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10 June 98

MEMORANDUM FOR AFIT/Major Johnson

FROM Major Tamara L. Link
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I, Major Tamara L. Link (273-70-3045), USAF, NC attended the Uniformed Services University of the Health Sciences from August 96 to May 98. I request reimbursement of $100 for my thesis entitled Factors Influencing Compliance with Mammography Screening Recommendations in an Air Force Population. Please send payment to above address (my permanant address). Thank you.

Tamara L Link
TAMARA L. LINK, Maj, USAF, NC

FACTORS INFLUENCING COMPLIANCE WITH MAMMOGRAPHY SCREENING RECOMMENDATIONS IN AN AIR FORCE POPULATION

by

TAMARA LOU LINK, RN, BSN

Major, United States Air Force, Nurse Corps

THESIS

Presented to the Graduate School of Nursing Faculty of

the Uniformed Services University of the Health Sciences

in Partial Fulfillment

of the Requirements

for the Degree of

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May 1998

FACTORS INFLUENCING COMPLIANCE WITH MAMMOGRAPHY SCREENING RECOMMENDATIONS IN AN AIR FORCE POPULATION

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ABSTRACT

What is the rate of compliance with mammography screening recommendations in an Air Force population and what factors influence compliance according to the Theory of Reasoned Action (TRA) model? This descriptive study surveyed 74 Air Force female health care beneficiaries ages 50 to 82 years with a mean age of 64 years old. Data was analyzed using SPSS for Windows version 6.1. This study found that over 80% of respondents indicated their last mammogram was for routine screening purposes as opposed to diagnostic purposes. Most respondents (82%) had had a mammogram within the past year. Only one respondent reported never having had a mammogram. Sixty-one percent of respondents demonstrated high participation in mammography screening according to NCI guidelines. Almost 80% of respondents reported it is extremely likely they will obtain a mammogram in the next year. The most important TRA attitude variable associated with mammography screening was finding cancer the examining provider could not. The most important social norm variable was provider recommendation for mammography screening. In terms of facilitating conditions for mammography screening, 75% of respondents reported their mammograms were easy to schedule. Only 17 women reported barriers to screening, the most frequently reported barrier being appointment availability. Most women used Champus as their health coverage, and 60% of respondents stated they paid nothing out of pocket for their mammogram. Overall, this study showed that the sample population participated in mammography screening more regularly that past studies.

Key Words: mammography mammogram military breast cancer women's health

DEDICATION

To my Lord Jesus Christ I dedicate this project as well as the rest of my professional and personal life. Every positive accomplishment in my life is possible only because of His grace and the gifts He has given me.

To my mother and father, I dedicate the creation of this thesis. They have instilled me with a drive toward excellence, professionalism, and dedication. Their years of support of my Air Force career and educational endeavers has been instrumental in motivating me to attain my dreams.

To my class mates, I dedicate this research. Their support of me during the challenging times of blooming into an advanced practice nurse was crucial. A generous spirit of cooperation permeated the Family Nurse Practitioner class of 1998, which I hope will create an legacy within the Graduate School of Nursing for years to come.

To my friend Captain Cheryl Sharp, I dedicate this project. Her encouragement and belief in my abilities gave me the courage to pursue graduate school and advanced practice nursing.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1 - INTRODUCTION

Background

Except for skin cancer, breast cancer is the cancer most commonly diagnosed in women in the United States, accounting for 1 out of 3 newly diagnosed cancers a year. The American Cancer Society estimates that approximately 184,000 new cases of invasive breast cancer were diagnosed in 1996. The annual incidence of breast cancer increased by 55% between 1950 and 1991, with an incidence of 110/100,000 between 1987 and 1991 (American Cancer Society [ACS], 1996). Data from the National Cancer Institute Surveillance, Epidemiology and End Results (SEER) showed that from 1973 to 1988 the breast cancer incidence increased by 17% in U.S. women under 65 years old and 41.8% in women older than 65 (Mettlin, 1994).

Incidence related to age and race

The incidence of breast cancer in U.S. women increases with age. Ninety-five percent of all breast cancers occur in women over age 40 and about 77% of newly diagnosed breast cancers occur in women over age 50 (Mettlin, 1994). Breast cancer is relatively uncommon in women aged 20-24, with an incidence rate of 1 case per 100,000. The rate per 100,000 women increases to 25.2 cases for women aged 30-34, 125.4 for women 40-44 years of age, and 232.7 for women in the 50-54 year age group (ACS, 1996). A woman's lifetime risk of developing breast cancer is 1 in 8.. When race is considered over all ages, White women are at greater risk for developing breast cancer than African American women with an incidence of 113.1 cases as compared to 101.0 per 100,000 women. However, African Americans have a higher mortality rate than White women (31.2 and 26.0 per 100,000 respectively).

Mortality

Breast cancer was the leading cause of cancer-related death in women until overtaken by lung cancer in 1987 (National Cancer Institute [NCI], 1997a). An estimated 44, 560 women in the United States died in 1996 from the disease. Mortality rates have remained relatively constant, increasing 1.1% from 1973 to 1988 in White women and 19.4% in African American women. Between 1989 and 1992 mortality rates declined in Whites and increased in African American women (ACS, 1996).

Trends in mortality rates have differed according to age group. Until 1980 the largest increase in mortality was among postmenopausal women. In 1991 the mortality rates rose in premenopausal women generally and young Black women (Kelsey & Gammon, 1991). Whereas heart disease is the leading cause of death in postmenopausal women in the United States, breast cancer is the leading cause of death in women between the ages of 35 and 54. Breast cancer is the leading cause of cancer-related deaths in African American and Hispanic women (Wingo, Tong, & Bolden, 1995). According to SEER cancer statistics review from 1973 to 1991, the estimated lifetime risk of U.S. women dying from breast cancer is 3.6% (U.S.Preventive Services Task Force [USPSTF], 1996)

Breast cancer mortality is strongly related to stage at detection (ACS, 1996). The 5-year survival rate for women with localized disease is 96%, but only 58% of cancers are detected this early. Regional stage cancer with spread to surrounding tissue carries a 75% survival rate. Thirty-two percent of cancers are diagnosed at this stage. For metastatic disease, i.e., cancer cells have migrated to distant organ systems, the 5-year survival rate is only 20%. A mere 6% of cancers are diagnosed at this stage. The 5-year survival rate

for women of lower socioeconomic status is 9% lower than women of higher socioeconomic status due to lack of medical insurance and poorer access to care. African American women have a lower survival rate at every stage of detection. (U.S. Department of Health and Human Services [USDHHS], 1994). Increased mammography use has led to increased detection of localized breast tumors that are smaller and less advanced. In 1983, 51% of localized tumors were less than 2 cm compared to 62% in 1988 (ACS, 1996).

Risk Factors for Breast Cancer

The epidemiology of breast cancer indicates that age is the most important risk factor. (Kelsey & Gammon, 1990, 1991; Mettlin, 1994). Risk factors can be classified into two broad categories: personal and environmental. Personal risk factors that have been generally accepted include female, Caucasian, residence in North America or northern Europe, affluent socioeconomic status, more years of cyclic ovarian activity (i.e., early menarche, late menopause), nulliparity, age 30 and older at first childbirth, never married, urban resident, atypical hyperplastic benign breast disease, no history of lactation, first-degree relative with breast cancer, previous breast, endometrial, or ovarian cancer. Environmental risk factors include daily consumption of alcohol and high dose exposure to radiation. The American Cancer Society notes that as many as one quarter of women diagnosed with breast cancer do not have any of the above risk factors except gender (Mettlin, 1994). Association of breast cancer with oral contraceptives, long-term estrogen replacement therapy, heavy postmenopausal weight, and a high fat diet have been hypothesized. However, causal relationships have not been well established (USPSTF, 1996).

Trends

The National Cancer Institute reported a sharp increase in incidence of breast cancer in 1973-1974 (NCI, 1997a). This rise was associated with wide publicity resulting from the diagnosis of breast cancer in the wives of the President Gerald Ford and Vice President Nelson Rockefellar. This heightened public awareness, led to an increase in early detection activity. Increased screening led to larger numbers of breast cancer diagnosed as well as a shift toward diagnosis at an earlier stage and earlier age.

The second major increase in cancer detection occurred in 1980 following the Breast Cancer Awareness Campaign by the American Cancer Society and other professional organizations (ACS, 1996). The 32% rise in breast cancer incidence between 1980 and 1987 may be attributed to the expanded use of mammography screening. Some researchers attribute it to the increased sale of new mammographic machines and the number of women receiving mammograms. Still others attribute the trends to the rising prevalence of women with more high risk factors, such as fewer childbirths and delayed childbirth until later age.

Breast Cancer Screening Principles

There are three screening tests for early detection of breast cancer: clinical breast exam (CBE) done by a trained health care provider, x-ray mammography, and breast self-examination (BSE) (USPSTF, 1996). The accuracy of a screening test is measured with two indices: sensitivity and specificity. In terms of breast cancer screening, sensitivity refers to the proportion of persons *with* breast cancer who test "positive" when screened. Specificity refers to the proportion of persons *without* breast cancer who correctly test "negative" when screened. The degree of sensitivity and specificity for mammography,

CBE, and BSE varies according to multiple factors including: size of tumor, characteristics of the breast being examined, age of the patient, skill of the examiner, experience of the radiographic interpreter, and quality of the mammogram.

Studies of mammography, CBE, and BSE have been conducted for at least 30 years. Several case-controlled and cohort studies and eight major randomized controlled trials of breast cancer screening with mammography, CBE or both have been conducted. The randomized trials have included 500,000 women (Fletcher, Black, Harris, Rimer, & Shapiro, 1993). Regardless of the extensive research, authorities still disagree on which screening tests should be used (Fletcher, et al., 1993; USDHHS, 1994; USPSTF, 1996). Most authorities advocate regular mammography every one to two years commencing at age 50. However, recommendations may be modified based on clinical judgment.

Clinical breast examination. The American Academy of Family Physicians, American Cancer Society, American College of Obstetricians and Gynecologists, and American College of Physicians agree that annual CBE should be performed on women aged 40 and older. The U.S. Preventative Services Task force recommends CBE for women over 50 years old every one to two years. Family history of breast cancer and other risk factors may modify the provider's decision for CBE (USDHHS, 1994). Effectiveness of CBE alone has not been evaluated. In general, CBE is less sensitive in younger women (i.e., under 50 years old) due to increased breast density in this population. (USPSTF, 1996).

Breast self-examination. The American Academy of Family Physicians, the American Cancer Society, the American College of Obstetricians and Gynecologists, and the National Cancer Institute recommend health care providers instruct and encourage

women to perform BSE monthly (USDHHS, 1994). BSE has not been studied as extensively as CBE and mammography. Estimated BSE sensitivity decreases with age: 41% for women aged 35-49, 21% for those aged 60-74 (O'Malley & Fletcher, 1987). BSE appears to be less sensitive than CBE or mammography and its specificity is uncertain (USPSTF, 1996).

Mammography. Mammography is considered the single most effective method of breast cancer screening (ACS, 1996). Early detection of breast cancer via mammography has shown a statistically significant reduction in breast cancer mortality, including a 30% reduction in women aged 50-69 years (Centers for Disease Control and Prevention [CDC], 1996). Mammography technology has improved considerably since 1930 when it was first used. The American College of Radiology's Mammography Accreditation Program in the late 1980s and the Mammography Quality Standards Act of 1992 have led to much improved imaging quality for mammography.

Numerous clinical trials have evaluated the effectiveness of mammography. These studies estimate the sensitivity of mammography from 74% to 88%. Specificity estimates range from 83 to 98.5%. Sensitivity of mammography in women aged 40-49 years old was 10-15% lower than in women over age 50, probably due to lack of contrast between cancer and normal glandular tissue or more rapid growth of cancers in younger women. (Fletcher et al., 1993). However, with more sophisticated mammographic techniques, sensitivity of mammography, especially for women in their forties, may be improved (USPSTF, 1996). Kerlikowske, Grady, Barclay, Sickles, and Ernster (1996) suggested that sensitivity is decreased for women over 50 years old who have high-density patterns (84%) than for women in whom fatty tissue predominates (98%). The

same study suggested that estrogen replacement therapy lowered the specificity of mammography.

