2004-04-01

The Effect of a Nurse Practitioner Intervention on Women Referred for Screening Mammography

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DOCTOR OF PHILOSOPHY IN NURSING

THE EFFECT OF A NURSE PRACTITIONER INTERVENTION ON WOMEN REFERRED FOR SCREENING MAMMOGRAPHY

by

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A dissertation presented to the

FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE

UNIVERSITY OF SAN DIEGO

In partial fulfillment of the

Requirements for the degree

DOCTOR OF PHILOSOPHY OF NURSING

April 2004

Dissertation Committee

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ABSTRACT

The use of mammography for the early identification of breast cancer when tumors are small and potentially curable has been well documented. Unfortunately, the rates at which women comply with their health care providers' recommendation for screening mammography remain low. Many reasons have been identified for the failure to adhere with this recommendation; pain with procedure, cost, lack of physician recommendation, perceived radiation exposure, and fear of results have been cited. The purpose of this study was to identify the effect of a specific intervention by a nurse practitioner on adherence with screening mammography in a healthy population of women ages 40 and older in North East Texas. Additionally, using Bandura's Social Learning Theory, the relationship between adherence with screening mammography and perceived self-efficacy were identified, as well as mammography adherence and attitude toward heath care approaches.

The total sample for this study was 39 women in North East Texas of whom 20 participants were in the control group, 19 in the experimental group. The total sample adherence with mammogram was 56.4%, control group 43.6%, and 68% for the experimental group. Study findings identified a positive relationship between health motivation and intent to follow through with their health care providers' recommendation for a mammogram. Results also identified a positive relationship between intent to have a screening mammogram and self-efficacy. Women who identified intent to have their mammogram, and then did so, had a positive health locus of control.

These findings suggest further research is needed to identify how to encourage women to follow through with their health care providers' recommendation for screening

mammogram. Additional research to validate the findings of this study include identifying what type of specific intervention would best increase patient adherence with mammography, and further exploration of the role of the nurse practitioner encouraging adherence with screening mammography. Further research that tests specific interventions by nurse practitioners in practice is still needed, as very little research has been done in this area.

DEDICATION

This dissertation is dedicated to my loving family thank you for your support with this endeavor. The endless support and caring will always be appreciated. Thanks Glenn for being such a terrific Dad to the girls. Jamie and Jessica, thank you for being so understanding when Mom was gone overnight and missed some special activities in your lives. Your bright smiling faces and unending love makes my heart sing. I love you both more than you will ever know. Thanks for the endless encouragement.

Mom and Dad, I can never thank you enough for your endless support and unconditional love. Thank you for the many trips to the airport as my personal chauffeur, for the great visits overnight, and the many adventures in baby-sitting. You have encouraged and supported my goals, career, and education since I was a little girl. Higher education has been a life-long family value, thank-you.

In memory of my Grandma Helen Jacobsen, who I know is looking down from Heaven with a smile on her face. Hey, Grandma, I am finished! Thanks, Grandma, for the outstanding example that you set for the women in our family, as a graduate from the University of Nebraska in 1918. Education is a priority for women.

Thanks to the Lord Jesus Christ as my personal savior, for without His sacrifice, there would be no eternal life.

Love to you all.

ACKNOWLEDGMENTS

I would like to begin by acknowledging and thanking the faculty of the School of Nursing for their individualized attention that allows each and every student to feel special. Personal interaction with the students the strength of the Doctoral program at the University of San Diego. I am most appreciative of the talented and attentive dissertation committee led by Dr. Jane Georges. Jane's leadership and unending support throughout this dissertation process have been wonderful. I am also grateful and thankful for the guidance from Dr. Cynthia Gantt, Dr. Kathy James, and Dr. Collette Jones, who have supported the importance of research for nurse practitioners in clinical practice. My experience with this dissertation process has been positive as a result of this committee. Now I may begin the long-term program of research related to nurse practitioners and the positive impact that they have on health care.

The support of my colleagues and friends is greatly appreciated. Without your support and encouragement, this journey would not have been possible.

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Chapter I

INTRODUCTION

Statement of Issue

Breast cancer is a significant health problem for women. Currently, one out of every nine women will have breast cancer during their lifetime. Breast cancer is the second leading cause of death in the United States for women of all ages and is the leading cause of death in women 40-55 years of age. The American Cancer Society estimated that 212,600 new cases of breast cancer would be diagnosed and approximately 39,800 women would die from breast cancer in 2003. The risk of breast cancer increases as women age, with a significant increase for all women over 40. Unfortunately, research has not identified strategies effective in preventing breast cancer. However, routine mammography enables the detection of cancer at an early stage, offering the best opportunity for identification of breast cancer when it is small, thereby increasing the longevity of the patient (American Cancer Society, 2003).

Beginning in 1963, the Landmark Health Insurance Plan of Greater New York provided the first scientific evidence supporting mammography screening for women. This study found that early detection and treatment of breast cancer reduced the 10-year mortality rate by 29% in women 40 years of age and older (Shapiro, Strax & Venet, 1988). The use of mammography has resulted in the early identification of breast cancer when tumors are small, earlier in development, and potentially curable (Entrekin & McMillan, 1993). The screening mammogram is recommended for women over age 40, who are asymptomatic and who have not had prior mammogram abnormalities. Despite

the success of mammography, the American Cancer Society (1995) reports that only 40% of age-eligible American women referred for screening mammography actually have the procedure.

Problem Statement

Despite the success of mammography as a diagnostic tool, many women who could benefit from mammography screening do not adhere to their health care providers' recommendation to receive a screening mammography. Failure to comply with this recommendation is a major concern for health care providers due to the increased incidence of breast cancer that occurs in women as they age. There is a significant decrease in mortality that occurs in women 40 years of age and older, who receive annual screening mammography. The National Health Interview Survey (2001) identified that the percentage of women who reported having had a mammogram in the past 2 years increased from 28.8% in 1987 to 66.9% in 1998. Women living in metropolitan areas were 10% more likely to receive a mammogram than those living in rural communities (Breen, Wagerner, Brown, Davis & Ballard-Barbash, 2001). The American Cancer Society's goal for 2008 is that 90% of all women 40 and older receive annual mammography screening (American Cancer Society, 2003).

Researchers have identified the following specific barriers to mammography adherence: 1) lack of physician or health care provider recommendation; 2) individual lack of awareness about mammogram; 3) cost or lack of insurance coverage for mammogram; 4) limited access to mammogram facilities; 5) fear of cancer or a belief that little can be done to reduce the chance of dying from breast cancer; 6) cultural

influence and 7) lack of social support (Centers for Disease Control and Prevention, 1997).

Women who are most likely to obtain mammography screening are those who practice positive health behaviors, such as having an annual physical, not smoking, and having a positive health-locus of control. Additionally, women who have a friend or family member with breast cancer are more likely to obtain a mammogram (Fajardo, Saint-Germain, Meakem III, Rose & Hillman, 1992). Factors such as level of education and family income have not been consistently identified as either positive or negative influences to mammography adherence. Women who are referred by a physician for a screening mammogram have a higher adherence rate than women who are not (Love, Brown, Davis, Baumann, Fontana & Sanner, 1993). Women who have had a previous mammogram are more likely to have future mammograms (Rakowski, Rimer & Bryant, 1993; Champion, 1992). Current health care literature focuses on two major areas regarding promotion of compliance with screening mammography. One area of focus has described specific physician interventions designed to enhance screening mammography adherence, such as postcard reminders or withholding prescription refills until the woman's mammography has been completed. A second focus has explored the reasons surrounding the decision that a woman makes about mammography. Despite numerous studies utilizing these two foci, little documentation exists regarding the role of nurse practitioners in fostering mammography adherence.

Nursing interventions that help individuals become actively involved in health promotion activities are based on promoting and teaching healthy behaviors. Florence Nightingale was the first nurse to advocate health promotion as a nursing responsibility

(Nightingale, 1992). The evolution of health promotion, disease prevention, and early detection of cancer continues to influence nursing practice as nurse practitioners carry out the goals of Healthy People 2010 in practice, education, and research (U. S. Department of Health and Human Services, 2000).

Nurse practitioners have assumed central roles in providing health care in primary care settings. They provide management and coordination of medical care services with dignity through a personalized, caring manner, emphasizing preventive care for their patients (Hickey, Ouimette & Venegoni, 1996). Nurse practitioners strive to be holistic in emphasizing wellness over acute episodic care through their professional role in the identification, diagnosis and referral of individuals' physical and mental care (Kalisch & Kalisch, 1995). Nurse practitioners are, therefore, in a unique position to promote healthy behaviors and influence a woman's decision to follow recommended screening mammography guidelines. This proposed study is designed to expand the current knowledge base regarding nurse practitioner interventions to enhance compliance with mammography.

Purpose of the Study

Nurse practitioners manage the treatment and education of patients in primary care. Therefore, nurse practitioners are in a unique position to influence women to obtain their screening mammography. It is imperative that nurse researchers explore and explicate the factors that influence women to adhere with the recommendation of their health-care provider for screening mammography. Successful interventions that encourage patients to adhere with the recommended screening mammography guidelines will decrease the mortality rate from breast cancer.

The overall purpose of this investigation was to identify the effect of a specific intervention by a nurse practitioner on rates of adherence to screening mammography in a healthy population of women ages 40 and older. In addition, this study described the relationship between rates of mammography adherence, and the variables of self-efficacy related to mammography and attitude toward health care treatment approaches in this population.

The specific research aims were as follows:

1. To test the effect of a specific intervention by nurse practitioners on rates of adherence to screening mammography;

2. To examine the relationship between rates of screening mammography adherence and perceived self-efficacy related to mammography;

3. To examine the relationship between rates of screening mammography adherence and attitude toward health care approaches.

Research Hypotheses

The following research hypotheses were tested:

H1: A significant difference in rates of screening mammography adherence will exist between a group of women who receive a structured nurse practitioner intervention and a group not receiving the intervention;

H2: A positive correlation will exist between rates of screening mammography adherence and perceived self-efficacy related to mammography;

H3: A positive correlation will exist between rates of screening mammography adherence and attitudes toward self-directed treatment.

Theoretical Framework

The theoretical framework for this study was Bandura's Social Learning Theory. This theory predicts behavior change through the measurement of perceived self-efficacy, which is the individual's confidence to complete a new task or behavior change successfully (Bandura, 1977). This framework provides a basis to identify motivation and behavior based on individual thought or action. Social learning theory was chosen as a basis for this study as it allows for the prediction of future behaviors based on past behaviors.

Definition of Terms

Mammography Adherence: Obtaining a mammogram within six weeks of the health care provider's recommendation.

Nurse Practitioner: A registered professional nurse who is prepared for advanced nursing practice through an advanced educational program of study. The nurse practitioner is prepared to practice independently and in collaboration with other health care professionals in the delivery of health care to individuals and family groups in a variety of settings (Texas Board of Nurse Examiners, 1995).

Intervention: Interaction by the nurse practitioner designed to encourage the patient to have her screening mammography; this will include the nurse practitioner explaining the importance of mammogram as a method for early detection of breast cancer when it is small, thereby increasing life expectancy.

Benefit: A positive expected outcome resulting from mammography screening

Barrier: A perceived or actual obstacle to mammography.

Self-efficacy: Perspective mechanism in humans that influences thought, action, and emotional patterns. It is the individual's confidence that a particular skill can be successfully completed (Bandura, 1977).

Significance of the Study

This study has relevance and significance for both present-day and future health care delivery to identify the impact of a specific nurse practitioner intervention on the adherence of women referred for screening mammogram, as well the individuals level of perceived self-efficacy related to health promotion and prevention.

Assumptions and Limitations

Assumptions: The following assumptions were identified for this study:

1. Women are referred for screening mammograms
2. The data collection sites identified were representative of Northern Texas.
3. Nurse practitioners have a positive influence with their patients

Limitations: The following limitations were identified for this study:

1. The sample was voluntary, with random assignment to the control or experimental group. The subjects had control over the decision to complete and return the questionnaires. The sample size is small and limited to the nurse practitioner sites in Northern Texas.

Summary

Breast cancer is a significant health problem for women. Screening mammography can significantly reduce the rate of breast cancer mortality in women who are 40 years of age and older. Unfortunately, the adherence rate of women who follow their health care providers' recommendations for having a screening mammography is

57.2% in the state of Texas, 62.6% Nationwide (ACS, 2003). Nurse practitioners in primary care are in a unique position to encourage their patients to adhere to the recommended screening mammography guidelines, thus improving longevity. Research studies that specifically identify the impact of nurse practitioner interventions designed to increase patient adherence with recommended screening mammography have not been identified in the literature.

In the next chapter, a selected review of literature will identify the relevance of this study to nursing, with a focus on theoretical and substantive literature related to social learning theory, screening mammography adherence, and interventions designed to influence patient adherence with screening mammography.

Chapter II

REVIEW OF THE LITERATURE

Introduction

The purpose of this chapter is to provide background information related to this study. A selected review of the literature identifies the relevance of this study to nursing and focuses on theoretical and substantive literature related to social learning theory. Breast cancer screening recommendations will be reviewed as a method for early detection of breast cancer, with the primary focus on mammography. Social learning theory will be discussed as the theoretical model for this research. Studies that identify variables related to self-efficacy, breast cancer screening and detection, the decision a patient makes to have a screening mammogram once referred by a health care provider, and specific interventions that influence mammography adherence in the literature related to screening mammography adherence will be presented. A theoretical model that identifies mammography screening as it relates to self-efficacy will be presented.

Significance

Early detection of breast cancer can decrease the rate of death from cancer. "The early detection of certain cancers can save lives, reduce extent of treatment and improve quality of life" (Cancer Prevention and early detection facts and Figures 2003, American Cancer Society, page 26). Between 1987 and 1999, the breast cancer rate in women increased by 40%. This increase has coincided with the increased use of mammography to detect breast cancer when it is small.

Breast cancer now accounts for one of five deaths in the United States

(U.S. Department of Health and Human Services, 2000). In the United States, the demands for health care are increasing as the population of America ages. In 2000, more than 36 million Americans will be 45-55 years of age (Henderson, 1995). In 2030, individuals over 65 years will represent 20% of the total population. Increased longevity is the result of health care promotion, disease prevention, and advances in the treatment of cardiovascular and pulmonary problems. A lifestyle that supports exercise, stress reduction, preventive health care, and healthy diet habits further increases both the length and quality of life (Hickey et al., 1996). As the population ages, the number of women at risk for breast cancer increases.

Cancer survival is dependent upon the early identification of cancer. Specific to breast cancer detection, mammography provides an early screening method to identify breast cancer while it is small. Unfortunately, many women referred for screening mammography did not follow through with their health care providers' recommendation. Nurse practitioners are in a key role to influence women to adhere with recommended screening mammography. A review of social learning theory will identify some of the possible causes for this lack of behavior change.

Social Learning Theory

One method of predicting behavior change is through the measurement of perceived self-efficacy, which is the individual's confidence in completing a new task or behavior change successfully (Bandura, 1977). Self-efficacy is defined in social learning theory as the individual's perceived ability to complete a skill, task, or behavior successfully. In his Social Learning Theory, Bandura (1977) identifies self-efficacy as a means to influence and predict future behaviors. Multiple research findings validate the

social learning theory properties that self-efficacy predicts long-term behavior change. What is the relationship between a woman's level of self-efficacy and the behavior of adherence with screening mammography recommendations?

Social Learning Theory is a theoretical framework for identifying motivation and behavior based on individual thought or action (Bandura, 1977). This theory emerged in the early 1940's as an attempt to predict and explain human behavior. Social learning is a combination of the individual's cognitive processing, behavior, and personality, which are affected their by perceptions, expectations, and prior experiences (Champion, 1993; Pajare, 1996). Cognitive processing is purposeful thinking that involves the review of experiences, the influence of others, religion or cultural beliefs, education level, and personal experience. An individual's cognitive processing allows for identification of consequences or outcomes based on past behaviors or actions and predict future actions based on those same experiences. This predictive element is the premise that perceived self-efficacy focuses on cognitive processing.

Social Learning Theory is one framework that nurse practitioners can utilize to understand the human behavioral response relative to adherence with recommended screening mammography guidelines. Bandura (1977) conducted research focusing on how cognitive processes influence behavior and learning. By cognitively practicing or imagining behaviors or interactions, individuals may increase their perceived level of effectiveness. Learning or behavior change takes place based on the individual's cognitive ability to process specific behaviors or actions. This cognitive ability is at the center of learning, as it reflects human thoughts and actions along with motivation and affect. Therefore, nurse practitioner interventions that influence the client's cognitive

learning about mammography may result in the behavior change of adherence with recommended screening mammography.

Self-Efficacy as a Predictor of Behavior Change

The concept of self-efficacy predicts how and why behavior change will take place based upon individual perceptions of effectiveness. Self-efficacy is a perceptive mechanism in humans that influences their thoughts, actions, and emotional patterns. Knowledge of Social Learning Theory is important to understanding why human beings respond as they do in a given situation. The level of self-efficacy can influence the individual's behavior or judgment of his or her own capabilities to organize and execute an action that results in a specific performance, or outcome, such as having a screening mammography (Bandura, 1977, 1986; Bigge, 1982; Haddock, 1994).

Interventions that influence perceived self-efficacy can result in individual learning or behavior change. Individual learning may be improved by using "cognitive aids" generated by cognitive processes or visualization. To be successful, behavior change should include the cognitive use of self-efficacy to strengthen the conviction on an individual that he or she can successfully execute a behavior required to produce a specific outcome. An individual who observes modeled behaviors forms cognitive ideas of the desired behaviors, thus avoiding the errors or mistakes that others made. Perceived self-efficacy decreases the necessity for trial-and-error learning (Bandura, 1977, 1986, 1989; Bigge, 1982). An intervention to strengthen self-efficacy in women referred for screening mammogram would be for the nurse practitioner to visualize with the patient the experience of having a mammogram.

Measurement of individual self-efficacy is an accurate predictor of behavioral change. Bandura's interpretation of self-efficacy emphasizes a cognitive relationship in which beliefs and perceptions predict outcomes (Bandura 1977, 1986; Murdock & Neafsey 1995). Expectations of self-efficacy determine what type of behavior will be initiated, the level of effort, and how long the effort will continue. Self-efficacy permits individuals to attempt tasks with confidence, which enhances the likelihood of completion. A strong belief in self-efficacy will result in a strong motivation for action and increase the potential for a positive outcome. In contrast, a negative perception will act in an adverse manner. Efficacy expectations are a predictor for successful outcome or expectation (Bandura, 1971).

An efficacy expectation is the internal belief that a specific action can be successfully completed (Bandura, 1977; Gecas, 1989). Perceptions of self-efficacy may be positive or negative and directly influence whether a task is attempted. When the perceptions of self-efficacy are positive, the motivation of the individual will be higher and a successful outcome will be more likely. Conversely, when self-perceptions are negative, expectations are lower, and outcomes are consistent with the lower expectations. Four sources of information are used to form perceptions of self-efficacy: performance accomplishments, vicarious experience, verbal persuasion, and psychological states. These sources of information may contribute to the learning process of the individual. Decisions are made about actions that will be carried out and about the time and energy to be invested (Bandura, 1984). Depending on the situation, as well as the strength or magnitude of the efficacy expectations, one or more of these information sources will be used to strengthen the perception of self-efficacy. Attention to the

components of each of these areas will help to identify a specific method to provide education or behavior change when the goal is to improve the level of perceived self-efficacy.

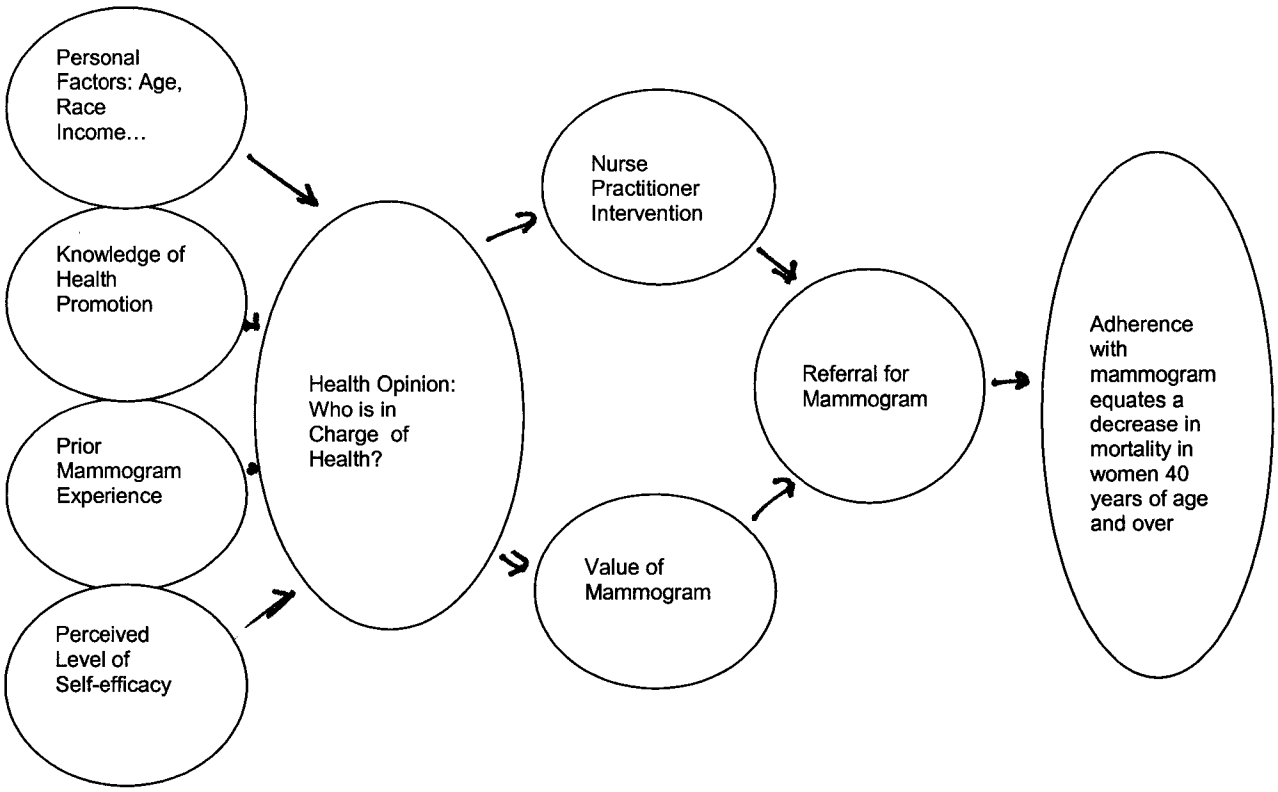
Accomplished performance is described by Bandura (1977) based on the perception by the individual that a certain task, skill, or behavior will be successful or unsuccessful, depending on prior accomplishments. Willingness to change behavior or to learn a new skill may be influenced by performance accomplishments. One method used to influence performance accomplishments is cognitive imagination or practice. When individuals imagine repetitively practicing a new skill or behavior, this reinforces their performance. This process is cognitive processing or repeated cognition. Cognitive processing may have positive results when used along with instruction for individual learning. Performance accomplishments are the most heavily weighted source of information that affects the perceived level of efficacy. A woman who perceives that she will be successful in having a mammography will be more successful than the woman who has previously been referred for a mammography but chose not to have it.

