of activated vitamin D. Other physiologic changes that can occur include elevated parathyroid hormone levels, dyslipidemia, and altered mental cognition.

Stage IV and Stage V CKD are marked by severe impaired renal function. In Stage IV, the GFR is 15-29 mL/min and individuals may have lab abnormalities such as

elevated creatinine and BUN (blood urea nitrogen). Other symptoms in Stage IV CKD include anorexia, edema, apathy, impaired memory, and decreased cognitive function. Stage V CKD is classified as End Stage Renal Disease (ESRD) with a GFR less than 15 mL/min. In this stage there are severe electrolyte imbalances (hyperkalemia and hyperphosphatemia), metabolic acidosis, fluid overload, and uremia (American Nephrology Nurses Association, 2011).

Pathophysiology of CKD

Pathophysiologic changes within the kidney depend on the etiology of CKD. When an individual has a diagnosis of CKD there is nephron dysfunction that persists three months or longer resulting in irreversible kidney damage. These dysfunctional changes to the kidney impair glomerular function and predispose the remaining viable nephrons to sclerosis (pathological hardening of the tissue).

Azotemia (retention of nitrogenous waste products) occurs as CKD develops. Other pathophysiological changes include uremia, fluid retention, and excessive weight gain. According to the American Nephrology Nurses' Association (2011) uremia consist of an accumulation of products that affect protein metabolism, and loss of kidney function that results in fluid and electrolyte imbalances. Common symptoms of uremia include nausea, vomiting, fatigue, anorexia, weight loss, muscle cramps, and change in mental status (Counts et al., 2008). Uremia often leads to major disturbances in the function of all other body systems such as a decline in endocrine abnormalities due to high level of toxicity, cardiovascular abnormalities from left ventricular hypertrophy, and gastrointestinal disturbances from malnutrition.

CKD and the Older Adult

CKD has become more prevalent for the entire U.S population. Twenty-three million individuals in the U.S have CKD with almost half of them 70 years and older (Boyd & Uhlig, 2011). These statistics illustrate how prevalent CKD is in the older adult and conveys the importance of educating the older adult population about CKD. Knowledge regarding CKD can prevent individuals from acquiring the disease and will also aid in the management of other chronic illness that place older adults at risk for CKD.

There is a need for older adults to be aware of CKD, the risk factors, the course of the disease, and prevention strategies. Since age is a risk factor for developing CKD, it is important for older adults to understand the age related physiological changes that occur. In the fourth decade physiologic changes become noticeable. There is a decline in vision (presbyopia), hearing (presbycusis), dry skin, and osteoporosis. There is also a suppression in bone marrow resulting in decreased red blood cells and reduced oxygenation to the body, constriction of blood vessels, and more accumulation of plaque in the arteries. Eighty percent of the older adult population have been identified with having as least one chronic illness that results in a disability. These chronic illnesses are caused by a pathological condition that is irreversible, requires rehabilitative training, and requires long-term supervision and care (Danaei et al., 2010).

Physiological Changes in the Older Adult

There are many systems in the body that start decline as the older adult age. The ability to accommodate is compromised, making it difficult to change the focus of vision

from near to far. Other changes with the eye occur when the lens becomes more opaque which makes it more challenging for older adults to react to change in lighting. Bilateral hearing loss and tinnitus (ringing in the ear) can also occur. There is an age related thinning of the bones which increases the risk for bone fractures. There may be decreased bone mass resulting from decreased activity, cigarette smoking, alcohol intake, and medications (Elliott, 2013). Respiratory, gastrointestinal, and immunologic function declines and places older adults at risk for malabsorption problems, decreased oxygen, labored breathing, and increased susceptibility to infections.

The bone marrow produces fewer red blood cells which decreases the body's ability to receive oxygen to the cells which contributes to hypoxia and fatigue. The amount of activity determines how healthy an individual's heart is and can determine the risk of cardiovascular disease. As aging process unfolds, the heart becomes stiffer which can lead to diastolic heart failure (Elliott, 2013). This can lead to other cardiovascular conditions such as hypertension and cardiac dysrhythmias. Plaque can accumulate in the vasculature of the heart leading to atherosclerosis and the occlusion of coronary arteries. According Ostchega et al. (2007), other factors such as exposure to cigarette smoke, elevated cholesterol levels, high blood pressure, and the presence of DM Type II can increase the risk of plaque formation.

The renal system will also incur age related changes. The kidneys will shrink in size and the filtering process declines resulting diminished ability to filter waste products. There also is a reduction in the number and function of nephrons. Nephrons aid in the filtering of toxins in the kidney and are responsible for the declining kidney function in the older adult (American Nephrology Nurses Association, 2011).

The kidneys also have other functions throughout the body. Most of the fluid in the body is absorbed and filtered via the kidney. Blood is the most important component of the body that is filtered through the kidneys. Inadequate function of the kidney causes an increase in the number of toxins that remain in the body. This influx of toxins causes a buildup of lactic acid leading to metabolic acidosis. As the older adult ages, the decline in physiologic functions can escalate their risk of multiple organ failure and the development of co-morbid conditions such as DM, hypertension, hyperlipidemia, that increases the risk for CKD (Elliott, 2012).