Mammography Screening Recommendations

The National Cancer Institute (NCI) held an International Workshop on Screening for Breast Cancer in February 1993 to gather a consensus of authorities on aspects of breast cancer screening. The final report, however, reflected a lack of consensus among professional organizations regarding the *age* group to be screened by mammography and the *frequency* of screening.

Ages 40 to 49. Most of the controversy regarding mammography screening centers on women aged 40 to 49. In response the NCI convened another consensus conference in January 1997 specifically focusing on this age group. The 12-member panel represented the fields of oncology, radiology, gynecology, and public health. An additional 32 experts in the same fields extensively reviewed the medical literature and presented scientific data as well as clinical anecdotal experiences to a conference audience of 1,100. The Panel could not unanimously agree on the recommendations. The majority report, representing 10 of the 12 members, concluded that the data then currently available did not warrant a universal recommendation for mammography for all women in their forties. Each woman should decide for herself based on scientific evidence and her individual medical history. Two Panel members writing the minority report disagreed. They believed the risks of mammography were overemphasized in the majority report and thereby concluded that data did support routine screening mammgraphy for women in their forties. The Panel did not specifically delineate the onset and frequency of screening in this age group (NCI, 1997b). The ACS, ACOG,

American College of Radiology, and various other organizations recommend a frequency of every one to two years for women aged 40 to 49

Ages 50 to 69. Data supporting the effectiveness of mammography screening for women aged 50 to 69 are much clearer than for the younger age group. Thus, experts in women's health and cancer generally support mammography alone or mammography and CBE these women. Most groups recommend yearly screening with the exception of the USPSTF, which recommends screening every one to two years. These groups include the American Academy of Family Physicians, American Cancer Society (ACS), American College of Obstetricians and Gynecologists (ACOG), American College of Physicians, Canadian Task Force on the Periodic Health Examination, and USPSTF. (USDHHS, 1994; USPSTF, 1996).

Age 70 and older. There is insufficient evidence to recomend for or against screening for women aged 70 and older. Most groups, therefore, do not make specific recommendations for women in this older group (Fletcher et al., 1993; NCI, 1997a; USDHHS, 1994; USPSTF, 1996). The only group to support routine mammography in older women is the American Geriatrics Society, which recommends screening every two to three years for women aged 65 to 85 (USPSTF, 1996).

Research Problem

Mammography has been shown to be effective in the early detection of breast cancer resulting in earlier treatment and reduced mortality, especially in women over age 50. Participation in routine screening mammography is rising (Zapka, Stoddard, Costanza, & Greene, 1989). Even so, this important screening tool continues to be underutilized. Martin, Calle, Wingo, and Health (1996) used data from the National

Health Interview Survey Cancer Control Supplements to examine trends in screening between 1987 and 1992. They found that, in 1992, 67% of women 40 years of age and older reported ever having had a mammogram compared with 36% in 1987. In 1992, only 29% women reported having had a mammogram within the past year, a 14% increase from 1987.

The U.S. Public Health Service (USPHS) has advocated increased emphasis on health promotion and disease prevention as an approach to containing health costs, improving quality of life, and decreasing chronic disease (Bergman-Evans & Walker, 1996). One of the National Health Objectives stated in Healthy People 2000 is to increase the rate of biannual mammography use among women aged 50 and older to 60% and among women aged 40 and older who have ever received a mammogram to 80% (CDC, 1995). The nation currently falls short of these goals. The CDC believes the reasons for this shortfall may be due to lack of health insurance coverage, primary care physician utilization, and clear communication from the provider regarding the importance of mammography. In many cases mammography cannot be done without a referral from a primary care provider. Providers must encourage routine screening and increased use of preventive care services. Providers must also understand the motivational factors for women to participate in health screening.

Relevance to the Military

The U.S. Department of Defense (USDoD) reports approximately 9 million U.S. citizens are eligible for care in the military health care system (Michels, Taplin, Carter, & Kugler, 1995). Active duty service members comprise about one fourth of the population, with family members and retired service members making up the other three

quarters. Military health care providers render primary care including performing clinical breast examinations and ordering mammography to active duty and retired females as well as female family members. The mammography procedure is either done in the military medical treatment facility or contracted out to a civilian mammography unit. The military provider is ultimately responsible for coordinating or providing the necessary follow-up and treatment for breast abnormalities detected by screening.

Whereas military health care providers are routinely ordering mammograms and treating breast disease, few researchers have studied factors influencing women's participation in screening programs in the Armed Forces. Michels et al. (1995) studied mammography use in a regional referral center of the U.S. Army. Their concern was that military women have not been adequately represented in previous studies. They mailed questionnaires to 500 women eligible for care at Madigan Army Medical Center in Washington State, receiving a 70% response rate of 309 women with a range of 41 to 89 years old. They found that use of mammography among military beneficiaries differed from reported use in national samples. Of their respondents, 21.5% reported never having had a mammogram, which exceeds the national mammogram rate. Nearly 40% had had their last mammogram within the last year. However, only 12% reported regular mammography participation, which was significantly lower than the 31% of women surveyed nationally.

Michels et al. (1995) concluded that the problem was not with getting the initial mammogram, but with following through with repeat examinations. Framed in the Theory of Reasoned Action, they found that women were more likely to participate in mammography testing if they perceived themselves susceptible to cancer and believed

that mammography detects curable breast cancer. Women were less likely to participate if they were concerned about radiation from the procedure or the treatment of breast cancer. These variables are referred to as Attitude Variables. The researchers found that certain social variables (subjective norm), such as provider recommendation for mammography, positively influenced screening participation in their population. Their findings assist military health care providers in understanding and influencing variables related to mammography screening in their patient population. Other than this U.S. Army study of mammography use, there has been little research in other military populations including women served by the U.S. Air Force.

Relevance to Nursing

Advanced practice nurses (APNs) are utilized in the United States military as women's health nurse practitioners, certified nurse midwives (CNMs), and, more recently, family nurse practitioners (FNPs). Military nurse practitioners provide primary care to a panel of patients assigned to them under the TRICARE system. TRICARE is a managed care program implemented by the DoD throughout the military services in an effort to improve cost effectiveness and access to care. NPs and CNMs play a vital role in delivering clinical preventive services including screening for early detection of disease and risk factors, immunizations, and counseling about lifestyle modification (Bergman-Evans & Walker, 1996). As a primary care provider the NP is "uniquely positioned and qualified to provide leadership in this area" (p 90). Mammography screening and early breast cancer detection is a powerful preventive tool implemented by advanced practice nurses (APNs) in the U.S. military. They must understand how to assess and motivate their clients to participate in this important screening event. In addition, as the primary

care provider military APNs serve as the focal point for coordinating care and follow up for women in whom they have detected breast disease.

Beyond the care of the individual patient, APNs can contribute to the larger health care picture. One of the Healthy People 2000 national health objectives targets increased mammography use on a national scale. Data concerning use of this preventive service must be collected to determine the effectiveness of the national health objectives. Data from various segments of the population including the military are needed to provide a baseline for evaluation of health care reform. Thus, in view of the disease prevention and health promotion position, as well as access to patient populations, military nurse practitioners should participate in data collection relevant to the national health objective of mammography participation.

Purpose

The purpose of this study is to investigate compliance with mammogram screening recommendations by female military health care beneficiaries 50 years of age and older served by an Air Force Regional Hospital. Because of the widely publicized recent controversy and lack of consistent screening recommendations for women under age 50, this study will exlude that age group. The study will also explore the attitudinal and social norm variables, as conceptualized in the Theory of Reasoned Action, that influence mammography use by beneficiaries aged 50 and older. Because of sample size limitations and the descriptive nature of this study, attempts to *predict* mammography intent or participation in the sample population were not undertaken.

Research Questions

The research questions are as follows:

In a selected population of women aged 50 years old and over who are beneficiaries of the Air Force health care system:

1. What is the rate of compliance with current mammography screening guidelines?
2. What are their intentions for obtaining mammograms within the next year?
3. How do they rate attitudinal variables for mammography as conceptualized by the Theory of Reasoned Action?
4. How do they rate social norm variables for mammography as conceptualized by the Theory of Reasoned Action?

CHAPTER 2 - REVIEW OF THE LITERATURE

Overview

Even though mammography is the most effective means of early breast cancer detection, as reflected in morbidity and mortality rates, many women still do not follow through with screening recommendations (NCI, 1990). The literature is replete with studies attempting to understand why screening rates are not higher and exploring factors that influence a woman's participation in mammography screening. Researchers have grouped compliance factors into diverse categories depending on the overlying conceptual or theoretical framework of the study. Studies have examined the relationships between various factors such as personality, health beliefs, environmental, and demographic variables (Friedman et al., 1995). Mayer-Oaks and colleagues (1996) grouped *factors* into sociodemographic factors, health status, and health-related behaviors. Kreher, Hickner, Ruffin, and Lin (1995) grouped *barriers* into provider factors (physician recommendations), patient factors (pain, embarrassment, fear), and system barriers (cost, lack of local services).

Vernon, Laville, and Jackson (1990) performed a meta-analysis of 16 published studies that reported participation rates or that examined factors associated with participation in selected breast screening programs. These investigators grouped variables into six categories: (a) demographic characteristics; (b) medical history and health status information including risk factors for breast cancer; (c) use of medical services and other health behaviors; (d) logistic barriers, (e) beliefs, attitudes, and knowledge about cancer and health care; and (f) intention. They found surprisingly little overlap in variables studied and reported most studies used only bivariate analysis.

Factors Influencing Mammography Participation

Demographic Variables

Demographic variables are included in virtually all studies on mammography participation. In a study of 802 women aged 40 and older in Los Angeles County, Bastani, Marcus, and Hollatz-Brown (1991) found that increasing age was associated with decreased participation in mammography screening. They also found that fewer than half of their respondents knew the screening guidelines for their ages. Fewer women aged 40-49 than women aged 50 and over were knowledgeable about the guidelines. However, younger women were more likely to be screened than older women, which is consistent with other studies (Bastani, Marcus, Maxwell, Prabhu, & Yan, 1994; NCI, 1990; Rimer, Trock, Engstrom, Lerman, & King, 1991). Taplin and Montano (1993) studied 666 women and found that women older than 65 were less likely to believe that mammography can detect breast cancer that they or their physicians could not find, and, thus, they participated less.

Smith and Haynes (1992) did a meta-analysis of four national surveys from 1983 to 1990. Data were included from the National Center for Health Statistics and NCI's National Health Interview Survey of 1987, the Robert Wood Johnson Foundation Access to Care Survey, the CDC Behavioral Risk Factor Surveillance System survey of 1987, and the Mammography Attitudes and Usage Study of 1990 by the Jacob's Institute of Women's Health in collaboration with the NCI. They found that patients who were between 40 and 64 years of age were more likely to have had both a baseline and a recent mammogram than women 65 and older. Women older than 75 had significantly lower

rates of recent screening than their younger counterparts. These findings have been supported by other studies (NCI, 1990; Vernon et al., 1990).

Other demographic factors are positively associated with mammography participation. Zapka et al. (1989) surveyed 1184 women by random digit dial telephone interview. They found that married, White women who lived in an urban area and had higher income and educational levels were more likely to participate in screening programs than women who lacked these characteristics. Their findings are supported by numerous other studies (Bastani et al., 1991; NCI, 1990; Smith & Haynes, 1992). Comparing data from the National Health Interview Survey Cancer Control Supplement, Martin et al. (1996) examined trends in demographics and mammography screening between 1987 and 1992. Their results supported the above conclusions with a few exceptions. Their data showed that race and ethnic differences in the rates of screening use were less strongly correlated; however income and education were still related. Other researchers also reached the same conclusion (Urban, Garnet, Anderson, & Peacock, 1994). However, Vernon and colleagues, in their meta-analysis, found that, although some studies showed that married women are more apt to have a mammogram, other studies revealed no higher participation among married women. Other studies support similar conclusions (Bastani et al., 1991; McCarthy, Yood, MacWilliam, & Lee, 1996).