According to Bandura's Social Learning Theory, the second method of promoting self-efficacy is through vicarious experience: acquiring learning by observing the actions or behaviors of others. Observation of others influences behavior change and allows individual modeling to occur, based on the consequences or outcomes (Bandura, 1977; Bigge, 1982). If a positive outcome takes place, the observer may be motivated to perform the observed behavior. Watching others perform activities in an environment that is non-threatening should increase the level of motivation to perform

(Bandura, 1977). This method relates to an increased mammography adherence rate when a woman has had a family member or friend who has experienced breast cancer (Fajardo et al., 1992; American Cancer Society, 1997).

A third method of forming perceptions of self-efficacy is the use of verbal persuasion, the attempt by discussion to change or lead individuals into successful behaviors or completion of a task. This method is used to convince people that they possess the capabilities to complete their task or goal. Negative perceptions of self-efficacy with negative verbal persuasion tend to correlate with unsuccessful outcomes (Bandura, 1986). Positive verbal persuasion will be utilized in this study as an intervention to influence patient adherence with recommended screening mammography guidelines. This method will be used in this research study. The final area that influences social learning is the psychological status or emotional well-being of the individual. Emotions such as anxiety or anger can alter the ability to function efficiently. Physiologic responses of comfort or discomfort will influence the anticipation or performance of a task or behavior in an individual (Bandura, 1977; Kavanagh & Bower, 1985). To predict human behavior, measuring self-efficacy is important because it predicts successful behavior change. Social Learning Theory provides a model for predicting behavioral change and the individuals' motivation to learn. A review of specific research will support that the individuals perceptions will be accurate indicators of success or failure at a given task, such as adherence to screening mammography.

Mammography Theoretical Model



The mammography adherence theoretical model identifies specific variables related to the decision a woman makes to adhere with the recommendation of their health provider to obtain a screening mammogram. Adherence with the referral will be based in specific variables, such as demographic data, health belief, prior experience with mammogram, and the level of perceived self-efficacy.

Early Detection of Cancer

Approximately one-third of Americans will develop cancer during their lifetime. Cancer affects three out of four American families. Early detection for all types of cancer is important because many types of cancer can be cured if they are detected and treated in early stages. Breast cancer is the most common type of cancer among women in the United States. Second only to lung cancer, breast cancer is a leading cause of death in the

United States. The average woman has a one in nine chance of developing breast cancer during her lifetime. A woman with localized breast cancer has a five-year survival rate of 93%. When the cancer has spread or metastasized, the five-year survival rate drops to 18% (U.S. guide to clinical preventative services, 1989).

Breast Cancer Prevention and Detection

Sixty years ago, White (1939) identified that, for the successful treatment of patients with breast cancer, treatment should begin when the cancer is a small, local disease of the breast. Breast cancer in the early stage has few signs or symptoms. Very small lumps in the breast are those that are only a few millimeters in diameter and cannot be felt by the patient. A lump is not palpable by the patient until it is approximately 1.5 cm in diameter. When an individual feels a breast lump, it is a usually a small, hard lump that is freely movable, not attached to the skin or muscle, and is non-tender. The average size of a breast lump found by the patient is about 2.5 cm. Unfortunately, when cancerous breast lumps are this size, 50 percent of these patients will have lymph node involvement at the time of lump detection. This correlates with a higher rate of metastasis and an increased mortality rate. Early detection of breast cancer involves screening and diagnostic techniques that allow breast cancer to be detected while it is small, localized, and more likely curable. To increase the longevity of patients with cancer, early detection by mammogram is a priority. Regardless of the treatment method used for breast cancer, the most important factor that influences survival is early recognition of the disease (Entrekin et al., 1993; White, 1939).

Cancer prevention and detection include a variety of specific activities that individuals may use to decrease their cancer risk. Primary prevention of cancer refers to

lifestyle changes, such as ceasing smoking, limiting sun exposure, or making dietary modifications. Secondary prevention involves screening procedures that are designed to detect cancer at an early and possibly curable stage. Breast mammography is a secondary screening method that has been identified as a successful method for the early identification of breast cancer when it is small and lumps are not detectable in a pre-clinical phase (Entrekin et al., 1993).

The pre-clinical phase of breast cancer occurs when cancerous lumps are not detectable by ordinary methods such as human touch. Early in the development of breast cancer, in the extended or pre-clinical phase, a breast cancer mass is only detectable by mammography due to its small size. A mass that is detected early in its development may be as small as a few millimeters in diameter. Because many of the breast cancer tumor types are slow growing, the pre-clinical stage may be lengthy. When a breast cancer doubles its size of a few millimeters every 100 days, there may be a 2- to 3-year pre-clinical, non-palpable stage, during which the tumor may be detected only by mammogram. When breast cancer is small and undetectable by human touch, yet found by mammogram, it is unlikely that there will be lymph node involvement or metastasis of the tumor, thereby increasing the woman's longevity (Wertheimer, Costanza, Dodson, D'Orsi, Pastides, & Zapka, 1986). When breast cancer is limited only to the breast tissue, with no lymph node involvement or metastasis, there is a 90% survival rate (American Cancer Society, 1997). This supports the use of mammography for early detection when cancer is only in the breast as a means to increase longevity.

Breast Cancer Screening Guidelines

The American Cancer Society and National Institute of Health developed guidelines for breast cancer detection in 1989 in conjunction with eleven national organizations. Prior to this time, there had been conflicting guidelines about cancer screening and age-appropriate guidelines (American Cancer Society, 1997). These guidelines have provided a consensus between health care organizations with a consistent recommendation for health care providers for the early detection of cancer. In May of 2003, the ACS updated their recommendations supporting screening mammography for the early detection of breast cancer for women over the age of 40. Prior to this time, the American Cancer Society had a three-part screening guideline that included; (a) self-breast exam (SBE), (b) clinical breast exam (CBE), and (c) mammography. The self-breast exam is an exam performed by a woman to become familiar with her breast's appearance and feel, so that she may note any changes in the breast tissue. The CBE is a clinical exam performed by a trained health care professional. The professional inspects the breast for any changes or abnormalities, and then completes a manual exam of the breast to identify any abnormalities. The final guideline is for all women 40 and older to be referred for and to obtain an annual screening mammography. The mammogram is a low-dose x-ray procedure that allows visualization of the internal structure of the breast.

The American Cancer Society (ACS) has established three levels of age-specific recommendations for women who are asymptomatic of breast disease (American Cancer Society, 2003). The recommendation for women aged 20-39. is that women be educated by their health care provider about the importance of the monthly self-breast exam, and should have a clinical breast exam every three years. For any woman who is in this age

group, with a strong family history of breast cancer, the health care provider should discuss the possibility of a screening mammogram beginning at the age of 30. Second, for women aged 40-49, the recommendation is a monthly SBE, a yearly clinical breast exam, and a mammography every year, with the first (baseline) mammography by the age of 40. Finally, women age 50 and older should have a monthly SBE, an annual CBE, and yearly mammography (ACS, 2003).

Mammography as a Screening Method for Breast Cancer

Albert Salomon first published the feasibility of using mammography to identify breast cancer in 1913. He utilized x-rays on the breasts of cadavers to identify abnormalities. These early breast x-rays were poorly understood and delivered high amounts of radiation while providing a poor quality view of the breast. Due to the lack of quality x-rays and the lack of understanding about the clinical significance of what was seen on these films, refinement of mammography was delayed for many years (Bassett, Manjikian, & Gold, 1990). The evolution of mammography has produced, through the utilization of a low-dose x-ray procedure, the current high-quality image that allows visualization of the internal structure of the breast. It has the sensitivity that identifies breast masses at a rate 76-94% higher than that of a clinical breast exam by a health care provider. Mammography is 90% accurate in identifying that a woman is free of cancer at the time of the examination. Mammography has been shown to reduce breast cancer mortality significantly--by at least 31% in women 50 years of age and older (American Cancer Society, 1995; United States Department of Health and Human Services, 1997).

Mammography Decreases Mortality

The first study that identified mammography as The Health Insurance Plan of Greater New York Trial conducted a successful screening tool. This study provided evidence that the early diagnosis and treatment of breast cancer by screening mammography can reduce the mortality rate from breast cancer in women 50 years of age and older (Shapiro et al., 1988). The randomized study of 62,000 women provided participants with four annual screening mammograms and a clinical breast examination each year for four years. The participants in the trial group that received screening mammography were found to have a ten-year breast cancer mortality rate that was 29% lower than that of the control group. This study was the first to identify the benefit of screening mammography for early identification of breast cancer and reduction in the mortality rate. Results from this study provided the foundation for further research. Since this landmark study, numerous studies have continued to support the use of mammography as a method for decreasing mortality from breast cancer in women. A Swedish study with a randomized trial involving 135,000 women provided mammography to 77,000 women every other year. Results of this study indicated a 31% reduction of breast cancer mortality (Taber, Fagerberg, Duffy, & Day, 1989). Additional studies support the reduction in mortality rate ranging from 20-36% for women age 40 and older (Rutqvist, Miller, Andersson, Hakama, Hakulinen, Sigfusson, & Taber, 1990).

Self-Efficacy and Mammography Use

A descriptive-correlation study surveyed 86 working women in a convenience sample about their personal health practices, current health status, and personal risk factors. Coppel's Perceived Self-Efficacy Scale was used to identify the health locus of

control. This 22-item scale had a test/re-test reliability of .86. The health status and practice instrument was researcher developed to assess the personal health status and specific practices related to health. This study identified that women who carry out preventative health practices have a higher level of self-efficacy (Wehrwein & Eddy, 1993).

Many factors influence the decision that a woman makes to have a screening mammography. Specific behaviors that improve or maintain health are knowledge about mammography, positive health practices, and concerns about healthy behaviors, satisfaction with medical care, general well being, and a positive locus of control. Women who were receiving screening mammography (n=521) were surveyed about the effect of personal factors, attitudes, and health-related behaviors related to mammography. This was a sample group of women who were at a screening center, having already made the decision to have their mammogram. Women who did not exercise, monitor their dietary intake, participate in health promotion activities, and who believed that there was little that they could do to reduce their chance of dying from breast cancer were less likely to undergo screening mammography (Fajardo et al., 1992). Women who had received a physician recommendation for mammography cited that this was a positive influence on their decision to have a mammogram.

Additionally, this study identified factors that influence women to adhere with their health care providers' recommendations for screening mammogram. Results of this study support the premise of self-efficacy through vicarious experience and past behaviors, as the rate of women who had previously undergone mammography was 75.8%. Limitations of this study are that this sample group was at a mammography

center; therefore, the decision to have mammography had already been made. Particular behaviors, personal attributes, attitudes, or health-related behaviors of women who have never had mammography are not identified since only women who were receiving mammography were surveyed. The results of this study support the critical role of the physician as a positive influence on attitudes and behaviors of women toward mammography since these women were referred by their physician (Fajardo et al., 1992). The more frequently a woman has a physical examination, pap smear, clinical breast exam, or exercises, the more likely she will be compliant with the American Cancer Society guidelines for mammography (Kurtz, Given, Given & Kurtz, 1993).

In a work-site based study of 3737 women 35 and older, barriers and facilitators related to mammogram, breast self examination, and clinical breast examination were identified. Utilizing self-efficacy theory, The Health Care Practices Survey identified demographic and personal information related to health maintenance behaviors. A second tool contained questions related to barriers and facilitators of breast cancer screening. No citation of reliability or validity of the instruments or previous use of the tool was discussed. However, data analysis identified a Cronbach's Alpha of .70.

These tools were based on a four-point Likert scale, distributed by mail. Results of this study identified that 98% of women had been taught breast self-exam, with 59% reporting adherence to the monthly recommendation. This study identified that 86% of the women had received one screening mammogram in the past and 97% had received a clinical breast examination. The mammography adherence rate of this sample was 71%, significantly higher than other stated rates (Kurtz, et al, 1993).

This study concurred that the more frequent a woman's physical examination, the more likely she is to be compliant with the American Cancer Society's screening guidelines. Those who had more frequent pap smears were more likely to be compliant with guidelines for mammography and clinical breast exam. Women who exercised more frequently were more likely to be compliant with breast self-exam. Results also identified that cost was not identified as a significant barrier; however, in this sample 99.7% of the women had health insurance. The results of this study identified that the perceived importance of mammography was significantly related to adherence with mammography and clinical breast exam. Women who were more compliant with mammography guidelines tended to be adherent at a higher rate with clinical breast exam and breast self-exam.

Critique of this study is that it is not reflective of most women because the screening was work-site based and all of the employees had health insurance (99%). The response rate of 43% indicates a self-selection with a bias of public sector of employed white women. This study identifies a significantly higher adherence rate with mammography than that identified by the American Cancer Society. Is this rate inflated by self-report? Are there conflicts with the behaviors of the 59% of the women who have been taught breast self-exam who are not practicing this behavior? Or does it identify that women rely more on clinical beast exam and mammography as an effective breast cancer screening programs in contrast to the American Cancer Society recommendation? This study has identified the work site an effective screening environment.

Factors That Influence a Woman's Decision to Have a Mammogram

Mammography has been shown to be an effective method for the early detection of breast cancer. However, there are many factors that influence the decision to have a mammogram. Physician recommendation for mammography has been identified as a major facilitator for women to have a screening mammogram (Miller & Champion, 1993; Phillips & Wilber, 1995). The current screening mammography recommendations are related specifically to age. However, for a woman who has increased risk factors for breast cancer, screening mammography may be recommended more frequently or at an earlier age. Hamblin (1991) identified that physicians say that they recommend mammography from 30-70% of the time. However, upon review of medical records, the actual written recommendation for screening mammography was documented in only 25 percent of the charts for age-eligible women (Selinger, Goldfarb, & Perkel, 1989).

Physician Recommendation for Mammography

Which patients are commonly referred for screening mammography? This question, along with demographic data and a scale to measure physician beliefs about breast cancer were completed by 212 physicians. A mail survey was designed using case study or vignettes about different patients who could be referred for mammography. The likelihood of a physician referring patients for mammography varied significantly with the characteristics of each patient described in the vignette. A 55-year-old patient who was in good health would be referred by 91.3 % of the physicians. A 70-year-old would be referred by 63.6% of the physicians, while a 40-year-old patient received recommendation for mammography 65.9% of the time. Patients who belonged to a prepaid health plan or were financially secure received a physician recommendation

97.3% and 93.5% respectively. When women had a family history of breast cancer, the recommendation was 96.7%. When a patient has other medical problems such as hypertension, diabetes or depression, the referral rate was lower, at 84.2%. When patients were described as retarded or in a nursing home, the recommendations were even lower, 66.8% and 15.3% respectively. The study concluded that many women do not receive referrals for screening mammography according to current recommendations. This contrasts with one of the most powerful reasons that women received their mammography being based on the recommendation of the health care provider (Fajardo et al., 1992).

Forty-primary care physicians were surveyed in an exploratory study about their performance of cancer screening. This convenience sample identified physicians in solo or small group practice who completed a self-administered 143-item multiple-choice questionnaire. This instrument included items that were drawn from another large sample survey that had "proven" reliability and internal consistency. The questionnaire contained categories that identified demographic information, personal health behaviors, attitudes and beliefs regarding health promotion, medical practice characteristics, and professional activities. Additionally, an audit of a random sample of medical records measured the physicians' prior year performance of cancer detection activities that included, but were not limited to, pelvic exam, breast exam, and mammography recommendation (Osborn, Bird, McPhee, Rodnick, & Fordham, 1991).

Results of this study identified that 65% of the physicians believed that mammography was an effective method in detection of cancer. However, audits of patient medical records found that the actual adherence rate with early detection methods

of cancer was less than reported; 43% of patients received a clinical breast exam and 29% received a mammogram recommendation.

A critique of this study is that it identified a small convenience sample of physicians who were given a self-administered questionnaire. This study was the confirmed the reported cancer screening activities by the audit of medical records. This audit identified that adherence with recommendations for cancer screening is low in this sample. The audit rate of a 29% recommendation rate for women to have mammography does not give the actual percentage of women who actually adhered to this recommendation and had their mammography. Conclusions from this study were that there is an increased need for cancer screening among physicians, that female physicians had a higher percent of visits in which preventative activities took place, and that there needs to be an increased collaboration between patient and providers for cancer screening (Osborn et al., 1991).

Knowledge of Nurses about Cancer Detection

Entrekin et al., (1993) used a convenience sample of 2,348 nurses to identify their knowledge level about cancer, their knowledge about clinical practice related to cancer prevention and detection, and their perception of who is responsible for teaching patients about cancer prevention and detection. Content validity for the researcher-developed questionnaire was based on the American Cancer Society guidelines. Reliability was established using a test/re-test method with a range of 55-82%. The results of this study found that the respondents knew the most about breast and prostate cancer, and the least about endometrial and lung cancer. Sixty-six percent of nurses believed that cancer prevention and early detection were part of their role; however, respondents reported

teaching breast self-exam, smoking cessation, and skin examination to only 0-20% of their patients.

Limitations of this study are that it used a self-report convenience study of nurses. The tool was researcher developed, based on guidelines of the American Cancer Society. A further breakdown of the areas in which the nurses are employed would be helpful to understand why so few of the nurses were involved in cancer prevention education. This study is significant in highlighting the lack of patient education and cancer detection (Entrekin et al., 1993). If so few nurses are involved in cancer education, where do patients learn about cancer prevention and early detection?

Adherence with Mammography Screening Recommendations

Champion (1992) surveyed 322 women about their compliance with recommended mammography screening. Compliance with mammography was determined if the participant's mammography behavior met the American Cancer Societies guidelines for screening mammography. Of the participants, 136 (43%) were identified as compliant while 176 (55%) were identified as non-compliant. These results are consistent with the published compliance rate by the American Cancer Society. Additionally, variables related to intent to seek mammography were also identified. Intent to seek mammography was measured using a 30- point summed scale that measured the variables of benefit, barriers, health motivation, control, knowledge of breast cancer, social support, whether mammography had been suggested, and whether the woman had recently received information about mammography.

Barriers to mammography were identified as cost, pain from procedure, lack of time, embarrassment, and worry about the possible results. Significant individual

variables that were identified as related to the intent to adhere to mammography were a family history of breast cancer, perceived control of over the effects of breast cancer, and age. Older women tended to be less compliant with mammography recommendation. The main factor for adherence was having mammography suggested; knowledge of breast cancer and social economic status were positively correlated to compliance. Additionally, women who had symptoms were more likely to adhere to recommended mammography. Champion (1992) recommends that health professionals must be aggressive in their approach to encourage mammography if the death rate for breast cancer is to be brought under control. Nurse practitioners are in a key role to encourage and influence women to adhere with the recommended mammography screening guidelines.

Researchers concluded that the compliance of African-American women with the current screening mammography guidelines is much lower than the American Cancer Society published rate. A non-probability sample of 154 African-American women, who were quota-sampled based on their employment status, were surveyed regarding the influence of their health care provider in relation to patient adherence to screening mammography guidelines. A researcher-developed tool was used that was based on the health belief model, a literature review, and other published instruments. Content reliability was based on other instruments; and internal consistency was identified using a Cronbach's alpha coefficient from .72-.88 (Philips et al., 1995).

Results of this study identified that unemployed women had a 12% compliance rate with recommended mammography screening; service workers, 16%; and teachers, 33%. Women who were more likely to adhere to the screening guidelines were women

who: (a) had some college education or a college degree, (b) had income levels above $31,000, (c) received a health care provider recommendation, and (d) who had fewer perceived barriers to mammography. Women who received a provider recommendation were 5.3 times more likely to comply with the guidelines for screening mammography. Limitations of this study were that the tool was researcher designed and that the respondents constituted a small sample. This study identified an adherence to screening mammography by African-American women at a rate that is much lower than reported by the American Cancer Society. This study supports the need for further research with minority women. The results of this study identify the importance of the health care provider recommendation as the most important strategy to encourage compliance with screening mammography guidelines (Phillips et al., 1995).

Barriers and Facilitators to Mammography

In a self-report descriptive study of 161 women, Miller and Champion (1993) identified predisposing and enabling factors related to mammography utilization in women 50 years and older. A researcher-designed tool, The Behavioral Model of Mammography Use Tool, incorporates predisposing, enabling, and need variables related to mammography and preventive health services. Content validity for the tool was addressed by expert review from six nationally known researchers and physicians. This tool used the sub-scales of susceptibility, benefits, barriers, social influence, and knowledge. The sub-scales had an internal consistency using Cronbach's alpha from .80-.94. The ACS based criteria for adherence with mammogram on the age-related recommendations.

Women with a higher adherence rate for their physician had referred receiving their recommended screening mammography, received a screening mammography before, and had intended to have a screening mammography. Other predisposing factors were age (younger), those who were Catholic, participants with at least 14 years of education, and a family history of breast cancer or a history of benign breast disease. Women who received their annual pap smears were more likely to obtain their screening breast mammography. Barriers were identified in individuals who had never received a mammography before or had mean income levels less $20,000 per year. Some suggestions to publicize and reinforce the importance with patient adherence to mammography guidelines were flagging charts for reminders, sending postcards to the patients, and making phone call reminders (Miller et al., 1993).