Other risk factors for developing CKD include:

- Dyslipidemia
- Autoimmune disease
- Urinary stones
- Urinary tract infections
- Lower urinary track obstruction
- Recovery from an acute kidney injury
- Neoplasia
- Tobacco use
- Inactivity
- Low income
- Education
- Obesity
- Exposure to nephrotoxic drugs, chemicals, or environmental toxins

- Family history (being over 50 years of age)
- Ethnicity (African American, Hispanic, American Indian, Asian, Pacific Islander) (Counts et al., 2008)

Co-Morbid Health Conditions Associated with CKD

According to Hoyert & Xu (2012), heart disease was ranked first and DM Type II ranked seventh out of the top ten leading causes of death. Additional research showed four preventable risk factors (smoking, blood pressure, blood glucose, and adiposity), decrease in mortality from cardiovascular diseases (Danaei et al., 2010). A reduction in these risk factors could increase the probability of adding more years to life expectancy. Therefore, a reduction in cardiovascular diseases can result in decreasing the incidence of CKD among older adults and increasing life expectancy.

DM Type II has also been a growing concern in the older adult as it relates to CKD. When evaluating the number of older adults with CKD, almost 50% of this population was diagnosed with DM Type II (Touhy & Jett, 2012). According to Touhy & Jett (2012) older adults should be screened for DM every three years and more frequently if risk factors are present. This will help detect any other abnormalities and other co-morbid conditions that could lead to CKD.

Hyperlipidemia is an elevation of cholesterol and triglycerides that usually occur as a result from the improper intake of nutrients. Hyperlipidemia, along with DM Type II has been linked to the development of CKD in the older adult population. Uncontrolled glucose levels can cause damage to the blood vessels leading to the hardening of the

arteries (atherosclerosis). Atherosclerosis can also be indicative of elevated triglyceride levels that are linked to an increase incidence in CKD (Touhy & Jett, 2012).

Hypertension is one of the most common and prevalent cardiovascular conditions among the older adult (Ostchega et al., 2007). Although some older adults are not diagnosed with hypertension, monitoring and screening could help reduce their risk of acquiring CKD. The higher an individual's blood pressure, the greater the risks are for developing a myocardial infarction, heart failure, cerebral vascular accident, and/or kidney disease (Ostchega et al., 2007).

In an analysis of CKD and the risks of death, cardiovascular events, and hospitalization, older adults with lower glomerular filtration rates were more at risk for developing serious cardiovascular conditions such as a myocardial infarction, angina, coronary artery disease, strokes, and chronic heart failure (Go et al., 2004).

Awareness of General Population

Research by Saab, McCollough, and Bakris (2008) showed how awareness and detection of CKD is low in the U.S. The results led to establishing the Kidney Early Evaluation Program (KEEP). This program has helped in determining why individuals were not aware of CKD, its prevalence, and how to prevention (Saab, McCollough, and Bakris, 2008).

KEEP is the first national health-screening program to target adult populations at high risk for CKD and promote awareness. According to Saab, McCollough, and Bakris (2008) the population-based surveys have suggested that most patients with CKD have not effectively been informed of this condition by medical professionals. To ensure

adequate teaching and screening, strategies can be implemented to provide community-based education for adults on ways to detect CKD.

There have been a wide variety of programs to determine the awareness of CKD within the U.S. Programs such as KEEP and Pair-Up are used to encourage and promote awareness of kidney disease. Pair-Up is a program used to help raise awareness in women about kidney disease that is sponsored by the American Kidney Fund. According to the American Kidney Fund the Pair-Up program educates women on risk factors of kidney disease, and positive ways to live healthy. This program also give ways to get involved by becoming an activist in preventing kidney disease, sharing personal stories, giving healthy tips, and donating to help those individuals suffering from kidney disease.

Awareness of the Older Adult Population

Plantinga et al. (2010) noted that understanding risk factors associated with CKD does not differ by gender. However, males with CKD were more likely than females in the U.S. to be aware of their disease status. This research aided in the understanding that individuals, depending on age and ethnicity, may be more aware with a greater awareness being in males. Plantinga et al. (2010) further explained that ethnic minorities (particularly African Americans) are more aware of CKD and risk factors due to a higher likelihood of having family members or friends that suffer from CKD.

As research on CKD unfolds, the importance of raising awareness is evident because CKD can often go undetected and untreated in the older adult population. According to Rothberg et al. (2008) awareness in the older adult is important to help slow the progression of the disease. Rothberg et al. (2008) stated CKD is a growing problem

among the older adult population. Early detection is considered essential to ensure proper treatment to slow down the damage of nephrons and help maintain kidney perfusion. Other reasons for lack of awareness in the older adult population can occur from the physician's lack of awareness. In Plantinga et al. (2010), the researchers found that there is a correlation between lack of provider awareness and decrease CKD knowledge.

According to Rothberg et al. (2008) the normal age related physiologic changes can interfere with properly diagnosing older adults with CKD. This correlates to the increasing number of older adults developing CKD and raises a call for CKD awareness.