Negatively Associated Factors (Barriers)

Numerous studies have specifically targeted barriers associated with mammography screening. Friedman and colleagues studied 312 asymptomatic female hospital employees, aged 50 or older, who participated in a free worksite breast screening program (Friedman et al., 1995). They found through multivariant analysis that the

strongest predictors of avoiding breast cancer screening were the women's perceived barriers to mammography. Rimer, Keintz, Kessler, Engstrom, and Rosan (1989) found that they could predict compliance more accurately than noncompliance. They attributed this to multiple factors or beliefs that act as barriers. They also stated that barriers are complex and often difficult to identify.

Radiation/Anxiety. Many researchers found fear of radiation and pain as significant barriers to screening. Lerman, Rimer, Trock, Balshem, and Engstrom (1990) conducted telephone interviews of 910 women aged 50 and over. In addition to radiation, they identified anxiety, embarrassment, and cost as deterrents to mammography. Bastani and colleagues (1991) found that overall 80% of their respondents were concerned about radiation. Twenty-three percent agreed that chances were high or very high that radiation would prevent them from obtaining a mammogram and 18% showed moderate concern. Other researchers found fear of radiation negatively associated with mammography participation as well (Fox, Murata, & Stein, 1991; Michels et al., 1995; Rimer et al., 1989; Zapka et al., 1989).

Fear of finding cancer. Both Bastani and colleagues (1991) and Rimer and colleagues (1991) found that fear of finding cancer was negatively associated with mammography participation. Anxiety and mammography participation were also negatively related. (Friedman et al., 1995; Lerman et al., 1990;). Fink, Shapiro, and Roester (1972) found a significant relationship between mammography behavior and attitudes toward screening in response to the item, physical exams just make you worry; it's like looking for trouble. Respondents who agreed with the statement were less likely to have examinations than those who disagreed.

Cost. Numerous studies identified cost as a significant barrier (Bastani et al., 1994; Glockner, Holden, Hilton, & Norcross, 1992; Lerman et al., 1990; Urban et al., 1994). Bastani and colleagues (1991) found that cost seemed to be the strongest barrier, with 28% of women reporting chances were somewhat high or very high that the cost of a mammogram would prevent them from getting one. Even when the cost barrier was removed, Rimer and researchers (1989) found that a number of significant barriers remained. In their study of 600 randomly selected women offered free mammographic examination, they discovered that perceived access barriers deterred mammography use, for example, thinking that a mammogram would be inconvenient, be too much trouble, or take too much time. Time demands or perceiving oneself as being too busy was also a barrier to participation, a finding supported by numerous other studies (Friedman et al., 1995; Glockner et al., 1992; Rimer et al., 1991).

Health perception. Rimer and co-investigators (1989) reported that the belief of many women that they do not need mammography if they are asymptomatic was a major barrier. The 1987 National Health Interview Survey (NHIS) showed the most common reasons women gave for never having had a mammogram was that they had not thought about it or there was not problem, or both (NCI, 1990). Bastani et al. (1994) interviewed 802 women in a randomized pretest-posttest control group design to see if an intervention increased screening mammography rates in Los Angeles. They found that perceiving oneself to be asymptomatic and healthy was the most important barrier. Women may find mammography unnecessary if there has been no recommendation from a physician and they believe that a mammogram is appropriate only in the presence of symptoms.

No previous mammogram. A final barrier is never having had a mammogram. Bastani et al. (1991) showed that women who have never had a mammogram may be particularly resistant. In their study of 381 asymptomatic women in Southern California, Glockner and co-researchers (1992) reported similar findings. They believe these women are perhaps more skeptical about mammography and think it is unnecessary. Women who have had at least one mammogram were more likely to be tested again.

Positively Associated Factors (Facilitating Factors)

Physician recommendation. Of all the factors positively associated with participation in mammography screening, physician recommendation is clearly the most frequently cited (Bastani et al., 1991; Bastani et al., 1994; Glockner et al., 1992; Michels et al., 1995; Zapka, Stoddard, Maul, & Costanza, 1991). Lerman et al. (1990) surveyed 910 women aged 50 and over and found that physician recommendation was the single best predictor of following through to testing. Rimer et al. (1991) conducted a random telephone survey of 910 women aged 50-74. They found in bivariate and multivariant analyses that women's perceptions of their doctors recommendations for mammography were the strongest predictor of mammography behavior.

Numerous other studies show that provider recommendation is the major reason women seek mammography (Friedman et al., 1995; NCI, 1990; Rimer et al., 1991; Zapka et al., 1989). Provider recommendations for mammograms to older women may be even more critical to screening behaviors than to younger women. Champion (1994) stratified her sample of 581 women into younger than age 50 and older than age 50. She found that provider recommendations had a higher impact on compliance among older women.

Glockner et al. (1992) found physician-initiated recommendations were more important than patient-initiated questions.

Other provider factors. Fox, Siu, and Stein, (1994) studied 972 women aged 50 and over and found three physician communication variables significantly related to recent mammogram utilization. Women who reported seeing a regular physician were three and a half times more likely to have had a recent mammogram. Physicians talking about mammography increased the likelihood of compliance by almost three times over women whose physicians did not discuss mammography. Women who initiated conversation about mammography with their physicians were four times more likely to obtain a mammogram than those who did not. Lastly, they found that women who perceived their physicians as having some or a great deal of enthusiasm for mammography were four and a half times more likely to report having had a mammogram in the previous year. Several other studies suggested that having a regular doctor, especially a gynecologist or internist, increased mammography participation (McCarthy et al, 1996; Zapka et al., 1989; Zapka et al., 1991). Zapka and colleagues (1991) reported that current and regular adherence to mammography screening is about four times greater in women who have a gynecologist then those who do not have a regular physician. Perhaps a gynecologist is more likely to recommend a mammogram or the compliance may be due to the characteristics of women who see a gynecologist.

Accessibility. McCarthy et al. (1996), in a large sample of 8,805 women, 50 to 74 years of age and members of a health maintenance organization, found that the number of patient visits per year and accessibility to the mammography facility were positively associated with obtaining a mammogram. Women who had 2 to 10 visits per year had the

highest mammography rate. In addition, the timing of the visit was important. Patients who visited the provider when they were due for a mammogram had a 33% higher rate of mammography than for those who had a visit during the year, but not when they where due for a mammogram. They also found that women who could obtain a mammogram at the usual clinic site without having to travel had a 10% higher rate of screening than those who had to travel.

Kreher and co-researchers (1995) studied a rural population of 416 women. They asked whether distance, travel time, and available transportation might affect compliance with mammography screening. Unlike McCarthy et al. (1996) they found no correlation between these factors and compliance. However, only a fourth of their sample lived 20 miles or more from the mammography unit and the study population consisted of women already visiting a provider's office. They believe that, for women seeking health care, distance and transportation may be less a barrier than for those who do not regularly seek health care (Krehler et al., 1995).

Health-promoting behavior. Several studies associated a woman's motivation to engage in health-promoting behavior with use of mammography (Champion, 1992; Glockner et al., 1992; Mayer-Oaks et al., 1996). Mayer-Oaks et al. (1996) conducted a longitudinal study of 1,050 women 65 years of age and older. The researchers found that women who engaged in self-care preventive practices, such as using seat belts, exercising regularly, undergoing annual dental exams, having current pap smears, and receiving regular immunizations complied with mammography recommendations more readily. They also found that a patient history of a recent pap smear was the single most important predictor of mammogram use after controlling for other variables such as age, income,

and health status. The meta-analysis by Vernon et al. (1990) examined the association between mammography acceptance and other health behaviors. Five studies showed a positive association between health behaviors and mammography participation (Calnan, 1984; Hobbs, Smith, George, & Sellwood, 1980; Maclean, Sinfield, Klein, & Harnden, 1984; Rimer et al., 1989).

Family history. A family history of breast cancer appears to encourage screening behavior in some women while deterring others. Vernon et al. (1990) reviewed five studies and found no significant relationship between family history and mammography use. Numerous researchers have found a positive association with compliance (Bastani et al., 1991; Friedman et al., 1995; Lerman et al., 1990). Zapka et al. (1991) queried 693 women through a random digit dial telephone survey and found that adherence was significantly associated with a family history of breast cancer. Other studies have shown that women with a positive family history do not seek mammograms.

Breast symptoms. Glockner et al. (1992), Rimer et al. (1991) and Fink et al. (1972) all found that women with breast symptoms were more likely to be tested. In addition, women with risk factors, breast symptoms, abnormal breast examinations, or close contacts with breast cancer showed better participation (Bastani et al., 1991; Glockner et al., 1992; Zapka et al., 1991). Zapka et al. (1991) also found that women with breast problems or abnormal mammography were significantly more likely to be in the most compliant group.

Social factors. Montano and Taplin (1991) surveyed 946 women age 40 and above who were invited to obtain a mammogram at the Group Health Cooperative of Puget Sound Breast Cancer Screening Program. They found in regression analysis that

social factors of encouragement from family and friends were a significant direct predictor of mammography intent and behavior. Zapka and colleagues (1989) randomly sampled 1184 women aged 45-75 years by telephone. They found a positive correlation between social interaction, media exposure, and mammography compliance.

Perceived efficacy of mammography. Several studies showed a positive relationship between perceived efficacy and mammography screening (Bastani et al., 1991; Friedman et al., 1995). Beliefs about beneficial outcomes of mammography and the belief that screening detects curable breast cancer have been associated with increased use (Burack & Liang, 1989; Michels et al., 1995). Montano and Taplin (1991) found that the perceived likelihood and value of good outcomes positively influenced screening. A woman's perceived susceptibility to breast cancer also has been shown to facilitate mammography screening (Bastani et al., 1991; Burack & Liang, 1989; Calnan, 1984; Lerman et al., 1990; Michels et al., 1995; Montano & Taplin, 1991).

CHAPTER 3 - FRAMEWORK OF THE STUDY

Theoretical Framework

Various theoretical frameworks have been used to identify variables related to mammography use and to investigate compliance with screening recommendations. These frameworks include the Health Beliefs Model (Aiken, West, Woodward, Reno, & Reynolds, 1994; Calnan, 1984; Champion, 1994; Friedman et al., 1995; Lerman et al., 1990; Rimer et al., 1991; Rutledge, Hartmann, Kinman, & Winfield 1988), Theory of Care-Seeking Behavior (Lauver, Nabholz, Scott, & Youngran, 1997), the Behavioral Model for Health Service Use (Miller & Champion, 1996), and the Theory of Reasoned Action (Champion, 1994; Michels et al., 1995; Montano & Taplin, 1991; Lierman, Young, Kasprzyk, & Benoliel, 1990). Many researchers have combined these health theories with social psychology theories. The predominant theoretical framework for mammography behavior has been the Health Beliefs Model (HBM). Although many studies support the model, numerous criticisms of its applicability have been offered (Becker & Maiman, 1983; Calnan, 1984; Hill, Gardner, & Rassaby, 1985; Janz & Becker, 1984; Montano & Taplin, 1991; Vernon et al., 1990). The HBM is more of a framework than a model because it does not specifically address how key constructs are to be measured. In addition, the HBM does not take into account the social influence on one's behavior.