Health Care Provider Recommendation

Physicians' recommendations for screening mammography were examined in a survey of 300 randomly selected physicians. The questionnaire described patient scenarios related to age, health and economic status, reason for the physician visit, and specific patient characteristics related to mammogram. Questions asked related to the beliefs and views of the physician about the effectiveness of mammogram for early detection of breast cancer, the effectiveness and safety of mammography, and the influence of malpractice related to breast cancer screening. Physicians were asked to respond to the likelihood of their recommending mammograms using a five-point Likert scale. Respondents were asked to rate their views as to the effectiveness of breast cancer screening by mammogram. 212 surveys were returned with a response rate of 71%, of which 91% were family physicians (Hamblin, 1991).

The physician likelihood of recommending screening mammography varied significantly, depending upon the patient characteristics described in each scenario. Analysis of data identified that physicians would recommend mammography 91.3% to patients who were 55 years of age and seeing the physician for their annual visit. Older or younger patients (less that 40 or greater than 70) would receive recommendations for screening only 65% of the time. Women with risk factors for breast cancer were recommended for screening more often than those without risk factors. Physicians were less likely to recommend screening if the woman had multiple medical problems, was retarded, or lived in a nursing home. If a patient requested a mammogram at her yearly visit, the physician almost always would recommend the mammogram. If the patient was seen for an urgent problem or if the physician was running behind schedule, a mammogram was ordered significantly less often. Physicians agreed that mammography was effective for screening of breast cancer: 97% of the physicians agreed or strongly agreed that patients should be screened annually even though patients did not always receive a referral, and 79% of the physicians agreed or strongly agreed that, between the ages of 40 and 50 years, a woman should be screened every one to two years. This study identified that older or younger women or women who did not see their physician for routine physicals had significantly less opportunity for screening mammograms (Hamblin, 1991).

Critiques of the study are that it involved a small group of respondents, there was no reliability or validity stated about the researcher-created tool, and that physicians in only one region of the country were surveyed. This study identified that there may be a lack of screening recommendations by physicians. Additionally, women who do not seek

preventive health care have a smaller chance of being referred for screening mammograms. This study was based on the physician response to the questions. There was no supporting information if the physicians actually recommended screening mammography as often as they stated in this study.

Improving Patient Outcomes

Adherence and favorable outcomes may be enhanced when patients are given a greater role and sense of personal responsibility in their health care decisions. One method to increase cooperation and actively involve patients is to obtain an overt commitment to the recommended treatment regimen (Kulik & Carlino, 1987). In an experimental study to identify the effectiveness of verbal commitment from parents of pediatric patients to comply with antibiotic administration, 89 patients were randomly placed in the control or treatment group. In the intervention group, the physician obtained a high level of commitment from the parents who were asked, "Will you promise me that you'll give all of the doses?" All of the subjects agreed. The results based on follow-up identified that a significantly greater percentage of children of the high-commitment parent group took more of their medication dosages. Health outcomes were identified in the high-commitment group as having a higher trend for resolution of their illness. Verbal commitment increased compliance by 5.72% and resolution of the illness by 10.93%. Eliciting a verbal commitment from patients or the parents is an extremely low-cost intervention. This perceived importance of performing the requested actions demonstrates the efficacy of verbal commitment (Kulik et al., 1987).

Contingency contracting is a specific negotiated agreement that provides for the delivery of a specific or desirable behavior that has been mutually agreed upon (Janz,

Becker & Hartman, 1984). Elements of contingency contracting involve a clear and specific goal, the behaviors that the involved parties are responsible for, how the behaviors will be measured, what happens if the individual fails to fulfill the contract, and a specific date that will identify when the contract is ended. Using contracting with clients increases adherence with health care provider recommendations because it allows the client to be an active participant in decision-making. The health care provider is also provided the opportunity to discuss health care options or health care opportunities (Kulik et al., 1987)

Behavioral contracting is a technique that may enhance the effectiveness of interventions designed to provide positive reinforcement for health promotion behaviors (Singleton, Neale, Hess & Dupuis, 1987). Behavioral contacting may be oral, written, or oral and written. Contracting has been identified as a positive method for behavioral reinforcement. It is based on targeting specific behaviors that are based on Social Learning Theory. The health-related behaviors and attitudes about smoking, blood pressure monitoring, exercise, and fitness of 223 participants, aged 25-55 years, were surveyed. A researcher-designed tool was created to measure these attitudes and behaviors. Each participant signed a contract that identified and measured their commitment to work toward reducing risk factors for two years. Participants received a review of their progress and motivational information at three counseling appointments during the study.

End results of this study at the two years mark identified participants who contracted to quit smoking were 16% more likely to have quit smoking in 2 years. Participants contracting to lose weight were successful with a 5.5 pound loss at six

months; however, there was no difference in the groups over time. Participants who contracted to decrease cholesterol levels were successful in decreasing their cholesterol level by 13.5%. The positive behavior change over time was related to commitment, specific goals, and encouragement to meet these goals (Singleton et al., 1987).

In a random clinical trial of adherence improvement, strategies used a post-test only control group design for measuring adherence. Graduate students who received a prescription for ten days of antibiotics received a self-efficacy questionnaire about their efforts toward resolving their illness. Review of their investment in getting better by the interviewer was designed to increase the patients' investment in their treatment. This also highlighted the consequences of non-adherence with the treatment and the increased benefits of treatment. After 7-10 days of treatment, a surprise visit was made to each of the participants. At this time, the researchers counted the number of pills that the participant had taken. A self-efficacy scale was also given to the patients for a self-report of adherence (Putman, Finney, Barlkey, & Bonner, 1994).

Results of this study identified that the rate of adherence and self-efficacy were correlated, thereby, the higher the level of commitment, the higher the level of adherence with the prescribed medication treatment. Commitment, such as pledging to adhere with a plan of treatment, influenced the individual behavioral actions. This study identified the importance of involving patients in their treatment and preventative health. This is related to this study because eliciting a verbal commitment from the patient being referred for a screening mammogram may influence their adherence.

Nurse Practitioner Interventions

The role of the nurse practitioner has been clearly linked with health promotion and health maintenance activities, and intervention activities for prevention and early detection. These activities are an integral component of the nurse practitioner role. Two different types of interventions have been used to improve mammography utilization. The first is the community-wide mammography promotion program that uses mass media to promote mobile vans for mammography utilization. The impact of these programs has been limited because they do not encourage women to develop life-long screening behaviors. These programs have been limited in their ability to reach women who are eligible for mammography. Second is the type of intervention that identifies women individually and attempts to increase their screening behaviors (American Cancer Society, 1995).

Warren and Pohl (1990) explored the type and frequency of cancer screening by nurse practitioners. In a descriptive study, four research questions were asked in a convenience sample of 97 primary care nurse practitioners: (1) What is the relationship between client age and the frequency of cancer screening practices? 2) What is the relationship between client genders with the frequency of cancer screening practices? (3) To what extent do nurse practitioners screen for a symptomatic cancer during the history and physical exam? (4) To what extent do nurse practitioners believe their activities related to cancer screening are part of their role?

The researcher developed tool was based on the American Cancer Society guidelines for cancer screening. Specific reliability and validity about the researcher-developed tool or about the scoring of the tool was not discussed. Specific questions

were related to breast self-examination and pap smears, to teaching of breast self-exam, and to obtaining a smoking history. Additionally, demographic data based on practice site, level of education, and certification background of the practitioners was included.

In response to the first question, screening for cancer occurred in all age levels. In young women, 38.6% of the respondents were screened for cancer. 24% of clients 65 years and older were screened for cancer during the patient history. Cancer screening practices for this group found that mammogram and sigmoid exam were the two tests that were significantly positive statistically.

The second question related to gender and the frequency of cancer screening practices identified that there was an increase in cancer screening when the patient was female. There was statistically significant cancer screening in all areas except in the performance of sigmoid and rectal exams. In the data collection related to this question, the researchers created a subset based on the practitioners who saw primarily adult clients. This resulted in a group of 58 practitioners, of which only two were male. This reflected on the specific exams that were performed.

The third research question reviewed the extent that nurse practitioners screen for a symptomatic cancer during a history and physical exam. Screening was performed most commonly in the following areas: breast exams (73%), pap smears (63%), and rectal exams for clients 40 and over (56%), inquiry about annual mammogram (55%), and prostrate exam (43%). Approximately 40% of all clients received some type of cancer screening. Young female clients were most likely to be screened for cancer, specifically by breast self-exam and pap smears.

The final research question identified that 94% of the nurse practitioners surveyed believed that cancer screening was a part of their role. Specific reasons for not carrying out cancer screening on all patients were lack of time, cost factors, working in a practice where it was not feasible to complete many types of screening, and the nurse practitioner's lack of knowledge related to current cancer screening recommendations.

One strength of this study was that it identified specific actions by nurse practitioners related to cancer screening activities. However, the sample group was small (n=97), with only two male respondents. The researchers developed this tool based on screening recommendations, but they failed to break down the specific examinations by age group, for example, asking the younger age group about mammography referral and history information when this group is not in the age group recommended for screening mammography. This study is based on the practitioners' responses about what they state is done in practice rather than on utilization of a client record audit that would reflect actual figures of screening activities.

A second study utilizing nurse practitioners was a quasi-experimental study to identify the impact of interventions on the rates of cervical and breast cancer screening in poor, elderly, black women. This study utilized two public hospitals in New York that gave care to 5000 patients each year. Approximately 90% of the elderly women attending the clinic for a year were approached about completing screening for breast and cervical cancer. Of the 689 women approached for screening, 76% of the women accepted screening.

Baseline and post-intervention screening rates were determined from medical record audits and compared to the post-intervention of both the control and experimental groups.

		Baseline	Post intervention
Mammography			
	Intervention	18.3	40
	Control	18.1	18.2
Pap testing			
	Intervention	17.8	56.9
	Control	118	18.2

The intervention in this study was offering screening to all women who were seen in the clinics. Same-day testing was offered to the clients by a nurse practitioner for pap testing. Mammogram screening was available by appointment, waiting times within four weeks. Characteristics of women in both the control and experimental groups were similar.

Strengths of this study were the design using an experimental and control group and using an intervention that provided same-day examinations for patients who were at the clinic for routine. Non-screening visits provided a significant increase in compliance with only one visit needed. This reason was identified as the difference between compliance with pap and mammography. The mammogram appointment required a second visit approximately one month later. Utilizing an active reminder system with available pap testing on the same day provided for the increased rate in cancer screening

services for the elderly (Mandelblatt, Traxler, Lakin, Thomas, Chauhan, Matseoane & Kanetsky, 1993).

A community-based intervention study, designed to reach African-American women 50 years of age and older, was developed specifically for this population due to their lack of health care provider visits. This decreased contact with health care providers results in fewer referrals for screening mammography. A target sample of 250 African-American women was identified in the culturally familiar setting of a local beauty shop. In four beauty shops, A Lifesaving Choice--a short film promoting mammography and breast self-exam, featuring a well-known individual--was shown to women while they received services at their local salon. A pamphlet that reinforced the early detection of breast cancer through mammogram was also distributed. Vouchers for low-cost or free mammograms, as well as the date when the mobile mammography van would be located at the salon, were distributed. This study provided an innovative model for a community-based intervention that targeted a specific population. Unfortunately, this study has not yet reported specific results.

Champion (1994) utilized a 2 x 2 factorial design to study the effect of specific interventions on women 35 years of age and older who had never had breast cancer and who were willing to participate in a one-year longitudinal study. 990 participants were identified by random digit dialing in a large metropolitan area. Of this group, 654 initially agreed to participate but only 322 returned the consent and tools for the study. These tools included demographic data, mammography history, and an assessment of beliefs related to mammography.

The tool used for beliefs related to mammography is a 5-point summated Likert scale that had been previously developed by the researcher. Content validity was based on three national experts in the area of the health belief model. The knowledge scale consists of 20 multiple-choice items that address facts about mammography and breast cancer. The internal consistency for the scale was 0.61. The mammogram influence form asked participants to rate specific factors according to how much influence they had on the decision to participate in mammography screening. No reliability or validity was given for this instrument. The Health Belief Index was modified from the original scale to measure the perceived susceptibility of breast cancer. This tool in the original form had three sub-scales: perceived susceptibility to breast cancer, perceived seriousness of breast cancer, and perceived benefits of mammography with alpha reliability of .84, .85, and .74 respectively. The Knowledge of Breast Cancer Survey was judged to have content validity for an assessment of knowledge about cancer.

Participants were randomly assigned to one of four groups. Group one was the control group. The second data collection involved an in-home session six weeks after the baseline information was obtained. The second group received an informational training session utilizing role modeling designed to increase beliefs about mammography. These interventions were developed based on the assessment tool of beliefs related to mammography completed by the participants. Pamphlets were given to participants designed to reinforce information related to the seriousness of breast cancer, barriers, benefits, and health motivation. Additionally, individual risk for breast cancer was discussed with the participants. Individual control over breast cancer through early detection was also emphasized. Groups 3 and 4 received information about

mammography and the correct screening intervals. Additionally, group 4 received an individualized belief intervention and information related to mammography, stressing the importance of mammography screening. Final data collection session was 1 year following the intervention when the data collection tools were repeated.

Results of this study identified that there were changes in the groups receiving belief interventions. Knowledge about breast cancer increased in all groups, including the control group. The group that received a combination belief and informational intervention, group 4, had the largest percentage increase in mammogram compliance, 87%, which was four times the control group. Group 2, receiving information about beliefs, had in increase in the seriousness of cancer increased. Other results of this study were that age was inversely related to mammography compliance. Women with a higher level of education were more compliant than less educated women. The greatest intervention benefit accrued to women who received both information about mammogram and specific belief intervention.

Results demonstrate that an intervention with information about mammography and individually tailored belief counseling is effective in increasing short-term mammography compliance. This study found that women who have a high level of perceived susceptibility to breast cancer and high levels of perceived benefits of mammography are associated with higher participation in mammography. Barriers to mammography were cost and lack of a health care provider recommendation (Champion, 1994).

Champion and Huster (1995) investigated the effect of an informational intervention on the rate of mammography compliance. Through random digit phone

dialing, 1104 women agreed to participate by completing a self-administered questionnaire. Actual sample size was 405 women aged 40-88 years of age with a mean age of 55.1. After completion of the survey about current beliefs related to mammography, participants were randomly assigned to one of four groups: control, intervention, belief, and intervention-belief. Data collection took place at three periods: pre-intervention mailed survey, post-intervention in-home interview, and 1-year post-intervention in-home interview. The intervention group received a training film and extensive written materials about mammography. The belief and intervention-belief groups received a belief intervention designed to develop the individuals' beliefs to be theoretically consistent with mammography compliance. The mammography information included facts about the correct intervals for mammography.

The survey was designed to measure the health belief variables based on a five-point Likert scale. The scales were assessed for criterion and construct validity using exploratory factor and multiple-regression analysis. Reliability coefficients ranged from .73 -.93. A knowledge scale of twenty items with facts related to breast cancer was also administered.

Results of this study identified that those from the intervention group that included belief strategies were successful in increasing compliance with mammography recommendation; the intervention was designed to discuss the benefits of mammography compliance. Identification of barriers to mammography and strategies to overcome these barriers were completed as part of the intervention.

Additionally women in the belief and belief informational groups were twice as likely to be compliant as women who received information only. Physician

recommendation was cited as the most important recommendation for mammography utilization. Level of education, having recently heard about mammography, and previous compliance with mammography were also important. Women who had a mammography suggested by a health care professional were three times more likely to have been compliant than those who did not. One critique of this study is that the study measured the intent to have mammography rather that the actual adherence with receiving the mammography (Champion et al., 1995).

A large-scale community-wide intervention study funded by the National Cancer Institute was designed to increase the use of mammography screening for breast cancer in women aged 50-74. This project was implemented over a two-year period in two separate rural communities that were demographically similar. This study design was a pre-test / post-test design with one community as the control group and one as the experimental group. For one year, an intervention program to promote breast cancer screening was implemented within the experimental community. The pre-test consisted of a 20-minute survey of 500 women aged 50-74 to assess their knowledge and attitudes and beliefs about breast cancer. A total count of all screening mammograms performed in each community for the prior year was completed. A survey of primary care physicians about their knowledge and attitudes toward breast cancer screening was completed. Additionally, a review of medical records was completed to determine the percentage of patients for whom physicians had ordered screening mammograms in the previous 12 months (Fletcher, Harris, Gonzalez, Degnan, Lannin, Strecher, Pilgrim, Quade, Earp, & Clark, 1993).

In the experimental community, media presentations by television and radio spots, along with 29 newspaper articles discussing breast cancer screening were routinely presented over a year. Speakers also addressed 82 community groups about the importance of screening mammography. In the areas of the community that were identified as lower income, free and low-cost mammography coupons were distributed. To reach individuals who may not have television, five billboard advertisements and 400 posters were displayed in the community.

Data analysis comparing the experimental and control groups identified that the number of mammograms in each community increased. Specifically, there was the increase in the screening mammography rate of the intervention community by 20%. Adherence with age-specific recommendations rose from 20% to 36%. However, there was little change in knowledge or attitudes about breast cancer. Intention to have a mammography rose by 30%. There was also an increase in the number of women reporting that their physicians advised them to have a screening mammography; this rate rose from 66% to 81%. In a review of the medical records, there was an increase in ordering, discussing, or completing mammography by 17-19% from 29-48%. The community-wide education program increased the percentage of mammograms in women 50-74 who had received mammography in the previous year by 89%. This was the first controlled community-wide effort to increase breast cancer screening with mammography. Other results were that there was an increase of mammography utilization in both white and black women, as well as an increased adherence in women who had a previous mammogram experience over those who had never had one (Fletcher, et al., 1993).

Another study surveyed women by telephone or via the mail about their rate of mammography adherence, breast cancer screening behaviors, and demographic characteristics. In the telephone survey, 1439 women age 50-75 years of age in rural areas were asked about their prior use of mammography, income level, type of health insurance, and location of health care treatment. A mail survey of 2358 women used the same type of questions as those in the telephone survey. Women in the telephone population lived in urban communities; women receiving the mail survey lived in rural areas. The tool used for this survey was a six-page survey. There was no title on the tool, nor was information on reliability or validity of the tool stated. Response rate for the mail survey was 67%; for telephone survey, 69.2 %. Results of the study identified that both the rural and urban women knew about mammography. The education level, marital status, and ethnicity of both groups were the same. The health care provider was similar between both groups. Both groups reported having commercial insurance (87%) or Medicare (Polednak, Lane & Burb, 1991).

The perceived benefits and barriers to mammogram were surveyed in a study of 817 women who were non-compliant with screening mammogram. The race of the study participants was Caucasian (71.5%) and African American (28.5%). Participants were identified from medical records of a large HMO and an inner-city general medical clinic. Inclusion criteria included non-adherence with screening mammography in the prior 15 months, not having breast cancer, and age from 50-85 years of age. Rawl, Champion, Menon and Foster (2000) sought to identify if there were differences in the perceived benefits and barriers to mammography by age and race.

Results of this study identified four major perceived barriers to mammography related to race and age of participants. First, having a mammogram was too time consuming. This barrier was higher for younger Caucasians, than older; the reverse was true for African Americans. Second, the barrier of pain associated having a mammogram was identified as a barrier for younger Caucasian women more than older Caucasian women; no difference was identified by African American women. Third, the perception that a mammogram exposes the participant to too much radiation was significantly higher in older African American women, while lower in older Caucasian women. The final barrier described was the difficulty in remembering to schedule a mammogram. This was most problematic for younger Caucasian women and older African American women.

The perceived benefit that having a screening mammogram decreases the chance of dying was significant. This benefit was identified by Caucasian women both young and old, more so than for African American women. Participants were asked to identify the reasons that they had not had a prior mammogram: Pain with mammography and failure of their doctor to recommend a mammogram were cited.

Additionally, a counseling intervention by both telephone and in-person specific messages related breast cancer, benefits of mammography, and methods to decrease the barriers to mammography. Limited information was given in this study about this intervention; it was briefly mentioned, further statistical analysis was not discussed as to the success with this intervention with adherence with mammography. This study did not cite if there was an increase in mammography or if the participants actually had a mammogram (Rawl et al., 2000).

Nurse Practitioner and Intervention Research

Few studies exist that involve nurse practitioners and research that involves interventions. The poor quality of these studies and their limited number has continued to be problem during the process of this dissertation. Due to these circumstances, the studies identified will be presented, even though their quality and results leave a lot to be desired.

In a randomized clinical trial of 309 hypertensive African-American men aged 21-54 years, the effectiveness of an intensive nurse practitioner community intervention on minimizing the progressing of left ventricular hypertrophy, controlling blood pressure and renal insufficiency was analyzed. At baseline screening, participants had blood pressure readings greater than 140/90. Exclusion criteria were dialysis, acute or terminal illness, mental illness, or participation in another study. Participants were randomized to either the more or less intensive intervention group. The more intensive group (n=157) was given free medication from the nurse practitioner that provided their care. This group also received a visit to assist with other health matters, such as job training, housing, and home visits for blood pressure monitoring. The less intensive group (n=158) received free medication, however, their referrals were to outside community resources for additional HTN care. Both groups were reminded of importance of their blood pressure medication and monitoring by phone calls every 6 months. In both groups, the nurse practitioner made therapeutic decisions for medication titration in accordance with protocol based on JNC-VI guidelines for hypertensive care (Hill, Han, Dennison, Kim, Roary, Blumenthal, Bone, Levine & Post 2003).

Both groups in this study showed trends toward lowering their blood pressure with the exception of the less intensive group at 36 months. Between group difference in blood pressure control was significant (P. >05) at 36 months. Both groups had decrease in baseline blood pressures from baseline up until this 36-month period. Additional changes that were noted were the decrease in smoking salty food intake.

This study identified the successful impact of the nurse practitioner intervention in a specific population of African-American males with elevated blood pressure. There was a significant statistical difference in the more intensive intervention group with blood pressure control that with the less intensive intervention group. This study supports that nurse practitioners have a positive impact on positive health practices, behavior and health promotion (Hill et al., 2003).

Patients with medically unexplained symptoms (MUS) are a source of frustration for primary care providers. These patients have a diagnosis of depression, as well as a wide variety of complaints and problems for which actual medical problems may not be found. These patients are described as high users of the health care providers' time and health care resources. A randomized control trial was developed with the hypothesis that patients given an intervention of structured time and intensive attention by a nurse practitioner would show more improvement over 12 months than participants in the control group. Nurse practitioners were chosen over physicians for this study as their education has a focus of biopsychosocial orientation that is effective in the management of MUS patients. Additionally, the nurse practitioners' schedule would allow for the eighty hours of patient contact for experiential learning with the MUS patients (Lyles,

Hodges, Collins, Lein, Given, Given, D'Mello, Osborn, Goddeeris, Gardiner & Smith, 2003).

