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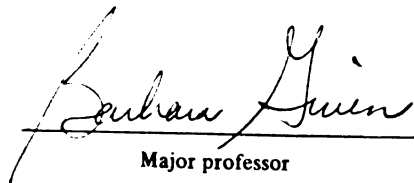
Perceived
Barriers to mammography screening in
women age 40 and older who do not
follow mammography screening guidelines

presented by

Rita A. Dekker

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of the requirements for

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**PERCEIVED BARRIERS TO MAMMOGRAPHY SCREENING IN
WOMEN AGE 40 AND OLDER WHO DO NOT FOLLOW THE
RECOMMENDED MAMMOGRAPHY SCREENING GUIDELINES**

By

Rita A. Dekker

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ABSTRACT

PERCEIVED BARRIERS TO MAMMOGRAPHY SCREENING IN WOMEN AGE 40 AND OLDER WHO DO NOT FOLLOW THE RECOMMENDED MAMMOGRAPHY SCREENING GUIDELINES

By

Rita A. Dekker

The purpose of this retrospective, descriptive study was to explore barriers to mammography screening in women who did not follow mammography screening guidelines. Specific barriers explored were: lack of physician recommendation, discomfort of mammography and cost and inconvenience of obtaining a mammogram. Data for this secondary analysis were from 226 women who participated in the original study, The Rural Breast Cancer Screening Project. Review of responses from a self-administered questionnaire completed by the participants was the method used to obtain the data.

Data was analyzed using descriptive statistics and chi square. A significant study finding was that women reported the cost of the mammogram was a barrier to screening. However, study results indicated that discomfort, lack of physician recommendation and inconvenience were not barriers to screening. Findings from this study suggest that Clinical Nurse Specialists (CNS) in primary care settings, should evaluate barriers to mammography related to cost prior to the mammography referral. The goal of the CNS is to foster mammography compliance by assisting the client to overcome identified barriers to screening, such as those related to the cost of mammography.

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Introduction

In women, cancer of the breast is the most frequent cancer and the second leading cause of cancer related deaths (Humphrey & Ballard, 1989). Approximately one out of nine women develop breast cancer during their lifetime (ACS, 1993). The American Cancer Society (ACS) estimated that in 1994 there would be 182,000 new cases of breast cancer diagnosed in this country, and 46,300 breast cancer related deaths (ACS, 1994).

Breast cancer is an insidious disease that may be present in women and develop over many years without signs or symptoms of any kind. Seventy-five percent of breast cancer cases occur in women with no known risk factors other than sex and age (Hortobagy, McLelland & Reed 1990).

While there is no demonstrated means of preventing breast cancer, there is a demonstrated means of detecting it. The most important mean is through screening and early detection (ACS, 1994). Consequently, the National Cancer Institute (NCI), and the ACS have recommended that women regularly undergo screening for breast cancer (Anda, Sienko, Remington, Gentry & Marks, 1990).

Mammography is recognized as the most effective early detection method for breast cancer (Schechter, Vanchieri & Crofton, 1990). The effectiveness of mammography for screening asymptomatic women is undisputed (Stein, Fox, Murata & Morisky, 1992). Mammograms are capable of cancer detection at a very early stage, when tumors are not yet clinically palpable, and possibly before metastasis has occurred (Humphrey & Ballard, 1989).

Mammography screening consists of an x-ray examination of the breasts using low level radiation (ACS, 1993). The recommended

mammography screening guidelines are: baseline mammogram for women age 35-40; annual or biannual mammogram for women age 40-49; and annual mammogram for women age 50 and over (Breast Cancer Screening and Detection in Michigan: Recommendations to Reduce Mortality, 1990).

Statement of the Problem

Although mammography is a proven technology for diagnosing curable breast cancer and preventing deaths, it remains underutilized (Schechter & Vanchieri, 1990). Research indicates that compliance with mammography has been poor (Rimer, Trock & Engstrom, 1991). Poor compliance with screening was evidenced in a 1990 NCI study which revealed that the following percentages of women had received mammograms: 40 to 49 years, 40%; 50 to 59 years, 35%; 60 to 69 years 28%; and 70 to 75 years, 18%. Although, these percentages indicate that the number of women obtaining mammograms is on the rise, nevertheless, the numbers remain low and are still far less than ideal (Smith & Haynes, 1991).

Research indicates that, although mammograms can detect lesions before they are clinically palpable, over 75% of breast cancers detected in 1989 were by women doing a breast self exam. Unfortunately, studies indicate that 50% of women who detect breast cancer by means of BSE already have lymph node involvement, and a majority die from the disease (Humphrey & Ballard, 1989). Consequently, the mortality rate for women with breast cancer has remained constant for the past 30 years (Clarke & Sandler, 1988).

There is a growing national recognition that mammography must be better utilized. Experts agree that regular mammography must be the standard of care for every woman (Hortobagyi et al., 1990). If screened

properly, mammograms could reduce the breast cancer mortality rates by at least 30% (Rimer & Trock 1990; Schechter, Vanchieri & Crofton, 1990).

The problem is that, even though breast cancer is the number one cancer in women, and the only way to reduce the breast cancer mortality rate is for women to follow mammography guidelines and detect breast cancer early, screening compliance continues to be poor. The literature suggests that a number of perceived barriers exist that are preventing women from participating in mammography screening (Rimer, Keintz, Kessler, Engstrom & Rosan, 1989; Rimer et al., 1991).

Many researchers have explored attitudinal components of preventive health behavior by using the Health Belief Model (HBM) as a theoretical framework for their research (Champion, 1987; Rutledge, Hartman, Kinman & Winfield, 1988). They have found that attitudinal components may serve as barriers to participating in screening.

Although, studies reveal that 98% of all women have heard of mammography (Rimer, Trock, Engstrom, Lerman & King, 1991) researchers have found numerous barrier to compliance with mammography screening, including physician underuse of mammography (Kruise & Phillips, 1987). Rimer et al., (1991) agree that lack of physician recommendation is a barrier to screening, and also cite other barriers such as distance, inconvenience, and cost. Ansell, Dillard, Rothenberg, Gentry and Marks (1988) report that many women cannot afford mammograms and that cost is a barrier to screening; and Richardson, Marks, Solis, Collins, Birba and Hisserich (1987) state that emotional reactions to screening, such as nervousness, are strongly correlated with non-compliance.

Although research studies indicate that a number of barriers prevent women from participating in mammography screening, Champion

(1991) feels that barriers to mammography need further research, and that researchers have only begun to gather preliminary data to determine which valid barriers exist.

Purpose of the Study

The purpose of this study will be to conduct a secondary analysis of data to better understand the barriers to mammography screening. The research question to be answered in this study is "What are the perceived barriers to mammography screening in women age 40 and older who do not follow the recommended mammography screening guidelines?" Specific barriers to be explored are related to three areas of concern: first, lack of physician recommendation; second, discomfort of the mammography procedure; and third, the cost and inconvenience of obtaining mammography.

This thesis will further explore barriers to mammography screening in an effort to provide useful information in order to sensitize nurses and health care providers to the barriers preventing women from participating in mammography screening, and to help nurses and health care providers develop skills for encouraging women to participate in mammography screening.

Conceptual Definition of Variables

The term barriers has been defined by a variety of authors. For example, Janz and Becker (1984) defined barriers as the potential negative aspects of a particular health action which may act as an impediment to undertaking the recommended behavior. Similarly, Rutledge et al., (1988) defined barriers to mammography as factors which have either moderate, or much influence on the decision not to have a mammogram. In addition, Smith and Haynes (1991) have defined barriers

as those factors that, either combined or alone, are associated with a reduced likelihood of having a mammogram.

Therefore, for the purpose of this thesis, barriers will be defined as those negative aspects or factors which are associated with a reduced likelihood of taking a health action such as having a mammogram. This research will explore three separate barriers to mammography screening that involve first, a lack of physician recommendation; second, discomfort related to the mammography procedure; and third, cost and inconvenience.

Lack of physician recommendation will be defined as there being no educational intervention or discussion regarding mammography guidelines and no referral or recommendation made by physicians to their clients to suggest that they obtain a screening mammogram.

Physicians are among the most frequent health care providers who are responsible for the ongoing health maintenance of their patients. Physicians should perform components of breast cancer screening by discussing with women mammography guidelines and the benefits of mammography, performing clinical breast exams and recommending to their patients that they obtain mammograms (Breast Cancer Screening and Detection in Michigan: Recommendations to Reduce Mortality, 1990).

Rimer et al., (1990) state that women who perceive their physicians as strongly recommending mammograms are significantly more likely to comply with mammography screening. In addition, according to Stein, Fox, Murata and Morisky (1992), studies regarding the utilization of mammography have generally found that a physician's recommendation or referral to mammography strongly influences whether a woman gets

screened. Therefore, Smith and Haynes (1991) describe physicians as "gatekeepers," stating that the role of the physician as gatekeeper represents the greatest challenge to understanding provider referral barriers to breast cancer screening. This is best explained by the discretionary decisions physicians make regarding which women are referred for mammography, i.e., who will or will not receive a recommendation for mammogram. Furthermore, Smith and Haynes (1991) state that gatekeeping decisions are shaped, not only by physician's knowledge and attitudes about CBE and mammography, but also by their perceptions of whether the exam is appropriate, acceptable and affordable by their patients.