Fishbein's Theory of Reasoned Action (TRA) has been used to study a variety of health behaviors such as condom use, BSE, and influenza vaccination behavior (Jemmott, & Jemmott, 1991; Lierman et al., 1990; Montano, 1986). The goal of TRA is to "predict and understand an individual's behavior" (Fishbein, 1980, p. 79). TRA assumes that

human beings are rational and that they make choices based on information available when deciding whether to engage in a behavior. The person's behavioral intention is the most important predictor of behavior provided that behavior is under their volitional control. Fishbein believes that a person will usually act in accordance with his or her intention. Thus the model focuses primarily on predicting behavioral intention. In order to predict behavior, a large sample size is required to facilitate multiple regression analysis. Adaptations of the Theory of Reasoned Action (TRA) will be used to examine factors associated with behavioral intention for mammography participation. Prediction of behavioral intention will not be attempted due to limited sample size and retrospective nature of the study.

In the TRA, behavior intention is a function of two basic determinants, one reflecting the person and the other reflecting the influence of society (Fishbein, 1980). The first component of behavior is the person's *attitude* toward the behavior. Attitude is influenced by the person's *beliefs that the behavior will lead to certain outcomes.* Attitude is also influenced by the *person's evaluation or beliefs about those outcomes.* Attitude is operationally defined by considering the person's perceived probability that each outcome will occur and by evaluating those outcomes. The sum of the products determines the component of attitude.

The second determinant of behavioral intention is the person's perception of social pressure by significant others, termed *social norm* (or subjective norm in some studies). Social norm is made up of the person's *perception of what others think they should do.* Social norm is also influenced by the *value they place on the other person's opinion* or motivation to comply with others wishes. Montano and Taplin (1991) define

subjective norm as "the person's perceptions of other's support for the behavior weighted by the person's motivation to comply with those others" (p. 733). Fishbein (1980) points out that sometimes intention is driven more by attitudinal considerations than normative considerations and vice versa. At times, each factor may weigh equally. Michels et al. (1995) represents the Theory of Reasoned Action as it relates to mammography behavior as diagramed in Figure 1 below (p. 432).

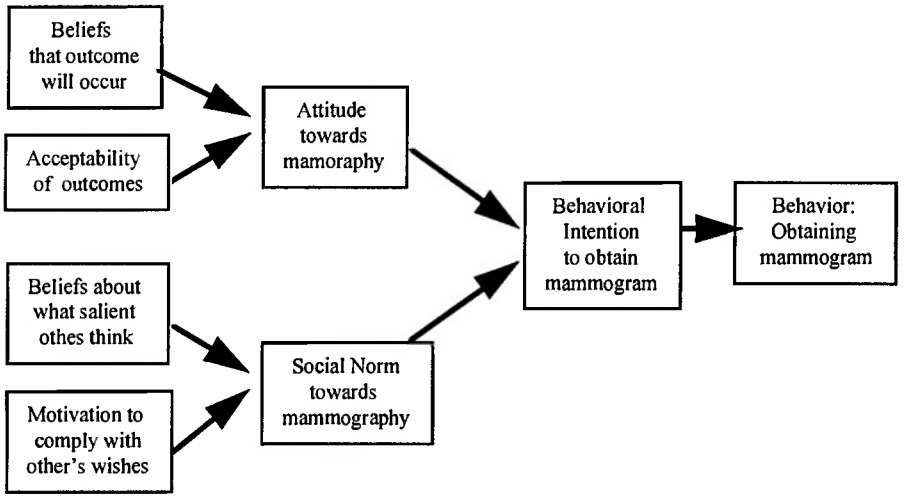

Figure 1.

Theory of Reasoned Action Applied to Mammography

Definition of Relevant Terms

Screening mammography. An x-ray of the breast for the purpose of detecting breast cancer in asymptomatic women.

Provider. A physician, nurse practitioner, or physician's assistant with credentials to provide direct patient care in a hospital or outpatient clinic.

Air Force beneficiary. Any active duty or retired service member as well as family members eligible for medical care associated with an Air Force medical treatment facility.

Clinical breast exam (CBE). Physical examination of the breast by a health care provider for the purpose of detecting palpable abnormalities as part of breast cancer screening.

Breast self examination (BSE). Physical examination of the breast by the woman herself for the purpose of detecting palpable abnormalities as part of self breast cancer screening.

Attitude variable. A Theory of Reasoned Action construct that consists of the sum of the likelihood variable and the acceptability variable (see figure 1 and chapter 4 operationally defining variables).

Social norm variable. A Theory of Reasoned Action construct that consists of the sum of the recommendations of salient others variable and the motivation to comply variables (see Figure 1 and Chapter 4 operationally defining variables).

CHAPTER 4 - METHODOLOGY

Overview

Mammography screening is the single most effective method for detecting breast cancer. Little is known about how well women over the age of 40 who are eligible for health care in the Air Force medical system comply with mammography screening guidelines. Experts recommend routine screening for breast cancer with mammography every 1-2 years for women aged 50-69. Currently, debate still exists regarding the routine screening of women in their forties. At the time of this study, the January 1997 NCI Consensus Conference and March 1997 presidentially appointed National Cancer Advisory Board publically explored this issue. Due to the extensive media coverage of this controversy, this study excluded women in their forties. The purpose of this study is to describe the rate of compliance with current mammography screening guidelines in a population of Air Force beneficiaries aged 50 and older and to describe factors associated with compliance.

Sampling

This study used a convenience sample of women aged 50 years and older who are Air Force beneficiaries eligible for care at the First Fighter Wing Regional Hospital at Langley Air Force Base, Virginia. The regional hospital provides primary care for approximately 55,000 people in its 20-mile catchment area. Data were collected at the base commissary at Langley Air Force Base. Women entering the commissary were asked if they conformed with two criteria: Air Force health care beneficiary and aged 50 or older. If they conformed to both criteria, they were requested t complete the

questionnaire. They were offered the option of completed the questionnaire at the site or at home to be returned to the researcher in a self-addressed, stamped envelope.

Measurement Methods

The Questionnaire

The questionnaire used in this study is a replication of the tool developed by Michels et al. (1995). Verbal permission was obtained from Lt. Col. Thomas Michels to use the tool. Minor changes were made to reflect the population being surveyed (i.e., Madigan Army Medical Center was changed to Langely Air Force Base Regional Hospital). Michels developed the questionnaire from several sources including the 1985 National Health Interview Survery, the Washington State Behavioral Risk Factor Surveillance System, and the Montano and Taplin (1991) survey. The questionnaire employed accepted principles of question wording, order, and placement. The Flesch-Kincaid Reading index is an eighth-grade level of readability. Michels validated the tool in a pilot study comprised of 50 women enrolled in the Family Practice Clinic at Madigan Medical Center. Twelve women in the clinic retook the questionnaire 5 days later to measure test-retest reliability. The reliability of the questionnaire was 0.85, which was satisfactory. The questionnaire was modified slightly from the pilot questionnaire.

Reliability and Validity of the Tool

Michels used Cronbach's alpha to measure internal consistency of the constructs from the Theory of Reasoned Action. The Attitude construct (see below) consists of two subscales: the likelihood of each potential outcome and the evaluation (acceptability) of each outcome. The initial Cronbach's alpha for the likelihood scale was 0.60 and for the evaluation scale, 0.79. The Social Norm scale also consisted of two subscales: perceived

recommendations of salient others and motivation to comply with each salient other (see below). The Cronbach's alpha for the recommendation scale and motivation to comply scales were 0.71 and 0.73 respectively.

Operationally Defining the Variables

The questionnaire was composed of 29 questions that measured past mammography behavior, behavioral intention, attitude, social norm, facilitators, and demographic variables. The model components and method of measurement are depicted in Figure 2 and described below.

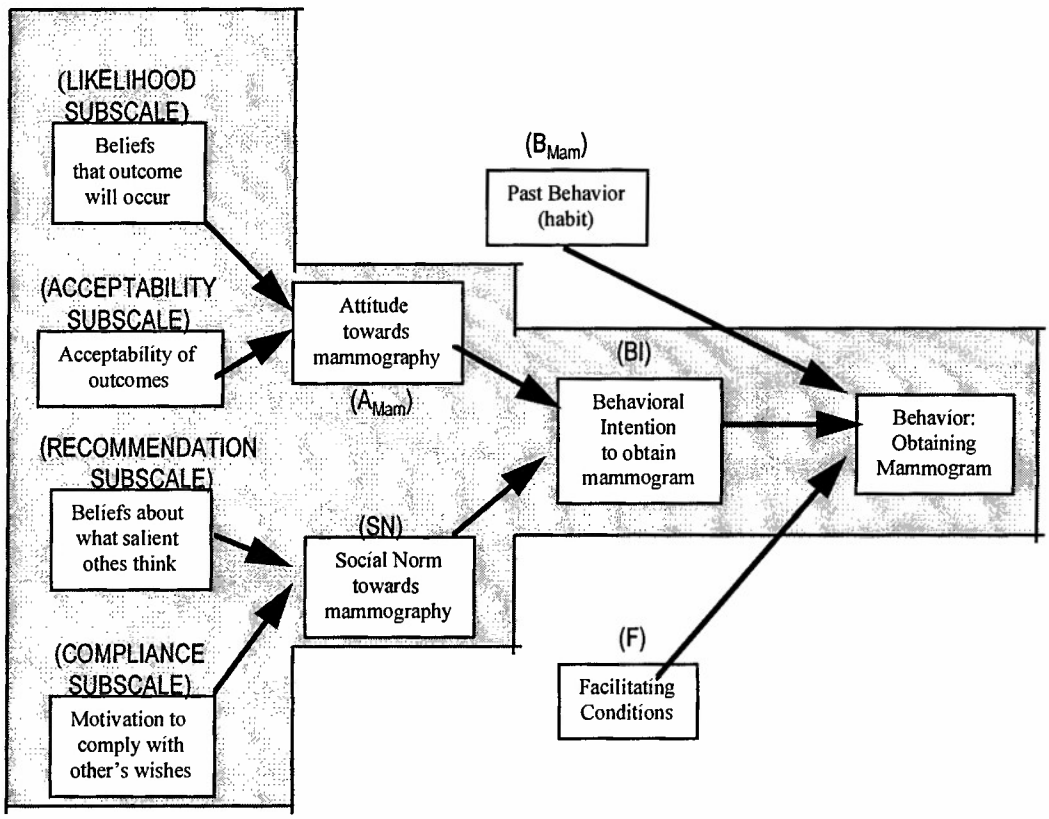

Figure 2.

Theory of Reasoned Action and Expanded Components Applied to Questionnaire
Note: Shaded area represents Fischbein's Theory of Reasoned Action

Past mammography behavior (Bmam). Four questions (Q1, Q2, Q10, Q11) were used to measure past mammography behavior. Utilization of mammography testing in the past five years measure habit. Women were asked to list the location of their past mammograms. The time frame since their last mammogram and reason for last mammogram were measured on an interval scale. Women were to skip questions if they have not had a mammogram, but were asked to complete questions measuring other TRA components.

Behavioral Intention (BI). Women were asked how likely it is that they would have a mammogram in the next year (Q3). The end points of the Likert scale were labeled extremely unlikely and extremely likely, with neither likely nor unlikely in the middle.

Attitude (Amam). A TRA attitude scale was used to measure the two components of attitude: (1) Q5 measured the belief (likelihood) that an outcome might occur and (2) Q6 measured the evaluation (acceptability) of that outcome. Ten attributes of mammography were measured on the likelihood and acceptability subscales: pain (Q5.1 & Q6.1), embarrassment (Q5.2 & Q6.2) , inconvenience (Q5.3 & Q6.3), cost (Q5.4 & Q6.4), radiation (Q5.5 & Q6.5), testing for breast cancer (Q5.6 & Q6.6), finding breast cancer (Q5.7 & Q6.7), thinking about breast cancer (Q5.8 & Q6.9), and surgery(Q5.9 & Q6.9) and treatment for breast cancer (Q5.10 & Q6.10). Likelihood of the outcome were measured on a 7-point Likert scale with the end points labeled strongly agree and strongly disagree, with neither in the middle. Acceptability of the outcome was measured using a 7-point Likert scale with the end points labeled unacceptable and acceptable, with neither in the middle.