Research from Plantinga et al. (2010) also indicated that the knowledge of CKD has been lacking, especially amongst the older adult. In a survey with African American adults, only 3% named kidney disease as an important health problem, compared with 61% and 55% naming hypertension and DM Type II. The research showed the need to provide more education to promote awareness of CKD. Along with careful monitoring of lab values and symptoms associated with CKD, educational efforts aimed at improving CKD awareness, and training programs should be considered to further promote awareness of CKD in the older adult.

Chapter III:

Methodology

This chapter provides a description of research design, variables, subjects, instruments, and procedures. The null hypothesis and statistical methods are also included.

Research Design

This research study provided a quantitative descriptive research design. A *Chronic Kidney Disease Awareness Survey* was provided before and after an educational seminar on CKD in a small population in northern Mississippi and a large population in central Mississippi. This study was used to identify if the older adult population in northern and central Mississippi were aware of CKD.

Subjects

The Foster Grandparent Program offers seniors age 50 and older opportunities to serve as mentors, tutors, and caregivers for children and youth in elementary, middle, and high school. The Foster Grandparents meet monthly for training sessions.

Criteria for subject selection included Foster Grandparents in central (large city) and northern Mississippi (small city) who were at least 50 years of age. Subjects obtained were individuals who served as Foster Grandparents in central and northern Mississippi.

Sample

There were 25 Foster Grandparents in northern Mississippi that ranged from 51-77 years old. There were 75 Foster Grandparents in central Mississippi that were 55-80 years old. There was a total of 100 possible study participants, 68 participated in the study. The participants were used as a convenience sample since this was a group of older adults who gathered monthly and guest speakers would share health related information.

Instrument

For this study a multiple choice pre-test and post-test was developed entitled *Chronic Kidney Disease Awareness Survey* (Appendix B & C). The pre-test contained ten questions that assessed current knowledge regarding what CKD is, risk factors, complications, and prevention strategies associated with CKD. The post-test was provided to re-assess current knowledge regarding what CKD is, risk factors, complications, and prevention strategies associated with CKD.

Procedures

Adults who were 50 years of age and older that served as Foster Grandparents through the Administration on Aging in Mississippi were recruited to participate in a study that determined their awareness and knowledge level related to what CKD is, risk factors, complications, and prevention strategies associated with CKD.

The Project Director from each location was contacted and was provided an explanation of the proposed study. Documents in support of the project were submitted by each of the project directors. Informed consent process was obtained from the pool of

participants. The participants were informed that inclusion or exclusion (by self) from the study did not have any effect on their current medical condition nor were there any penalties to affect their status as a Foster Grandparent.

The consenting participants were provided a pre-test that included questions that assessed their current knowledge about definition and characteristics of CKD, the risk factors, complications, and prevention strategies.

After the pre-test was completed, a CKD educational seminar was conducted to explain the definition and characteristics of CKD, the risk factors, complications, and prevention strategies. Immediately after the CKD seminar was completed, a post-test was provided to re-assess their knowledge about what is CKD, risk factors, complications, and prevention strategies associated with CKD. The post-test contained the same questions that were included on the pre-test. The same procedure took place at both locations. Completion of the pretest took approximately 15 minutes to complete. More time was provided, if needed. The CKD seminar took 45-60 minutes. Completion of the post-test took approximately 15 minutes.

The data obtained was used to see if there was a difference in scores from pre-test to post-test. This data also was a foundation to determine the need for education initiatives and other programs that could be implemented with a focus on the older adult and CKD.

Research Question & Hypotheses

Research Question 1. Is there a change in the individual scores from pre-test to post-test in each location?

Research Question 2. Will there be a significant difference in scores in the small city versus the large city from pre-test to post-test?

Null Hypotheses 1. There is not a change in the individual scores.

Null Hypotheses 2. There are no significant differences between the pre-test and post-test scores on the *Chronic Kidney Disease Awareness Survey* with the Foster Grandparent study participants in the small city versus the large city.

Chapter IV:

Results

The participants from the small city and large city were asked to provide demographic information and complete a pre-test and post-test related to CKD. The demographics section provided questions related to age, race, gender, and if they currently had a diagnosis of DM Type II, hypertension, and CKD by a health care professional (physician, nurse practitioner, physician assistant)(See Appendix A). After providing demographic information, the participants were asked to complete a *Chronic Kidney Disease Awareness Survey Pre-test* to determine their awareness of CKD. Upon completion of the pre-test, the participants attended an educational seminar on CKD. After the seminar was conducted, the participants were given a *Chronic Kidney Disease Awareness Survey Post-test* to reassess their knowledge of CKD. Below are the results from both the small and large city Foster Grandparent program sites.

Small City

Demographics.

The Foster Grandparent program located in northern Mississippi has a total 25 Foster Grandparents. On the day the data was obtained 21 Foster Grandparents were present and all consented to participate in the study. The age of the participants ranged from 57 years old to 77 years old. One (4.8%) participant was between 50-59 years of age. Eleven (52.4%) participants were between 60-69 years old, and nine (42.9%) were between 70-79 years of age.

Twenty (95.2%) participants were female and one (4.8%) was a male. All of the participants were African American. Fifteen (71.4%) participants were diagnosed with high blood pressure, 11 (52.4%) were diagnosed with DM Type II, two (9.5%) participants were diagnosed with CKD. Diagnoses were determined by a physician or nurse practitioner. Two (9.5%) of the participants did not answer the question related to having a diagnosis of CKD. All participants have never attended an educational seminar related to CKD.