Discomfort related to mammography procedure has been described by researchers in a variety of ways. For example, Fox, Baum, Klos and Tsou (1988) state that many variables help explain the underuse of screening for breast cancer, such as "negative feelings or apprehension" about the mammography procedure. Kurtz, Kurtz, Given and Given (1994) suggest that women who do not participate in screening, may have concerns related to the fact that mammograms may be perceived as being unpleasant, painful, embarrassing or anxiety provoking. Hamwi (1990) states that when the breast tissue is compressed for the mammography procedure, a woman may feel a sensation of breast discomfort or pain. Furthermore, Strax (1988) adds that in some instances, due to the vigorous breast compression of the mammography device, many women have complained of bruised breasts.

Therefore, discomfort in this thesis will be defined as any unpleasant physical or emotional response that is related to the

mammography procedure. It will include anxiety, embarrassment, nervousness, discomfort or pain.

Cost and Inconvenience of mammography procedure are situations that prevent women from obtaining mammograms. Some of the reported access barriers that prevent women from obtaining mammograms include the actual cost of mammograms; the lack of health insurance to cover the cost; the lack of available mammograms in certain locations; and the fact that mammograms may be inconvenient or difficult to arrange (Brown, 1989; Rutledge et al., 1988).

Mammogram cost is defined as all costs, which not only include the incurred cost of an actual mammogram, but also any other hidden financial costs such as the cost of office visits for CBE and mammogram referral, or the cost of follow-up visits as a consequence of abnormal mammography findings (Humphrey & Ballard, 1989; Wertheimer, Costanza, Dodson, D'Orsi, Pastides & Zapka 1986). Therefore, for the purpose of this study cost will be interpreted as a single generalized cost.

Inconvenient mammograms will be defined as those which are difficult or inconvenient to arrange. This inconvenience may result from having to travel long distances to the mammography facility, or from the extensive process women must go through to obtain mammography. For example, currently it is necessary for women to make several appointments, including visits to the provider for referral, before traveling to the mammogram facility for the mammogram. This results in multiple time off from work, requiring transportation, baby-sitters, and an anxiety-provoking waiting period to obtain results (Brown, 1989).

Theoretical Framework

In an effort to further explore barriers currently preventing women from participating in mammography screening, this study will use the Health Belief Model (HBM) as a theoretical framework to explore barriers to mammography screening.

The HBM is a theoretical framework, originally developed in the early 1950's, by social psychologists in an attempt to understand the widespread failure of people to accept screening tests for the early detection of asymptomatic disease (Janz & Becker, 1984). In Figure 1, the original HBM is demonstrated. The HBM is a psychosocial model that attempts to explain health behaviors that maintain health, prevent disease or detect disease when the individual is asymptomatic (Stein et al., 1992). Since the HBM's initial development, it has been used by many researchers in an attempt to understand why some individuals engage in preventive health behaviors at an individual decision-making level, and why others do not. Some of the past investigators who have utilized the HBM as a framework for research in cancer detection and screening behaviors are: Brown (1989); Champion (1991); Given and Given (1984). The HBM continues to be used as an explanatory model in preventive health behavior research (Nemcek, 1990) and has been used successfully by researchers. Champion (1991) investigated breast cancer detection behaviors of women, and Stein et al., (1992) investigated women's mammography usage and participation in preventive behaviors.

The HBM suggests that when barriers to engaging in prevention are minimal, and other disease specific health beliefs are strong, then a person can be expected to engage in prevention. When the reverse exists, these actions are unlikely (Janz & Becker, 1984). The HBM

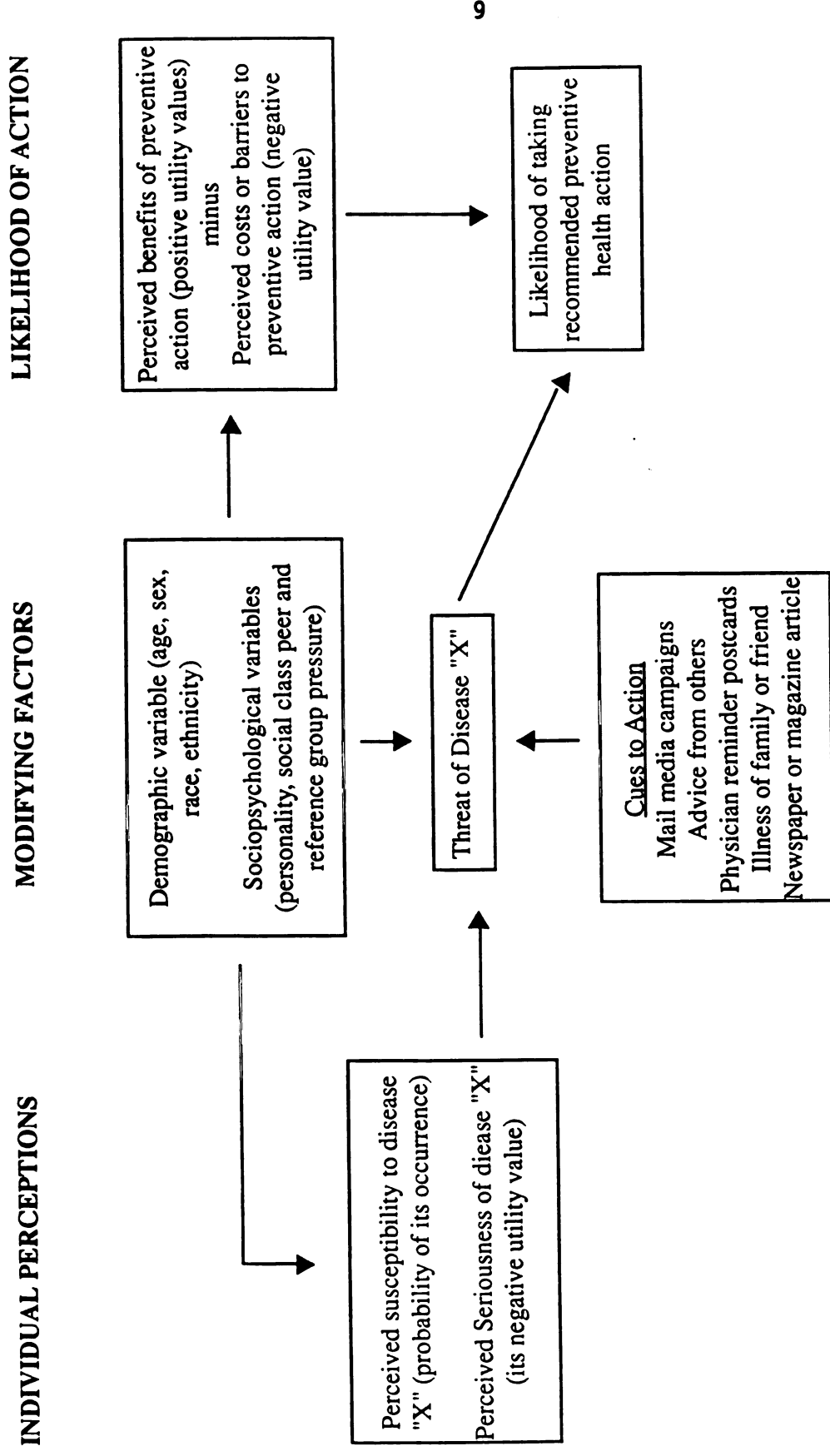


Figure 1. The HBM as predictor of preventive health behavior. Adapted from Sociobehavioral Determinants of Compliance with the Medical Care Recommendations. (Becker & Marman, 1975).

hypothesizes that health related behavior depends upon two variables: the desire to avoid illness and the belief that a specific health action will prevent or ameliorate illness (Janz & Becker, 1984). The HBM links individual attitudes about health to health actions, and hypothesizes that health-related behaviors depend upon the simultaneous occurrence of the following four items: first, the existence of motivation or a health concern; second, the belief that one is susceptible to a serious health problem, or perceives a health threat; third, the belief that following a particular recommendation would be beneficial in reducing the perceived health threat; and fourth, a decrease of the perceived barriers to participating in particular health recommendation (Rosenstock, Strecher & Becker, 1988).

The four original concepts of the HBM are defined as follows: **perceived susceptibility**, or one's subjective perception of the risk of contracting disease; **perceived severity**, or feelings concerning the seriousness of contracting the disease, or the medical consequences such as death, disability and pain; **perceived benefits**, or beliefs regarding the effectiveness of the various actions available in reducing the disease threat; and **perceived barriers**, or the potential negative aspects of a particular health action which may act as an impediment to undertaking the recommended behavior.

According to the conceptual framework of the HBM, health behaviors are more likely to occur if an individual feels susceptible to a specific condition and feels the condition is serious (Champion, 1987). Furthermore, Mikbail (1981) states that the individual's perception of susceptibility to a disease has been found to be positively related to the taking of a wide variety of preventive health actions and obtaining

screening. Similarly, Stein (1992) states that basic cognitive variables influence behavior, and that factors positively associated with behavior are an understanding of personal susceptibility to illness and understanding of benefits of treatment.

The HBM model also has **modifying factors** that influence individual perceptions. These modifying factors include demographic variables (such as age, sex, race, and education) and structural variables (such as knowledge and prior contact). Therefore, modifying factors such as education may influence knowledge of susceptibility or a clearer understanding of threat of illness.

The HBM also proposes that before care-seeking behavior takes place, the individual must experience a **cue to action** or stimulus to act. The cue might be external such as advice from family members, knowing someone with breast cancer, physician recommendation, or exposure to mass media (Lauver, 1987; Rosenstock, Stretcher & Becker, 1988). The modifying factors and the cues both influence the perceived threat of disease, the perceptions of benefit, and barriers to taking action (Rosenstock, 1974).

Likelihood of taking necessary action, or motivation, is an added concept to the HBM's four original concepts. Motivation has been operationalized as the state of readiness to take specific action (Champion, 1984).