Four certified nurse practitioners received an 84-hour training program that centered about role playing and modeling the specific intervention to treat the MUS patients with depressive disorders and multiple complaints. Participant inclusion was patients who had clinical criteria of one physical symptom with absent disease explanation for six of the preceding twelve months. Patients needed to have had eight or more visits to the HMO clinics in the prior 2 years. Recruitment took place via mail contact with follow up phone calls to try to include HMO participant's aged 18-65 in the study. A total of 1646 possible MUS patients were identified, of these 742 had predominant MUS symptoms and were felt to be possible participants. Of this group, 502 were actively recruited, 206 enrolled with a 41% recruitment rate.

Nurse practitioners working with the participants in the intervention group used a 5 step patient centered method to facilitate long term goals such as better work records, improved relationships with significant others, reduced use of addicting medications, education about illness, ensuring a realistic understanding that the patient is having real problems, giving MUS a real name, showing confidence that the patient will get better, and noting that stress, depression and anxiety are all concerns to the patient.

This study was one of very few that was identified that included nurse practitioners and interventions. However, the study only included vague results of the study. Results were stated as successful, the nurse practitioners were able to implement a complex intervention in primary care. The patients were appreciated of the additional time with the nurse practitioners and they rarely missed appointments during this time.

This study appears to have been a large, well-funded study that has just been completed with final results pending; however, once again, the nurse practitioners are shorted in the research.

Individuals at high risk for coronary events may benefit from secondary prevention. Ace inhibitors, statins, beta blockers, smoking cessation, and lifestyle modification are included in areas that may be modified in secondary prevention. In a quasi experimental study, the impact of a structured nurse practitioner intervention was significant in decreasing cumulative death rate and coronary events in the experimental group (Murchie, Campbell, Ritchie, Simpson, Thain, 2003).

Participants with a working diagnosis of coronary heart disease were recruited for this study. Exclusion criteria was terminal illness, as dementia, or home bound status. Participants were randomized to the control or experimental group by using a table of random numbers. Participants were recruited from 19 general practices in Northeast Scotland. Participants in the intervention group (N=673) were invited to participate in clinics in which their disease process was discussed along with a review of their treatment. Blood pressure and lipid management, aspirin use, diet, exercise, and behavior modification were reviewed. Follow-up was every two- six months per protocol. Control group participants (N=670) received usual care. After one year, data was collected on secondary prevention and participants' current health status. End point data occurred at 4 years when original participants were traced.

Outcome for this study was patient mortality, coronary event rate, and secondary prevention that included blood pressure, lipids, aspirin use, smoking cessation and exercise. In the first year of this study 81.9% of the participants in the intervention group

had attended the clinic at least once, 62.7% for the control 19.1% for the control group. At the 4.7 year follow-up, 14.5% for the intervention group, 18.9% for the control group, this was a significant decrease in the intervention group death rate with a P=0.038%. The non-fatal MI rate was significant in the intervention group with a P=0.052%. These nurse practitioner led clinic identified that interventions related to secondary prevention had a positive impact on patient outcome (Murchie et al., 2003).

Limitations of this study are that the outcome was based on mortality and coronary events. There was not any discussion if quality of life was improved. Specific medications were not identified in this study, were all participants in the intervention group placed on statins and aspirin? If so, this could be the reason for the decrease in mortality, it just happened that the nurse practitioner intervention included these pharmacological interventions. Little information was given that specifically identified how the researchers were able to keep up with the study participants for almost five years.

Strengths of this study were the size, methodology, and time frame of the study. The use of the nurse practitioners to provide the intervention is also a benefit.

Review of Current Research

Breast cancer continues to be a leading cause of death in American woman. Mammography has been clearly identified as a screening method to detect breast cancer when it is small and less likely to have metastasized, thereby increasing longevity (Entrekin et al., 1993; White, 1939).

A factor that may have a positive influence on the decision to have a mammogram is physician recommendation (Fajardo et al., 1992), even though physicians do not

recommend mammography as often as they report or when compared to retrospective chart audits (Hamblin, 1991; Selinger et al., 1989). Pain with mammogram and failure of the physician to recommend a mammogram were two reasons cited as reasons that women fail to adhere with screening mammography (Rawl et al., 2000).

Each of these studies was small, using self-report tools that were researcher-designed. Physicians support mammography as an effective method of cancer screening; however, other factors influence the lack of referral for a patient to have mammography: lack of time, office visits for emergent or acute problems, and lack of current documentation of past screening. There are no studies that identified the screening mammography referral practices of nurse practitioners.

Entrekin and McMillan (1993) identified that 66% of nurses believed that cancer prevention was part of their role, however, few of their patients were actually taught cancer detection methods such as breast self-exam or smoking cessation. This study found that there is a significant lack of cancer education to patients. This relates to the study of physicians in which only 29% of the eligible patients received screening mammography referrals (Osborn et al., 1991). Several studies have demonstrated that interventions have a positive impact on mammography screening. Community-wide interventions have been effective, but the results of screening continue to fall short of the 60% goal of mammogram screening in the two preceding years (U. S. Department of Health and Human Services, 2000; Mandelblatt et al., 1993).

Women who practiced health promotion behaviors, non-smokers, and women who had prior experience with someone who had breast cancer or prior mammography were more likely to follow the recommendation for a screening mammography (Miller et al.,

1993; Champion, 1992). In patients who are given a greater sense of personal responsibility in their health care decisions, a higher level of commitment is obtained (Kulik et al., 1987). When clients are involved in decisions, there is an increased level of adherence (Singleton et al., 1987). These previous behaviors help to predict future actions based on the individual level of self-efficacy. By increasing individuals' involvement in their health care decisions, utilizing prior experiences, and obtaining commitment from the patient, heath care providers can increase the adherence of individuals with their own health promotion. Nurse practitioners are in a positive position to influence the behavior of adherence with screening mammography due to the unique relationship with their patients. Despite the abundance of research about mammography as a successful means of decreasing mortality from breast cancer, there are too few women taking advantage of this life-saving screening method. There have been no studies that have actually identified specific interventions by the nurse practitioners to increase adherence with screening mammography.

Summary

Social Learning Theory provides a theoretical foundation that helps to understand how and why individuals respond in a given situation. Despite the abundance of literature related to the early detection of breast cancer, there are no studies that identify the impact of specific nurse practitioner interventions with women who are referred for screening mammography. Since the rate of adherence with recommended screening mammography is low, despite the decrease in mortality rate of women who adhere to recommended mammography guidelines, it is critical to identify interventions that are effective in increasing mammography adherence.

In this chapter, various research studies related to breast cancer, screening recommendations, characteristics of women who adhere to the recommended screening mammography guidelines, and the barriers and benefits from mammography adherence have been discussed. In the next chapter, a pre-test/ post-test quasi-experimental research design will be discussed to measure the impact of a structured nurse practitioner intervention on patients who are referred for screening mammography.

Chapter III

METHODOLOGY

Introduction

In the previous chapters, the research problem was addressed, research needs were identified, and a review of current relevant literature was presented. The research design utilized a pre-test/ post-test control group quasi-experimental design. The purpose of this study was to identify: (a) the effect of a structured nurse practitioner intervention on patients who were referred for screening mammography, (b) the relationship between the patients' opinions of who makes their health care decisions and the decision to have a screening mammogram, and (c) the patients' perceived barriers to and beliefs about mammography. The methodology, nurse practitioner intervention, and instrumentation will be described.

Description of Research Methodology

This research study utilized the pre-test/ post-test control group quasi-experimental design. This method allowed the researcher to compare groups that received different interventions at a certain time (Cook and Campbell, 1979). The design strength of this method is that it provides information on any changes that may take place within the intervention group. Participants who received a nurse practitioner referral for a screening mammogram were identified and chosen to participate in this study. Participants were purposefully selected and placed in two groups. Each participant was randomly assigned to either the treatment or control group. Randomization is an effective technique for achieving equity among groups because it distributes uncontrolled

characteristics (Munro & Page, 1993). The treatment group received the intervention by the nurse practitioner designed to facilitate adherence to the screening breast mammography referral. Because this study used a sample of convenience, the two groups were tested for equivalence during data analysis.

The experimental group treatment was a caring, personal intervention by the nurse practitioner that reviewed the importance of mammogram for women over 40 years of age. Additionally, a written information sheet that reviewed the importance of mammogram screening was given to the participants in the treatment group. Experimental group subjects were informed that follow-up in the medical record would be made to determine if the patient received her screening mammography. The control group did not receive any additional intervention other than the routine clinic recommendation for a mammogram. The normal routine at each clinic was that women over 40 years are recommended for a mammogram on an annual basis. Both groups of participants received complete instrumentation that was created in a program named Teleform that is a scanned format for optical character recognition (Appendix C). This format included the following tools: Multidimensional Health Locus of Control Scale, Krantz Health Opinion Survey, Barriers to and Beliefs of Mammography Tool, Self-efficacy survey, and the demographic information. The pre-test component of this study was the presence or absence of a previous screening mammography. The post-test was the adherence or failure to adhere with the recommendation by the nurse practitioner to have the screening mammogram within six weeks of the referral.

Research Design

The researcher randomly assigned women who visited each clinic and met the inclusion criteria for this study to either the treatment or control group. Randomization occurred by drawing I (treatment group) or C (control group) out of a cup for group assignment. Envelopes were color coded and labeled for each group. Randomization improves the likelihood of equity among groups. The control group was instructed to schedule and complete their mammography according the clinics' normal routine. The treatment group received the intervention by the nurse practitioner. This intervention was designed to provide written information and verbal encouragement from the nurse practitioner for patients referred for mammography. The nurse practitioner reviewed a brief one-page information sheet about the importance of mammogram. The written copy was given to the patient. The control group did not receive this intervention. The nurse practitioner followed the medical records of each patient to verify that the mammogram was completed. Compliance or outcome was represented by O2, the respondents' adherence to the recommended screening mammography within four weeks of referral. The effectiveness of the intervention will be measured by comparing the treatment group and the control group regarding adherence of each patient with the recommended screening mammography. Scores on each instrument may identify variables that correlated to the outcome, but may not be directly related to the nurse practitioner intervention.

Random	Group	Pre-test	Intervention	Post-test
R	E	O1	X	O2
R	C	O1		O2

R = randomization of two groups by the researcher.

E = represents the experimental group.

C = represents the control group.

O1= represents the pretest of both groups to identify if and when the patient has had a screening mammography before

X = intervention by the nurse practitioner

O2 = patient adherence with recommended screening mammography

Variables

The dependent variable will be the adherence of the client with the recommended screening mammography. Mammography adherence is defined as the patient receiving the screening mammography within six weeks of the recommendation by the nurse practitioner.

Independent variables will be the patients' individual scores on the Multidimensional Health Locus of Control Scale, Barriers to and Beliefs of Mammography Tool, Krantz Health Opinion Survey, Self-Efficacy Tool. The demographic information of age, ethnicity, marital status, education, income, family history of breast cancer, religion, smoking status, and type of health care insurance will also be included.

Extraneous Variables

Every attempt was made to control extraneous variables. Participants were selected based on their having an appointment with a nurse practitioner during the data collection period. Participants were randomly assigned to the treatment or control group. Extraneous variables such as the patients' experience with friends, family, or

acquaintances that have had cancer are uncontrollable. Each participant has a different level of knowledge regarding the importance of mammogram for early detection of breast cancer. Knowledge about detection and prevention of cancer may occur from media sources such as television, radio, or talk shows. Patients may also have received prior education about the importance of mammography screening from their health care provider.

Data Analysis

Analysis of the covariance will be completed on the variables to identify the impact of the nurse practitioner intervention on the patients' adherence with the screening mammography referral. These variables include the participants' levels of self-efficacy, the participants' opinions of who is responsible for their health care, the perceived barriers to and benefits of mammography, and the level of self-efficacy and health locus of control. Use of the analysis of covariance allows the researcher to measure group differences after considering individual differences between participants (Munro et. al., 1993).

Self-efficacy, perceived benefits of and barriers to mammography, desire for health information and control over health behaviors, health locus of control, and demographic information such as age, race, marital status, education, occupation, income, presence of breast cancer in the family, smoking, and type of insurance carrier will be identified.

Hypothesis	Statistical Method	Measure
1. A significant positive difference in rates will exist between the intervention and control groups	ANOVA (t-test)	Adherence With screening mammography
2. A positive correlation exists between rates of screening mammography adherence and perceived self-efficacy related to screening mammography.	Correlation	Barriers of and benefits of mammography
3. A positive correlation exists between rates of screening mammography adherence and attitudes toward self-directed treatment	Correlation	Krantz Health Opinion Survey

Selection of Subjects

The sample group for this study is patients who are referred for screening mammography by family or adult nurse practitioners whose practice is located in North Texas and who were willing to participate. To be eligible for this study, the female participant must be forty years of age or older, be referred for a screening mammography by a nurse practitioner, and never have received a diagnosis of cancer.

A network sampling of nurse practitioners was identified at a local Texas Nurse Practitioner Meeting. Six clinic sites were utilized, based on the nurse practitioner's willingness to participate as a research assistant. The nurse practitioner's acting as a research assistant was necessary so that clients of nurse practitioners who are referred for mammography could be identified and participate in this study. Each nurse practitioner

received information about the study, the questionnaire, and an in-depth explanation of the study. The nurse practitioner received the script to use with the clients with whom the personal interaction about the importance of mammogram was used as an intervention. Each nurse practitioner was orientated about the research study before data collection began. This time allowed each nurse practitioner to ask questions about the study and to understand the method for data collection.

The information letter with an overview of the study, number for contacting the principal investigator, information regarding the right to refuse participation by not completing the questionnaires, the ability to withdraw at anytime, and a guarantee of confidentiality were placed in the packet for the patients. The patient packet included the informed consent (Appendix A), introduction letter (Appendix B), Teleform document including tools, and demographic information (Appendix C), and information letter (Appendix D). The principal investigator maintained anonymity of all participants. All consent forms, instruments, and data are kept in a locked file.

Subject Participation

Participation for both the intervention and control group will be approximately one hour. This allows time for the completion of each survey, from the time that the envelope is opened and the introduction letter is read, to the time the consent, demographic data, and instruments are completed. Additional time may be required if the participant has questions or wishes to contact the principal investigator.

Instrumentation

Instrumentation for this study used the Multidimensional Health Locus of Control Scale (B), the Barriers to and Belief of mammography tool, Self-efficacy Scale, Krantz Health Opinion Survey, and demographic data. Each of these tools will be discussed.

Multidimensional Health Locus of Control Scale (B)

The Multidimensional Health Locus of Control Scale (B) was designed to identify the source of heath-related behaviors. This scale measures behavior as internal, a matter of chance, or under the control of others such as the physician (Wallston, Wallston & DeVellis, 1978). The 18-item-Likert scale comprised of three sub-scales that identify the dimensionality of health locus of control. The internal locus of control is a 5 item sub-scale that identifies the dimension of internal health. The second scale is a 6 item sub-scale measures the influence of others. The third sub-scale identifies whether things such as luck or fate determine health measures the health external factors

Barriers of and Benefits to Mammography

The barriers of and benefits to mammography instrument was originally developed by Champion (1984) to investigate the constructs of the health belief model to investigate the relationship between attitudes and behaviors of women toward health. In 1993, the tool was revised to include a confidence scale that allows more accurate assessment of patient behaviors for breast cancer screening based on the Health Belief Model and the concept of self-efficacy. This instrument measures the six constructs of the HBM. These are susceptibility, seriousness, benefits, barriers, health motivation, and confidence, using the context of breast cancer and breast self-examination. Internal consistency for this instrument has been identified using Cronbach's Alpha, which

identified all test/re-test correlation coefficients as significant beyond the .01 level. The scales in this tool have been cited to have acceptable content, construct, and predictive validity, as well as internal consistency (Champion, 1993).

This instrument is a 55-item 5-point Likert scale that ranges from strongly agrees to strongly disagree and has a Cronbach Alpha reliability of .61-.78, and a test/re-test reliability of .47-.86. A high score means that the patient has greater susceptibility, seriousness, benefits, barriers, health motivation, and confidence related to mammography. This tool was chosen for this study because it identifies the patient's perceived barriers of and benefits to mammography tool. Additionally, this tool identifies the patients' level of self-efficacy.

Krantz Health Opinion Survey

The Krantz Health Opinion Survey (KHOS) is designed to be a specific measure of how individuals vary in respect to their view of health care and who the patient believes is responsible for it. Prior measures for individual differences or perceptions about health care have been based upon intuition or measures of coping styles. Personality-based expectations and beliefs about health and illness may determine the efficacy of patient-orientated approaches to health care (Krantz, Baum & Wideman, 1980). Individuals have different preferences for information and treatment; these preferences may reflect themselves in overt behavior exhibited while undergoing treatment. Some patients prefer more information, ask more questions, and prefer to know more details about their treatment.

The attitude of the patient towards treatment can be measured in a reliable way. Preferences for or against behavioral involvement and information may be an index of

how the individual interprets those approaches that encourage patient involvement, self-care, and informed participation. Beliefs about health care and who is involved in health care decisions are important so that appropriate treatment and sharing of information will be successful. Individuals who prefer an active role in health care may be more likely to participate in health promotion activities.

The Krantz Health Opinion Survey is designed to measure individual preferences for treatment approaches by their health care provider. It is a 16-item questionnaire with two sub-scales that identifies the participant's response by circling agrees or disagrees. The first sub-scale is an information sub-scale that identifies the patient's desire to ask questions and to be informed about medical decisions (seven items). The second sub-scale is a behavioral involvement scale that identifies the patient's attitude toward self-treatment and active behavioral involvement related to medical care (nine items). A high score represents favorable attitudes toward self-directed or informed treatment. The importance of patient expectations for health care outcomes suggests the need for a measure of individual attitudes toward different treatment approaches. The health care provider chose this tool because it identifies the patient's preference for different treatment approaches. With this knowledge, the nurse practitioners may individually tailor their appropriate treatment for each patient.

Self-Efficacy Scale

The Self-efficacy scale (Sherer, Maddux, Mercandante Prentice-Dunn, Jacobs & Rogers, 1982) is a 19-item measure of general self-efficacy expectations. These include willingness to initiate a behavior, expend effort in completing the behavior, and persistence in the face of adversity. The self-efficacy scale is comprised of 19 general

self-efficacy item and 2 filler items. These scales measure generalized the expectations of self-efficacy based on past experience and success attributed to skill rather than chance. The general expectances are likely to manifest in general patterns of behavior in response to situations that the individual has little or no information. Reliability for the general self-efficacy is .86.

Demographic Data

The demographic data tool includes items about the personal characteristics of the respondent. These characteristics may be related to the behavior of an individual or their attitudes about mammography. Demographic data will allow the investigator to compare the characteristics of the sample group with those of the population. The demographic tool is composed of questions dealing with the following information about the respondent: (a) age, as measured in years, (b) race, as measured by Hispanic, African-American, Caucasian, Asian, Multi-ethnic, or none of the above, (c) marital status, as measured by single, married, divorced, widowed, or involved in a stable relationship, (d) education as measured in years, (e) income, as measured by increments of 5,000 dollars, (f) smoking history, (g) insurance type, and (h) family history of breast cancer. Demographic data such as the respondents' age, race, and gender will be included so that, if there are differences in the participants' mammography adherence rate, possible limitations to generalizablity will be identified (Huck, Cormier, & Bounds, 1974).

Variables

The dependent variable will be the adherence of the client with the recommended screening mammography. The patient receiving her screening mammography within six

weeks of the recommendation by the nurse practitioner will define mammography adherence.

Independent variables will be the patients' adherence with mammography by the nurse practitioner, individual scores on the Multidimensional Health Locus of Control Scale, Barriers to and Beliefs of Mammography Tool, Krantz Health Opinion Survey, and the Self-efficacy Tool. Additionally, the demographic information of age, ethnicity, marital status, education, income, presence of breast cancer in the family, smoking status, and type of health care insurance will also be included.

Extraneous Variables

Extraneous variables will not be controlled except by random assignment to the treatment and control group. Participants will be selected based on their having an appointment with a nurse practitioner during the data collection period. Participants will be randomly assigned to the treatment or control group. Experience with friends, family or acquaintances that have had cancer are uncontrollable. Each participant will relate different education or knowledge about cancer prevention, or specifically related to mammography from various media or health care providers.

Field Procedures

Distribution of materials and instructions to subjects were given by the nurse practitioners working as intermediaries regarding the recruitment of participants. The nurse practitioner identified female patients aged 40 or older, eligible for screening mammography. The packet was given to each subject by the nurse practitioner. Patients who met the inclusion criteria of not having had a mammography in the last 12 months and of being 40 years of age were sought for this study. Packets were color coded for

easy identification by the nurse practitioner to determine if the patient was in the control group or treatment group. Before the patient's visit, the nurse practitioner reviewed the chart to find out if the patient had a screening mammography in the past year. The nurse practitioner saw the patient per normal routine during the office visit. During this personal contact, the nurse practitioner requested participation in the study. If the patient agreed to participate, the respondent was given the packet and asked her to fill out the consent and questionnaires while in the office. This personal contact should result in a higher return rate than surveys returned via mail. The packet contained the consent to participate in the study, demographic data, and survey tools. The nurse practitioner provided the intervention for the treatment group.

Once the intervention was complete for the treatment group, the survey was given to the participant to complete. For the study, the pre-test is the patient's prior experience of having a mammography. A packet of surveys labeled, as I or C were available to the intermediary to identify whether the respondent is in the treatment or control group. Patients in the intervention group received the intervention by the nurse practitioner. Participants in the control group received no intervention. Participants were requested to complete the packet while in the office. For respondents who requested to take the packet home, a return-postage paid envelope was given. After the participants completed the tools in the packet was left with the nurse practitioner. Medical records of each respondent were reviewed six weeks after the data collection to identify if the patient received her recommended screening mammography. Patients who do not have their mammography completed in the six-week period were identified as non-adhering. Each

nurse practitioner that participated as an intermediary assisted by verifying patient adherence to recommended screening mammography via the patients' medical records.