Table 5

Demographics of Foster Grandparent Participants in the Small City

High Blood Pressure	Diabetes Mellitus (DM) Type II	Chronic Kidney Disease (CKD)	Chronic Kidney Disease Seminar
28.6% (6) -No	52.4 % (11)-No	81% (17)-No	100%-No
0% (0)-Unknown	0% (0)-Unknown	9.5% (2)-Unknown	0% (0)-Unknown
71.4% (15)-Yes	47.6% (10)-Yes	9.5% (2)-Yes	0% (0)-Yes

*Unknown= Did not answer the question (See Appendix A)

Pre-test.

1. What is chronic kidney disease? (*Select one answer*)
 - a. A disease where the kidneys slowly stops working.
 - b. A disease where a person urinates too much.
 - c. A disease where there are a lot of stones in the kidney
 - d. A disease where there is cancer in the kidney.

The correct answer was a: A disease where the kidneys slowly stop working. Approximately 81% of the participants answered the question correctly. Nineteen percent answered the question incorrectly.

2. How many stages are there in chronic kidney disease? (*Select one answer*)
- a. Two stages
 - b. Three stages
 - c. Four stages
 - d. Five stages

The correct answer was d: Five stages. All of the participants answered the question incorrectly.

3. Which of the following medical conditions can cause chronic kidney disease? (*Select more than one answer*)
- a. Diabetes
 - b. High blood pressure
 - c. Gout
 - d. Arthritis

The correct answers were a and b: Diabetes and High blood pressure. Approximately 76.2% answered the question correctly. Approximately 23.8% answered the question incorrectly.

4. Which age group is at greatest risk for developing chronic kidney disease? (Select one answer)

- a. Newborn babies
- b. Teenagers
- c. Young adults between the ages of 25-35
- d. Older adults over 50 years old

The correct answer is d: Older adults over 50 years old. Approximately 95.2% answered the question correctly. Approximately five percent (4.8%) answered the question incorrectly.

5. Which race of people is at greatest risk for developing chronic kidney disease? (Select one answer)

- a. Japanese and African American
- b. Hispanics and Caucasians
- c. Hispanics and African Americans
- d. Caucasians and Chinese

The correct answer is c: Hispanics and African Americans. Approximately 71.4% answered the question correctly. Approximately 28.6% answered the question incorrectly.

6. Which statement is true about chronic kidney disease? (Select one answer)
- a. Once a person has chronic kidney disease, they always have chronic kidney disease.
 - b. Once a person has chronic kidney disease, it can be cured with medicine and dialysis.

The correct answer is a: Once a person has chronic kidney disease, they always have chronic kidney disease. Approximately 38.1% answered the question correctly.

Approximately 61.2% answered the question incorrectly.

7. If a person has chronic kidney disease, what organs in the body can be affected? (Select more than one answer)

- a. Heart
- b. Lungs
- c. Skin
- d. Brain

The correct answers are a, b, c, & d: Heart, Lungs, Skin, and Brain. All of the participants answered the question incorrectly.

8. What is the leading cause of death in a person who has chronic kidney disease?

(Select one answer)

- a. Heart disease
- b. Bone disease
- c. Liver disease
- d. Kidney disease

The correct answer is a: Heart disease. Approximately 48% answered the question correctly. Approximately 52.4% answered the question incorrectly. Approximately five percent (4.8%) did not answer the question.

9. When a person has chronic kidney disease, the only available treatment is hemodialysis. *(Select one answer)*

- a. True
- b. False

The correct answer is b: False. Approximately 28.6% answered the question correctly. Approximately 71.4% answered the question incorrectly.

10. Which of the following is a way to prevent chronic kidney disease? *(Select more than one answer)*

- a. Keep blood sugar levels under control
- b. Stay away from juices and soft drinks

- c. Keep blood pressure under control
- d. Keeping weight under control

The correct answers are a, c and d: Keep blood sugar levels under control, keep blood pressure under control, and keeping weight under control. Approximately 14.3% answered the question correctly. Approximately 85.7% answered the question incorrectly.

Post-test.

Question 1: See Appendix C

The correct answer is a: A disease where the kidneys slowly stops working. Approximately 81% answered the question correctly. Approximately five percent (4.8%) answered incorrectly. Approximately 14.3% did not answer the question.

Question 2: See Appendix C

The correct answer is d: Five stages: 71.4% answered the question correctly. Approximately 28.6% answered the question incorrectly.

Question 3: See Appendix C

The correct answers are a and b: Diabetes and High blood pressure. Approximately 71.4% answered the question correctly. Approximately 28.6% answered the question incorrectly.

Question 4: See Appendix C

The correct answer is d: Older adults over 50 years old. Approximately 81% answered the question correctly. Approximately 19% answered the question incorrectly.

Question 5: See Appendix C

The correct answer is c: Hispanics and African Americans. Approximately 81% answered the question correctly. Approximately 19% answered the question incorrectly.

Question 6: See Appendix C

The correct answer is a: Once a person has chronic kidney disease, they always have chronic kidney disease. Approximately 71.4% answered the question correctly. Approximately 28.6% answered the question incorrectly.