Prior to taking action, the HBM suggests that an individual must first perceive the **benefits** of the preventive actions (or positive utility value), and then evaluate the perceived **barriers** or costs of the preventive action (negative utility value). The HBM's assumption is that individuals will not take action unless the course of action is

believed to be beneficial in reducing the threat of disease, and the perceived barriers do not outweigh the perceived benefits (Kasl, 1974). In contrast, if the benefits outweigh the barriers, then the individual will take action.

Given and Given (1984) modified the HBM to include the client's desire to comply with recommended treatment. Given and Given (1984) define compliance as the behavior or set of behaviors that a patient performs at the suggestion of the health care provider in order to maintain her health.

Rosenstock and Stretcher (1988) indicate that a weakness of the original HBM is that it ignored efficacy expectations, and thus may have failed to account for differences in behavior. In recent years the HBM has been revised to incorporate concepts of self-efficacy to explore problems of explaining, predicting and influencing behavior. Lauver (1987) defines self-efficacy as perceived competence or incompetence in one's own examination, or how well a person can act in a given situation. According to Rosenstock et al., (1988), people may fail to comply with medical advice or to take health protective actions because they fail to exhibit sufficient motivation, or because they do not think they are likely to contract the illness, or be seriously affected by it.

Relationship of the HBM and Study Variables

Selected concepts of the HBM will be used in this study to further explore barriers to mammography screening. The study will use the Given and Given (1989) modified HBM which has been adapted for the specific variables in this study. Refer to Figure 2 which demonstrates the modified HBM as adapted to the study.

HEALTH BELIEF MODEL CONCEPTS AND THEIR RELATIONSHIP TO STUDY VARIABLES

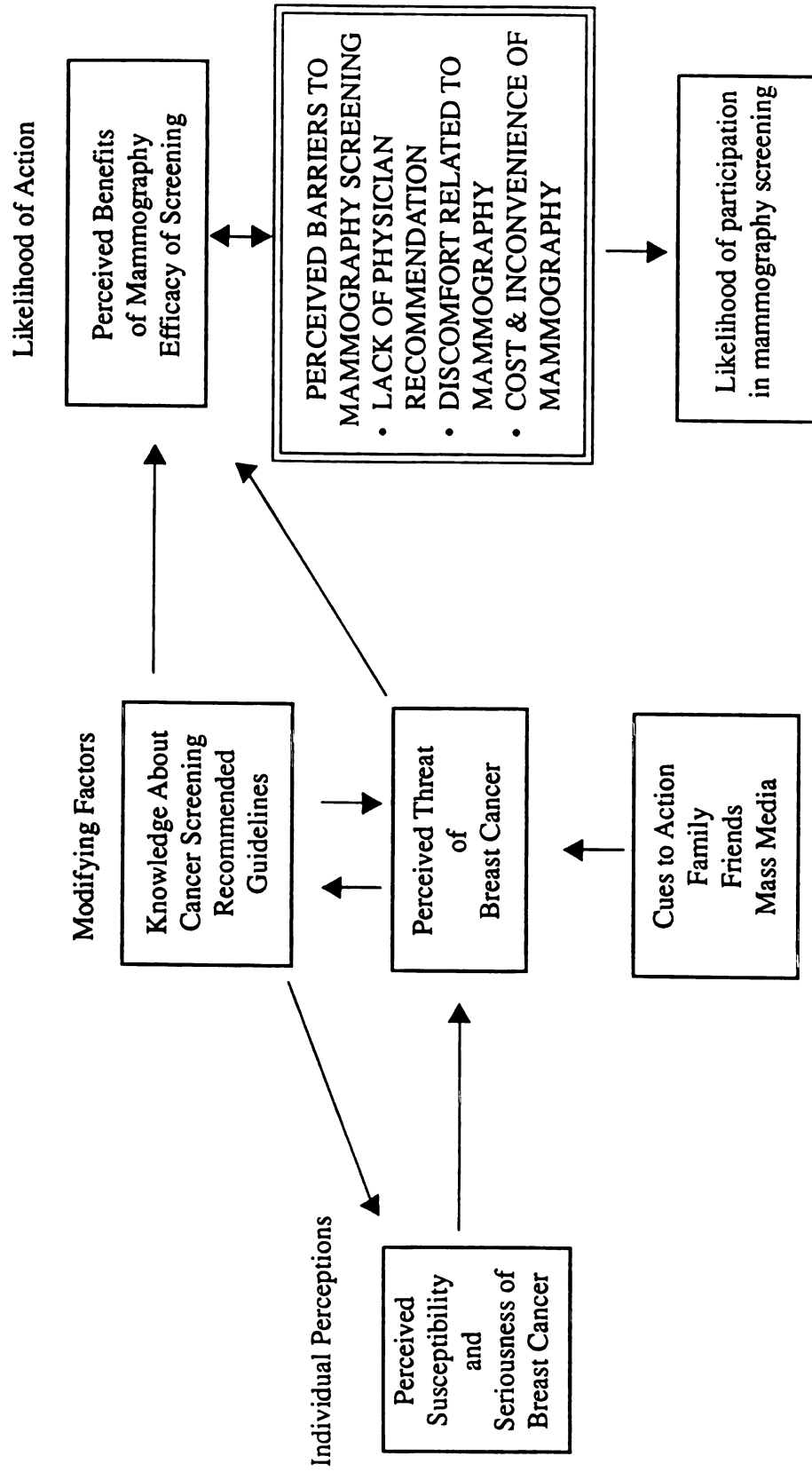


Figure 2. The HBM concepts and their relationships to breast examinations. Adapted from Assessment of Barriers and Facilitators to Screening for Breast Cancer a Worksite Approach. (Given & Given, 1989).

This study explores **perceived barriers to screening**. Therefore it involves only one component of the HBM. Study variables are found in the double lined box on the diagram. Although barriers are only one component of the HBM, the understanding of barriers to mammography is considered very important since the HBM suggests that a person can only be expected to engage in prevention if disease specific beliefs are strong and the **perceived barriers** are minimal. If the reverse exists, then screening is unlikely to take place. Therefore, a woman's perceived barriers to mammography screening may have a direct effect on the utilization or lack of utilization of mammography.

The focus of this study is on the barriers to mammography screening. But first the general adaptation of the HBM as it relates to breast cancer screening will be reviewed. Although, all components of the HBM are not in the study, the components will be discussed to give the reader a better understanding of concepts as they relate to the study.

When using the HBM (Figure 2), a basic premise underlying the model is that knowledge is a prerequisite to screening behavior. Knowledge is the factual information a woman recalls when questioned about breast cancer and screening. As indicated in the model with one-headed arrows, a woman with knowledge of breast cancer should have an awareness of her susceptibility to breast cancer, the severity of the disease, she should perceive a threat of getting breast cancer, as well as understand the benefits of screening mammography.

The first one-headed arrow on the HBM Figure 2, the one that points from knowledge to the box on the left, indicates the **perceived risk and severity of breast cancer**. The arrow implies a woman's

perception of susceptibility, or her perceived risk of breast cancer. An example of individual perception of risk could be an awareness that 1 in 9 women will develop breast cancer during her lifetime, and severity, an understanding of the seriousness of the disease.

The second one-headed arrow on the HBM Figure 2 points from the box on the left containing susceptibility and severity to the middle box which is perceived threat. The HBM implies that the combination of the two variables perceived susceptibility and seriousness together represent the implied or perceived threat of certain condition such as breast cancer. The model also shows two arrows the first one, directed from knowledge to perceived threat and the second one, from perceived threat to knowledge. This helps explain, first, that a woman with knowledge about breast cancer would perceived breast cancer as a threat and would be concerned with how serious or life-threatening the disease would be and second, that the level of perception of threat may vary depending on the knowledge that each individual has regarding breast cancer. According to the HBM, modifying factors influence perceptions about the threat of a disease, and therefore influence preventive behavior. Literature reviewed for this thesis indicates that some studies that explore breast cancer prevention have revealed that demographic characteristics have influenced participation in preventive behaviors (Rimer et al., 1991; Smith & Haynes, 1991; Stein, 1992). For example, women who are younger, better educated and have higher income tend to have more knowledge about cancer risk and the seriousness of disease, and therefore get mammograms more frequently than women who are older, poorer and have less education.

Similarly, (Figure 2) the HBM suggests that, cues to action, as indicated in the box located directly below the perceived threat box that contains a one-headed arrow pointing toward perceived threat, can be defined as a stimulus to act, or any measure that supports and promotes participation in preventive behavior. Rosenstock et al., (1984), state that a cue to action must occur to trigger the appropriate health behavior. Cues to action can come from educational campaigns via the media to increase women's knowledge regarding breast cancer, or from the encouragement of family and friends.

Third, the HBM Figure 2 shows a one-way arrow from knowledge to a box located to the right of the diagram, or the perceived benefits of mammography. Benefit is defined as the effectiveness of a specific behavior. A woman with knowledge about breast cancer should be aware of the benefits of mammography, or believe that mammograms can detect breast cancer early. Women who understand the efficacy of mammography would be aware of the benefits of early detection, and would understand that the outcome and survival rate of cancer strongly depends on finding breast cancer early via mammography, or before the cancer has an opportunity to spread.

Given and Given (1984) state that knowledge and perception of benefits are factors that correlate with compliance. Figure 2 shows an arrow from perceived threat to perceived benefits, because according to the HBM, knowledge regarding susceptibility, severity and threat of disease, plus knowledge of perceived benefits of a health care behavior, would be the motivator for a client's participation in preventive action. Likewise, Janz and Becker (1984) state that the combined levels of susceptibility and severity and benefits provide the energy and force

to act; minus perception of the ratio of benefits to barriers which provide the direction or preferred path of action. However, in order to take action, the HBM suggests that an individual must perceive sufficient benefits to a specific action while perceiving few barriers (Stein et al, 1992).