Data Collection and Recording

Entry was obtained at each facility by contacting the medical director, whose name had been obtained from the nurse practitioner. To both the medical director and the nurse practitioner participating as an intermediary, the investigator explained the study and the method of data collection. Institutional Review Board criteria were met at the University of San Diego. The research design used a pre-test/ post-test control group quasi-experimental design to investigate the effect of nurse practitioner interventions on women who are referred for screening mammography.

Statistical Analysis

Statistical analysis for this study included analysis of variance of the scores of the both intervention and control groups, regression analysis, and descriptive information. Statistical analysis for this design was ANOVA analysis of variance or the t-test to compare the groups with respect to their post-test means. The analysis of covariance was used to determine the influence of impact of the identified non-experimental variable on adherence to mammography.

Methodological Assumptions

The researcher assumed that there was a linear relationship among the variables. A power analysis was completed to identify the appropriate population based on large effect.

Limitations and Weaknesses

1. Instrumentation: This questionnaire uses a paper and pencil to record the respondent response. There may be a tendency for respondents to answer all items in a similar fashion, such as all yes or all no.

2. History and maturation: A baseline will be obtained, but some participants may have friends with breast cancer, may have viewed TV shows about breast cancer, or may have become wiser with age with life experience.

3. Research bias: Simply participating in the research study may result in bias.

4. Nurse practitioners assisting with the study may unconsciously attempt to provide differing amounts of information to the participants based on their knowing which participants are in the control or treatment group.

Time Line

Anticipated length of the data collection was six months or until the appropriate number of respondents had been surveyed. Questionnaire packets were delivered to the nurse practitioners participating as research assistants. Six weeks after the initial screening mammography referral contact has been made, the nurse practitioner identified if the participant received the screening mammography. If the respondent had not received the mammography, the respondent was identified as not adhering to the mammography recommendation. The data collection for this study began November 1, 1999 and ended May 1, 2000. Once the data collection ended, the questionnaires were submitted for statistical analysis. Data analysis was completed.

Internal Review Board

Participants may have experienced anxiety related to answering questions about screening mammography. However, there was minimal physical or physiological risk. There was no burden to the participant. The study was explained in the introduction letter. Participants were given a chance to ask questions and were required to sign the consent before completing the instruments. The introductory letter included an instructive statement for the release of non-willing participants and an explanation of the right to withdraw from the study at any time without jeopardy. Subjects were informed of the means to assure confidentiality by data coding by number, security of raw data and coding information, and analysis of data as a group. All data, consents and any correspondence were confidential and kept in a locked file. The investigator was available in person or by telephone for the participants who requested additional information.

Potential benefits were related to an increased awareness of the subjects' perceived barriers and beliefs about mammography. Positive benefits to the general population may have included an increased knowledge about mammography as an indirect result occurring after reviewing the research abstract, or by identifying their own beliefs and barriers to mammography. Identification of the risk-to-benefit ratio finds the benefits to the scientific base of nursing and to the participants outweigh potential risks. An attempt has been made to identify and minimize or eliminate the possible risks. There will no financial impact to the participants. No monetary reimbursement will be provided.

Summary

This chapter has identified the research methodology of the quasi-experimental control group design for this study. Participants will be identified for participation in this study, the randomized to either the experimental or control group. The experimental group will receive a caring personal intervention by the nurse practitioner reviewing the importance of a mammogram for women over 40. The control group will receive the clinic normal procedure. Both groups will receive complete instrumentation for this study that includes the Multidimensional Health Locus of Control Scale, Krantz Health Opinion Survey, Barriers to and Beliefs of Mammography tool, Self-efficacy survey and demographic information. The adherence with mammography will be defined as if the patient received their screening mammogram within six weeks of the nurse practitioners recommendation.

CHAPTER IV

PRESENTATION AND DISCUSSION OF FINDINGS

This chapter presents the results of the data analysis from this study. The data is presented in five sections. The first section provides an item description of the sample related to each demographic variable for the total sample, control and experimental groups. Section two presents a descriptive comparison and interpretation of scores on the Multidimensional Health Locus of Control Scale, Barriers of and Benefits to Mammography Instrument, Krantz Health Opinion Survey, and the Self-efficacy Scale. Section three provides a descriptive comparison and interpretation between the intervention groups of both the control and experimental groups for each tool utilized. Section four describes the relationship between to the nurse practitioner intervention and the patient adherence with screening mammogram. Section five describes the specific quantitative statistical tests run on the data.

Description of the Sample

In describing the sample population of this study, frequencies and descriptive statistics will be reported for each demographic variable or characteristic. The variables of age, ethnicity, marital status, level of education, income, family history of breast cancer, religion, smoking status, and type of insurance will be discussed. The sample size was N=39 women recruited from seven different sites in North-Eastern Texas. The control group was N=20 and the experimental group was N=19.

Demographic Variable Description

Demographic Characteristics. Table 1 provides a summary description of the demographic characteristics of the subjects along with the number of respondents and missing respondents for each characteristic. This data provides an overview of the demographic questionnaire data for this study. Each variable will be discussed individually.

Table 1. Summary Description of the Demographic Characteristics of Women Referred for Screening Mammography by a Nurse Practitioner and the Number of Respondents for Each Characteristic.

VARIABLES	VALID	MISSING
Age	39	0
Ethnicity	39	0
Marital Status	37	2
Years of Education	37	2
Income	36	3
Family History	39	0
Smoking Status	39	0
Type of Insurance	39	0
Past Screening	39	0
Mammogram Intent	39	0

Location. Table 2 provides a description of the site location for each nurse practitioner participating in data collection for this study. Each location was identified with a site number for each nurse practitioner. Seven sites were used for data collection. Thirteen participants (33.3%), or the majority of the sample, were located at the site in

Waco. Nine participants (23.0%) were located at the site in Bedford. Nine participants (23.0%) were located at the site in Ft. Worth. Four participants (10.2%) were located at the site in Groesbeck. Two participants (5.1%) were located in the site at Bond. One participant was located at each site of Goldthwaite (3.9%) and Mt. Vernon (3.9%).

Table 2. Description of Demographic Characteristic Location of Nurse Practitioner Practice

LOCATION	FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
Waco	13	33.3	33.3	33.3
Bedford	9	23	56.3	56.3
Ft Worth	9	23	79.3	79.3
Groesbeck	4	10.25	89.55	89.55
Bond	2	5.12	94.67	94.67
Goldthwaite	1	2.56	97.23	97.23
Mt. Vernon	1	2.56	100	100
TOTAL	39	100	100	100

Ethnicity. Table 3 provides a description of the demographic characteristic "ethnicity" of women referred for mammogram utilizing frequency. All thirty-nine participants responded to this item on the demographic questionnaire. Twenty-four participants (61.53%) were identified as Caucasian. Five participants (12.8%) were identified as Hispanic. Three participants (7.69%) were African-American. Three (7.69%) participants were identified as multi-ethnic. Two participants (5.12%) were identified as Asian. Two participants (5.12%) were identified as other.

Table 3. Description of the Demographic Characteristic Ethnicity of Respondents Utilizing frequency

ETHNICITY	FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
Caucasian	24	61.53	61.53	61.53
Hispanic	5	12.82	12.82	74.35
African-American	3	7.69	7.69	82.04
Multi-ethnic	3	7.69	7.69	89.73
Asian	2	5.12	5.12	94.85
Other	2	5.12	5.12	100
Total	39	100	100	

Age. Table 4 provides a description of the demographic characteristic "age" of women referred for screening mammography utilizing frequency. All thirty-nine participants responded to this item on the demographic questionnaire. Five participants (12.82%) identified their age as 41. Five participants identified their age as 42 (12.82%). Three participants each represented the age of 43 (7.69%), and 44 (7.69%). Two participants each represented the age of 47 (5.12%), 48 (5.12%), 49 (5.12%), 50 (5.12%), 54 (5.12%), 56 (5.12%), and 72 (5.12%). One participant represented each age of 45, 46, 51, 52, 57, 59, 60, 63, 82 (each at 2.56%).

Table 4. Description of Demographic Characteristics Age of Women Referred for Screening Mammogram Utilizing Frequency.

	AGE	FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
VALID	41	5	12.8	12.8	12.8
	42	5	12.8	12.8	25.6
	43	3	7.7	7.7	33.3
	44	3	7.7	7.7	41.0
	45	1	2.6	2.6	43.6
	46	1	2.6	2.6	46.2
	47	2	5.1	5.1	51.3
	48	2	5.1	5.1	56.4
	49	2	5.1	5.1	61.5
	50	2	5.1	5.1	66.7
	51	1	2.6	2.6	69.2
	52	1	2.6	2.6	71.8
	54	2	5.1	5.1	76.9
	56	2	5.1	5.1	82.1
	57	1	2.6	2.6	84.6
	59	1	2.6	2.6	87.2
	60	1	2.6	2.6	89.7
	63	1	2.6	2.6	92.3
	72	2	5.1	5.1	97.4
	82	1	2.6	2.6	100
TOTAL		39	100.0	100.0	

Table 5 provides a description of the demographic characteristic "age" of women referred for screening mammogram utilizing descriptive statistics. The mean is 49.82. the median 47.0, and the mode 41 and 42 (SD 9.66).

Table 5. Description of the Demographic Characteristic Age of Women Referred for Screening Mammogram Utilizing Descriptive Statistics Valid N of 39

Mean	49.82
Median	47
Mode	41, 42
Std. Deviation	9.66

Marital Status. Table 6 provides a description of the demographic characteristic "marital status" of women referred for screening mammography utilizing frequency. Thirty-seven out of 39 participants responded to this item on the demographic questionnaire. Two participants (5.1%) did not complete this item on the demographic questionnaire and were considered "missing." Twenty-three participants (59.0%) indicated current marital status as "married." Seven participants (17.9%) indicated their current marital status to be divorced. Three participants (7.7%) indicated their current marital status as "widowed." Three participants (7.7%) identified their current marital status as "single." One participant (2.6%) identified her marital status as separated.

Table 6. Description of Demographic Characteristic Marital Status of Women Referred for Screening Mammography

	MARITAL STATUS	FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
Valid	Married	23	59.0%	59.0%	59.0%
	Divorced	7	17.9%	17.9%	76.9%
	Widowed	3	7.7	7.7	84.6%
	Single	3	7.7	7.7	92.3%
	Separated	1	2.6%	2.6%	94.9%
	Missing	2	5.1%	5.1%	100.0%
	Total	39	100.0	100.0	

Education. Table 7 provides a description of the demographic characteristic of "education." Two (5.1%) participants had a grade school education. Three (7.7%) participants had a seventh to ninth grade education. Seven (17.9%) of the participants had some high school. Six (15.4%) of the participants were high school graduates. Fourteen (35.9%) of the participants had some college. Four (10.3%) of the participants were college graduates. One participant (2.6%) had a graduate degree. Two participants (5.1%) did not respond.

Table 7. Description of Demographic Characteristic Education of Women Referred for Screening Mammogram Utilizing Frequency

VALID	GRADE	FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
	1-6th grade	2	5.1	5.1	5.1
	7-9th grade	3	7.7	7.7	12.8
	Some H.S	7	17.9	17.9	30.8
	H.S. Grad	6	15.4	15.4	46.2
	Some College	14	35.9	35.9	82.1
	College Grad	4	10.3	10.3	92.3
	Grad Degree	1	2.6	2.6	94.4
	MISSING	2	5.1	5.1	100
TOTAL		39	100.0	100.0	

Household Income. Table 8 provides a description of the demographic characteristic "household income" of women referred for screening mammography. Two participants

(5.1%) had a household income of less than $10,000. Thirteen participants (33.3%) had an income from 10,001. - $25,000. Five participants (12.8%) identified a household income from $25,001. - 45,000. Four participants (10.3%) had a household income from 45,001. -50,000. Eight participants (20.5%) had an annual household income of 50,000. - 75000. Four participants had an income above 75000. per year. Three participants did not identify their annual household income.

Table 8. Description of Demographic Characteristic Annual Household Income of Women Referred for Screening Mammogram Utilizing Frequency

	ANNUAL INCOME	FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
Valid	Less than $10,000	2	5.1	5.1	5.1
	$10,001 - $25,000	13	33.3	33.3	38.5
	$25,001 - $45,000	5	12.8	12.8	51.3
	$45,001 - $50,000	4	10.3	10.3	61.5
	$50,000 - $75,000	8	20.5	20.5	82.1
	$75,001 or above	4	10.3	10.3	92.3
Missing		3	7.7	7.7	100.0
Total		39	100.0	100.0	

Family History of Breast Cancer. Table 9 provides a description of the demographic characteristic "family history of breast cancer" of women referred for screening mammography. Twenty-one women (53.8%) identified that they had no family members

with breast cancer. Seventeen (43.6%) of the respondents identified that they had a family member with breast cancer. The specific relation of the family member will be discussed in the next section. One participant (2.6%) did not respond.

Table 9. Description of Demographic Characteristic Family Members with Breast Cancer of Women Referred for Screening Mammogram Utilizing Frequency

		FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
Valid	NO	21	53.8	53.8	53.8
	YES	17	43.6	44.7	97.4
Missing		1	2.6	2.6	100%
Total		39	100.0	100.0	

Smoking Status. Table 10 provides a description of the demographic characteristic "smoking status" of women referred for screening mammography. Twenty-five participants (64.1%) of the respondents denied smoking currently. Eleven participants (28.2%) responded that they currently smoked. One participant (2.6%) did not respond. Three participants (7.7%) did not respond.

Table 10. Description of Demographic Characteristic Smoking Status of Women Referred for Screening Mammogram Utilizing Frequency

		FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
Valid	NO	25	64.1	64.1	64.1
	YES	11	28.2	28.2	92.3
Missing		3	7.7	7.7	100
Total		39	100	100	

Years of Smoking. Table 11 provides a description of the demographic characteristic "years of smoking" of women referred for screening mammography. One participant (2.6%) smoked cigarettes from one to five years. Three participants (7.7%) smoked from 6-10 years. One participant (2.6%) smoked for 11-15 years. One participant (2.6%) smoked for 16-20 years. Thirteen women (33.3%) smoked cigarettes for twenty years or more.

Table 11. Description of Demographic Characteristic Years of Smoking of Women Referred for Screening Mammogram Utilizing Frequency

	YEARS SMOKING	FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
Valid	1-5 years	1	2.6	3.3	3.3
	6-10 years	3	7.7	10.0	13.3
	11-15 years	1	2.6	3.3	16.7
	16-20 years	1	2.6	3.3	20.0
	20 years or greater	13	33.3	43.3	63.3
	Not applicable	11	28.2	36.7	0
Total		30	76.9	100.0	100.0
Missing/ Non Smoking		9	23.1		
Total		39	100.0		

Type of Insurance. Table 12 provides a description of the demographic characteristic "type of insurance" of women referred for screening mammography. Twelve women (30.76%) had health care insurance that was a PPO type of plan. Fifteen women

(38.46%) had health care insurance that was an HMO type of insurance. Five participants (12.82%) had health care insurance that required that the patient pay 20% of the health care costs. Seven participants (17.94%) did not identify their type of health care insurance. None of the participants identified having either Medicare or Medicaid their insurance carrier.

Table 12. Description of Demographic Characteristic Type of Health Care Insurance of Women Referred for Screening Mammogram Utilizing Frequency.

	FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
PPO	12	30.76	30.76	30.76
HMO	15	38.46	38.46	69.22
Pay 20%	5	12.82	12.82	82.04
Medicaid	0	0	0	82.04
Medicare	0	0	0	82.04
Missing	7	17.94	17.94	0
Total	39	100	100	100

Adherence with Mammography. Table 13 provides a description of the demographic characteristic adherence with mammogram for women referred for screening mammography. This represents both the control and experimental groups. Twenty-two participants (56.4%) adhered with the recommendation for receiving a screening mammography. Nineteen participants (43.6%) did not receive their screening mammogram.

Table 13. Description of the Demographic Characteristic Adherence with Screening Mammogram Utilizing Frequency.

VALID	FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
Received Mammogram	22	56.4	56.4	56.4
Did not receive Mammogram	19	43.6	100	100
Total	39	100	100	100

Summary. Table 14 provides a summary description of frequencies for each demographic characteristic as previously discussed. The most prevalent characteristic "location" was Waco, Texas with 33.3% of the participants. The most represented "ethnicity" was Caucasian with 61.53% of the sample participants. The typical respondent's "age" was 41 and 42 for a total 25.6% of the participants. The typical characteristic of "marital status" was married, with 59% of the study participants. The most represented "years of education" was some college for 35.9% of the participants. The most prevalent "income" was $10,001-25,000. For a total of 33.3% of the participants. The typical respondent did not have a "family history of breast cancer with 53.8% of the participants. The most prevalent characteristic of "smoking" was 33% of the respondents smoking 20 years of more. The typical "type of insurance" was an HMO, with 38.46% of the respondents. The typical respondent was "adherent" with mammogram recommendation with 56.4% of respondents having had the recommended screening mammogram.

Table 14. Description of Demographic Characteristics of Women Referred for Screening Mammography Utilizing Frequency.

VARIABLE	NUMBER	PERCENT
Location		
Waco	13	33.3
Bedford	9	23
Ft. Worth	9	23
Groesbeck	4	10.25
Bond	2	5.12
Goldthwaite	1	2.56
Mt. Vernon	1	2.56
Ethnicity		
Caucasian	24	61.53
Hispanic	5	12.82
African-Am	3	7.69
Multi-ethnic	3	7.69
Asian	2	5.12
Other	2	5.12
Age		
41	5	12.8
42	5	12.8

43	3	7.7
44	3	7.7
45	1	2.6
46	1	2.6
47	2	5.1
48	2	5.1
49	2	5.1
50	2	5.1
51	1	2.6
52	1	2.6
54	2	5.1
56	2	5.1
57	1	2.6
59	1	2.6
60	1	2.6
63	1	2.6
72	2	5.6
81	1	2.6
Marital Status		
Married	23	59
Divorced	7	17.9
Widowed	3	7.7
Single	3	7.7
Separated	1	2.6

Education		
1-6th grade	2	5.1
7-9th grade	3	7.7
Some H.S.	7	17.9
H.S.grad	6	15.4
Some College	14	35.9
College grad	4	10.3
Grad Degree	1	2.6
Income		
< 10,000.	2	5.1
10,001-25,000.	13	33.3
25,000-45,000.	5	12.6
45,001-50,000.	4	10.3
50,000-75,000.	8	20.5
75,000. or >	4	10.3
Family with Breast Cancer		
No	21	53.7
Yes	17	43.6
Smoking Status		
Yes	11	28.2
No	25	64.1

Years of Smoking		
1-5 years	1	2.6
6-10 years	3	7.7
11-15 years	1	2.6
16-20 years	1	2.6
20 years >	13	33.3
Type of Insurance		
PPO	12	30.76
HMO	15	38.46
Pay 20%	5	12.82
Adherence with mammogram		
Yes	22	56.4
No	19	43.6

Summary Description. Table 15 provides a description of the demographic characteristics of the control and experimental groups. Characteristics of women referred for screening mammography by a nurse practitioner and the number of respondents for each characteristic by the control (n=20) and experimental (N=19) group for age, ethnicity, family history, smoking status, type of insurance, past screening and mammogram intent. Seventeen participants of the control group responded to marital status, years of education, and income; two participants did not respond in each of these categories. All participants of the experimental group responded to marital status, and years of education.

Table 15. Summary Description of the Demographic Characteristics of Women Referred for Screening Mammography by a Nurse Practitioner and the Respondents for Each Characteristic by Control and Experimental Group.

VARIABLES	VALID		MISSING	
	C	E	C	E
Age	20	19	0	0
Ethnicity	20	19	0	0
Marital Status	17	19	2	0
Years of Education	17	19	2	0
Income	17	18	2	1
Family History	20	19	0	0
Smoking Status	20	19	0	0
Type of Insurance	20	19	0	0
Past Screening	20	20	0	0
Mammogram Intent	20	19	0	0

Ethnicity. Table 16 provides a description of the demographic characteristic "ethnicity" of women referred for mammogram utilizing frequency. All thirty-nine participants responded to this item on the demographic questionnaire. Twenty-four participants (61.53%) were identified as Caucasian (11 control, 13 experimental), Five participants (12.8%) were identified as Hispanic (2 control, 3 experimental). Three participants (7.69%) were African-American (1 control, 2 experimental). Three (7.69%) participants were identified as multi-ethnic (2 control, 1 experimental. Two participants (5.12%) were identified as Asian (both control). Two participants (5.12%) were identified as other (both control).

Table 16. Description of the Demographic Characteristic Ethnicity of Respondents Utilizing frequency for the Control and Experimental Groups

	FREQUENCY C	FREQUENCY E
Caucasian	11	13
Hispanic	2	3
African-American	1	2
Multi-ethnic	2	1
Asian	2	0
Other	2	0
Total	20	19

Age. Table 17 provides a description of the demographic characteristic "age" of women referred for screening mammography utilizing frequency. All thirty-nine participants responded to this item on the demographic questionnaire. Five participants (12.82%) identified their age as 41 (3 control, 2 experimental). Five participants identified their age as 42 (12.82%) three control, two experimental. Three participants each represented the age of 43 (7.69%), and 44 (7.69%) both that had two control and one experimental participants. Two participants each represented the age of 47 (5.12%), 48 (5.12%), 49 (5.12%), 50 (5.12%), and 56 (5.12%), with one participant of experimental and control participant. Two participants aged 54 (5.12%) were both in the experimental group. Two participants aged 72 (5.12%) were both in the control group. One participant represented each age of 45, 57, and, 82 (each at 2.56%) were control group members. One Participant represented age 46, 51, 52, 59, 60, 63, (each at 2.56%) were experimental group members.

Table 17. Description of Demographic Characteristics Age of Women Referred for Mammogram Utilizing Frequency for Control and Experimental Groups.

VALID	AGE	FREQUENCY	
		C	E
	41	3	2
	42	3	2
	43	2	1
	44	2	1
	45	1	0
	46	0	1
	47	1	1
	48	1	1
	49	1	1
	50	1	1
	51	0	1
	52	0	1
	54	0	2
	56	1	1
	57	1	0
	59	0	1
	60	0	1
	63	0	1
	72	2	0
	82	1	0
TOTAL		20	19

Age. Table 18 provides a description of the demographic characteristic "age" of women referred for screening mammogram utilizing descriptive statistics. The mean is 49.82. for the control, 48.8 for the experimental, the median 47.0 for both the control and experimental, and the mode 41 and 42 (SD 9.66) for the control. The mode for the experimental group is 41, 42, 54 (SD 6.674).