Question 7: See Appendix C

The correct answers are a, b, c, and d: Heart, Lungs, Skin, and Brain. Approximately 38.1% answered the question correctly. Approximately 61.9% answered the question incorrectly.

Question 8: See Appendix C

The correct answer is a: Heart disease. Approximately 61.9% answered the question correctly. Approximately 38.1% answered the question incorrectly.

Question 9: See Appendix C

The correct answer is b: False. Approximately 47.6% answered the question correctly. Approximately 42.9% answered the question incorrectly. Approximately ten (9.5%) did not answer the question.

Question 10: See Appendix C

The correct answers are a, c and d: Keep blood sugar levels under control, keep blood pressure under control, and keeping weight under control. Approximately 47.6% answered the question correctly. Approximately 52.4% answered the question incorrectly.

Below is a comparison of the number of questions answered correctly on the pre-test and post-test results for participants in the small city.

Table 6

Comparison of Pre-test & Post-test Results for Small City

#	Correct Answer	Pre-test	Post-test	Increase/Decrease
1	A	17 (81%)	17 (81%)	0%
2	D	0 (0%)	15 (71.4%)	71.4% (+)
3	AB	16 (76.2%)	15 (71.4%)	4.8% (-)
4	D	20 (95.2%)	17 (81%)	14.2% (-)
5	C	15 (71.4%)	17 (81%)	9.6% (+)
6	A	8 (38.1%)	15 (71.4%)	33.3% (+)
7	ABCD	0 (0%)	13 (61.9%)	61.9% (+)
8	A	10 (47.6%)	13 (61.9%)	14.3% (+)
9	B	6 (28.6%)	10 (47.6%)	19% (+)
10	ACD	3 (14.3%)	10 (47.6%)	33.3% (+)

Large City

Demographics.

The Foster Grandparent program in the large city has a total of 75 Foster Grandparents. On the day the data was obtained 52 Foster Grandparents were present and 47 participated. The age of the participants ranged from 61 years old to 90 years old. Sixteen (34%) participants were between 60-69 years of age. Twenty-two (46.8%) participants were between 70-79 years old. Eight (17%) participants were between 80-89 years old and one (2.1%) participant was 90 years old.

Thirty-five (74.5%) participants were female, nine (19.1%) were male, and three (6.4%) did not answer the question. Forty-one (87.2%) participants were African Americans, two (4.3%) participants were Caucasian, one (2.1%) participant was American Indian, and three (6.4%) did not answer the question. Forty (85.2%) participants were diagnosed with high blood pressure, 22 (46.8%) were diagnosed with DM Type II, three (6.4%) participants were diagnosed with CKD. Diagnoses were determined by a physician or nurse practitioner. One (2.1%) participant did not answer the questions on DM Type II and CKD and two (4.3%) participants did not answer the question related to the diagnosis of CKD. Two (4.3%) participants previously attended an educational seminar related to CKD.

Table 7

Demographics of Foster Grandparent Participants in the Large City

High blood pressure	Diabetes Mellitus (DM) Type II	Chronic Kidney Disease (CKD)	Chronic Kidney Disease Seminar
7 (14.9%)-No	24 (51.1%)-No	42 (89.4%)-No	44 (93.6%)-No
0 (0%)-Unknown	1 (2.1%)-Unknown	2 (4.3%)-Unknown	1 (2.1%)-Unknown
40- (85.2%)-Yes	22 (46.8%)-Yes	3 (6.4%)-Yes	2 (4.3%)-Yes

*Unknown= Did not answer the question (See Appendix A)

Pre-test.

Question 1: See Appendix B

The correct answer was a: A disease where the kidneys slowly stops working.

Approximately 57.4% of the participants answered the question correctly.

Approximately 19.2% answered the question incorrectly. Approximately 23.4% did not answer the question.

Question 2: See Appendix B

The correct answer was d: Five stages. Approximately 17% answered the question correctly. Approximately 57.5% answered the question incorrectly.

Approximately 25.5% did not answer the question.

Question 3: See Appendix B

The correct answers were a and b: Diabetes and High blood pressure.

Approximately 46.8% answered the question correctly. Approximately 42.6% answered the question incorrectly. Approximately 10.6% did not answer the question.

Question 4: See Appendix B

The correct answer is d: Older adults over 50 years old. Approximately 51.1% answered the question correctly. Approximately 29.8% answered the question incorrectly. Approximately 19.1% did not answer the question.

Question 5: See Appendix B

The correct answer is c: Hispanics and African Americans. Approximately 44.7% answered the question correctly. Approximately 38.3% answered the question incorrectly. Approximately 17% did not answer the question.

Question 6: See Appendix B

The correct answer is a: Once a person has chronic kidney disease, they always have chronic kidney disease. Approximately 44.7% answered the question correctly. Approximately 23.4% answered the question incorrectly. Approximately 31.9% did not answer the question.

Question 7: See Appendix B

The correct answers are a, b, c, & d: Heart, Lungs, Skin, and Brain. Approximately 12.8% answered the question correctly. Approximately 78.7% answered the question incorrectly. Approximately nine percent (8.5%) did not answer the question.