This study explores **perceived barriers** to mammography screening, as indicated in the model by a double lined box found on the diagram, Figure 2, directly under benefits. The diagram Figure 2, shows a two-headed arrow between benefits and barriers because the two variables benefits and barriers may relate to a positive or negative aspects of taking action (Champion, 1987). The two headed arrow on Figure 2 signifies the variations in the relationship between barriers and benefits or the exchange that can take place, since benefits must be perceived through barriers. The HBM suggests that an individual must perceive sufficient benefits to a specific action, while perceiving few barriers for action to take place.

Likewise, if an individual perceives numerous barriers, and few benefits, then action will not take place. Therefore, if the barriers outweigh the benefits, early detection via screening mammography may not occur.

It is evident in the literature that many existing barriers are currently preventing women from participating in mammography screening. Stein et al., (1992) state that reviews of studies using the HBM as an explanatory model have found that the variables of perceived susceptibility and perceived barriers are usually the most important predictors of preventive health behaviors.

Therefore, this investigation will explore three barriers to mammography screening related to lack of physician recommendation, to discomfort related to mammography, and to cost and inconvenience of obtaining mammography.

The HBM in the past has conceptualized physician recommendation as a cue to action. However, current literature suggests that women, who have been non-compliant with screening, have revealed that lack of physician recommendation is one of the reasons. Since lack of physician recommendation has been a factor associated with the lower likelihood of mammography, for the purpose of this thesis, lack of physician recommendation will be explored as a possible barrier to obtaining mammography.

The literature also has revealed that for many women discomfort related to the mammography procedure may be a barrier to participating in breast cancer detection (Hamwi, 1990; Kurtz et al., 1994; Stein et al., 1992). Therefore, it is possible that for many women concerns related to discomfort such as embarrassment, anxiety, pain or discomfort related to the procedure may be a barrier to mammography. In addition, for many women access barriers such as cost and inconvenience may be barriers to recommended screening (Stein et al., 1992).

Rosenstock et al., (1984) state that prior to the occurrence of a positive health action, the individual estimates the action's potential benefits in reducing severity or susceptibility weighed against their perceptions of physical, psychological, financial or other barriers of the proposed action. Therefore according to the HBM's conceptual framework if the barriers are too great, preventive behavior will not take place. Similarly (Nemeck, 1990) states that when perceived

barriers to engaging in prevention are minimal and other disease specific health beliefs are strong a person may be expected to engage in prevention.

Rimer et al., (1991) state that, according to concepts of the HBM, a woman will tend to get a mammogram if she believes first, that she is vulnerable to breast cancer; second, that breast cancer is a serious disease; third, that mammography is an effective method of early detection; fourth, that early detection of breast cancer increases the probability of cure; and fifth that the benefits of mammograms outweigh any barriers or costs involved. However, as the model suggests, if perceived barriers are greater than benefits women participation in mammography is less likely.

In preventing the spread of breast cancer, it is necessary that women be motivated to follow recommended breast cancer prevention guidelines. Champion (1984) defines health motivation as a state of concern about general health matters, which result in positive health activities and willingness to seek and comply with activities that are aimed at decreasing or preventing disease or the likelihood of taking action, indicated in the model by a single headed arrow below both containing perceived barriers. A cognitive decision to participate in early detection by obtaining screening mammography must be made by each woman on an individual basis.

Therefore, following concepts of the HBM, women who understand the seriousness of breast cancer and the benefits of early detection via mammography and who perceive few barriers would be more likely to comply with mammography screening. Health care providers must continue to explore barriers to mammography, in an effort to better understand, and

thereby decrease the perceived barriers to screening. Decreasing barriers to mammography may result in an increasing number of women age 40 and older complying with screening guidelines and making a decision to participate in yearly mammography screening, thus decreasing the current mortality rate from breast cancer.

Literature Review

An extensive literature search was done, and literature relevant to breast cancer and mammography was reviewed. Articles in the literature revealed diverse research findings and the existence of a wide variety of barriers to mammography screening. Relevant research pertaining to mammography barriers was reviewed related to lack of physician recommendation, discomfort related to mammography procedure, and cost or inconvenience of mammograms. These will be presented in an effort to underscore the barriers that currently prevent women from adhering to life-saving mammography screening guidelines.

The literature suggests that most women are aware of mammography. Several researchers found that approximately 91% of women reported having heard of mammography (Richardson, Marks, Solis, Collins, Birba & Hisserich, 1987; Rimer et al., 1990; Smith & Haynes, 1991). However, while most women have heard of mammography, many women are non-compliant with screening. Studies revealed that some of the reasons for non-compliance with mammography may be related to perceived barriers to mammography screening (Lane & Burg, 1990; Weinburger, Saunders, Samsa, Bearson, Gold, Brown, Booher & Loehrer, 1991). Barriers to be discussed are those relevant to the study.

Lack of Physician Recommendation

Many research studies have explored lack of physical recommendation as a possible current barrier to mammography. Literature reveals that physicians play a major role in determining whether women have mammograms, and a physician's endorsement of mammography can have a powerful impact on patient motivation. Stein et al., (1992) found that many women, who do not get mammograms, have stated that their physician has nether discussed mammography nor recommended they get a mammogram.

Conversely, according to Rimer et al., (1990) women who perceive that their primary physicians have strongly have recommended mammograms, are significantly more likely to obtain them. Studies estimate that more than 80% of women would get mammograms if referred by their physician (Fox et al., 1988; Rimer et al., 1990; Schechter et al., 1990; Zapka, Stoddard, Costanza & Greene, 1989). However, a 1989 nationwide survey reports that only 37% of physicians follow ACS mammography guidelines (Stein et al., 1992). The survey suggests that physicians under-refer women for mammograms. Their powerful role to refer women for mammograms must be recognized and addressed.

Consistently, research findings indicate that one of the most frequently encountered barriers to mammography screening is the lack of physician recommendation (Kruise & Phillips, 1987; Rimer et al., 1991; Schechter et al., 1990; Smith & Haynes, 1991; and Vernon et al., 1991). Researchers have found that physicians have ample opportunities to recommend breast cancer screening to their patients, since most studies indicate that a large percentage of women have an usual source of health care and a regular provider (Lantz et al., 1990; Richardson et al., 1987; Zapka et al., 1989).

In the study of Anda et al., (1990), 80% of the women interviewed reported having a regular physician, or a "check up" within the past year. Yet, of these women who reported having a check up with their regular physician, only 29% of those age eligible reported having a mammogram within the same year. The Richardson et al., (1987) study of Hispanic women indicated that 97% of the women reported a routine place to go for health care. Of these, 61% stated that they had a complete physical exam in the past year. Yet, 74% of those interviewed had not had a mammogram that year, and 82% reported that their physician had not suggested that they have one. According to Schechter et al., (1990) research shows that most women see a physician on the average of five times a year. Brown (1989) states that the problem is not a lack of access to a physician. Rather, the problem is that many women say their doctor never recommended mammography. In addition, Brown (1990) reports many women state that if a mammogram was that important, then their doctor would have said so and recommended one. Similarly, Rimer & Keintz (1989) found that a woman's belief that her doctor believed in regular mammography was an important predictor of mammography compliance.

Richardson et al., (1987) found that many women were not referred to mammography due to lack of physician recommendation, and three years later, Lane & Burg (1990) completed a similar study which likewise revealed many women still were not being referred to mammography, since 44% of women who had not had mammogram stated they did not get a physician referral. By contrast, some improvements were noted in the 1990 Lantz & Soref study, where 61% of women age 50 and older reported

seeing a physician within the past year and of those only 4% reported not being referred for mammography.

An interesting finding in the literature is that all physicians do not refer their patients for mammography on a regular basis and that there is no consistency among physicians regarding referrals for screening. Smith and Haynes (1991) state that a significant factor related to having a mammogram is the physician specialty, and that according to the particular specialty, the chances of having a mammogram referral may increase or decrease. Obstetricians and gynecologists far exceed general internists and family practitioner colleagues in following guidelines for screening (Smith & Haynes, 1991; Zapka et al., 1989). Similar findings were reported by Lane and Burg (1990) in their study of physician referral practices. The study revealed that 85% of gynecologist consistently refer older women for mammography, while the referral rates for family physicians and internists were only 30% and 27% respectively.

Further evidence of the gatekeeper function for mammography is demonstrated in the study done by Fox et al., (1988) which demonstrates the underuse of screening mammography by the Michigan Academy of Family Physicians. Study results revealed that almost two-thirds of the physicians gave only one reason for referring women who were under age 50, as well as those over 50: the patient at risk for breast cancer. Therefore, most referrals were usually made for diagnostic purposes. Only 22% of the physicians reported the most frequent reason for referral was for yearly screening.

Rimer et al., (1990) conducted a survey of 300 physician's breast screening practices. Results indicated that only 71% of the physicians

ordered mammograms for all women age 50 to 75, as recommended the NCI and ACS. The low rate of mammography referral is a problem of particular concern, since women over 50 are at much higher risk than those who are younger (Lane & Burg, 1990).

Seventy-five percent of the breast cancers occur in women with no risk factors other than their sex and advancing age (Hortobagyi et al., 1990). Therefore, the importance of screening mammography for all women, specially including those age 50 and older, can not be overstated.

Wheat, Kunitz and Fisher (1990) indicate that medical schools should put more emphasis on preventive medicine in their residency programs. They also state that few studies have examined the screening behavior of hospital based resident physicians, despite the importance of this training period in influencing later practice.