Social norm (SN). Social norm was measured on two subscales: (1) Q7 measured the recommendations or expectations of others and (2) Q8 measured the motivation to comply with others recommendations. The recommendations or expectations for mammography from significant others including friends or neighbors(Q7.1), husbands or partners (Q7.2), relatives or family (Q7.3), doctors, nurse practitioners, or physician assistants (Q7.4), and media (Q7.5) were measured. The women were asked to rate the expectation of these individuals or groups on a 7-point Likert scale with the end points labeled strongly disagree and strongly agree, with neither in the middle. How strongly a woman is motivated to comply with the expectations or recommendations of others (Q8.1, 8.2, 8.3, 8.4, 8.5) were measured on a 7-point Likert scale with end points labeled strongly disagree and strongly agree, with neither in the middle.

Facilitating conditions (F). In addition to the TRA components Michels et al. (1995) added six questions regarding facilitating conditions or barriers to mammography screening were used. Ease of appointment scheduling (Q12) were measured on a 7-point Likert scale that asked women to agree or disagree with the statement, "in my opinion, the procedure to schedule an appointment for mammogram is easy." Women were asked to list barriers to obtaining a mammogram in an open ended question (Q13). Q18 asked women to rate the distance from the medical treatment facility facility. Health care coverage orcosts related to mammography were measured in Q19, 20, and 21.

Other measures. The questionnaire included other items such as risk categories for breast cancer (Q4), demographics (Q22 - Q 28), the health belief about susceptibility

to breast cancer (Q9), source of medical care (Q14, 15,16) other health-related behaviors (17).

Protection of Human Rights

The Air Force Survey Branch approved the survey per Air Force Instruction 36-2601. The Air Force Research Representative sponsored and approved the project. The hospital commander at Langely AFB deemed that Internal Review Board (IRB) approval within the hospital was not required because data were not collected within the facility nor were patient records utilized. The commander of the 1st Support Group and the commissary manager approved the distribution of the quesitonnaires within the commissary. Lastly, the Institutional Review Board (IRB), Research Administration at the Uniformed Services University of the Health Sciences, approved the project.

To protect the rights of self-determination and privacy subjects were obtained voluntarily from women patrons at the base commissary. No rewards or reimbursement were offered, and volunteers were told that the study was from USUHS and not their servicing medical center. After reading the consent form, subjects indicated verbal consent by filling out the questionnaire. Each participant read a standard explanation of the general purpose of the study and instructions before completing the questionnaire. No assistance with question interpretation was offered by the researcher.

The anonymity and confidentiality of the subjects were protected. Subjects were instructed not to place identifying data such as name, social security number, address, or phone number on the questionnaire. Anonymity and confidentiality was ensurred by not linking the subject's identity with her responses on the questionnaire and by presenting data in aggregate form. Standard demographic data such as date of birth and race was

obtained. To ensure fair treatment subjects were not excluded for any reason except in keeping with the necessary demographics of the sample: i.e., incorrect gender, branch of service other than Air Force, age less than 50 years, and ineligibility for military medical care. Participation in the study created no foreseeable risk or harm to the subjects.

CHAPTER 5 - ANALYSIS OF DATA

Description of Data

Return rate

One hundred questionnaires were handed out to eligible participants. Forty questionnaires were completed at the site and 34 were returned by mail for a return rate of 74%. None of the questionnaires were excluded from the study although some were not completed in entirety. Two of the participants reported a personal history of breast cancer, which may have influenced their opinions on routine screening mammography.

Demographic Information

Table 1 presents demographic information including age by decade category, race, education level, combined annual family income, and marital status. Data were not available to compare demographic data with the target population. The age of the subjects ranged from 50 to 82 years old. Two respondents did not report their age. The mean age was 64 years. The education range for respondents was 8 years or fewer up to 16 years or more. The majority had between 12 and 15 years of education. Only 3% had less than a high school education and 15% had more than 16 years of education.

Over 80% of respondents were Caucasian, 14% were Black, and 5% Asian or Pacific Islander. The Hispanic race was not represented in the sample.

Almost three-quarters of respondents were dependent wives of retired enlisted Air Force members. Fewer than a forth of the women were employed at the time of the survey. Most of the women were married. The range of annual combined family income was less than $10,000 up to more than $50,000. The largest number of respondents

(39%) fell in the annual income category of more than $50,000 with a second major category 26% of the respondents reporting an income in the $30,000 to $39,000 range.

Table 1.

Demographics of Respondents Including Age, Race, Education Level, Combined Family Income, and Marital Status

Categories	N	%
Age by Decade Category	72	
Age 50 to 59 years		36.1%
Age 60 to 69 years		36.5%
Age 70 to 79 years		23.0%
Age 80 to 89 years		2.7%
Race of Respondents	74	
White		81.1%
African-American		13.5%
Hispanic		-
Asian/Pacific Islander		5.4%
Education Level	74	
8 years or less		2.7%
Some high school (9-11 yrs)		9.5%
High school graduate (12 years)		36.5%
Some college or technical school(13 - 15 years)		36.5%
College graduate or graduate school (16 or more years)		14.9%
Combined Family Income Per Year	74	
<$10,0000		4.1%
$10,000 - $19,000		10.8%
$20,000 - $29,000		12.2%
$30,000 - $39,000		25.7%
$40,000 - $49,000		8.1%
$50,000 and over		39.2%
Marital Status	72	
Married		83.3%
Divorced		0%
Separated		2.8%
Widowed		13.9%

Note: N = number of respondents; (%) = valid percentages

Breast Cancer Risk Factors

Table 2 presents information regarding the potential breast cancer risk factors and perceived risk of breast cancer among survey respondents. Seventy-three women responded to the question regarding risk factors for breast cancer. Only two respondents reported a personal history of breast cancer. One third of women reported having had a breast biopsy and one fourth reported having had a breast lump. Only six women identified a first degree relative (i.e., mother, sister, or daughter) with breast cancer. Over a third of the women knew a close friend or other relative with breast cancer. When asked to rate their perception of their personal risk of breast cancer, most respondents rated themselves as very low to moderate risk.

Table 2.

Potential Breast Cancer Risk Factors, And Perceived Risk Of Breast Cancer Among Survey Respondents

Category	N	%
Potential Risk Factors for Breast Cancer	73	
Close friend or other relative		39.2%
Personal history of breast biopsy		34.2%
Personal history of breast lump		27.4%
First degree relative with breast cancer		8.1%
Personal history of breast cancer		2.7%
Perceived Risk of Breast Cancer	72	
Very low risk		26.4%
Low risk		18.1%
Moderate risk		41.7%
High risk		6.9%
Very high risk		6.9%

Note: N = Number of respondents; (%) = valid percentage

Use of Health Services

Table 3 presents use of health services among survey respondents. Half of the women surveyed used a civilian facility as their usual source of health care. Slightly under half used a military health care facility. Over three quarters of respondents identified a physician as their regular health care provider. The majority of their regular physicians specialized in family practice. Some women did not consider a physician to be their regular health care provider. A small percentage identified a nurse practitioner or physician's assistant as their regular provider. Almost two thirds of respondents acknowledged participating in other preventive services screening tests.

Table 3.

Use Of Health Services Among Survey Respondents

Category	%
Usual Source of Care	
Military family practice clinic	26.0%
Other military facility	17.8%
Civilian facility	50.7%
No regular source of care	5.5%
Type of Regular Provider	
Doctor (MD or DO)	78.9%
Nurse practitioner	12.7%
Physician's assistant	7.0%
Other	1.4%
Specialty of Regular Physician	
Family practice	45.5%
Ob-Gyn	29.1%
Internal medicine	23.6%
Do not know	1.8%
Preventive Services[1]	
Influenza vaccine[2]	72.4%
Dental check	66.7%
Cervical cancer screen	70.8%
Physical exam	65.3%
Cholesterol check	58.3%

Note: (%) = valid percentages

[1]For preventive services, percent refers to percent participating in the past year.

[2]Influenza vaccine is limited to respondents ages 65 and greater (N=29).

Research Question One

The first research question is: What is the rate of compliance with current mammography screening guidelines? Of the 67 respondents who indicated the reason for their last mammogram, 83.6% indicated it was for routine breast cancer screening and 16.4% indicated it was for diagnostic reasons (i.e., a breast problem).

Sixty-seven respondents indicated the interval since their last mammogram (Table 4). Most respondents had a mammogram within the past year (82.1%). Of those women reporting mammograms in the past year, the 60-69 year old age group was slightly higher than the 50-59 year group and the 70 year old and older group.

Regular use of mammography testing according to the National Cancer Institute guidelines was also measured. Low participation was defined as no mammogram for women age 50, one or none ages 51-52, two or less age 53 or older. High participation refers to participation according to NCI guidelines (i.e., yearly age 50 to 69). Intermediate participation falls between these two. Of the 71 respondents cross-linked with age groups, 63.4% demonstrated high participation, 14.1% intermediate participation, and 22.5%, low participation. Two respondents who did not indicate their age demonstrated low participation. By recalculating the valid percentage using an N or 73, the high participation category changes to 61.6%, intermediate, to 13.7%, and low to 24.7%. Only one woman, in the age 70 and older age group, reported never having had a mammogram. Although the criteria for grouping participation in the 70 and older age group is the same as for the younger age groups, there are no specific NCI recommendations for mammography use in the older group. The only group to support routine mammography in older women is the American Geriatrics Society, which

recommends screening every two to three years for women aged 65 to 85 (USPSTF, 1996).

Table 4.

Reason, Interval for Last Mammogram, and Regular Use of Mammography

Category	Ages 50-59 y/o	Age 60-69 y/o	Ages ≥70 y/o	N
Reason for Last Mammogram				
Routine screening	32.8%	29.9%	20.9%	56
Diagnostic	4.5%	9.0%	3.0%	11
Interval for Last Mammogram				
Within the past year	31.3%	34.3%	16.4%	55
1-2 years ago	3.0%	4.5%	3.0%	7
3-5 years ago	-	-	4.5%	3
More than 5 years ago	3.0%	-	-	2
Regular Use of Mammography by Age in Decades				
High participation	21.1%	31.0%	11.3%	45
Intermediate participation	5.6%	2.8%	5.6%	10
Low participation[1]	9.9%	2.8%	9.9%	16

Note: (%) = valid percentage; N = Number of respondents

[1] Low participation equals no mammogram for a woman over age 50, one or none for women ages 51 and 52, and 2 or less for a woman 53 or older; high participation according to NCI/ACS guidelines (see text); intermediate falls between these two.

Research Question Two

The second research question is: What are respondents intentions for obtaining a mammogram within the next year? Almost 80% of respondents reported it is extremely likely they will obtain a mammogram in the next year; only 6.8% stated their intent as extremely unlikely. The mean response for likelihood to obtain a mammogram was 6.2 (between quite likely and extremely likely). Table 5 shows respondent's intent to get a mammogram in the next year according to the reason for their last mammogram. Of the respondents who last received a mammogram for screening purposes, most reported it is extremely likely that they will obtain another mammogram in the next year; fewer than 9% stated that it would be extremely unlikely. In the group of women who last received a mammogram for diagnostic purposes (i.e., a breast problem), 100% stated that it is extremely likely they would receive a mammogram in the next year.

Table 5.

Intent to Get a Mammogram in the Next Year

Response		Combined[a]	Screening group[b]	Diagnostic group[c]
Extremely unlikely		6.8%	8.6%	-
Somewhat likely		4.1%	3.4%	-
Neither likely nor unlikely		2.7%	3.4%	-
Slightly likely		2.7%	1.7%	-
Somewhat likely		4.1%	5.2%	-
Extremely likely		79.5%	77.6%	100%
	Mean[d]	6.2	6.1	7
	SD	1. 8	1.9	0.0

Note: N = number of responses; (%) = valid percent

[a] Total responses to intent question (N= 73)

[b] Response from women reporting last mammogram for screening purposes (N = 58).