Question 8: See Appendix B

The correct answer is a: Heart disease. Approximately 40.4% answered the question correctly. Approximately 40.5% answered the question incorrectly. Approximately nine percent (8.5%) did not answer the question.

Question 9: See Appendix B

The correct answer is b: False. Approximately 34% answered the question correctly. Approximately 53.2% answered the question incorrectly. Approximately 12.8% did not answer the question.

Question 10: See Appendix B

The correct answers are a, c and d: Keep blood sugar levels under control, keep blood pressure under control, and keeping weight under control. Approximately 23.4% answered the question correctly. Approximately 63.8% answered the question incorrectly. Approximately 12.8% did not answer the question.

Post-test.

Question 1: See Appendix C

The correct answer is a: A disease where the kidneys slowly stops working. Approximately 78.7% answered the question correctly. Approximately 19.2% answered the question incorrectly. Approximately two percent (2.1%) did not answer the question.

Question #2: See Appendix C

The correct answer is d: Five stages: Approximately 76.6% answered the question correctly. Approximately 17% answered the question incorrectly.

Approximately six percent (6.4%) did not answer the question.

Question 3: See Appendix C

The correct answers are a and b: Diabetes and High blood pressure.

Approximately 44.7% answered the question correctly. Approximately 51% answered the question incorrectly. Approximately four percent (4.3%) did not answer the question.

Question 4: See Appendix C

The correct answer is d: Older adults over 50 years old. 85.1% answered the question correctly. Approximately six percent (6.4%) answered incorrectly (e.g. too many answers provided, not enough answers provided or provided wrong answer).

Approximately nine percent (8.5%) did not answer the question.

Question 5: See Appendix C

The correct answer is c: Hispanics and African Americans. Approximately 57.4% answered the question correctly. Approximately 27.7% answered the question incorrectly. Approximately 14.9% did not answer the question.

Question 6: See Appendix C

The correct answer is a: Once a person has chronic kidney disease, they always have chronic kidney disease. Approximately 66% answered the question correctly.

Approximately 17% answered the question incorrectly. Approximately 17% did not answer the question.

Question 7: See Appendix C

The correct answers are a, b, c, and d: Heart, Lungs, Skin, and Brain.

Approximately 10.6% answered the question correctly. Approximately 78.8% answered the question incorrectly. Approximately 10.6% did not answer the question.

Question 8: See Appendix C

The correct answer is a: Heart disease. Approximately 38.3% answered the question correctly. Approximately 46.8% answered the question incorrectly.

Approximately 14.9% did not answer the question.

Question 9: See Appendix C

The correct answers is b: False. Approximately 51.1% answered the question correctly. Approximately 31.9% answered the question incorrectly. Approximately 17% did not answer the question.

Question 10: See Appendix C

The correct answers are a, c and d: Keep blood sugar levels under control, keep blood pressure under control, and keeping weight under control. Approximately 38.3% answered the question correctly. Approximately 53.2% answered the question incorrectly. Approximately nine percent (8.5%) did not answer the question.

Below is a comparison of the number of questions answered correctly on the pre-test and post-test results for participants in the large city.

Table 8

Comparison of Pre-test & Post-Test Results for the Large City

#	Correct Answer	Pre-test	Post-test	Increase/Decrease
1	A	27 (57.4%)	37 (78.7%)	21.3% (+)
2	D	8 (17%)	36 (76.6%)	59.6% (+)
3	AB	22 (46.8%)	21 (44.7%)	2.1% (-)
4	D	24 (51.1%)	40 (85.1%)	34% (+)
5	C	21 (44.7%)	27 (57.4%)	12.7% (+)
6	A	21 (44.7%)	31 (66%)	21.3% (+)
7	ABCD	6 (12.8%)	5 (10.6%)	2.2% (-)
8	A	19 (40.4%)	18 (38.3%)	2.1% (-)
9	B	16 (34%)	24 (51.1%)	17.1% (+)
10	ACD	11 (23.4%)	18 (38.3%)	14.9% (+)

Comparison of the Small City versus the Large City

Below is a comparison of the number of questions answered correctly on the pre-test results for participants at the small city versus the large city.

Table 9

Comparison of Small City versus Large City Pre-test Results

#	Correct Answer	Pre-test (Small City)	Pre-test (Large City)
1	A	17 (81%)	27 (57.4%)
2	D	0 (0%)	8 (17%)
3	AB	16 (76.2%)	22 (46.8%)
4	D	20 (95.2%)	24 (51.1%)
5	C	15 (71.4%)	21 (44.7%)
6	A	8 (38.1%)	21 (44.7%)
7	ABCD	0 (0%)	6 (12.8%)
8	A	10 (47.6%)	19 (40.4%)
9	B	6 (28.6%)	16 (34%)
10	ACD	3 (14.3%)	11 (23.4%)

Below is a comparison of the number of questions answered correctly on the post-test results for participants in the small city versus the large city.