Therefore, these researchers did a study in the medical clinics of two university affiliated teaching hospitals. Results of their study revealed poor compliance by residents with recommended mammography screening guidelines. Forgetfulness on the part of the provider was an important reason for poor compliance. Results of Wheat et al., (1990) research indicated that 23% of residents responded "I just forget" as a response for not recommending mammography screening. The Wheat et al., (1990) study is significant because this information serves as a reminder that one must not overlook the importance of educating physicians early on in their medical training regarding the need of adequate referral for mammography screening and the importance of their role in making appropriate referrals.

An interesting situation was found by Hortobagyi et al., (1990) where they found that some physicians reported feeling uncomfortable suggesting the examination and referring women for mammography during a hospital visit or, at a time when the client has sought attention for an unrelated condition. According to Lane and Burg (1990) a possible explanation for the lower referral rates for older women visiting family physicians, could be that they present with a multitude of chronic medical problems and the visit is not for health promotion or prevention.

The current low mammography screening rate is a complex issue. When exploring reasons for low mammography referral and perceived barriers as reported by women, one cannot overlook, physician reported barriers to utilization by patients. Smith and Haynes (1991) state that, although women report lack of physician referral as the most frequently given reason for lack of screening, investigations reveal that physicians themselves have numerous concerns about referrals and report barriers to screening by their patients.

An example of physician reported barriers is found in the Weinberger et al., (1991) study of breast cancer screening practices for older women, results indicated that 86% of physicians were aware of the ACS guidelines for women age 50 and over, and 93.7% agreed with the statement "mammography can effectively detect early cancers in asymptomatic women." Yet physicians reported screening elderly women less often than younger women. Overall, according to Weinberger et al., (1991) the top concerns for physicians or reported physician barrier to screening are: inadequate insurance coverage, patient reluctance and discomfort.

The provider referral problem is a complicated one. Stein et al., (1992) state that, although physicians referral to mammography strongly influences whether a woman gets screened, there is also a behavioral and motivational component to mammography utilization on the women's part also. According to Smith and Haynes (1991) one controversy concerning this issue is that currently there is no clear sense of where the responsibility for scheduling routing breast cancer screening lies. Some feel that routine breast cancer screening is a woman's responsibility, and others believe in the notion of shared responsibility, i.e. that both the physician and the woman are responsible for assuring timely screening for breast cancer.

However, the clear message received from women is that they rely on their physician to tell them when they need a mammogram (Brown, 1989). However, although physicians appear in principle to support preventive medicine, they comply poorly with screening recommendation (Wheat et al., 1990).

Anda et al., (1990) state that physicians have excellent opportunities to refer women, and that through education, early detection and appropriate treatment physicians have not only the opportunity, but an obligation to order screening mammography for all their patients and thus increase the cure rate and decrease the mortality rate of women from breast cancer.

Implications of the Literature Review. The literature reveals that a number of studies have been done regarding utilization of mammography. Studies have generally found that a physician recommendation to mammography strongly influences whether a woman gets screened (Stein et al., 1992). In addition, researchers agree that

women who perceive their physician strongly recommending mammography are more likely to be compliant with screening (Lane & Burg 1990; Lantz, Remington & Soref, 1990; Rimer et al., 1990).

Based on the literature review, most of these studies were conducted in large metropolitan areas (Stein et al., 1992; Zapka et al., 1989), medical centers (Rutledge et al., 1988) or HMO's in large cities (Rimer et al., 1991). Thereby, more research is needed using a different population. This study is important because it intends to contribute to the current information, by exploring if lack of physician recommendation is a barrier to screening in women who live in rural populations of four counties in Michigan.

Discomfort Related to Mammography Procedure

Several articles were reviewed in an effort to evaluate barriers related to mammography screening related to the discomfort of the procedure. The literature reviewed showed that discomfort of mammograms is currently a barrier to mammography screening. Kurtz et al., (1994) participated in a research designed to investigate facilitators and barriers to breast cancer screening in working women. Results of their study revealed that for many participants discomfort related to the mammography procedure was a statistically significant finding. Study participants were asked to identify some of the unpleasant reasons for non-compliance with mammography, and findings revealed several reasons why women found mammograms unpleasant. These included pain and embarrassment. Lantz et al., (1990) explored barriers to mammography screening in women who had never had a mammogram.

Respondents were asked to give reason why they had never had a mammogram, 10% responded they thought mammograms might be painful and 9%

responded mammograms would be embarrassing. Similarly results of the Richardson et al., (1987) study of elderly women revealed that subjects were nervous to have their breast examined by a doctor, and that nervousness and embarrassment were significant barriers to mammography screening.

In 1992, Stein et al., participated in a research of mammography usage. Study data indicated that embarrassment and pain both were significant barriers to mammography screening. Likewise, a survey by Lane and Burg (1990) revealed that one of the reasons women gave for not participating in mammography was a fear that the examination might be painful.

An interesting research study was conducted by Weinberger et al., (1991) to evaluate barriers to screening older women as reported by physician. Results indicated that physicians have concerns for their patients relating to the discomfort of the mammography procedure since 45% and 51% of physicians felt that mammography would be uncomfortable or painful to their 65 and 75 year old patients.

Implications of the Review. The literature review reveals several studies that have reported barriers to mammography related to discomfort, the studies however are limited in numbers. For example, Richardson and Marks (1987) found that elderly women reported embarrassment and nervousness as a barriers to screening also embarrassment was a barrier in the study of Stein et al., (1992) which involved women age 35 and older. In the study of Rutledge et al., (1988) a slightly different variable was investigated, since women only reported "bad feeling about the mammography procedure".

The study of Kurtz et al., (1994) which researched barriers and facilitators to mammography screening, was a study conducted at the worksite and involved a population of middle class women who were mostly well educated. Results of study findings provided evidence that discomfort related to mammography was a significant barrier to screening.

In sum, there is evidence in the literature that discomfort of mammography is a barrier to screening. Considering the data available, further research needs to be done. This study will further explore discomfort related to mammography using data from a population of women living in rural counties of Michigan. It is hoped that information obtained will contribute to current evidence that the discomfort related to the mammography procedure may be a barrier to mammography screening. Through further research, more could be learned about women's attitudes about the discomforts of mammography. The information obtained could be used by health care providers to attempt to decrease barriers related to discomfort of procedure and therefore enhance women's compliance with screening.

Cost and Inconvenience of Mammograms

Literature review reveals that cost and inconvenience can also be deterrents to mammography screening (Schechter et al., 1990; Stein et al., 1992). Strax (1988) states that for women in low-income brackets, the cost of mammography is certainly a very important issue. Especially, since in the United States the cost of a mammogram can be anywhere from \$25 to \$250, with an average cost of \$100-\$125 (Council on Scientific Affairs, JAMA, 1989). Mammograms in the city of Lansing, Michigan varied in cost from \$67 to \$180 (Kurtz et al., 1994).

Although, research studies indicate that the number of women obtaining mammograms has substantially increased in the last several years, this increase is higher among white, middle and upper socio-economic level women (Zapka et al., 1989). Smith and Haynes (1991) agree stating that surveys conducted to date have revealed predictable patterns of experience with mammography by age, race and socio-economic status. Higher education and higher income are positively associated with ever having had a mammogram (Anda et al., 1990; Lane & Burg, 1990; Kruise & Phillips, 1987; Smith & Haynes, 1991). Clearly, studies indicate that although the trends in the percentages of women obtaining mammography continue to increase, not all groups of women are benefiting equally from the increasing trends in screening.

A study was conducted by Anda et al., (1990) the purpose of their study was to assess current trends in the percentage of women 50 years of age and older who have had a screening mammogram. Study findings indicated that, cost was found to be an important factor. For women whose household income was less than \$10,000, only 22% reported having a mammogram while women whose household income was greater than \$35,000 a total of 38% had a screening mammogram the previous year. These research findings show that women belonging to lower socio-economic groups continue to receive less screening (Kruise & Phillips, 1987; Rimer et al., 1991; Smith & Haynes, 1991).

It is disturbing that older women and women of low socioeconomic status were least likely to have been screened than those with better household incomes. However, this also could be confounded by women's lack of knowledge regarding screening. Furthermore, these researchers comment, that the tendency for populations at higher risk of disease

(such as older women) to be least likely to be screened has not only been observed in breast cancer screening, but also in other preventive services such as, papanicolaou smears and hypertension screening. Anda et al., (1990) state that this tendency is termed "reverse targeting" and may be due, at least in part to lack of insurance coverage.

For many women today mammograms are not accessible due to barriers related to cost (Ansel & Dillard, 1988; Council on Scientific Affairs, JAMA, 1989). In the Rimer and Trock (1991) study 63% of the HMO, and 53% of the control group gave low cost as a potential reason for getting a mammogram, furthermore research participants stated that they would get a mammogram, if it were free.

Similar findings were those reported in the research study of Vernon, Vogel, Halabi, Jackson, Lundy and Peters (1991) who used a multi-ethnic sample of women to compare whites, blacks and hispanic with respect to behaviors and attitudes toward breast cancer screening. More than 64,000 women participated in the project. Results indicated that for 33% of participants, one of the most important reasons for not participating in screening was the cost of mammography. Similarly, in the study of Rutledge and Hartman (1988) 15% of participants reported high cost and 11% inconvenience as barriers to participation in mammography screening.

Convenience of location is also an important factor, Smith and Haynes (1991) state that women who live in urban areas are more likely to have mammograms than women who live in rural areas. In the study of Vernon et al., (1991), participants indicated that a reason for not obtaining mammography for 15% of black females was related to inconvenience and 13.8% of hispanics the location of mammography site

was a barrier. Likewise, the Schechter et al., (1990) and Rimer et al., (1991) studies revealed that access barriers such as inconvenience and distance to mammography facility were an important barrier to mammography.