[c] Response from women reporting last mammogram for a diagnostic purposes (N = 15).

[d] Mean uses a 7-point Likert scale with 1 = strongly disagree to 7 = strongly disagree.

Research Question Three

The third research question is: How do respondents rate attitudinal variables for mammography as conceptualized by the Theory of Reasoned Action? The attitude scale measures two subscales: the belief (likelihood) that an outcome will occur and the evaluation (acceptability) of that outcome. In Tables 6 and 7, the categories were condensed from a 7- point Likert scale. The disagree category is a total of: 1=strongly disagree, 2=somewhat disagree, 3=slightly disagree. The agree category is a total of: 5=slightly agree; 6=somewhat agree, and 7=strongly agree. The mean and standard deviation for each component or the attitude scale are based on responses to the 7-point Likert scale.

Likelihood Subscale

The variable believed to be the most likely to occur was finding cancer that the examining doctor or nurse can not find (96%). Sixty percent of respondents agreed that the following conditions related to mammography were likely: chemotherapy or radiation if breast cancer found; testing for asymptomatic breast cancer; and thinking about breast cancer. Fewer than 20 percent of respondents indicated that a mammogram would be embarrassing, expensive, or inconvenient.

Table 6.

Attitude Variables: Perceived Likelihood Of Each Outcome

Variable	Disagree[1]	Neither[1]	Agree[1]	Mean[2]	SD[2]
Finding cancer provider cannot	2.7%	1.4%	95.9%	6.74	1.05
Chemo/radiation if cancer found	19.2%	16.4%	64.4%	5.16	1.93
Thinking about cancer	24.7%	16.4%	60.3%	4.90	2.32
Testing for asymptomatic cancer	13.7%	16.4%	60.3%	5.81	2.07
Surgery if cancer found	28.8%	27.4%	43.8%	4.29	1.98
Radiation	34.7%	26.4%	38.9%	4.01	1.97
Pain	42.5%	23.3%	34.2%	3.75	2.05
Embarrassment	65.8%	17.8%	16.4%	2.52	1.94
Expense	58.9%	26.0%	15.1%	2.74	1.97
Inconvenience	68.5%	20.5%	9.6%	2.29	1.78

Note: N = 73; (%) = valid percent for each variable; SD = standard deviation

[1]Percentages under "disagree," "neither," and "agree" are condensed from a seven item rating scales

[2]Mean and standard deviation computed from responses to 7-point likert scale (See Questionnaire, Appendix A)

Acceptability Subscale

Over half of respondents indicated that all of the attitude variables would be acceptable occurrences (Table 7). Over 90% found the following conditions related to mammography acceptable: testing for asymptomatic breast cancer, finding cancer that the examining provider could not detect, the pain of mammography, and the inconvenience of mammography.

Table 7.

Attitude Variables: Perceived Acceptability of Each Outcome[1]

Variable	N	Unaccep-table [1]	Neither[1]	Acceptable [1]	Mean[2]	SD[2]
Testing for asymptomatic cancer	72	6.9%		95.8%	6.69	0.96
Finding cancer provider cannot	72	2.7%	2.7%	94.4%	6.67	1.14
Pain	73		8.2%	91.8%	6.63	0.89
Inconvenience	72		97.2%	90.3%	6.62	0.94
Embarrassment	72	1.4%	12.5%	86.1%	6.42	1.23
Expense	73	2.7%	13.7%	82.2%	6.17	1.33
Surgery if cancer found	74	6.8%	18.9%	74.3%	5.84	1.59
Radiation	72	8.3%	18.1%	73.6%	5.86	1.61
Thinking about cancer	74	16.2%	25.7%	58.1%	5.07	2.03
Chemo/radiation if cancer found	74	5.4%	9.5%	58.1%	6.07	1.52

Note: N = frequency of responses to each variable component; (%) = valid percent for each variable; SD = standard deviation

[1]Percentages under "disagree," "neither," and "agree" are condensed from a seven item rating scales

[2]Mean and standard deviation computed from responses to 7-point likert scale (See Questionnaire, Appendix A)

Sum of the Likelihood and Acceptability Subscales

According to the TRA, the attitude variable is a sum of the likelihood and acceptability subscales (attitude = likelihood x acceptability). The means of the likelihood and acceptability ratings were summed for each component (Table 8). The component of the attitude variable considered most likely to occur as well as most acceptable if it occurs was finding cancer that the provider cannot, followed by testing for asymptomatic cancer, and chemotherapy or radiation if cancer were found. The lowest sum was expense, embarrassment, and inconvenience.

Table 8.

Attitude Variable: Sum of the Means of the Likelihood and Acceptability Components

Attitude variable component	Likelihood[1]	Acceptability[1]	Sum[2]
Finding cancer provider cannot	6.74	6.67	44.96
Testing for asymptomatic cancer	5.81	6.69	38.87
Chemo/radiation if cancer found	5.16	6.07	31.32
Surgery	4.29	5.84	25.05
Pain	3.75	6.63	24.86
Thinking about cancer	4.90	5.07	24.84
Radiation	4.01	5.86	23.50
Cost	2.74	6.17	16.91
Embarrassment	2.52	6.42	16.18
Inconvenience	2.29	6.62	15.16

[1] Numbers in this column represent mean score of responses to questions on a 7-point Likert scale

[2] Sum = likelihood x acceptability for each individual component

Research Question Four

The forth research question is: How do respondents rate social norm variables for mammography as conceptualized by the Theory of Reasoned Action? The social norm scale consists of two subscales: recommendations of salient others and compliance with recommendations of salient others. The social norm scale was condensed in the same manner as the attitude scale. The mean and standard deviation for each variable is based on responses to the 7-point Likert scale.

Recommendation Subscale

Table 9 presents aggregate responses to the recommendation subscale. Just over 90 % of respondents agreed that their health care provider recommended mammography. The next most agreed upon groups were the media (78%), husband or significant other (63%), relatives (58.9%), and friends (51.4%).

Table 9.

Social Norm Variables: Recommendations of Salient Others

Variable	N	Disagree	Neither	Agree	Mean	SD
Provider	73	2.7%	6.8%	90.4%	6.58	1.24
Media	73	8.2%	13.7%	78.0%	6.01	1.81
Husband	73	2.7%	34.2%	63.0%	5.73	1.61
Relative	73	5.5%	35.6%	58.9%	5.49	1.76
Friends	74	6.8%	41.9%	51.4%	5.19	1.78

Note: N = frequency of responses to each variable component; (%) = valid percent for each variable; SD = standard deviation

[1] Percentages under "disagree," "neither," and "agree" are condensed from a seven item rating scales

[2] Mean and standard deviation computed from responses to 7-point Likert scale (See Questionnaire, Appendix A)

Compliance Subscale

Table 10 shows the aggregate response to compliance with the recommendations of salient others. Ninety-four percent of respondents agreed that they generally comply with the recommendations of their provider. Only 28.8 % agreed that they generally comply with the advice of friends.

Table 10.

Social Norm Variables: Compliance with Recommendations of Salient Others:

Variable	N	Disagree	Neither	Agree	Mean	SD
Provider	72	5.6%		94.4%	6.64	0.95
Husband	73	8.2%	25.0%	67.1%	5.58	1.76
Relatives	73	8.2%	35.6%	56.2%	5.15	1.76
Media	72	15.3%	43.0%	41.7%	4.54	1.74
Friends	73	21.9%	49.3%	28.8%	3.95	1.80

Note: N = frequency of responses; (%) = valid percent for each variable
[1] Scales are condensed from seven item scales (See Questionnaire, Appendix A).
[2] Standard Deviation

Sum of the Recommendation and Compliance Subscales

The social norm variable is a sum of the recommendations and compliance subscales (social norm = recommendation x compliance). Just as with the attitude scale, the means of the recommendation and compliance ratings were summed for each component. The results showed that the group that most recommended mammography and were most complied with were the provider group followed by husband or significant other, relative, media, and friends (see Table 11).

Table 11.

Social Norm Variable: Sum of Recommendation and Compliance Components

Social norm variable component	Recommendation[1]	Compliance[1]	Sum[2]
Provider	6.58	6.64	43.69
Husband	5.73	5.58	31.97
Relative	5.49	5.15	28.27
Media	6.01	4.54	27.29
Friends	5.19	3.95	20.50

[1] Numbers in this column represent mean score of responses to questions on a 7-point Likert scale

[2] Sum = recommendation x compliance for each individual component

Facilitating Conditions

Facilitating conditions may influence the respondents willingness and ability to obtain a mammogram. Five facilitating conditions were assessed: ease of scheduling the appointment, barriers to obtaining the mammogram, insurance coverage, cost of the mammogram, and distance from the mammogram facility.

Ease of Scheduling

Women were asked to score on a 7-point Likert rate their agreement or with the statement: "In my opinion, scheduling a mammogram is easy." The mean was 5.74 with a standard deviation of 1.43. The answers were condensed with strongly disagree, somewhat disagree, and slightly disagree interpreted as the difficult to schedule a mammogram; strongly agree, somewhat agree, and slightly agree interpreted as easy to schedule. Seventy-five percent of respondents reported mammograms were easy to schedule, 13.2 percent indicated they were difficult to schedule, and the remaining 11.8 percent were neutral.

Barriers

The second facilitating condition was barriers to obtaining a mammogram (Figure 3). Seventeen women responded to an open ended question asking for barriers to obtaining a mammogram. Each respondent listed only one barrier to screening. Two thirds of the women stated appointment availability was the biggest obstacle. Other barriers identified were time factors, cost, unsure when to get a mammogram, and unsure how to schedule one.

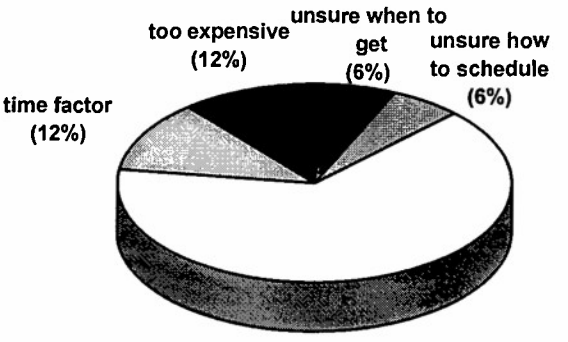

Figure 3.

Barriers to Obtaining a Mammogram Reported by Respondents
(% = valid percent; number of respondents = 17)

Health Insurance

A third facilitating condition for obtaining a mammogram is health insurance. Seventy-two respondents identified their health insurance coverage (see Figure 4). The largest insurance group was Champus followed by spouse's private insurance and Medicaid.

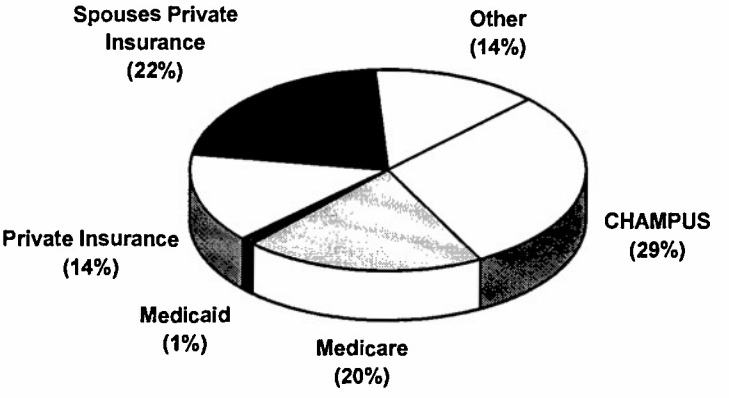

Figure 4.

Insurance Coverage for Medical Care
(% = valid percent; number of respondents = 72)

Cost of mammogram

The forth facilitating condition for obtaining a mammogram was the amount the respondent had to pay out of pocket for the mammogram (Figure 5). Almost three-quarters of 71 respondents stated insurance covers a part of the mammogram, the rest stated it doesn't cover any part of the cost. Sixty percent stated they paid nothing for the procedure.