Table 18. Description of the Demographic Characteristics Age of Women Referred for Screening Mammogram Utilizing Descriptive Statistics for Control and Experimental Groups

	C	E
Mean	49.55	48.8
Median	47	47
Mode	41,42	41,42,54
Std. Deviation	11.46	6.674

Marital Status. Table 19 provides a description of the demographic characteristic "marital status" of women referred for screening mammography utilizing frequency. Thirty-seven out of 39 participants responded to this item on the demographic questionnaire. Two participants (5.1%) did not complete this item on the demographic questionnaire and were considered "missing." Twenty-three participants (59.0%) indicated current marital status as "married," fourteen experimental, nine control group. Seven participants (17.9%) indicated their current marital status to be divorced, five control, two experimental. Three participants (7.7%) indicated their current marital status as "widowed," two control, one experimental. Three participants (7.7%) identified their current marital status as "single," two control, one experimental. One participant identified herself as single.

Table 19. Description of Demographic Characteristic Marital Status of Women Referred for Mammography for Control and Experimental Groups

VALID	MARITAL STATUS	FREQUENCY C	E
	Married	9	14
	Divorced	5	2
	Widowed	2	1
	Single	2	1
	Separated	0	1
	Total	20	19

Education. Table 20 provides a description of the demographic characteristic of "education." Two (5.1%) of the participants had a grade school education, both experimental. Three (7.7%) of the participants had a seventh to ninth grade education, one control, two experimental. Seven (17.9%) of the participants had some high school, two control, five experimental. Six (15.4%) of the participants were high school graduates, two control, four experimental. Fourteen (35.9%) of the participants had some college, nine control, five experimental. Four (10.3%) of the participants were college graduates; all were in the control group. One participant (2.6%) had a graduate degree (control group). Two participants (5.1%), both in the experimental group, did not respond.

Table 20. Description of Demographic Characteristic Education of Women Referred for Screening Mammogram Utilizing Frequency for Control and Experimental Groups

VALID	GRADE	FREQUENCY	
		C	E
	1-6th grade	0	2
	7-9th grade	1	2
	Some H.S	2	5
	H.S. Grad	2	4
	Some College	9	5
	College Grad	4	0
	Grad Degree	1	0
	MISSING	0	2
TOTAL		20	18

Household Income. Table 21 provides a description of the demographic characteristic "household income" of women referred for screening mammography. Two participants (5.1%), both in the control group, had a household income of less than $10,000. Thirteen participants (33.3%), seven control, six experimental group, had an income from 10,001. - $25,000. Five participants (12.8%), one control group, four experimental group, identified a household income from $25,001. -45,000. Four participants (10.3%), three control, one experimental had a household income from 45,001. -50,000. Eight participants (20.5%), three control, five experimental, had an annual household income of 50,000. -75000. Four participants, two control, two experimental, had an income above

75000. per year. Three participants, 2 control, 1 experimental, did not identify their annual household income.

Table 21. Description of Demographic Characteristic Annual Household Income of Women Referred for Screening Mammogram Utilizing Frequency for Control and Experimental Groups

Valid	Annual Income	Frequency	
		C	E
	Less than $10,000	2	0
	$10,001 - $25,000	7	6
	$25,001 - $45,000	1	4
	$45,001 - $50,000	3	1
	$50,000 - $75,000	3	5
	$75,001 or above	2	2
Missing	99	2	1
Total		20	19

Family History of Breast Cancer Table 22 provides a description of the demographic characteristic "family history of breast cancer" of women referred for screening mammography. Twenty-one women (53.8%) identified that they had no family members with breast cancer. Seventeen (43.6%) of the respondents identified that they had a family member with breast cancer. The specific relation of the family member will be discussed in the next section. One participant (2.6%) did not respond.

Table 22. Description of Demographic Characteristic Family Members with Breast Cancer of Women Referred for Screening Mammogram Utilizing Frequency for Control and Experimental Groups

		Frequency	
		C	E
Valid	NO	11	6
	YES	9	13
Total		20	19

Years of Smoking. Table 23 provides a description of "years of smoking" of women referred for screening mammography. One participant in the experimental group (2.6%) smoked cigarettes from one to five years. Three participants all in the control group (7.7%) smoked from 6-10 years. One participant in the experimental group (2.6%) smoked for 11-15 years. One participant in the control (2.6%) smoked for 16-20 years. Thirteen women (33.3%), seven in the control group, six in the experimental group smoked cigarettes for twenty years or more.

Table 23. Description of Demographic Characteristic Years of Smoking of Women Referred for Screening Mammogram Utilizing Frequency

Valid	YEARS SMOKING	FREQUENCY	
		C	E
	1-5 years	0	1
	6-10 years	3	0
	11-15 years	0	1
	16-20 years	1	0
	>20 years or greater	7	6
	n/a	2	9
Total		13	17

Type of Insurance. Table 24 provides a description of the demographic characteristic "type of insurance" of women referred for screening mammography. Twelve women (30.76%), three control, nine experimental, had health care insurance that was a PPO type of plan. Fifteen women (38.46%), ten control, five experimental, had health care insurance that was an HMO type of insurance. Five participants (12.82%), four control, one experimental had health care insurance that required that the patient pay 20% of the health care costs. Seven participants (17.94%), four control, three experimental did not identify their type of health care insurance. None of the participants identified having either Medicare or Medicaid their insurance carrier.

Table 24. Description of Demographic Characteristic Type of Health Care Insurance of Women Referred for Screening Mammogram Utilizing Frequency for Control and Experimental Groups.

	FREQUENCY	
	C	E
PPO	3	9
HMO	10	5
Pay 20%	4	1
Medicaid	0	0
Medicare	0	0
Missing	4	3
Total	21	18

Adherence with Mammography. Table 25 identifies the number of women receiving their screening mammogram from the control and experimental groups. Twenty-two participants (56.4%), nine control, thirteen experimental, adhered with the recommendation for receiving a screening mammography. Nineteen participants (43.6%), eleven control, six experimental did not receive their screening mammogram.

Table 25. Description of the Demographic Characteristic Adherence with Screening Mammogram Utilizing Frequency for Control and Experimental Groups.

VALID	FREQUENCY	
	C	E
Received Mammogram	9	13
Did not receive Mammogram	11	6
Total	20	19

Demographic Profile of Study Participant Table 26 provides a demographic profile of the typical study participant. The most prevalent characteristic "location" was Waco, Texas with 33.3% of the participants. The most represented "ethnicity" was Caucasian with 61.53% of the sample participants. The typical respondent's "age" was 41 and 42 for a total 25.6% of the participants. The typical characteristic of "marital status" was married, with 59% of the study participants. The most represented "years of education" was some college for 35.9% of the participants. The most prevalent "income" was $10,001-25,000. for a total of 33.3% of the participants. The typical respondent did not have a "family history of breast cancer with 53.8% of the participants. The most prevalent characteristic of "smoking" was 33% of the respondents smoking 20 years of more. The typical "type of insurance" was an HMO, with 38.46% of the respondents. The typical respondent was "adherent" with mammogram recommendation with 56.4% of respondents having had the recommended screening mammogram.

Table 26. Description of Demographic Characteristics of Women Referred for Screening Mammography Utilizing Frequency.

VARIABLE	NUMBER		PERCENT	
	C	E	C	E
Location				
Waco	8	5	20.50	12.75
Bedford	5	4	12.75	10.25
Ft. Worth	5	4	12.75	10.25
Groesbeck	0	4	0	10.25
Bond	0	2	0	5.12
Goldthwaite	1	0	2.56	0
Mt. Vernon	1	0	2.56	0
Total	20	19	51.3	48.7
Ethnicity				
Caucasian	11	13	28.16	33.28
Hispanic	2	3	5.12	7.68
African-Am	1	2	2.56	2.56
Multi-ethnic	2	1	5.12	0
Asian	2	0	5.12	0
Other	2	0	5.12	0
Age				
41	3	2	7.7	5.1
42	3	2	7.7	5.1
43	2	1	5.1	2.6

44	2	1	5.1	2.6
45	1	0	2.6	0
46	0	1	0	2.6
47	1	1	2.6	2.6
48	1	1	2.6	2.6
49	1	1	2.6	2.6
50	1	1	2.6	2.6
51	0	1	0	2.6
52	0	1	0	2.6
54	0	2	0	5.1
56	1	1	2.6	2.6
57	1	0	2.6	0
59	0	1	0	2.6
60	0	1	0	2.6
63	0	1	0	2.6
72	2	0	5.1	0
82	1	0	2.6	0
Marital Status				
Married	9	14	23.0	35.8
Divorced	5	2	12.8	5.1
Widowed	2	1	5.1	2.6
Single	2	1	5.1	2.6
Separated	0	1	0	2.6
Total	18	19		

Education				
1-6th grade	0	2	0	5.1
7-9th grade	1	2	2.6	5.1
Some H.S.	2	5	5.1	12.8
H.S.grad	2	4	5.1	10.2
Some College	9	5	30.	12.8
College grad	4	0	10.2	0
Grad Degree	1	0	2.6	0
Missing	0	2	0	5.4
Income				
< 10,000.	2	0	5.5	0
10,001-25,000.	7	6	18.0	15.6
25,000-45,000.	1	4	2.6	10.2
45,001-50,000.	3	1	7.8	2.6
50,000-75,000.	3	5	7.8	13.2
75,000. or >	2	2	5.4	5.4
Missing	2	0	5.4	0
Years of Smoking				
1-5 years	0	1	0	2.6
6-10 years	3	0	7.7	0
11-15 years	0	1	0	2.6
16-20 years	1	0	2.6	0
20 years >	7	6	17.9	15.4

Non Applicable	2	9	5.4	23.1
Type of Insurance				
PPO	3	9	8.6	29.16
HMO	10	5	25.64	12.82
Pay 20%	4	1	10.24	2.56
Missing	4	3	10.24	7.68

Data Analysis of Individual Scales

This section provides a descriptive comparison and interpretation of scores on the Multidimensional Health Locus of Control Scale, Barriers of and Benefits to Mammography Instrument, Krantz Health Opinion Survey, and the Self-efficacy Scale.

Multidimensional Health Locus of Control Scale Total Score Table 27 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 27: Multidimensional Health Locus Control Scale Descriptive Statistics of Total group score, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	2.9525	3.0165	2.8852
Median	2.94	2.94	2.94
Mode	2.94	2.94	3.17
SD	.42153	.43308	.33884
Range	1.94	1.94	1.05

Multidimensional Health Locus of Control Scale Internality Sub-scale Table 28 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 28: Multidimensional Health Locus of Control Sub Scale: Internality Descriptive Statistics of Total group score, Experimental and Control

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	56.641	53.65	51.5789
Median	53	53	53
Mode	53	53	52
SD	8.7914	11.273	5.1674
Range	38	38	38

Multidimensional Health Locus of Control Scale Internality Chance Sub-scale Barriers of and Benefits to Mammography Total Score: Table 29 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 29: Barriers of and Benefits to Mammography Total Score: Descriptive Statistics of Total group score, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	3.812308	3.50150	3.63211
Median	3.71	4	3.71
Mode	3.71	4	3.71
SD	.35419	.33297	.52563
Range	2.72	1.130	.79

Barriers of and Benefits to Mammography Tool Sub-Scale health Motivation Table 30 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 30: Barriers of and Benefits to Mammography Tool Sub-Scale Health Motivation Score: Total, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	2.952564	3.0165	2.8852
Median	2.94	2.94	2.94
Mode	2.94	2.94	3.17
SD	.39817	.46664	.50198
Range	1.94	1.65	1.05

Barriers of and Benefits to Mammography Tool: Sub-scale Barriers of Mammography.

Table 31 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 31: Barriers of and Benefits to Mammography Tool Sub-Scale Barriers of Mammography: Total, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	2.625641	2.75	2.4974
Median	2.6	2.7	2.4
Mode	2.4	4	2.8
SD	.43135	.79439	.35508
Range	2.6	2.6	1.40

Barriers of and Benefits to Mammography Tool Sub-Scale Benefits of Mammography

Table 32 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 32: Barriers of and Benefits to Mammography Tool Sub-Scale Benefits of Mammography: Total, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	3.812308	3.943	3.67474
Median	3.71	4	3.71
Mode	3.71	4	3.71
SD	.60113	.6000	.62282
Range	2.72	2	2.43

Barriers of and Benefits to Mammography Tool Sub-Scale Benefits of BSE Table 33 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 33: Barriers of and Benefits to Mammography Tool Sub-Scale Benefits of BSE: Total, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	3.714	3.898	3.1421
Median	3.833	3.83	3.83
Mode	4	3.83	4
SD	.451	.39865	.49116
Range	1.8	1.5	1.40

Barriers of and Benefits to Mammography Tool Sub-Scale Barriers of BSE Table 34 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 34: Barriers of and Benefits to Mammography Tool Sub-Scale Barriers of BSE Total, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	2.0984	2.276	1.91158
Median	2	2.25	2
Mode	2	2.67	1.83
SD	.49025	.80945	.48511
Range	3	3	1.83

Barriers of and Benefits to Mammography Tool Sub-Scale Consequences of BSE Table 35 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 35: Barriers of and Benefits to Mammography Tool Sub-Scale Consequences of BSE Total, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	3.382564	3.391	3.37368
Median	3.36	3.27	3.45
Mode	3.09	3.09	3.09
SD	.50023	.49063	.50799
Range	2.28	2	1.91

Barriers of and Benefits to Mammography Tool Sub-Scale Seriousness Table 36 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 36: Barriers of and Benefits to Mammography Tool Sub-Scale Seriousness: Total, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	3.13564	3.30050	2.96211
Median	3.14	3.43	2.86
Mode	3.43	3.43	2.86
SD	.59652	.57097	.52309
Range	2.14	2	2.14

Kranz Health Opinion Survey Total Score: Total, Experimental and Control Groups

Table 37 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 37: Barriers of and Benefits to Mammography Tool Sub-Scale Susceptibility: Descriptive Total, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	2.544	2.72	2.37895
Median	2.4	2.8	2.2
Mode	2	2.8	2
SD	.812	.72664	.87913
Range	4	2.8	4

Kranz Health Opinion Survey Total Score: Table 38 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 38: Kranz Health Opinion Survey Total Score: Total, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	.617788	.65480	.52623
Median	.625	.69	0.5
Mode	.6875	.69	.69
SD	.234014	.17194	1.4190
Range	1.3125	.69	.5

Kranz Health Opinion Survey Sub-Scale Information: Table 39 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 39: Kranz Health Opinion Survey Sub-Scale information: Total, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	0.557	0.6445	.466316
Median	.44	0.67	.44
Mode	.44	.067	.44
SD	.29515	.20311	.27036
Range	1.22	1.22	.45

Kranz Health Opinion Survey Sub Score: Behavioral Group Score: Table 40 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 40: Kranz Health Opinion Survey Sub-Score Behavioral Total group score, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	.693077	0.784	.597368
Median	0.44	0.71	.57
Mode	0.44	0.71	.71
SD	7.49	.20311	.27036
Range	1.22	1.42	.86

Self-Efficacy Total group score, Experimental and Control Groups: Table 41 presents a comparison of the total group, control and experimental group scores for this tool. The number of participants, number missing, mean, median, mode, and standard deviation are presented below.

Table 41: Self-Efficacy Total group score, Experimental and Control Groups

	Total Score of Both Groups	Control Group	Experimental Group
Number	39	20	19
Missing	0	0	0
Mean	2.821795	2.906	2.733158
Median	2.82	2.85	2.76
Mode	2.94	2.65	2.94
SD	.59132	.58490	.61772
Range	1.71	1.71	1.29

Comparison of Variables with Follow-up

Test of between subject effect: Table 42 provides an understanding between the variable health belief and women who had their mammogram. There was a significant relationship between women who had their mammogram and a positive health belief at .012 at a .05 level of significance.

Table 42: Test of Between Subject Effect HBM

Tests of Between-Subjects Effects					
Dependent Variable: HBM					
Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	274.01[a]	3	91.337	2.874	.050
Intercept	188806.556	1	188806.556	5940.934	.000
GROUP	225.714	1	225.714	7.102	.012
FOLLOWUP	7.684	1	7.684	.242	.626
GROUP * FOLLOWUP	88.286	1	88.286	2.778	.105
Error	1080.541	34	31.781		
Total	207523.000	38			
Corrected Total	1354.553				

[a] R Squared = .202 (Adjusted R Squared = .132)

Test of between subject effect: Table 43 provides an understanding between the Barriers of and Benefits to Mammography Tool Sub-scale Barriers of Mammography variable and women who had their mammogram. There was not a significant relationship as the table clearly illustrates.

Table 43: Test of Between Subject Effect: Barriers to Mammogram

Dependent Variable: BARRIMAM

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	73.685[a]	3	24.562	1.471	.240
Intercept	4531.125	1	4531.125	271.318	.000
GROUP	48.546	1	48.546	2.907	.097
FOLLOWUP	1.441	1	1.441	.086	.771
GROUP * FOLLOWUP	26.967	1	26.967	1.615	.212
Error	567.815	34	16.700		
Total	5667.000	38			
Corrected Total	641.500	37			

[a] R Squared = .115 (Adjusted R Squared = .037)

Test of between subject effect: Table 44 provides an understanding between the Barriers of and Benefits to Mammography Tool Sub-scale Benefits of Mammography variable and women who had their mammogram. There was not a significant relationship as the table clearly illustrates.

Table 44: Test of Between Subject Effect: Benefit of Mammogram
Dependent Variable: BENMAMM

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	101.537[a]	3	33.846	1.738	.178
Intercept	24104.420	1	24104.420	1238.060	.000
GROUP	58.397	1	58.397	2.999	.092
FOLLOWUP	61.578	1	61.578	3.163	.084
GROUP * FOLLOWUP	11.104	1	11.104	.570	.455
Error	661.963	34	19.470		
Total	27449.000	38			
Corrected Total	763.500	37			

[a] R Squared = .133 (Adjusted R Squared = .056)

Test of between subject effect: Table 45 provides an understanding between the Barriers of and Benefits to Mammography Tool Sub-scale Benefits of BSE variable and women who had their mammogram. There was not a significant relationship as the table clearly illustrates.

Table 45: Test of Between Subject Effect Benefits of BSE

Dependent Variable: BENBSE

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	27.713[a]	3	9.238	1.295	.292
Intercept	17085.608	1	17085.608	2394.495	.000
GROUP	17.976	1	17.976	2.519	.122
FOLLOWUP	13.465	1	13.465	1.887	.179
GROUP * FOLLOWUP	4.781	1	4.781	.670	.419
Error	242.603	34			
Total	19016.000	38			
Corrected Total	270.316	37			

[a] R Squared = .103 (Adjusted R Squared = .023)

Test of between subject effect: Table 46 provides an understanding between the Barriers of and Benefits to Mammography Tool Sub-scale Barriers of BSE variable and women who had their mammogram. There was not a significant relationship as the table clearly illustrates.

Table 46: Test of Between Subject Effect: Barriers of BSE

Dependent Variable: BARBSE

Source	Type II Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	61940[a]	3	20.647	1.203	.323
Intercept	5466.587	1	5466.587	318.630	.000
GROUP	55.207	1	55.207	3.218	.082
FOLLOWUP	15.519	1	15.519	.905	.348
GROUP * FOLLOWUP	.079	1	.079	.005	.946
Error	583.323	34	17.157		
Total	6658.000	38			
Corrected Total	645.263	37			

[a] R Squared = .096 (Adjusted R Squared = .016)

Test of between subject effect: Table 47 provides an understanding between the Barriers of and Benefits to Mammography Tool Sub-scale Consequences of BSE variable and women who had their mammogram. There was not a significant relationship as the table clearly illustrates.

Table 47: Test of Between Subject Effect: Consequences of BSE

Dependent Variable: CONBSE

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	23.336[a]	3	7.779	.223	.880
Intercept	47261.966	1	47261.966	1352.428	.000
GROUP	15.579	1	15.579	.446	.509
FOLLOWUP	12.026	1	12.026	.344	.561
GROUP * FOLLOWUP	2.526	1	2.526	.072	.790
Error	1188.164	34	34.946		
Total	51837.000	38			
Corrected Total	1211.500	37			

[a] R Squared = .019 (Adjusted R Squared = .067)

Test of between subject effect: Table 48 provides an understanding between the Barriers of and Benefits to Mammography Tool Sub-scale Seriousness variable and women who had their mammogram. There was not a significant relationship as the table clearly illustrates.

Table 48: Test of Between Subject Effect: Seriousness

Dependent Variable: SERIOUS

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	77.061[a]	3	25.687	1.892	.150
Intercept	17358.067	1	17358.067	1278.256	.000
GROUP	52.638	1	52.638	3.879	.057
FOLLOWUP	1.751	1	1.751	.129	.722
GROUP * FOLLOWUP	7.330	1	7.330	.540	.468
Error	461.703	34	13.579		
Total	19063.000	38			
Corrected Total	538.763	37			

[a] R Squared = .143 (Adjusted R Squared = .067)

Test of between subject effect: Table 49 provides an understanding between the Barriers of and Benefits to Mammography Tool Sub-scale Susceptibility variable and women who had their mammogram. There was not a significant relationship as the table clearly illustrates.

Table 49: Test of Between Subject Effect: Susceptibility

Dependent Variable: SUSCEPT

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	83.654[a]	3	27.885	1.745	.176
Intercept	5894.297	1	5894.297	368.783	.000
GROUP	4.222	1	4.222	.264	.611
FOLLOWUP	51.304	1	51.304	3.210	.082
GROUP * FOLLOWUP	17.064	1	17.064	1.068	.309
Error	543.425	34	15.983		
Total	6665.000	38			
Corrected Total	627.079	37			

[a] R Squared = .133 (Adjusted R Squared = .057)

Test of between subject effect: Table 50 provides an understanding between the variable Health Motivation Sub-scale and women who had their mammogram. There was a significant relationship between women who had their mammogram and a positive health belief at .004 at a .05 level of significance.