Another study done by Lantz et al., (1990) who explored women's knowledge of, use of, and concerns about mammography. Results indicated participants had several concerns regarding mammography screening. Result finding indicated that greatest concern for 22% of participants was related to cost of mammography, while 15% of participants reported that mammograms were inconvenient to obtain.

Likewise, Rimer et al., (1991) explored access barriers to mammography. Of the women getting mammograms, 64% of the HMO group and 61% of the control group gave convenience as a potential reason for getting a mammogram. Similarly, the Kruise and Phillips (1987) study demonstrated that 50.2% of the women who responded, categorized reduced cost of mammograms as a very important factor for getting one.

For many women cost or inconvenience is an important barrier that needs to be looked at when examining factors related to compliance with mammography. Rutledge et al., (1988) study offered participants the opportunity to participate in mammography screening for a cost of \$40.00. Interestingly, results indicated that for the women who participated screening cost and convenience served as an influence, since 62% cited the low cost of the mammogram and 85% cited convenience as having much influence in their participation in the screening. However, in contrast when non-participants were asked to identify barriers to mammography 31% still mentioned that the high cost of the

procedure was a barrier and 15% reported inconvenience as having much influence in their decision not to participate in the screening.

Similarly, in the study of Rimer et al., (1989) non-compliers with mammography were more likely to believe that mammograms were too much trouble and inconvenient. Study findings indicate that for some women even the small cost of a so called "low cost" mammography may still represent a barrier that needs to be addressed.

Brown (1989) summarizes access barriers to mammography screening, by stating that for women multiple access barriers to mammography exist today, since, getting a mammogram takes time, is costly, requires transportation, loss of work time, may require babysitters and is generally inconvenient. Further, research needs to be done, to evaluate the extent to which access barriers such as cost and inconvenience are currently preventing women from participating in mammography screening. Also research to further explore if providing on site, reduced rate mammogram may in the future reduce barriers for many women and enhance compliance with mammography screening may prove to be beneficial.

Implications of the Review. In a comprehensive review of the literature there is considerable evidence that cost and inconvenience are barriers related to non-compliance with mammography screening. Many authors conclude that cost is a barrier to screening (Vernon et al., 1991; Kruse and Phillips, 1987; Lantz et al, 1990) authors also agree that inconvenience such as long distance to facility (Rimer et al., 1990; Schechter et al., 1990) is a barrier. Most of these studies however, were conducted in large urban areas.

Interesting findings were those of Smith and Haynes (1991) which demonstrated that women who live in urban areas tend to obtain

mammography screening more than women who live in rural areas and Anda et al., (1990) who conducted research within a Health Department setting and found that women of lower socio-economic status also tend to obtain less mammography.

Based on the review of the literature, further research is needed in an effort to better understand the access barriers related to cost and inconvenience of obtaining mammography. This research will contribute to current knowledge by analyzing data of women residing in rural counties of Michigan in an effort to further evaluate barriers to mammography related to cost and inconvenience of women living within rural populations.

In summarizing the studies reviewed, it is important to note that many of the research studies consistently cited a multitude of barriers to screening. Frequently, the literature documents numerous existing barriers to screening related to lack of physician recommendation, discomfort related to mammograms or access barriers.

From the literature reviewed, one of the most basic explanations of why women have not been screened with mammography was their doctor did not refer them for mammography screening. According to Smith and Haynes (1991) this explanation independently accounts for about 30% of the "most important reason" offered by women for not having a mammogram.

Therefore, since 30% of women report lack of physician recommendation as a barrier to screening this is indicative that this barrier merits further research. In addition, since the literature suggests 70% of women have other possible explanations related to barriers, such as cost or inconvenience of obtaining mammograms, further

research regarding perceived barriers to mammography screening is necessary.

Need for Study

The HBM postulates that certain basic cognitive variables influence behavior, however in order for behavior to occur there need to be relatively few barriers (Stein et al., 1992). Keeping in mind that if an individual perceives multiple barriers to mammography screening the early detection will not take place, therefor it is of utmost importance to have a better understanding of the barriers which currently are so strongly preventing women from following recommended breast cancer screening guidelines and getting mammograms.

It is very likely that relevant information related to barriers that keep women in this community from participating in mammography screening can be obtained through this research.

Knowledge gained from this research in areas related to lack of physician recommendation, discomfort of mammography, or access due to cost and inconvenience, can be used to develop more effective strategies to increase women's participation in screening mammography. If more women participated in mammography screening breast cancers could be detected early, the disease could have a better prognosis and the cancer death rates would be reduced.

Methods

A retrospective, descriptive, secondary analysis of data was used in this study to identify and to investigate perceived barriers to mammography screening which prevent women from following the recommended mammography guidelines and obtaining screening mammography.

The original study from which this data was collected was The Rural Breast Cancer Project. Given and Given were the co-principal investigators in this research study, which was co-sponsored by Michigan State University Breast Cancer Center, Ingham County Health Department, the Cooperative Extension Service, community hospitals and health care providers. The Rural Breast Cancer Project was funded by a grant from the American Cancer Society-Michigan Division to provide breast cancer screening to women in Michigan. A description of the original study is provided in Appendix A.

Sample

The sample for this retrospective secondary analysis consisted of all of the women who completed the questionnaire for the original study. The research sample consisted of 226 women. Criteria for inclusion in this study was the same as in the original research study. Therefore, study participants were women age 40 or older; who did not have breast cancer; and who never had a mammogram, or did not have a mammogram within 5 years prior to the original study.

Operational Definition of Study Variables

For this study, selected items used to explore barriers to mammography screening were obtained from the instrument entitled Rural Breast Cancer Screening Project Questionnaire used in the original project. The original instrument is provided in (Appendix C).

Barriers to Mammography Screening.

1. Lack of physician recommendation

Lack of physician recommendation was defined as there being no educational intervention or discussion by a physician to their patient regarding mammography and no recommendation to screening. To address

the question of whether lack of physician recommendation is a barrier to mammography screening, participants in the original study were asked if their physician had ever discussed mammography with them or suggested that they obtain a mammogram. Specific items selected from the instrument to explore if lack of physician recommendation is a barrier to screening are as follows:

Question 12v. My doctor has never suggested that I have a mammogram.

Question 22. Has your doctor advised or discussed mammography with you?

Question 12v. Scored on a 4 point Likert scale with responses ranging from strongly disagree (1) to strongly agree (4), while question 22 was scored with a yes-no response.

Therefore, in order to appropriately measure responses, question 12v was recoded to a dichotomous response, so that strongly agree and agree represented (1) a yes response and strongly disagree and disagree represented (2) a no response. Both responses to questions 12v and 22 were compared for consistency in recognizing a barrier and coded as one response. Combined responses of yes to question 12v and a no response to question 22 were coded as representing (1) yes, which corresponded to a barrier to mammography screening. Compared responses of no to question 12v and yes to question 22 represented (2) a no response which corresponded to no barrier. The frequency and percentage of women who reported lack of physician recommendation were used to indicate if, lack of physician recommendation was a barrier to screening.

2. Discomfort Related to mammography procedure

Discomfort was defined as any unpleasant physical or emotional response, that was related to the mammography procedure whether is perceived or actual, that prevents a woman from obtaining mammography. It includes anxiety, embarrassment, nervousness, discomfort or pain. To address the question of whether discomfort related to mammography was a barrier to screening, participants were asked if mammograms are unpleasant, painful, embarrassing, or made them feel anxious or uncomfortable. Specific items selected from the instrument to explore if discomfort related to the mammography procedure is a barrier to screening were the following:

- Question 12c.** A mammogram is an unpleasant procedure.
- Question 12e.** A mammogram is painful.
- Question 12b.** A mammogram is an embarrassing procedure.
- Question 12f.** A mammogram would make me feel anxious.
- Question 12i.** A mammogram makes me feel uncomfortable.

The discomfort questions were combined to form a 5 item discomfort scale consisting of items "unpleasant, painful, embarrassing, anxious and uncomfortable". The five discomfort questions were scored on a four point Likert scale with responses ranging from strongly disagree (1) to strongly agree (4).

Discomfort items were combined to make a discomfort scale. Then the frequency, percentage of responses, mean and standard deviation were calculated for the discomfort scale. A high mean score represented a high level of discomfort, and a low mean score represented a low level of discomfort.

3. Cost and inconvenience of mammography

Barriers related to cost and inconvenience were defined as any situation that prevents a woman from getting a mammogram related to the high cost of the procedure, or a hardship or difficulty in obtaining a mammogram due to either lack of availability or inconvenience. To address the question of whether access barriers related to cost or inconvenience are a barrier to mammography participants were asked if mammograms are a hardship due to cost, and if mammograms were inconvenient to arrange or unavailable near their area of residence. Specific research items selected from the instrument to explore barriers related to cost and inconvenience of mammography are the following:

Cost of obtaining a mammogram

Question 12d. A mammogram is a hardship due to cost.

Inconvenience of obtaining a mammogram

Question 12g. A mammogram is convenient to arrange.

Question 12i. A mammogram is not available in my area.

Both cost and inconvenience questions were scored on a 4 point Likert scale with responses ranging from strongly disagree (1) to strongly agree (4). The cost question consisted of one item which addresses the cost of mammograms, and inconvenience consisted of two separate items which were combined to address the inconvenience of mammograms. Two separate analysis were done, one to address the cost barrier and the other to address the inconvenience barrier.

First the frequency, percent, mean and standard deviation were calculated for the cost item. A high mean score on the cost item represented a hardship or a barrier.