Table 10

Comparison of Small City versus Large City Post-test Results

#	Correct Answer	Post-test (Small City)	Post-test (Large City)
1	A	17 (81%)	37 (78.7%)
2	D	15 (71.4%)	36 (76.6%)
3	AB	15 (71.4%)	21 (44.7%)
4	D	17 (81%)	40 (85.1%)
5	C	17 (81%)	27 (57.4%)
6	A	15 (71.4%)	31 (66%)
7	ABCD	13 (61.9%)	5 (10.6%)
8	A	13 (61.9%)	18 (38.3%)
9	B	10 (47.6%)	24 (51.1%)
10	ACD	10 (47.6%)	18 (38.3%)

Statistical Analysis

Research Question 1

To answer research question 1, test scores from the Chronic Kidney Disease Awareness Survey pre-test and post-test for each participant were analyzed to determine if there was in change in individual scores. Based on the analysis of table 6 and table 8

there was a change in scores from pre-test to post-test in both the small city and large city.

Research Question 2

To answer research question 2, test scores from the Chronic Kidney Disease Awareness Survey pre-test and post-test for each participant were analyzed to determine if there was a change in individual scores. Based on the analysis of table 9 and table 10 there was not a significant difference in scores in the small city versus the large city from pre-test to post-test.

Hypotheses 1 & 2

To test hypotheses one and two, a two-tailed t-test was performed to compare the mean scores of the pre-test and post-test on the Chronic Kidney Disease Awareness Survey between Foster Grandparents in the small city versus the large city. The t-test results were 0.5425 which showed that there was not a statistical significance at the 0.05 level.

Chapter V:

Discussion

Small City

Based on the results from participants in the small city there were changes in the scores from pre-test to post-test. All participants answered question #2 (How many stages are there in chronic kidney disease?) and #7 (If a person has chronic kidney disease, what organs in the body can be affected?) incorrectly. This indicated that the participants did not know about the number of stages and organs affected by chronic kidney disease. As a group the participants in the small city averaged 45.2% on the pre-test. The results from the pre-test and post-test indicated a need for further teaching related to CKD.

The participants' post-tests scores showed improvement with a 22.4% increase for the average of the group from pre-test to post-test. The only decrease in number correct from pre-test to post-test was question #3 and question #4 where 71.4% answered correctly on the post-test as compared to the 76.2% who answered correctly on the pre-test. The results from the pre-test to post-test indicated that there was significant improvement in scores after the chronic kidney disease seminar.

There are many factors that could have influenced the increased participant average from pre-test to post-test. For example, all of the participants answered question #2 (How many stages are involved in chronic kidney disease?) incorrectly on the pre-test and there was a 71.4% increase in correct responses for on the post-test. Providing

education resulted in an increase in scores from pre-test to post-test. The average collectively increased by 22.4% resulting in overall increase awareness of CKD.

Table 11

Average Scores for the Small City

Test/Change	Average of Scores
Pre-test	45.2%
Post-test	67.6%
% of Change	22.4%

Large City

Based on the results from participants at the large city, there were changes between the pre-test and post-test. Most of the participants answered the questions incorrectly, with an average of 37.2%. Over 50% of the participants answered question #1 (What is chronic kidney disease?) and #4 (Which age group is at greatest risk for developing chronic kidney disease?) correct. The rest of the questions were answered incorrectly. The results from the pre-test indicate a need for further teaching as it relates to CKD.

The post-test average was 54.7%. This showed a 17.5% increase from pre-test to post-test, which indicated that the CKD seminar was effective.

Table 12

Average Scores for the Large City

Test/Change	Average of Scores
Pre-test	37.2%
Post-test	54.7%
% of Change	17.5%

Comparison of Small City versus Large City Average Scores

When comparing the participants in the small city and the large city there were approximately a 15% difference the results. The participants in the small city performed better on both the pre-test and post-test. For example, the average pre-test scores for the Foster Grandparents in the small city was 45.2% while the average pre-test scores for the Foster Grandparents in the large city was 37.2%. Furthermore, the post-test average for the Foster Grandparents in the small city was 67.6%, while the post-test average for the Foster Grandparents in the large city was 54.5%.

Chapter VI:

Conclusion

Based on results there is need for community-based education related to CKD and the older adult. The main objective (to see who was aware of chronic kidney disease) was reached in this study. This study also helped determine which locations have a better understanding of CKD and who is most likely understand factors associated with contracting chronic kidney disease. This study furthermore gave the Foster Grandparents in the small city and the large city a better understanding of CKD, the risk factors, complications, and prevention strategies.

This research is vital because awareness of CKD is very important, especially for older adults. Since older adults are more at risk for developing CKD, it is imperative that they are aware of what it is, other co-morbid conditions associated with the disease, and how it can negatively affect the body. The research study helped determine the number of people who are aware of CKD and how effective a CKD seminar is to the participants by analyzing the change in test scores from pre-test to post-tests in both settings.

Future Implications

During this study there were variables that may have affected the results. In the future, the researchers may use smaller groups as evidence by the comparison between the small city versus the larger city average scores. Based on this study, a smaller number of participants performed better on the pre-test and post-tests. Other implications include the format of the assessment and only using single answer multiple-choice questions instead of multiple answer multiple-choice questions.

While there is the possibility of chance occurrences, this study had the basic intent to provide a foundation and determine the scores on the pretest and the posttest.