Table 50: Test of Between Subject Effect: Health Motivation

Dependent Variable: HEALMOT

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	123.758[a]	2	61.879	6.379	.004
Intercept	16061.359	1	16061.359	1655.785	.000
Q93	123.758	2	61.879	6.379	.004
Error	339.505	35	9.700		
Total	27308.000	38			
Corrected Total	463.263	37			

[a] R Squared = .267 (Adjusted R Squared = .225)

Test of between subject effect: Table 51 provides an understanding between the variable Kranz Health Opinion Survey Total Score and women who had their mammogram. There was a significant relationship between women who had their mammogram and a positive health belief at .007 at a .05 level of significance.

Table 51: Test of Between Subjects Effect: Kranz Total Score

Dependent Variable: KRANTZ

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	70.327[a]	3	23.442	2.861	.051
Intercept	2956.353	1	2956.353	360.866	.000
GROUP	67.399	1	67.399	8.227	.007
FOLLOWUP	7.105	1	7.105	.867	.358
GROUP * FOLLOWUP	1.446E-05	1	1.446E-05	.000	.999
Error	278.541	34	8.192		
Total	3591.000	38			
Corrected Total	348.868	37			

[a] R Squared = .202 (Adjusted R Squared = .131)

Test of between subject effect: Table 52 provides an understanding between the variable Kranz Health Opinion Survey Sub-Scale Information and women who had their mammogram. There was a significant relationship between women who had their

mammogram and the desire for information about their health at .005 at a .05 level of significance.

Table 52: Test of Between Subjects Effect: Kranz Sub-scale Information

Dependent Variable: INFOKRAN

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	24.764[a]	3	8.255	3.350	.030
Intercept	756.314	1	756.314	306.898	.000
GROUP	22.677	1	22.677	9.202	.005
FOLLOWUP	2.248	1	2.248	.912	.346
GROUP * FOLLOWUP	.261	1	.261	.106	.747
Error	83.789	34	2.464		
Total	933.000	38			
Corrected Total	108.553	37			

[a] R Squared = .228 (Adjusted R Squared = .160)

Test of between subject effect: Table 53 provides an understanding between the variable Kranz Health Opinion Survey Sub-Scale Behavior and women who had their mammogram. There was a significant relationship between women who had their

mammogram and the desire to be involved in their health care .043 at a .05 level of significance.

Table 53: Test of Between Subjects Effect: Kranz Sub-scale Behavior

Dependent Variable: BEHKRAN

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	12.067[a]	3	4.022	1.500	.232
Intercept	722.062	1	722.062	269.000	.000
GROUP	11.886	1	11.886	4.431	.043
FOLLOWUP	1.360	1	1.360	.507	.481
GROUP * FOLLOWUP	.257	1	.257	.096	.759
Error	91.197	34	2.682		
Total	900.000	38			
Corrected Total	103.263	37			

[a] R Squared = .117 (Adjusted R Squared = .039)

Test of between subject effect: Table 54 provides an understanding between the Self-Efficacy Score variable and women who had their mammogram. There was not a significant relationship as the table clearly illustrates.

Table 54: Test of Between Subjects Effect: Efficacy

Dependent Variable: EFFICACY

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	86.665[a]	3	28.888	.787	.509
Intercept	126945.707	1	126945.707	3459.717	.000
GROUP	11.886	1	11.886	1.362	.251
FOLLOWUP	.032	1	.032	.001	.976
GROUP * FOLLOWUP	48.564	1	48.564	1.324	.258
Error	1247.545	34	36.693		
Total	139578.000	38			
Corrected Total	1334.211	37			

[a] R Squared = .065 (Adjusted R Squared = .018)

Section five provides a descriptive comparison and interpretation between the intervention groups of both the control and experimental groups related to the control group.

Additional Statistical Analysis

This section will present additional statistical analysis of the data. The following will be discussed: Tukey analysis, Chi Squared and Pearson Correlation.

Health Motivation and Intent to have the recommended screening mammogram: Table 55 Presented below is the Tukey HSD that identifies the relationship between Health Motivation and the patients' intent to have their screening mammogram as identified in question 93, "I intend to have the recommended screening mammogram." This test identified a positive relationship between participants who strongly agreed with intent to have mammogram at the 0.05 level of significance.

Table 55: Multiple Comparisons Health Motivation Tukey HSD

Dependent Variable: HEALMOT
Tukey HSD

(I) Q93	(J) Q93	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Neutral	Agree	-1.7000	1.75263	.600	-5.9892	2.5892
	Strongly Agree	-4.8158*	1.71335	.021	-9.0088	- .6227
Agree	Neutral	1.7000	1.75263	.600	-2.5892	5.9892
	Strongly Agree	-3.1158*	1.07574	.017	-5.7484	-.4832
Strongly Agree	Neutral	4.8158*	1.71335	.021	.6227	9.0088
	Agree	3.1158*	1.07574	.017	.4832	5.7484

Based on observed means.
*. The mean difference is significant at the .05 level.

Chi-Square. Table 56 A Chi-Square was completed to identify relationship between intent to have Mammogram and the patient actually having their mammogram. There was no a significant relationship.

Q93		Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Neutral	Pearson Chi-Square	1.333[b]	1	.248		
	Continuity Correction [a]	.000	1	1.000		
	Likelihood Ratio	1.726	1	.189		
	Fisher's Exact Test				1.000	.500
	Linear-by-Linear Association	1.000	1	.317		
	N of Valid Cases	4				
Agree	Pearson Chi-Square	1.607[c]	1	.205		
	Continuity Correction [a]	.547	1	.460		
	Likelihood Ratio	1.632	1	.201		
	Fisher's Exact Test				.315	.231
	Linear-by-Linear Association	1.500	1	.221		
	N of Valid Cases	15				
Strongly Agree	Pearson Chi-Square	.037d	1	.848		
	Continuity Correction [a]	.000	1	1.000		
	Likelihood Ratio	.037	1	.848		
	Fisher's Exact Test				1.000	.608
	Linear-by-Linear Association	.035	1	.852		
	N of Valid Cases	20				

[a]. Computed only for a 2x2 table
[b]. 4 cells (100.0%) have expected count less than 5. The minimum expected count is .50
[c]. 4 cells (100.0%) have expected count less than 5. The minimum expected count is 2.80.
[d]. 2 cells (100.0%) have expected count less than 5. The minimum expected count is 2.80.

A Pearson Correlation was completed on the data. Positive correlations were present. The list below identifies the relationship and level of significance. All were a 1 tailed test.

Follow up with mammography was significant with the following variables:

Kranz Information	-.382	significant at 0.01level
Kranz Behavior	-.348	significant at 0.05 level
Kranz Total	-393	significant at 0.01level
Seriousness	-.301	significant at 0.05 level
PPO	.351	significant at 0.01 level

A higher level of education was significant with the following variables:

Income	.808	significant at 0.01level
Barriers to BSE	.286	significant at 0.05 level
Self-efficacy	.297	significant at 0.05 level

A higher level of income was significant with the following variables:

Barriers to BSE	.319	significant at 0.05 level
Self-efficacy	.314	significant at 0.05 level

Health Locus of Control was significant with the following variables:

Kranz Information	.493	significant at 0.01 level
Kranz Behavior	.447	significant at 0.05 level
Kranz Total	.539	significant at 0.01 level
Barriers to Mammogram	.287	significant at 0.05 level
Barriers to BSE	.478	significant at 0.01 level
Seriousness	.320	significant at 0.05 level

Self-efficacy	.410	significant at 0.01 level
PPO	-.379	significant at 0.05 level

The Health Motivation subscale was significant with the following:

Self-efficacy	-.360	significant at 0.05 level

Self-efficacy was significant with the following:

Education	.297	significant at 0.05 level
Income	.314	significant at 0.05 level
Health Belief Model	.410	significant at 0.05 level
Health Motivation	-.360	significant at 0.05 level
Kranz Total	-.276	significant at 0.05 level

Kranz Total was significant with the following variables

Group Follow-up	-.393	significant at 0.01 levels
PPO	-.370	significant at 0.05 levels
Health locus of Control	.539	significant at 0.01 level

Kranz Information was significant with the following variables

Group follow-up	-.382	significant at 0.01 level
PPO	-.275	significant at 0.01 level
Health Locus of Control	.493	significant at 0.01 level

Kranz Behavior was significant with the following variables

Group follow-up	-.348	significant at 0.05 level
PPO	-.420	significant at 0.0.1 level
Health Locus of Control	.447	significant at 0.01 level

Summary

This chapter presented the results of the data analysis from this study. The data was presented in five sections. The first section provided an item description of the sample related to each demographic variable for the total sample, control and experimental groups. Section two provided a descriptive comparison and interpretation of scores on the Multidimensional Health Locus of Control Scale, Barriers of and Benefits to Mammography Instrument, Krantz Health Opinion Survey, and the Self-efficacy Scale. Section three provided a descriptive comparison and interpretation between the intervention groups of both the control and experimental groups for each tool utilized. Section four described the relationship between to the nurse practitioner intervention and the patient adherence with screening mammogram. Section five described the specific quantitative statistical tests run on the data.

Chapter V

Summary, Conclusions, and Recommendations

This chapter includes a summary of the research design and method as well as the findings, conclusions and implications for practice, education and research, as well as recommendations for further research.

Summary of the Study

The purpose of this quasi-experimental descriptive study was to examine the influence of a nurse practitioner intervention on women referred for screening mammography in North East Texas. The theoretical framework for this study was Bandura's Social Learning Theory. This study was designed to add to the knowledge base regarding the relationship between the patients' opinions of who makes their health care decisions and the decision to have a screening mammogram, as well as the perceived barriers to and beliefs about mammography. Additionally, the patient's level of self-efficacy, and how that relates to the patients intent to have and adherence with mammography was identified.

It is hoped that this research would provide a basis for further research that involves intervention research that involves nurse practitioners in practice. This study supports past research that women who have practice positive health care practices are more likely to participate in preventative screening activities.

Limitations

There are some limitations related to this study. One of the first limitation of this study is related to the questionnaire. The use paper and pencil to record the respondent response may lead to here a tendency for respondents to answer all items in a similar fashion, such as all yes or all no. Secondly, prior experiences with mammogram, or friends with breast cancer, or viewing TV shows may influence the responses of the participants. The participants experience with life and becoming wiser with age experience may influence the responses of the participants in a way that may not be measurable. Simply participating in the research study may result in bias that participants may answer question all the same as they think that would lead to the "correct" answers to the question that the researcher is asking. Another limitation may be related to the Nurse practitioners assisting with the study. They may unconsciously attempt to provide varying amounts of information to the participants based on their knowing which participants are in the control or treatment group. This external threat to validity is one of difficulty, as the participation of the nurse practitioners as research assistants is necessary. However, there is not a way to identify their bias, of if additional information was given to the participants to influence their decision to have a mammogram.

Participation by the women in this sample was voluntary, with random assignment to the control or experimental group. The subjects had control over their decision to participate and return their questionnaires, and make the decision to have the recommended screening mammogram or not. This small sample was limited to the nurse practitioner sites in Northern Texas. A power analysis identifies that the sample groups should have been bigger. Sokel and Rolf (1981) recommend the following for 2 groups,

with 5 anticipated differences in standard deviations and 4.4 difference in means (p263).

Sample size per group

	Type I error 0.05%	Type II error 0.01%	Type I error 0.001%
Power = 80%	22	32	48
Power = 80%	29	40	58
Power = 80%	35	48	65

The sample groups for this study of 20 in the control and 19 in the Experimental group fall short of the 22 for a type I error at 0.05% with a power of 80%. The power analysis was not completed until after the study was completed.

Basic Assumptions

The following assumptions were identified for this study.

1. Women will be referred for screening mammograms
2. The sites identified are representative of Northern Texas.
3. Nurse practitioners have a positive influence with their patients.

Criteria for inclusion in the sample included women age 40 or older, not having been referred for a screening mammogram in the last year, never having had cancer, and willingness to participate as demonstrated by signing a consent from and completing the research packet. The data was collected on site at each of seven locations in North Texas. Verbal and written consent was obtained prior to completion of data from the written aspects of this study. The instruments used to collect data for this study were the multidimensional health locus of control scale, Barriers to and Belief of mammography tool, self-efficacy scale, Kranz Health opinion Survey, and Demographic Data tool.

Demographic Data Analysis

The population for the study was obtained from ten nurse practitioner practice sites throughout North-Eastern Texas. The sample included 39 women, 20 in the control group, and 19 in the experimental group. The ages of the women varied, from 41 to 82 years; the mean age for the control group was 49.55 (SD= 11.46) years, 48.8 (SD=6.674) years for the experimental group. More than half of the subjects were married (n=23, 58.9%). All of the subjects had health care insurance that paid for the majority of their health care costs. Most of the women had received a screening mammogram at some point in the past (n=33 or 87.1%). However, only 6 (15.3%) of the women reported had received their screening mammogram on an annual basis.

Adherence with Mammography. Twenty-two participants (56.4%), nine in the control group, thirteen in the experimental group, adhered with the nurse practitioner recommendation for receiving a screening mammography. Nineteen participants (43.6%), eleven control, six experimental did not receive their screening mammogram. In the control group, the adherence with mammography rate was 45%, the rate for the experimental group was 68%. The experimental group rate was higher than the ACS reported mammography adherence rate of 62.6% and Texas reported rate of 57.2%.

Quantitative data was analyzed using the SPSS statistical package. A descriptive analysis of the sample was complete typical study participant was from Waco, Texas, Caucasian, 41 or 42, married, having attended some college, with an income from 10,001-25,000. per year, no family history of breast cancer, smoking for more than 20 years, typical insurance of and HMO adherent with the mammogram recommendation.

Interpretation of Findings Related to Research Questions

Research Hypothesis

H1: A significant difference in rates of screening mammography adherence will exist between a group of women who receive a structured nurse practitioner intervention and a group not receiving the intervention.

There was no difference in the rates of mammography adherence between the control and experimental group. The adherence rate for the control group was 45% and 68% for the experimental group, however, was not statistically significant.

H2: A positive correlation will exist between rates of screening mammography adherence and perceived self-efficacy related to mammography;

The intent to have a mammogram was identified by question 93 that stated "I intend to have a screening mammogram." A positive correlation with this question for the total group (n=39) and the individual score of self-efficacy was significant at 0.71 at the 0.01 level of significance.

H3: A positive correlation will exist between rates of screening mammography adherence and attitudes toward self-directed treatment.

Correlation was measured by a Tukey HSD motivation identified significance at the 95% confidence level of 0.021% with intent to have a mammogram as strongly agree. An individuals' health motivation measured as a component of the Barriers to and Benefits of Mammography tool and intent to have a mammogram (question 93) was also a significant predictor for adherence with mammography for the total group. This was significant at the .05 level of significance at .004.

Participants with a higher level of health belief were more likely to adhere with their screening mammography recommendation. Positive relationships were identified between the health belief model and adherence with mammography at .012 at the level of 0.05 level of significance.

Participants who adhered with mammography identified a positive correlation between the Kranz sub-scales of information and behavior. Participant who adhered with mammography prefer to be active in their medical care and desire to be informed about treatment. Additionally, these participants prefer to prefer to be more informed about their health care decisions. The information sub scale was significant at the .05 level of significance at .005. The behavior sub scale was significant at the .05 level of significance at .043.

This study supports prior research that has identified that patients adhere and have more favorable outcomes when they are given a greater role and sense of personal responsibility in their health care decisions. This method by which patients are encouraged to commit to their recommended treatment by obtaining an over commitment, such as it is important for you to get your mammogram, will you promise do this for me (Kulik, et. al, 1987)

Implications for Nursing

The review of literature identifies the very limited research that involves nurse practitioners as well as interventions related to nurse practitioners and their interventions for cancer screening. Nurse practitioners are advancing as leaders in the health care delivery system. It is vital for nurse practitioners to utilize their current expertise related to promotion of health and disease prevention for the prevention of breast cancer.

Referring patients for screening mammograms will continue to be an integral component of health promotion for women. Any method that will encourage and support patients to follow through with their providers' recommendation and have their mammogram is needed.

This study supports the continued need for further research as to how to encourage women to get their mammograms. The percentage of women adhering with their health care providers' recommendation for screening mammogram in this study is no where near the American Cancer Societies' Goal for 2008 that 90% of women have a screening mammogram annually.

A positive level of self-efficacy is a predictor of who may be more likely to follow up with getting their mammogram; however, this does not identify any means to increase the level of self-efficacy for patients who do not have a positively level of self efficacy. This study has identified that there are positive relationships between self-efficacy, health belief, and following through with mammogram. It will still remain an important priority that the patient be referred for a mammogram and be reminded of the importance of this potentially life-saving procedure by their nurse practitioner.

Nursing education must prepare graduating students for their future and maintain a curriculum which is applicable to a reality based practice. Nurse educators need to be on the forefront of questioning historical models for curricum development and initiate new strategies in an effort to integrate theory and practice using strategies that will move practitioners to a prevention model. Current nurse practitioner education needs to place some of its focus on the importance of research that identifies and supports the uniqueness and quality of patient care that nurse practitioner deliver given the current

market forces shaping health care. Unfortunately most nurse practitioners are too busy seeing patients rather than identifying the interventions that they are doing that makes a difference. Nurse practitioner education needs to add a course that teaches nurse practitioners how to integrate simple research into their daily practice. If there is not a change, the lack of nurse practitioner research will continue.

Recommendations for Future Research

In strongly recommended that this study be replicated with a larger sample of women including a wider range of ethnic and socioeconomic diversity and in different geographic locations. The location of the study in North Texas may have provided trends of the Southern United States; there may be geographical variations related to the decisions that women make regarding mammography. Additional research that relates specifically to why women make the decision to have their mammogram or fail to adhere with their health care providers' recommendation for preventative screening needs to addressed using both a qualitative and quantitative methodology.

The barriers to and beliefs of mammography tool should be revamped to follow the new American Cancer Society guidelines that encourage BSE, but do not recommend it on a monthly basis; further supporting the value of screening mammography. The subscales of the barriers to BSE and benefits of BSE may need to be eliminated or revised in light of the ACS changes. The new recommendations encourage teaching BSE, but strongly recommend that women over the age of 40 have a breast exam by their health care profession annually.

Replication of this study in a larger population supported by the power analysis that is recommended. The number for the control and experimental groups should exceed

at least 29 per group to have a Type I error of 0.05% at a power of 90%. A larger study would provide greater information that would have greater potential to be generalized to larger populations and more diverse populations.

Further qualitative research in the area of early cancer detection and screening is needed. Qualitative research would help in seeking the realities of why women do not get their mammograms; is it they don't have time, forget, and fail to make the appointment, or really just fear the results? Additionally, what finally gets women to have their screening mammogram when it may have been recommended many times.

Determining what motivates patients in their decision to adhere with mammography recommendations needs further study. The incidence of mammography adherence has not increased in the last 5 years. Effective interventions are needed which will result in an increase in the rate of mammography adherence thereby reduce mortality and to reach the ACS 2008 goal of 90% of women over the age of 40 having annual mammography.

Very few studies measure the impact of nurse practitioner interventions on patient outcomes and decisions related to preventative screening. Extensive research has been conducted that measures patient satisfaction with nurse practitioners; however, the lack of quality research that relates to health promotion activities and the early detection and screening of cancer are few, in both qualitative and quantitative research.

Summary

Breast cancer is a significant health problem for women. Screening mammography can significantly reduce the rate of mortality from breast cancer in women. Despite the abundance of literature related the success of mammography in the

early detection of breast cancer, there are no studies that identify the impact of specific nurse practitioner interventions with women who are referred for screening mammography. Since the rate of adherence with recommended screening mammography is low, it is critical to identify interventions that are effective in increasing mammography adherence. of breast cancer mortality in women who are 40 years of age and older.

This quasi-experimental research design was discussed to measure the impact of a structured nurse practitioner intervention on patients who were referred for screening mammography. Participants were randomized to the experimental or control group. The experimental group received a caring personal intervention by the nurse practitioner reviewing the importance of a mammogram for women over 40. The control group received the clinic normal procedure. Both groups received complete instrumentation for this study that includes the Multidimensional Health Locus of Control Scale, Krantz Health Opinion Survey, Barriers to and Beliefs of Mammography tool, Self-efficacy survey and demographic information. The adherence with mammography was defined as if the patient received their screening mammogram within six weeks of the nurse practitioners recommendation.

Results of this study identified that there was no difference in the rates of mammography adherence between the control and experimental group. The adherence rate for the control group was 45% and 68% for the experimental group, however, was not statistically significant. This however does show a tread toward being significant. There was a positive correlation between intent to have a mammogram the individual score of self-efficacy. There was also a relationship between rates of screening mammography adherence and attitudes toward self-directed treatment.

Recommendations for future research based on this study are replication on a larger and more racially diverse population. Additionally, further research is needed as to why women make the decision to have their mammogram or fail to adhere with their health care providers' recommendation for preventative screening needs to addressed in both a qualitative and quantitative methodology.

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Appendix A

Informed Consent

University of San Diego Consent to Act as a Research Subject

The purpose of this research study to identify the effect of a nurse practitioner intervention on attitudes and adherence with screening mammography. Since I have been selected to participate in this study, I understand that I will be asked to complete a survey that is titled Mammography Information, which includes demographic information, the Krantz Health Opinion Survey, Barriers and Beliefs of Mammography Tool, and a Self-efficacy questionnaire.

This data collection will take less than an hour of my time while at the nurse practitioner's office to complete the packet containing demographic information and questionnaires. Participation in the study should not involve any add risks or discomforts to me except for the possible minor fatigue or reflection. Possible benefits from participation in this study may be related to how I think about health promotion activities.

I authorize my nurse practitioner to verify my adherence to recommended health promotion activities such as annual physical, well woman or mammography examinations.

My participation in this study is entirely voluntary. I understand that I may withdraw from this study at anytime without to jeopardy to the care that I receive.

I understand that my responses and identity will be kept confidential and to preserve my anonymity only group data will be used in any publication or reporting the results of this study. All research records will be kept completely confidential in a locked file cabinet.

The principal investigator for this study is Susan Carlson. My nurse practitioner is assisting in this study as an research assistant. She has explained this study to me and answered my questions prior to signing this consent. If I have other questions or research-related problems, I can research Susan Carlson at 817-281-0221. I understand that I will receive $5.00 reimbursement for my participation.

There are no other agreements, written or verbal, related to this study beyond that expressed on this consent form.