A descriptive analysis was done to evaluate if cost was a barrier for women who reported higher vs. lower income and for women who had insurance vs no insurance.

The inconvenience questions were worded such that one was negative and the other was positive. Therefore, item 12g will be reverse scored. The frequency and percent were calculated for each inconvenience item. Then the two inconvenience items were combined to form an inconvenience scale. The mean and standard deviation was calculated on the inconvenience scale, with a high mean score on the inconvenience item representing a barrier.

Description of Instrument

The Rural Breast Cancer Screening Project Questionnaire is a 37 item instrument intended to measure women's attitudes toward breast cancer screening. The instrument was developed by Co-Principal Investigators B. Given and C. W. Given, for the original research project. The original questionnaire is provided in (Appendix C). Items that were consistent with the conceptual definition for this study, were selected from the questionnaire in the original study. A list of selected study items is provided in (Appendix B).

Validity

Validity refers to the degree to which an instrument measures what it is intended and presumed to measure. The discomfort scale was identified as an independent scale by factor analysis in the original study. Demonstrating instrument validity for the scales, is beyond the scope of this research paper.

Reliability

Measures of reliability, or internal consistency were conducted on the original instrument by the co-principal investigators. Cronbach's alpha coefficient for discomfort scale in the original instrument was .85. Selected items of the 37 questions in the original instrument were used. The items that were selected from the subscales of the original questionnaire are consistent with the concepts in this study. There is no reliability data available for other items from inconvenience and lack of physician recommendation. Measures of reliability were calculated for the constructs of discomfort, cost and inconvenience used in this study.

Data Collection

Data for the original study was collected by self-administered questionnaires and telephone interviews (refer to Appendix C for original questionnaire). For this study, data was obtained from a computer disk of the original project, containing the variables necessary for this study. The disk was provided by the primary investigator. Therefore, analysis of variables for this study, related to barriers preventing women from participating in mammography screening, were those of the original research project.

Human Subject Protection

The primary study was approved by the University Committee on Research Involving Human Subjects (UCRIHS) prior to initiation of the research project. The rights of the respondents in the primary study were protected through adherence to standard criteria set forth by the Michigan State University Committee on Research Involving Human Subjects. This study consisted of a secondary analysis from the primary

study. Data obtained from computer disk provided for this research contained coded material only. No access was available to individual names or primary study participants. Therefore, confidentiality of participants was assured.

Analysis of the Data

Descriptive statistics were used to describe the socio-demographic characteristics of the sample. Socio-demographic variables that were included were age, ethnicity, marital status, education, and income. A table summarizing distribution and percentages of subjects by demographic variables will be presented in the next section.

Each of the research questions were answered by using the following methods:

1. Lack of physician recommendation

The percentage of women who reported no physician recommendation indicated whether a lack of physician recommendation was a barrier or not a barrier to obtaining a screening mammogram. Then Chi Square statistics was used to compare the two percentages, to see if the proportion of women considering lack of physician recommendation a barrier was different from the proportion of those not considering physician recommendation a barrier to screening.

2. Discomfort related to mammography procedure

The frequency and percent was calculated for each discomfort response. Then a scale was made of the discomfort items. The mean and standard deviation was calculated for the discomfort scale. High scores represented a high level of discomfort. High level of discomfort corresponded to a barrier to mammography screening related to discomfort construct.

3. Cost and Inconvenience of mammography

The frequency, percent, mean and standard deviation was calculated for the cost item. Cost item was then described looking at income and insurance, from frequency and percent. The frequency and percentage of the inconvenience item was calculated. Then the two inconvenience items were combined and the mean and standard deviation was calculated for the inconvenience scale. Responses corresponding to a high score indicated a barrier, responses corresponding to low scores indicated no barrier related to cost or inconvenience of mammography procedure.

An analysis of the data and findings relevant to the research questions were presented in the next chapter.

Assumptions and Limitations of Study

This study was a secondary analysis which used data from an original study. The questions used in this study originated from an already established questionnaire, prepared for the original study. The definition of concepts in the original study had considerable variations from the concepts in this study. Therefore, this study was limited by questions prepared for the original study and which may not completely capture all of the concepts intended in this study. In addition due to using secondary data the opportunity to expand the questionnaire was not available for this study.

Another possible limitation of this study is due to the fact that the sample was not a random sample, but a convenience sample from the original study. Considering that this was a convenience sample the results obtained from the data can only apply to the group of women who responded to this particular questionnaire and cannot be generalized.

Assumptions of this study are that the women who answered the self-administered questionnaire in the original study answered the questions truthfully. In addition, this study makes the assumption that the data collected in the original study was coded and entered correctly and accurately.

Data Presentation and Analysis

Overview

A description and analysis of the sample is discussed in this chapter. Data relevant to each of the research questions used to examine barriers to mammography screening is presented. Additional relevant findings from data analysis is also discussed.

Sample Characteristics

The sample for which data was available and analyzed for this study consisted of 226 women who completed the questionnaire. While 226 women were enrolled in the study, approximately 160 subjects generally responded to items in the questionnaire with other respondents only responding to parts of the questionnaire. Therefore, because many of the women did not complete the questionnaire, the sample for this study consists of 160 participants. The subjects were mostly from Livingston county with $n=132$ (58.4%), followed by Ingham county $n=84$ (37.2%), Shiawassee county $n=9$ (4 %), and Barry county $n=1$ (0.4%).

As seen in Table 1 the age of the participants ranged from 34 to 90, with eight participants not meeting age guidelines. The eight participants (5.3%) not meeting age guidelines ranged in age from 34 to 39 and were included in the analysis, since according to ACS guidelines they should obtain a screening mammogram. The mean age of the participants was 53.9 with a ($sd= 12.9$). Ninety-seven percent of the

Table 1 Distribution of subjects by frequency and percent and socio-demographic variables N=158

Variable	Subject	Percentages
<u>Age</u>		
<40	8	5.3
40-49	67	44.7
50-59	27	18.0
60-69	28	18.7
70-79	13	8.7
80-89	6	4.0
>90	<u>1</u>	<u>.7</u>
	150	100.0%
<u>Ethnicity</u>		
White	154	97.5
Black	0	.0
Hispanic	1	.6
Am. Indian	2	1.3
Other	<u>1</u>	<u>.6</u>
	158	100.0%
<u>Marital Status</u>		
Single	10	6.3
Widowed	21	13.0
Married	102	63.8
Separated/divorced	<u>27</u>	<u>16.9</u>
	166	100.0
<u>Education</u>		
< 8th grade	2	1.3
8-11 grade	14	8.8
HS-GED	58	36.3
Vocational	16	10.1
1-3 yrs. college	42	26.3
College grad	<u>28</u>	<u>17.5</u>
	160	100.0
<u>Income</u>		
<15,000	83	50.3
15-20,000	23	14.2
21-25,000	19	11.7
26-30,000	10	6.2
31-35,000	9	5.6
36-40,000	1	.6
41-45,000	4	2.5
> 46,000	<u>13</u>	<u>8.1</u>
	162	100.0
<u>Location</u>		
Livingston	132	58.4
Ingham	84	37.2
Shiawassee	9	4.0
Barry	<u>1</u>	<u>0.4</u>
	226	100.0

participants were Caucasian, with the remaining 3% consisting of a varied ethnic background. None of the subjects reported being African American. Sixty-four percent were married and 16% were divorced. Fifty-three percent had an education beyond high school, 36% completed high school and 10% did not have a high school education. The combined household income varied, with half of the sample reporting an income of less than \$15,000, and the remaining distributed across income levels to \$50,000. Therefore, the subjects were primarily white (97.5 %), married (63.8%) with varied levels of education. One-half of the subjects had a combined household income of less than \$15,000.

Research Questions

The specific research questions used in this study to explore barriers to mammography screening related to 1) lack of physician recommendation, 2) discomfort of mammography procedure, and 3) cost or inconvenience of mammography are presented along with a review of the findings relevant to each question.

The first barrier explored in this study was lack of physician recommendation to mammography screening.

Barrier 1: Lack of physician recommendation:

Question 12v: My doctor has never suggested that I have a mammogram.

Question 22: Has your doctor advised or discussed mammography with you?

To evaluate if lack of physician recommendation is a barrier to mammography screening two items were selected. The majority of participants 65.8% (n=96) "disagreed or strongly disagreed" with the statement that their physician had never suggested mammography, only

34.2% (n=50) agreed or strongly agreed that their physician had not recommended mammography to them.

Similarly, when participants were asked if their physician had advised or discussed mammography with them, 64.5% (n=80) indicated that their physician had suggested mammography, and only 35.5% (n=44) of the subjects indicated that their physician had not recommended mammography to them.

Of the subjects who answered both items forming the lack of physician recommendation scale, similarly, a significantly higher proportion of the women 71.7% (n=66) reported that lack of physician recommendation was not a barrier (Table 2).

Since only 28.3% (n=26) of the sample indicated that lack of physician recommendation was a barrier to mammography screening, it was concluded from the findings in this study that lack of physician recommendation was not a barrier to mammography screening.

Additional Findings:

Data related to how important participants perceived their physicians advice to have mammography was examined by asking "With regard to breast cancer screening practices, how important to you is the opinion and advice of your doctor". Of the sample, 157 or 69.5% of participants responded to this question. The majority of participants 97.4% (n=153) indicated that a physicians opinion and recommendation to mammography was either important or very important. None of the participants indicated that a physicians recommendation was not at all important.

Barrier 2: Discomfort related to mammography procedure.

Question 12c: A mammogram is an unpleasant procedure.