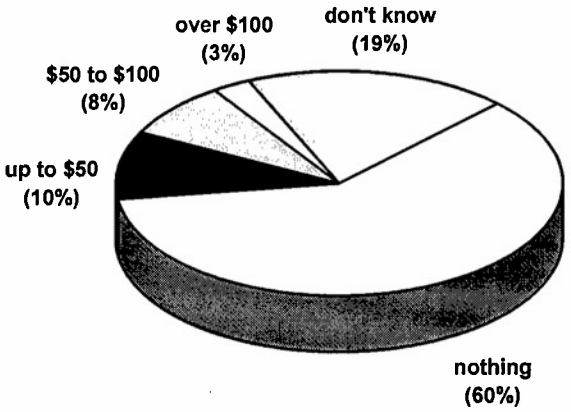

Figure 5.

Amount Paid out of Pocket for Last Mammogram
(% = valid percent; number of respondents = 71)

Distance from the facility

The final facilitating condition was the distance the respondent lived from the health care facility (Figure 6). Seventy-two women responded to the question. The vast majority (88%)of the respondents lived within 30 minutes of the facility. Only 6% of respondents lived more than 30 minutes away, and 7% did not know or their answer was not applicable.

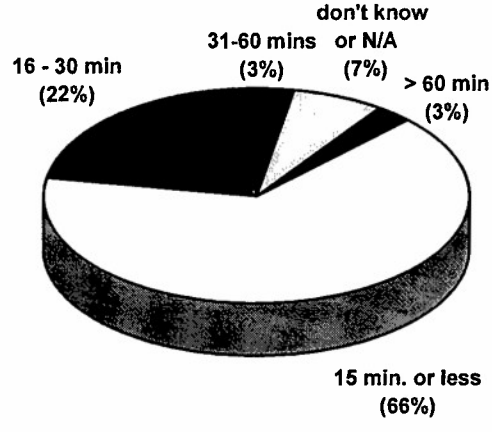

Figure 6.

Distance Respondents Live from Langely Air Force Base
(% = valid percentage; number of respondents = 72)

CHAPTER 6 - CONCLUSIONS

Discussion

Early detection of breast cancer through mammography has led to a statistically significant reduction in breast cancer mortality within the United States. Despite its effectiveness, the NCI reports continued underutilization of this important screening tool. The National Health Objective set by Healthy People 2000 seeks to increase the rate of women aged 50 years and older who have received a biannual mammogram to 60%.

The purpose of this study was to investigate the compliance of Air Force female health-care beneficiaries aged 50 and older with to NCI screening recommendations. Because of the widely publicized recent controversy and lack of consistent screening recommendations for women under age 50, this study excluded that age group. The following section discusses the findings, limitations, and conclusions of this study.

Findings

Behavior

Few studies have been done on mammography use in a military population. Michels and colleagues (1995) in their study of mammography participation in a U.S. Army population found only 12% reported regular mammography participation, which was significantly lower than the 31% of women surveyed nationally. Michels concluded that the problem was not with getting the initial mammogram, but with following through with repeat examinations. Follow through did not seem to be an issue with the respondents in this study as 61.6% reported regular participation in mammography. This participation rate also exceeded the Healthy People 2000 goal of a 60% biennial screening rate for women over age 50 years old.

In the Michels et al. study (1995), about 20% of his respondents over age 50 reported never having a mammogram which was significantly lower than nearly all national studies. In this study, although the sample size was considerably smaller, only one respondent reported never having had a mammogram (1.4%). This response rate exceeds the Healthy People 2000 goal to have 80% of women report *ever* having a mammogram. Not only did respondents in this study report having had a mammogram in the past, but those mammograms were recent. A surprising 82.1% of this study's respondents reported having their last mammogram within the past year. In comparison, only approximately 40% of respondents in Michels et al. had had their last mammogram within the last year.

Intent

When assessing intent to obtain a mammogram within the next year, nearly 80% of respondents indicated it was extremely likely. Of the women who had their last mammogram for routine screening purposes, the percentage fell slightly to 77.6%. Of those women receiving their last mammogram because of a breast problem, 100% stated they were extremely likely to have a mammogram the next year. This study supported several other studies, including Michels et al. (1995), which showed that women were more likely to participate in mammography testing if they perceived themselves susceptible to cancer. The concern associated with a diagnostic mammogram may have made the women in this study feel more susceptible to breast disease.

Attitude Variables

The attitude variables consist of likelihood of an outcome and acceptability of that outcome. The three most likely outcomes of mammography reported by respondents were

finding cancer their provider cannot, treatment if cancer found, and thinking about cancer. The three most *acceptable* outcomes of mammography were testing for asymptomatic cancer, finding cancer the provider cannot, and pain. The outcomes most important to the respondents (i.e., most likely and most acceptable) were finding breast cancer the provider could not and testing for asymptomatic breast cancer. Past studies have shown that women who do not believe mammography can find asymptomatic breast cancer are less likely to obtain mammogram (Bastani et al., 1994; Rimer et al., 1989). Michels et al. (1995) found that women who believed mammography detects curable breast cancer tended to participate more in mammography screening. This study supports those findings. Of the respondents, 60% believed mammography detects asymptomatic breast cancer and 96% believed that mammography can find cancer their provider could not by physical examination.

The respondents in this study demonstrated less concerned about barriers to mammography such as inconvenience, radiation, pain, and expense. These findings are not consistent with past studies that show great concern for these factors (Bastani et al., 1991; Fox et al., 1991; Lerman et al, 1990; Michels et al., 1995; Rimer et al., 1989; Zapka et al., 1989). Past studies show that women who are negatively influenced by barriers to breast cancer screening do not obtain regular mammograms. The lack of concern over these factors in this sample and the high rate of mammography use supported these findings.

Social Norm Variables

The social norm variables consist of recommendations for mammography by salient others and compliance with their recommendations. Literature review reveals the

most frequently cited factor positively associated with participation in mammography screening is physician recommendation. (Bastani et al., 1991; Bastani et al., 1994; Glockner et al., 1992; Michels et al., 1995; Zapka et al., 1991). Provider recommendation was the most important social norm variable identified in this study as well. Ninety percent of respondents reported that their provider recommended mammography and 94% stated that they usually comply with their provider's recommendations. The media was the second most likely group to recommend mammography, more than husbands, friends, and relatives. However, respondents were neutral to slightly agreeing that they would follow the media's advice and more apt to follow the advice of their husband or significant other.

Risk of Cancer

A personal history of breast cancer, first-degree relative with breast cancer, and certain history of specific breast lesions places a woman at risk for breast cancer. The incidence of these risk factors among this study's participants was slightly lower than in other studies. The majority of the women in this study perceived their risk of breast cancer to be very low to moderate; only 12% believed they were high to very high risk. Past studies have correlated perceived risk of breast cancer with participation in screening mammography. Therefore, based on the low perception of breast cancer risk and the high participation in screening, these findings were not consistent with other studies.

Other Factors

The majority of respondents were white, had 13 years of education or more, had a family income over $30,000 annually, and were married. Numerous studies have shown that white, well educated, urban dwellers with a higher income and education were more

likely to participate in screening programs than women who lacked these characteristics (Bastani et al., 1991; NCI, 1990; Smith & Haynes, 1992; Zapka et al., 1989). Thus the demographic finding in this study probably influenced the high rate of mammography participation.

Numerous studies have associated a woman's motivation to engage self-care preventive practices with use of mammography (Champion, 1992; Glockner et al., 1992; Mayer-Oaks et al., 1996). This study supported those findings as the majority of respondents demonstrated an active interest in preventive measures as well as a high participation rate in breast cancer screening. Bergman-Evans and Walker (1996) found that the prevalence of clinical preventive services utilization decreased as age increased. This study did not support those findings. In their study of U.S. Army beneficiaries, Michels and colleagues (1995) found a 50-64% rate of preventive services utilization in the past year. The respondents in this study reported a higher utilization of preventive services in the past year between 65-72% (see Table 3).

Past studies have demonstrated conflicting views on distance lived from the mammography facility as a barrier to mammography participation. McCarthy et al. (1996) found that women who do not have to travel far have a 10% higher rate of mammography screening that those who have to travel. Kreher and co-researchers (1995) found no correlation between rate of mammography screening and distance, travel time, or available transportation. The majority of respondents in this study lived within 15 minutes of the health care facility. This finding seems to support McCarthy's findings.

Limitations

A convenience sample was used in this study for data collection. In order to prevent enlisting volunteers who were already displaying health-seeking behaviors, data collection at the base hospital was avoided. The use of a convenience sample was inexpensive and easy. Because this is a descriptive study and not meant as a confirmatory study, this method of sampling was generally acceptable. However, convenience sampling may not generate a true representation of the larger population.

The small sample size was also a limitation of this study. It was adequate for the stated purposes of this study and to address the research questions. However, the small sample did not make full use of the theoretical framework. The Theory of Reasoned Action is a theoretical model with a mathematical formula based on multiple regression analysis to predict behavioral intent for some health behavior. Multiple regression analysis allows the researcher to correlate specific variables with certain behaviors, lending a level of significance to those variables. If the researcher points out, for example, that women who have a negative attitude toward pain or embarrassment with mammography are less likely to obtain a mammogram, health-care providers can engender to decrease pain and embarrassment in order to increase mammography participation. This study, however, did not make any attempt to predict intent or behavior, or weigh the importance of variables toward that end.

Conclusions

The purpose of this descriptive study was to gain more information about mammography use in an Air Force population. No attempt was made to correlate characteristics framed in the Theory of Reasoned Action with mammography intent or

behavior. Overall, this study showed that participation in mammography screening by this Air Force sample was higher than previously demonstrated in national and military samples. A possible explanation for this finding is the increased emphasis on preventative screening as reflected in Healthy People 2000 goals. In addition, the women seemed more concerned with the effectiveness of mammography to detect curable, asymptomatic breast cancer, than they were with established barriers. As with other studies, the health care provider rated as the most important person to influence mammography participation.

The research tool utilized in this study was somewhat cumbersome. With more researchers refining the Theory of Reasoned action, future researchers would benefit from streamlining this tool by deleting items that have been shown to have little impact on participation in mammography screening.

Implications for Practice

With regard to breast cancer screening, women follow the advice of their health care providers more than spouses, family, friends, and the media. Women are also highly interested in the effectiveness of mammography in detecting asymptomatic and curable breast cancer. Health-care providers must be familiar with mammography screening recommendations and effectiveness in order to counsel their patients appropriately. Primary and secondary prevention must be a part of every patient visit.

Nurse practitioners play a vital role in delivering clinical preventive services including screening for early detection of disease. Although only a small percentage of the sample identified a NP as their primary provider, the number of FNPs in the Air Force is on the rise. Almost half of my respondents identified their physician's specialty as

family practice. It would be interesting to study the impact of the rising number of military FNPs on the rate of compliance with breast cancer screening and other preventive measures.

Suggestions for Future Research

Further research is needed to evaluate factors influencing mammography participation in various military populations. This study could serve as a pilot study for health care facilities to survey a larger, more representative sample size. A larger sample would more fully utilize the mathematical formulation and multiple regression analysis of the Theory of Reasoned Action. As the structure of the Air Force health care system changes with the downsizing of health care services and the use of TRICARE, more families are receiving their health care at civilian facilities. One might wonder how this change will influence participation in mammography screening among those military beneficiaries using civilian services.

It would be interesting to survey various health care providers (i.e., physicians, nurse practitioners, and physician assistants) to assess their knowledge of breast cancer screening guidelines and compare how well the various disciplines guide their patients to comply with these recommendations. Past studies have demonstrated the importance of physician recommendation for mammography screening. Does the recommendation by non-physician providers carry the same weight? Do women seeing numerous specialists, without a primary health-care provider as a case manager, receive the same recommendations for cancer screening tests?