I, the undersigned, understand the above explanations and, on that basis, I give consent to my voluntary participation in this research.

_____ _____

Signature of Subject Date

_____

Location

_____ _____

Signature of Witness Date

_____ _____

Signature of Researcher Date

Appendix B

Introduction Letter

Thank-you for letting me takes a moment of your valuable time. Please let me introduce myself, my name is Susan Carlson. Your participation in this study is very important, as it will help us to understand more about how women make their health care decisions, as well as their views about preventative health care and breast health.

Let me tell share a bit about me. I am completing my doctoral degree in nursing at the University of San Diego; this survey is part if a very large project that will enable me to graduate. I am married, with two wonderful daughters who are 11 and 13. I work as a family nurse practitioner in Grand Prairie, Texas, and I teach part-time in the nurse practitioner program at University of Texas at Arlington.

Enclosed in this packet are the items for your completion.

1. First is the consent for participation in this study. All information will be kept confidential, your name will never be identified, nor will your responses affect your health care or be shared with your health care provider.

Please sign the consent on the purple page.

2. Second, is a questionnaire for you to complete. Please take the time to fill the booklet out while you are in the office, then replace all of the items in the envelope and return it to the nurse practitioner or the office staff. Please try to complete all questions to the best of your ability. Be sure to use the black pen enclosed. You may keep it when you are done.

3. The $5.00 is for you as a small token of my appreciation of your time. Thank–you. All participants who complete the questionnaire will be entered into a drawing for a 100.00 grocery certificate to use at the grocery store of your choice. It will be a random drawing for the women who complete the surveys.

Thank you for your participation in this study. Have a great day.

Susan Carlson

Appendix C

Teleform Tool

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Mammography Questionnaire

Susan Carlson, RNC, MSN, FNP
University of San Diego

MARKING INSTRUCTIONS: PLEASE USE A BLACK PEN OR BLACK FINE-POINT MARKER TO PRINT LETTERS & NUMBERS IN THE BOXES OR TO CIRCLE CHOICES; NO PENCILS PLEASE.

Please rank your **Level of Agreement** with the statements below describing how you feel or view a certain health-related issue. Each item is a belief statement with which you may agree or disagree. Beside each statement is a scale that ranges from strongly disagree (1) to strongly agree (5). The more strongly you **DISAGREE** with the statement the **LOWER** the number you circle. Please make sure that you answer every item. This is a measure of your personal beliefs; obviously there are no right or wrong answers. Thank-you for your time.

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
1. If I get sick, it is my own behavior that determines how soon I get well again.	1	2	3	4	5
2. No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5
3. Having regular contact with my health care provider is the best way for me to avoid illness.	1	2	3	4	5
4. Most things that affect my health happen to me by accident.	1	2	3	4	5
5. Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5
6. I am in control of my health.	1	2	3	4	5
7. My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5
8 When I get sick, I am to blame.	1	2	3	4	5
9. Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5
10. Health care professionals control my health.	1	2	3	4	5
11. My good health is largely a matter of good fortune.	1	2	3	4	5
12. The main thing that affects my health is what "I" myself do.	1	2	3	4	5
13. If I take care of myself, I can avoid illness.	1	2	3	4	5

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	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
14. When I recover from an illness, it's usually because other people (for example doctors, nurses, family, or friends) have been taking good care of me.	1	2	3	4	5
15. No matter what I do, I'm likely to get sick.	1	2	3	4	5
16. If it's meant to be, I will stay healthy.	1	2	3	4	5
17. If I take the right actions, I can stay healthy.	1	2	3	4	5
18. Regarding my health, I can only do what my health care provider tells me.	1	2	3	4	5
19. When I get a recommended mammogram, I feel good about myself.	1	2	3	4	5
20. When I get a mammogram, I don't worry as much about cancer.	1	2	3	4	5
21. My doctor or nurse will praise me if I obtain the recommended mammogram.	1	2	3	4	5
22. Having a mammogram or x-ray of the breasts will help me find lumps early.	1	2	3	4	5
23. Having a mammogram or x-ray of the breasts will decrease my chances of dying from breast cancer.	1	2	3	4	5
24. Having a mammogram or x-ray of the breasts will decrease my chances of requiring radical or disfiguring surgery if breast cancer occurs.	1	2	3	4	5
25. Having a mammogram will help find a lump before it can be felt by myself or health care professional.	1	2	3	4	5
26. Having a routine mammogram or x-ray of the breasts would make me worry about breast cancer.	1	2	3	4	5
27. Having a mammogram or x-ray of the breasts would be embarrassing.	1	2	3	4	5
28. Having a mammogram or x-ray of the breasts would take too much time.	1	2	3	4	5
29. Having a mammogram or x-ray of the breasts would be painful.	1	2	3	4	5
30. I know how to perform breast self-examination.	1	2	3	4	5

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
31. Having a mammogram or x-ray of the breast would cost too much money.	1	2	3	4	5
32. I am confident I can perform breast self-examination correctly.	1	2	3	4	5
33. If I were to develop breast cancer I would be able to find a lump by performing breast self-examination.	1	2	3	4	5
34. I am able to find a breast lump if I practice breast self-examination alone.	1	2	3	4	5
35. I am able to find a breast lump which is the size of a quarter.	1	2	3	4	5
36. I am able to find a breast lump which is the size of a dime.	1	2	3	4	5
37. I am able to find a breast lump which is a size of a pea.	1	2	3	4	5
38. I am sure of the steps to follow for doing breast self-examination.	1	2	3	4	5
39. I am able to identify normal and abnormal breast tissue when I do breast self-examination.	1	2	3	4	5
40. When looking in the mirror, I can recognize abnormal changes in my breast.	1	2	3	4	5
41. I can use the correct part of my fingers when I examine my breasts.	1	2	3	4	5
42. I want to discover health problems early.	1	2	3	4	5
43. Maintaining good health is extremely important to me.	1	2	3	4	5
44. I search for new information to improve my health.	1	2	3	4	5
45. I feel it is important to carry out activities which improve my health.	1	2	3	4	5

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	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
46. I eat well balanced meals.	1	2	3	4	5
47. I exercise at least 3 times a week.	1	2	3	4	5
48. I have regular health check-ups when I am not sick.	1	2	3	4	5
49. When I get a recommended mammogram, I feel good about myself.	1	2	3	4	5
50. It is extremely likely I will get breast cancer in the future.	1	2	3	4	5
51. The thought of breast cancer scares me.	1	2	3	4	5
52. When I do breast self-examination I feel good about myself.	1	2	3	4	5
53. I feel funny doing breast self-examination.	1	2	3	4	5
54. I feel I will get breast cancer in the future.	1	2	3	4	5
55. When I think about breast cancer, my heart beats faster.	1	2	3	4	5
56. When I complete monthly breast self-examinatio I don't worry as much about breast cancer.	1	2	3	4	5
57. Doing breast self-examination during the next yeai will make me worry about breast cancer.	1	2	3	4	5
58. There is a good possibility I will get breast cancer in the next 10 years.	1	2	3	4	5
59. I am afraid to think about breast cancer.	1	2	3	4	5
60. Completing breast self-examination each month will allow me to find lumps early.	1	2	3	4	5
61. Breast self-examination will be embarrassing to me.	1	2	3	4	5
62. My chances of getting breast cancer are great.	1	2	3	4	5
63. Problems I would experience with breast cancer would last a long time.	1	2	3	4	5
64. If I complete breast self-examination monthly during the next year, I will decrease my chance of dying from breast cancer.	1	2	3	4	5

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
65. Doing breast self-examination will take too much time.	1	2	3	4	5
66. I am more likely than the average woman to get breast cancer.	1	2	3	4	5
67. Breast cancer would threaten a relationship with my boyfriend, husband, or partner.	1	2	3	4	5
68. If I complete breast self-examination monthly I will decrease my chance of dying from breast cancer.	1	2	3	4	5
69. Doing breast self-examination will be unpleasant	1	2	3	4	5
70. If I had breast cancer my whole life would change.	1	2	3	4	5
71. If I complete monthly breast self-examination it will help me to find a lump which might be cancer before it is detected by a doctor or nurse.	1	2	3	4	5
72. I don't have enough privacy to do breast self-examination.	1	2	3	4	5
73. If I developed breast cancer, I would not live longer than 5 years.	1	2	3	4	5
74. When I make plans, I am certain I can make them work.	1	2	3	4	5
75. One of my problems is that I cannot get down to work when I should.	1	2	3	4	5
76. If I can't do a job the first time, I keep trying until I can.	1	2	3	4	5
77. I like to cook.	1	2	3	4	5
78. When I set important goals for myself, I rarely achieve them.	1	2	3	4	5
79. I give up on things before completing them.	1	2	3	4	5
80. I avoid facing difficulties.	1	2	3	4	5
81. If something looks too complicated, I will not even bother to try it.	1	2	3	4	5

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	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
82. There is some good in everybody.	1	2	3	4	5
83. When I have something unpleasant to do, I stick to it until I finish it.	1	2	3	4	5
84. When I decide to do something, I go right to work on it.	1	2	3	4	5
85. When trying to learn something new, I soon give up if I am not initially successful.	1	2	3	4	5
86. When unexpected problems occur, I don't handle them well.	1	2	3	4	5
87. I avoid learning new things when they look too difficult for me.	1	2	3	4	5
88. Failure just makes me try harder.	1	2	3	4	5
89. I feel insecure about my ability to do things.	1	2	3	4	5
90. I am a self-reliant person.	1	2	3	4	5
91. I give up easily.	1	2	3	4	5
92. I do not seem capable of dealing with most problems that come up in my life.	1	2	3	4	5
93. I intend on completing the screening mammography that I have been referred to have.	1	2	3	4	5

Please rank if you AGREE or DISAGREE with the statements below describing how you feel. Each item is a belief statement with which you may agree or disagree.

94. I usually don't ask the doctor or nurse many questions about what they're doing during a medical exam.	DISAGREE	AGREE
95. Except for serious illness, it's generally better to take care of your own health than to seek professional help.	DISAGREE	AGREE
96. I'd rather have doctors and nurses make decisions about what's best than for them to give me a whole lot of choices.	DISAGREE	AGREE

97. Instead of waiting for them to tell me, I usually ask the doctor or nurse immediately after an exam about my health.	DISAGREE	AGREE
98. It is better to rely on the judgements of doctors (who are the experts) than to rely on "common sense" in taking care of your body.	DISAGREE	AGREE
99. Clinics and hospitals are good places for help since it's best for medical experts to take responsibility for health-care.	DISAGREE	AGREE
100. Learning how to cure some of your illness without contacting a physican is a good idea.	DISAGREE	AGREE
101. I usually ask the doctor or nurse lots of questions about the procedures during a medical exam.	DISAGREE	AGREE
102. It's almost always better to seek professional help than to try and treat yourself.	DISAGREE	AGREE
103. It is better to trust the doctor or nurse in charge of a medical procedure than to question what they are doing.	DISAGREE	AGREE
104. Learning how to cure some of your illness without contacting a physician may create more harm than good.	DISAGREE	AGREE
105. Recovery is usually quicker under the care of a doctor or nurse than when the patient takes care of themselves.	DISAGREE	AGREE
106. If it costs the same, I'd rather have a doctor or nurse give me treatments than to do the same treatments myself.	DISAGREE	AGREE
107. It is better to rely less on physicians and more on your own common sense when it comes to caring for your body.	DISAGREE	AGREE
108. I usually wait for the doctor or nurse to tell results of a medical exam rather than asking them immediately.	DISAGREE	AGREE
109. I'd rather be given many choices about what's best for my health than to have the doctor make decisions for me.	DISAGREE	AGREE

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Please fill in the blank or circle the answer that is most appropriate. Be sure to answer each question to the best of your ability. Thank you for your participation in this study.

110. What year were you born? ____

111. What is your ethnic background? (check one)

- _ Hispanic
- _ Anglo-Caucasian
- _ African-American
- _ Multi-ethnic
- _ Asian
- _ None of above

112. List if other ethnic background: ____

113. What is your marital status? (check one)

- _ Married
- _ Divorced
- _ Widowed
- _ Single
- _ Separated
- _ Living together

114. My years of education level is best described as: (check one)

- _ 1-6th grade
- _ 7th - 9th grade
- _ Some high school
- _ Graduated from high school
- _ Some college
- _ College graduate
- _ Graduate degree

115. My household income is approximately: (check one)

- _ Less than $10,000 per year
- _ $10,001 - $25,000
- _ $25,001 - $45,000
- _ $45,001 - $50,000
- _ $50,000 - $75,000
- _ $75,001 or above per year

116. My health care expenses are covered by: (check all that apply)

- _ HMO
- _ PPO
- _ I am responsible for 20% of costs
- _ Medicaid
- _ Medicare

117. I visit my health care provider approximately___ times per year: (enter number) ☐☐

118. Have you received a clinical breast exam by a health care provider in the last 12 months?

_ YES _ NO _ I don't remember

119. If yes, enter month and year.

month ☐☐ year ☐☐☐☐

120. How many times have you practiced breast self-exam in the last year? (enter number) ☐☐

121. Have you practiced breast self-exam in the last month?

_ YES _ NO _ I don't remember

122. Have you ever had a screening mammography before?

_ YES _ NO

123. In the last 10 years, how many mammograms have you had? (enter number) ☐☐

124. If yes, when was the last one? Enter month and year.

month ☐☐ year ☐☐☐☐

125. Have you been referred for a screening mammography in the last 12 months?

_ YES _ NO _ I don't know

126. Have you ever had any type of cancer?

_ YES _ NO

127. If yes, what type? _____

128. Have any of your family members had breast cancer?

_ YES _ NO

129. If yes, what is their relationship to you and their approximate age when the breast cancer was found?

Relationship	Age:
_____	___
_____	___
_____	___
_____	___

130. Do you currently smoke cigarettes?

_ YES _ NO

131. Have you ever smoked cigarettes on a regular basis?

_ YES _ NO

132. If you have smoked cigarettes, how many years have you smoked?

_ 1-5 years
_ 6-10 years
_ 11-15 years
_ 16-20 years
_ 20 years or greater
_ Not applicable

First Name **I.** **Last Name**

Number & Street Address

City **State** **Zip Code** -

(Area Code) Telephone Number

( ) -

Thank you for completing this questionnaire.

Appendix D
Information Letter

Thank you for agreeing to participate with the data collection for my dissertation. My research question is to identify if a nurse practitioner intervention increases the adherence with screening mammography in women 40 years or older, referred by a nurse practitioner for their screening mammography. The most important criteria for inclusion is that the patient has NOT had a mammogram within a year, and that she is 40 years or older.

There will be an intervention and control group. The control group will not receive any intervention other than what you normally do in your office. The stack of white or gold envelopes that you have received is in random order. Therefore, if you received an unequal amount of packets, that is all right, it was the random ordering. Please use if surveys in the order that they have been received. Both groups will complete the survey tool that is in their packet. The end of data collection for this study concludes when the patient has had her mammogram. Let me begin by describing the control group.

Participants in the control group will receive the WHITE packet. Enclosed is the WHITE packet is the consent, survey tool, $5.00, and a pen to complete the tool. The patients in this control group will not receive any specific intervention, other than what you normally do in your office. Once the patient has agreed to participate, refer her as you normally would for a screening mammogram. These packets also have "control" written on the top outside of the envelope.

The intervention group will be the women who receive the GOLD envelope, from the random pile of surveys. The GOLD envelopes have "intervention" written on the envelope, and the yellow information sheet on the top of the packet. Review the importance of the patient having a mammogram, by reviewing the yellow mammography sheet with each patient willing to complete the survey.

The intervention is the information sheet for your review with the patient. The yellow sheet is the top of intervention packet. This sheet is attached to this letter for you to review, along with the survey. The intervention group packets are the GOLD envelopes. These packets have information sheet written on the envelope.

There is a check sheet for name and date that the patient was at your office, completed the survey, and received the referral for a screening mammogram. I would like you to verify if each patient has had her mammogram one month after the woman was seen in your office. This most likely way will be by determining if your office has received the radiologist report. Please write the date of mammogram in the blank provided on the tally sheet. There is also a yes or no and date on the outside of the envelope where you may circle if yes the patient had her mammogram, and the date.

Remember, participants must be women who are 40 years of age or older who have **not** had a mammogram in the last year. The women do not have to be in for a well-woman exam, any patient who is 40 or older who has not had their mammogram in the last year may participate if they are willing.

If you see the patient first, and she is willing to participate, the intervention may be completed before, during or after you see the patient, what ever works best for you. Remember that the yellow mammogram sheet for the intervention group only. I am hoping that the intervention group has a better adherence with mammogram.

Each packet has a consent form, questionnaire, $5.00, and a pen in it. The patient may keep the $5.00 and the pen. Ask the patient to put the survey back in the envelope when finished. Please have the patient complete the survey before leaving your office.

I would appreciate receiving the surveys when they are completed, and one month has passed. A place on the envelopes has a yes or no to be circled, regarding mammogram adherence along with a blank for the date of completion. The postage paid envelope is addressed to my home. It will be important for you to record the name and date of the patient on your check sheet, and the date that the mammogram is completed. At the end of one month, please verify if the patient has had her mammogram and mail the packet back to me. Once your participant packets are gone, please send the check sheet back to me in the last packet.

Thanks so much for your help. Please call me if you have any questions at all. I would like to have the questionnaires completed as soon, as is reasonably possible.

Sincerely,

Susan Carlson, RNC, FNP

Appendix E

Letter of Support

Affiliated with the

HEALTH TEXAS
PROVIDER NETWORK

THE MEDICAL CENTER AT RIVERSIDE

Family Practice
Kenneth L. Katzen, D.O.
Kevin D. Katzen, D.O.
Jamie A. Nivens, D.O.
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Obstetrics/Gynecology
James D. Peters, D.O.
William S. White, III, D.O.

June 15, 1999

To Whom It May Concern:

This is a letter of support for Susan Carlson for her dissertation research study titled the effect of a nurse practitioner intervention on women referred for screening mammography. I understand that potential research subjects will be invited to participate in this study. Susan has permission to seek and utilize patients in the practice who are willing to participate in this study.

Sincerely,

Kenneth Katzen, DO

2210 N. Highway 360, Grand Prairie, Texas 75050
(972) 606-8300 Fax (972) 606-8597

Appendix E

Permission to Use Tools

UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES
F. EDWARD HÉBERT SCHOOL OF MEDICINE
4301 JONES BRIDGE ROAD
BETHESDA, MARYLAND 20814-4799

MEDICAL PSYCHOLOGY

TEACHING HOSPITALS
WALTER REED ARMY MEDICAL CENTER
NAVAL HOSPITAL, BETHESDA
MALCOLM GROW AIR FORCE MEDICAL CENTER
WILFORD HALL AIR FORCE MEDICAL CENTER

To Those Interested in the Krantz Health Opinion Survey (KHOS):

I apologize for this form letter, but I do not have the resources to reply personally to every inquiry received on this topic.

I am enclosing a copy of the KHOS and verbatim instructions for its use. The scoring key and scale of validation may be found in the article by Krantz, Baum & Wideman in Journal of Personality and Social Psychology, 1980, vol. 39, no. 5, pp. 997-990.

I have not worked in this area for several years, but can suggest three articles providing further validation for the KHOS scales, and research applying the instrument to health care stress situations:

1. Martelli, M.F., Auerbach, S.M., Alexander, J., & Mercuri, L.G. Stress management in the health care setting: matching interventions with patient coping styles. Journal of Consulting and Clinical Psychology, vol. 55, no. 2, April, 1987, pp. 201-208.

2. Auerbach, S.M., Martelli, M.D., & Mercuri, L.G. Anxiety, information, interpersonal impacts, and adjustment to a stressful health care situation. Journal of Personality and Social Psychology, vol. 44, no. 6, June 1983, pp. 1284-1296.

3. Smith, R.A., Wallston, B.S., Wallston, K.A., Forsberg, P.R., & King, J.E. Measuring desire for control of health care processes. Journal of Personality and Social Psychology, vol. 47, no. 2, August, 1984, pp. 413-427.

Please keep me informed on your results, so that I will be able to provide others like yourself with new information.

Sincerely yours,

David S. Krantz
Professor

ser/DSK
enc.

INDIANA UNIVERSITY

SCHOOL OF NURSING

Dear Ms. Carlson,

Thank you for your interest in my work. I am enclosing a copy of the 1993 Health Belief Model instrument plus the mammography and benefits scales which was published in 1995. The knowledge of breast cancer mammography inventory that you sight from Nursing Research, 1996 was developed by the lead author Dr. Anna Miller, you will find her address below. Please feel free to use or modify my instruments as long as you cite my work and send me a complete copy of your results. Please feel free to contact Dr. Anna Miller for the knowledge of breast cancer and mammography inventory. Thank you for your interest and I look forward to hearing from you

Dr. Anna Miller
6132 N. Central Ave
Indpls, IN
46220

Sincerely,

Victoria Champion, RN, DNS, FAAN

CENTER FOR NURSING RESEARCH

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Located on the campus of
Indiana University
Purdue University
Indianapolis

BMDS Behavioral Measurement Database Services

Health and Psychosocial Instruments (HaPI)

Director: Evelyn Perloff, PhD
Behavioral Measurement Database Services

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Harvard University Graduate School of Business Administration

Stephen J. Zyzanski, PhD
Case Western Reserve University School of Medicine

To: **Susan Carlson**
From: **Evelyn Perloff, PhD**

Date: **April 26, 2000**

Enclosed is the:

Multidimensional Health Locus of Control Scale—Form C
K. A. Wallston, M. J. Stein, C. A. Smith

Multidimensional Health Locus of Control Scale—Form B
K. A. Wallston, B. S. Wallston, R. DeVellis

Self-Efficacy Scale
M. Sherer, J. E. Maddux, B. Mercandante, S. Prentice-Dunn, B. Jacobs, R. W. Rogers

As I have indicated authors like to receive feedback on your study. All that is asked is that you provide a brief summary of your findings upon completion of your study/project. In addition, we encourage you to send a full report which we will consider for inclusion in Health and Psychosocial Instruments (HaPI) and which you may list on your vita/resume.

Enclosed also is an invoice. It covers the cost (e.g., handling, postage, and copyright fee) for these instruments.

Please note that the instruments are for a single study only. It is, of course, necessary to provide the appropriate title and author credit in reproduced material and in your report.

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