Determination if there was an increase in the score after the educational activity was the primary goal for this specific study. However, when the study is replicated, more advanced statistical analysis will be conducted.

Additional research can be done to obtain additional data from other southern states and other regions in Mississippi to using a more diverse population. Future implications also include data analysis of demographics of the older adult including education level and socioeconomic status. Other initiatives include seeking funding to help provide older adults with community-based education initiatives to promote awareness and prevention of CKD.

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Appendices

Appendix A

Chronic Kidney Disease Awareness Survey Demographics

1. **What is your age?** _____
2. **Are you male or female?**
_____ Female/Woman
_____ Male/Man
3. **What is your race?**
 - a. African-American/Black
 - b. Caucasian/White
 - c. Hispanic
 - d. American Indian
 - e. Asian American
4. **Do you have high blood pressure?**
 - a. Yes
 - b. No
5. **Do you have Diabetes?**
 - a. Yes
 - b. No
6. **Do you have Chronic Kidney Disease?**
 - a. Yes
 - b. No
7. **Have you ever attended a seminar or workshop about Chronic Kidney Disease?**
 - a. Yes
 - b. No

Appendix B

**Chronic Kidney Disease Awareness Survey
Pre-Test**

- 1. What is chronic kidney disease? (Select one answer)**
 - a. A disease where the kidneys slowly stops working.
 - b. A disease where a person urinates too much.
 - c. A disease where there are a lot of stones in the kidney
 - d. A disease where there is cancer in the kidney.

- 2. How many stages are there in chronic kidney disease? (Select one answer)**
 - a. Two stages
 - b. Three stages
 - c. Four stages
 - d. Five stages

- 3. Which of the following medical conditions can cause chronic kidney disease? (Select more than one answer)**
 - a. Diabetes
 - b. High blood pressure
 - c. Gout
 - d. Arthritis

- 4. Which age group is at greatest risk for developing chronic kidney disease? (Select one answer)**
 - a. Newborn babies
 - b. Teenagers
 - c. Young adults between the ages of 25-35
 - d. Older adults over 50 years old

5. Which race of people is at greatest risk for developing chronic kidney disease? (Select one answer)
- a. Japanese and African American
 - b. Hispanics and Caucasians
 - c. Hispanics and African Americans
 - d. Caucasians and Chinese
6. Which statement is true about chronic kidney disease? (Select one answer)
- a. Once a person has chronic kidney disease, they always have chronic kidney disease.
 - b. Once a person has chronic kidney disease, it can be cured with medicine and dialysis.
7. If a person has chronic kidney disease, what organs in the body can be affected? (Select more than one answer)
- a. Heart
 - b. Lungs
 - c. Skin
 - d. Brain
8. What is the leading cause of death in a person who has chronic kidney disease? (Select one answer)
- a. Heart disease
 - b. Bone disease
 - c. Liver disease
 - d. Kidney disease
9. When a person has chronic kidney disease, the only available treatment is hemodialysis. (Select one answer)
- a. True
 - b. False

**10. Which of the following is a way to prevent chronic kidney disease?
(Select more than one answer)**

- a. Keep blood sugar levels under control
- b. Stay away from juices and soft drinks
- c. Keep blood pressure under control
- d. Keeping weight under control

Appendix C

**Chronic Kidney Disease Awareness Survey
Post-Test**

- 1. What is chronic kidney disease? (Select one answer)**
 - a. A disease where the kidneys slowly stops working.
 - b. A disease where a person urinates too much.
 - c. A disease where there are a lot of stones in the kidney
 - d. A disease where there is cancer in the kidney.

- 2. How many stages are there in chronic kidney disease? (Select one answer)**
 - a. Two stages
 - b. Three stages
 - c. Four stages
 - d. Five stages

- 3. Which of the following medical conditions can cause chronic kidney disease? (Select more than one answer)**
 - a. Diabetes
 - b. High blood pressure
 - c. Gout
 - d. Arthritis

- 4. Which age group is at greatest risk for developing chronic kidney disease? (Select one answer)**
 - a. Newborn babies
 - b. Teenagers
 - c. Young adults between the ages of 25-35
 - d. Older adults over 50 years old

5. Which race of people is at greatest risk for developing chronic kidney disease? (Select one answer)
- a. Japanese and African American
 - b. Hispanics and Caucasians
 - c. Hispanics and African Americans
 - d. Caucasians and Chinese
6. Which statement is true about chronic kidney disease? (Select one answer)
- a. Once a person has chronic kidney disease, they always have chronic kidney disease.
 - b. Once a person has chronic kidney disease, it can be cured with medicine and dialysis.
7. If a person has chronic kidney disease, what organs in the body can be affected? (Select more than one answer)
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Appendix D



INSTITUTIONAL REVIEW BOARD

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NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 14042301

PROJECT TITLE: Awareness and Prevention of Chronic Kidney Disease in the Geriatric Population

PROJECT TYPE: New Project

RESEARCHER(S): Rowena Elliott, Ph.D.

COLLEGE/DIVISION: College of Nursing

DEPARTMENT: Advanced Nursing Practice

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Exempt Review Approval

PERIOD OF APPROVAL: 05/27/2014 to 05/26/2015

Lawrence A. Hosman, Ph.D.
Institutional Review Board