Women in this study rated the efficacy of mammography as a more important factor than well established, negatively associated factors, such as pain and

embarrassment, that deter a women from obtaining a mammogram. Future research should explore these positively associated factors as well as women's understanding of the efficacy of mammography. It is important that women understand both the effectiveness as well as the limitations of a mammogram to detect cancer.

Clearly, health promotion and disease prevention is a successful approach to containing health costs, improving quality of life, and decreasing chronic disease. Healthy People 2000 set goals for various health care services including clinical breast examination, Papanicolaou test, proctosigmoidoscopy, fecal occult blood test, and digital rectal examination (CDC, 1995). Further research is needed in all areas of cancer screening to evaluate provider recommendation and patient compliance in military populations. In order to maximize health, military physicians, NPs and PAs must continuously update standards of practice through solid, timely research.

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APPENDIX A

Mammography Survey

Langley Air Force Base

Uniformed Services University of the Health Sciences

Mammography Questionnaire
USAF SCN 97-53

Instructions for Rating Scales

Some questions in this survey ask you to fill out rating scales. Please make a circle around the number that best describes your opinion. Some questions ask if you AGREE or DISAGREE, some ask how ACCEPTABLE or UNACCEPTABLE you feel a choice is, or how BAD or GOOD you feel something is. The numbers on the scale correspond roughly like this (but use your own judgment):

BAD			NEITHER			GOOD
EXTREMELY	QUITE	SLIGHTLY	GOOD NOR BAD	SLIGHTLY	QUITE	EXTREMELY
1	2	3	4	5	6	7
STRONGLY DISAGREE	SOME-WHAT	SLIGHTLY	NEITHER AGREE NOR DISAGREE	SLIGHTLY	SOME-WHAT	STRONGLY AGREE

The descriptions won't be included with the actual questions. **For example**, if you were asked to rate "The Weather in Eastern Virginia" on such a scale, the question would look like this:

The weather in Eastern Virginia is:

BAD			NEITHER			GOOD
1	2	3	4	5	6	7

If you think the weather in Eastern Virginia is *extremely good,* then you would place your circles as follows:

BAD			NEITHER			GOOD
1	2	3	4	5	6	(7)

If you think the weather in Eastern Virginia is *quite bad,* then you would place your circles as follows:

BAD			NEITHER			GOOD
1	(2)	3	4	5	6	7

If you think the weather in Eastern Virginia is *neither good nor bad,* or if *you didn't know*, if the question *does not apply to you*, then you would place your circles as follows:

BAD			NEITHER			GOOD
1	2	3	(4)	5	6	7

Please answer all the questions in the order given, or skip certain parts as directed. Please circle the one letter or number that best applies to you for each question. Thank you. Your answers are important and appreciated.

Q1. How many mammograms have you had in the past five *years (please circle one number)*

1. I have never had a mammogram (skip to question 3)
2. I have had a mammogram, but not in the past 5 years
3. 1 mammogram in the past 5 years
4. 2 mammograms in the past 5 years
5. 3 mammograms in the past 5 years'
6. 4 mammograms in the past 5 years
7. 5 or more mammograms in the past 5 years

Q2. Where did you get your last mammogram? (*Please circle one and list where; skip to question 3 if you have not had one*)

1. Military clinic or hospital (*list*) _____
   _____
2. Civilian clinic or hospital (*list*) _____
   _____
3. Don't know or can't remember.

Q3. We are interested in whether you plan to have a mammogram in the next year. Circle the number that best describes how likely it is that you will have a mammogram within the next 12 months:

EXTREMELY UNLIKELY			NEITHER LIKELY NOR UNLIKELY			EXTREMELY LIKELY
1	2	3	4	5	6	7

Q4. Have you ever had (*please circle one answer for each item*)

1. Breast cancer? YES NO
2. A breast biopsy? (a biopsy is removal of a small piece of breast tissue) YES NO
3. A breast lump? YES NO
4. A mother, sister, or daughter with breast cancer? YES NO
5. A close friend or other relative with breast cancer? YES NO

Q5. Please give your opinion of each of the following statements. (*please circle answer even if you have never had a mammogram; circle the number which best reflects you opinion for each*)

A. For me, getting a mammogram causes pain or discomfort:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

B. For me, getting a mammogram causes embarrassment:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

C. For me, getting a mammogram is inconvenient:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

D. For me, getting a mammogram is expensive:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

E. Getting a mammogram involves exposing me to radiation:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

F. Getting a mammogram involves testing me for breast cancer even if I do not have breast symptoms or problems:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

G. Getting a mammogram would allow finding breast cancer that my doctor or nurse can't find by examining me:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

H. For me, getting a mammogram involves thinking about the possibility that I may have breast cancer:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

I. If breast cancer were found in me, it would lead to surgery resulting in a change in my physical appearance:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

J. If breast cancer were found in me, it would lead to radiation treatment or chemotherapy:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

Q6. ***(please circle the number that best reflects your opinion for each statement; answer even if you have never had a mammogram)***

A. For me, the discomfort of a mammogram is:

UNACCEPTABLE			NEITHER			ACCEPTABLE
1	2	3	4	5	6	7

B. For me, the embarrassment of a mammogram is:

UNACCEPTABLE			NEITHER			ACCEPTABLE
1	2	3	4	5	6	7

C For me, the inconvenience of a mammogram is:

UNACCEPTABLE			NEITHER			ACCEPTABLE
1	2	3	4	5	6	7

D. For me, the cost of a mammogram is:

UNACCEPTABLE			NEITHER			ACCEPTABLE
1	2	3	4	5	6	7

E. For me, exposure to radiation from a mammogram is:

UNACCEPTABLE			NEITHER			ACCEPTABLE
1	2	3	4	5	6	7

F. For me, testing for breast cancer, even if I do not have symptoms or problems is:

BAD			NEITHER			GOOD
1	2	3	4	5	6	7

G. For me, finding breast cancer that my doctor or nurse can't find by examining me is:

BAD			NEITHER			GOOD
1	2	3	4	5	6	7

H. For me, thinking about the possibility that I may have breast cancer is:

UNACCEPTABLE			NEITHER			ACCEPTABLE
1	2	3	4	5	6	7

I. If breast cancer were found in me, surgery resulting in a change in my physical appearance would be:

UNACCEPTABLE			NEITHER			ACCEPTABLE
1	2	3	4	5	6	7

J. If breast cancer were found in me, radiation treatment or chemotherapy would be:

UNACCEPTABLE			NEITHER			ACCEPTABLE
1	2	3	4	5	6	7

Q7. Please answer each of the following statements as they apply to you. (*circle the number that best reflects your opinion for each statement; answer even if you have never had a mammogram*).

A. Friends or neighbors recommend I get a mammogram:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

B. My husband/partner recommends I get a mammogram:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

C. Other relatives, family recommend I get a mammogram:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

D. My doctor, nurse practitioner, or physician's assistant recommends I get a mammogram:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

E. The media (like newspapers, magazines, TV) recommend I get a mammogram:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

Q8. Please answer each statement as it applies to you. (*please circle the answer which best reflects your opinion for each statement; answer even if you have never had a mammogram*)

A. Generally speaking, I try to do what my friends or neighbors recommend I should do:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

B. Generally speaking, I try to do what my husband/partner recommends I should do:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

C. Generally speaking, I try to do what my other relatives/family recommend I should do:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

D. Generally speaking, I try to do what my doctor, nurse practitioner, or physician's assistant recommends I should do:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

E. Generally speaking, I try to do what the media (newspapers, magazines, TV) recommend I should do:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

Q9. My risk of getting breast cancer is: (*please circle one*)

1. very low
2. low
3. moderate
4. high
5. very high

If you have <u>never</u> had a mammogram, please go to Question 13.

Q10. How long has it been since your last mammogram?

1. Within the past year
2. More than one, but less than two years ago
3. More than two, but less than three years ago
4. More than three, but less than five years ago
5. More than five years ago

Q11. Please circle the reason you had your <u>last</u> mammogram

1. It was done as part of a routine checkup
2. It was done because I had a breast problem
3. I don't know or can't remember

Answer Question 12 only if you have had a mammogram; go to Question 13 if you have not.

Q12. In my opinion, the procedure to schedule an appointment for a mammogram is easy:

STRONGLY DISAGREE			NEITHER			STRONGLY AGREE
1	2	3	4	5	6	7

Q13. Please list all the barriers, in your opinion, to getting a mammogram (factors making it hard to get one)

_____

_____

_____

_____

The following questions are about your medical care and your background

Q14. What is your usual source of medical care? (*please circle one*)

1. military Family Practice Clinic
2. other military Hospital or Clinic
3. civilian Hospital, Clinic, or provider's office
4. do not have a regular source of care

Q15. Which of the following do you consider your regular provider? (*please circle one*)

1. Doctor (M.D. or D.O.) (*go to Question 16*)
2. Nurse practitioner (*go to Question 17*)
3. Physician's assistant (PA) (*go to Question 17*)
4. Other (*please list, then go to Question 17*)

_____

Q16. If you consider your doctor as your regular provider, please circle the type of doctor you usually see (*circle one*):

1. Obstetrician-Gynecologist (Ob-Gyn)
2. Internist (Internal Medicine)
3. Family Physician (Family Practice)
4. Surgeon
5. Don't know
6. Other (*please list*) _____

Q17. In the last 12 months have you had (please circle an answer for each item):

1. A flu shot	YES	NO
2. A dental exam	YES	NO
3. A pap smear	YES	NO
4. A general physical exam	YES	NO
5. A blood cholesterol test	YES	NO

Q18. How long does it usually take you to get to Langley?

1. 15 minutes or less
2. Between 16 and 30 minutes
3. Between 31 and 45 minutes
4. Between 46 and 60 minutes
5. More than 60 minutes
6. Don't know or doesn't apply

Q19. What type of insurance coverage for medical care do you have? (*please circle one for each*)

1. Military coverage?	YES	NO
2. CHAMPUS	YES	NO
3. Medicaid?	YES	NO
4. Medicare?	YES	NO
5. My own private health insurance?	YES	NO
6. My spouse's private health insurance?	YES	NO

7. Other? (*please list*) _____

Q20. Does your insurance cover any part of the cost of a mammogram? (*please circle one*)

YES NO

Q21. If you have had a mammogram, how much did you, yourself, have to pay for your mammogram, not counting the part paid for by Health Insurance? *(if you have not had a mammogram, please skip to Question 22)* (*circle one*):

1. Nothing, it was all paid for
2. $25 or less
3. From $25 to $50
4. From $50 to $75
5. From $75 to $100
6. More than $100
7. Don't know or can't remember

Q23. In what year were you born? (*please list*)

_____

Q24. Please give your (or your sponsor's) military rank:

My sponsor's rank is:_____

My rank is: _____

Q 25. Are you employed at this time? (*please circle one)*

YES NO

--

Q 26. Please circle your marital status:

1. Married
2. Divorced
3. Separated
4. Widowed
5. Never married

Q27. What is the highest grade or year of school you have ever finished? (*please circle one*):

1. 8 years or less
2. 9-11 years (some high school)
3. 12 years (high school graduate)
4. 13-15 years (some college or technical school)
5. 16 or more years (college graduate or graduate school)

Q28. (Please answer the following questions)

A. What do you consider to be your race? *(please circle one)*

1. Asian/Pacific Islander
2. Black/African American
3. White/Caucasian
4. American Indian/Native American/Aleut/Eskimo/
5. Other (*please list*) _____

B. Do you consider yourself to be of Hispanic origin? (*please circle one*) YES NO

Q29. Which of these income categories comes closest to the total yearly income for your household from all sources?

1. Under $10,000
2. $10,000 - $20,000
3. $20,000 - $29,000
4. $30,000 - $39,000
5. $40,000 - $49,000
6. $50,000 or over

Thank you!

Please use the space below or on the back cover for any comments or questions about this survey or mammography in general.