Table 2 Chi-square for comparison of barrier status by two item response related to: Lack of physician recommendation N=92

Barrier	Yes	No
Lack of physician recommendation	28.3% 26	71.7% 66
Chi square = 17.4		p = .0000

* Note: 24 subjects did not respond consistently to both items and 110 subjects did not answer either question or one of the questions

Table 3 Discomfort items related to mammography procedure

Strongly Disagree (1)		Disagree (2)		Agree (3)		Strongly Agree (4)		Missing Cases
N	%	N	%	N	%	N	%	N
Unpleasant 20 14.1		53	37.3	63	44.4	6	4.2	84
Painful 21 15.6		64	47.4	42	31.1	8	5.9	91
Embarrassing 33 22.0		62	41.3	48	32.0	7	4.7	76
Anxious 21 14.4		72	49.3	44	30.1	9	6.2	80
Uncomfortable 23 17.2		61	45.5	44	32.8	6	4.5	92

- Question 12e:** A mammogram is painful.
- Question 12b:** A mammogram is an embarrassing procedure.
- Question 12f:** A mammogram would make me feel anxious.
- Question 12l:** A mammogram makes me feel uncomfortable.

The second barrier explored in this study was discomfort related to the mammography procedure. Discomfort for this study, were any unpleasant physical or emotional response related to mammography. Discomfort of mammography includes anxiety, embarrassment, uncomfortable, unpleasant or painful perceptions related to the procedure.

First, the frequency and percentage was calculated for each individual discomfort item. Overall, when looking at barriers related to discomforts of mammography, results demonstrated that responses were varied or mixed, while some women perceived discomforts related to the mammography procedure, the majority of women did not (Table 3). Responses to individual discomfort items were reported as follows: Fifty-one percent (n=73) indicated that mammograms were not unpleasant; 62% (n=85) indicated that mammograms were not painful; 63.3% (n=95) mammograms are not embarrassing; 63.7% (n=93) mammograms do not cause anxiety and 62.7% (n=84) reported that mammograms did not make them feel uncomfortable.

The individual discomfort items were then grouped and a discomfort scale was constructed with all of the discomfort items (See Table 4). Reliability analysis on the group of discomfort items yielded a Chronbach's alpha of .79, which indicated that these items could make a good construct. The average was slightly less than the middle point of the scale (2.50). The mean for the scale was 2.27 (sd=.58). This

Table 4 Frequency and distribution of discomfort scale

	Value	N	%	
	1.00	7	4.5	
	1.20	2	1.3	
	1.33	1	.6	
	1.40	5	3.2	
	1.50	2	1.3	
	1.60	11	7.1	
	1.80	6	3.9	
	2.00	25	16.1	
	2.20	12	7.7	
	2.25	5	3.2	
	2.33	1	.6	
	2.40	15	9.7	
middle point* of scale	2.50	5	3.2	62.6%
	2.60	23	14.8	
	2.67	1	.6	
	2.75	2	1.3	
	3.80	11	7.1	
	3.00	15	9.7	
	3.20	2	1.3	
	3.40	1	.6	
	3.60	1	.6	
	3.80	1	.6	
	4.00	1	.6	100.0%
<hr/>				
Mean score = 2.27		sd = .58		
Missing Cases = 71		chi square = 9.8	sig = .0017	
<hr/>				
* Note	< 2.25	97 (62.6%)		
	> 2.25	58 (37.4%)		

indicated that the average response was "disagree" which meant that most women responded that discomfort was not a barrier. Study findings revealed that 97 women or 62.6% of the respondents strongly disagreed or disagreed that discomfort was a barrier, and 58 women or 37.4% of the sample strongly agreed or agreed that discomfort was a barrier. Thereby, based on the statistical findings from this study, it was concluded that discomforts related to the mammography procedure were not a barrier to mammography screening.

Additional Findings

Data was then analyzed to evaluate if discomfort correlated to age, education or income. Data analysis revealed that education and income were slightly correlated at .14. However, study findings demonstrated that income, age and education were not correlated to discomfort.

Barrier 3: Cost and inconvenience of mammography

Question 12d: A mammogram is a hardship due to cost.

Question 12g: A mammogram is convenient to arrange.

Question 12i: A mammogram is not available in my area.

The third barrier to be evaluated was cost and Table 4 inconvenience of mammography. To evaluate if cost or inconvenience were barriers to mammography, the one cost item and the two inconvenience items were analyzed separately. First, as noted in Table 5, data were analyzed to evaluate if the cost item was a barrier to mammography. The frequency and percent for the cost item was calculated. Of the 156 participants who responded to this item, the majority of respondents (n=123) or 79.3% either agreed or strongly agreed that mammograms were a hardship due to cost. The mean for the cost item was 3.14 (sd =.91).

Table 5 Frequency and percentage of women reporting by barrier response: Related to inconvenience of mammograms N=156

	N	%
(1) Strongly Disagree	11	7.0%
(2) Disagree	22	14.1%
(3) Agree	57	37.0%
(4) Strongly Agree	66	42.3%
Totals	156	100.0%

Table 6 Frequency and percentage of women reporting by barrier response: Related to inconvenience of mammograms

	Strongly Disagree		Disagree		Agree		Strongly Agree		Total	
	N	%	N	%	N	%	N	%	N	%
Convenient to arrange	9	6.1	34	23.1	85	57.8	19	12.9	147	100%
Not available in my area	52	36.3	82	57.3	5	3.5	4	2.8	143	100%

* Convenient to arrange N = 147

* Not available N = 143

Therefore, it was concluded from this study that the cost of mammography is a barrier to mammography screening.

Then, presented in Table 6 the frequency and percentage of the inconvenience barrier was calculated for the two inconvenience items. Results indicated that of 147 subjects who responded to the first item, the majority (70.7%) responded that mammograms were convenient to arrange with only (n=43) or 29.2% who disagreed or strongly disagreed that mammograms were convenient to arrange.

Similarly, when asked about mammogram availability near area of residence, of 143 subjects who responded only (n=9) participants or 6.1% agreed or strongly agreed that mammography were not available in their area. Therefore, for most of the subjects (n=134) or 93.6% mammograms were available. The two inconvenience items were not combined because the alpha reliability was .15. On examination of both inconvenience items, 7 of the 9 people that responded that mammograms were not available in their area, then agreed or strongly agreed that mammograms were convenient to arrange. Perhaps this was due to the fact that these women felt that even if they had to travel a distance, this would not be an inconvenience. Mean score for inconvenience was 2.25. Due to the inconvenience responses it was impossible to analyze the combined inconvenience items. Therefore, it was concluded from the data that inconvenience was not a barrier to mammography screening.

Additional Findings

In Table 7 the cost item was then compared to income. Of the 156 subjects who responded 50% had low incomes of less than \$15,000. Of those low income women, 80.8% responded that mammograms were a barrier due to cost. An interesting finding, also was that the other 50% of the

Table 7 Cost barrier related to income N=156

Row Pct Col Pct	Cost Barrier		Row Total
	Yes	No	
Income	63	15	78
Less than \$15,000	80.8 51.2	19.2 45.5	50.0%
More than \$15,000	76.9 48.8	23.1 23.1	50.0%

* Chi square .35
Significance .56

sample or the higher income women, 76.9% also reported that cost was a barrier to mammography. Therefore, cost was a barrier for the majority of women regardless of their income.

The cost was then related to insurance. Respondents consisted of n=159, of these 58% of the low income women (less than \$15,000) reported having insurance, while 78.5% of higher income women whose (greater than \$15,000) reported having insurance. Overall of the total sample 67.5% had health insurance. However, even though more than half of the sample reported having health insurance, most of the insurance did not cover screening mammograms. Since 96.5% of the women who reported having insurance also reported that their insurance did not cover screening mammograms.

Summary

The goal of this study was to explore potential barriers to mammography screening related to: lack of physician recommendation; discomfort of the mammography procedure; cost and inconvenience of mammograms and to evaluate if these barriers were preventing women from participating in mammography. The most important finding of the study was that cost was a barrier to mammography screening. Study findings indicated that 79% of the participants responded that mammograms were a hardship due to cost.

However, the study did not substantiate the proposition that a lack of physician recommendation, discomfort or inconvenience were barriers to mammography. While the study showed that of those surveyed, 71% disagreed that their physician had not recommended mammography, it should not be overlooked however, that for 28% of the women in the study lack of physician recommendation was a barrier to mammography screening.

Findings related to discomfort showed that for some women discomfort was a barrier 37.4%, however, the majority or 62.5% reported that discomfort was not a barrier to mammography. In addition, inconvenience did not appear to be a barrier to screening, because 70% of the women surveyed reported that mammograms were convenient to arrange.

Discussion

Upon completion of the analysis of the data, several conclusions related to barriers to mammography screening have been reached. These conclusions are presented with discussion as to the value of the information.

Conclusion #1: Lack of physician recommendation was not a barrier to mammography screening.

Statistical analysis of the study data revealed that, for participants in this study, lack of physician recommendation was not a barrier to screening. The majority of the sample, or 71%, indicated that lack of physician recommendation was not a barrier. Results of this study were not consistent with data reviewed from the literature.

When comparing results of this study to the literature, the percentage of women reporting lack of physician recommendation was greater in the literature. For example, in the study of Lane & Burg (1990), 44% of the women reported lack of physician recommendation was a barrier. Similarly, Richardson & Marks (1987) found in their study that 82% of women reported a lack of physician recommendation as a barrier. In this study, a finding of clinical significance was that 28% of study participants indicated that their physician had not discussed or recommended mammography to them. Therefore, lack of physician recommendation was a barrier for less than one-third of the sample.

In addition, the literature also suggests that a physician recommendation is the single most important factor to women receiving mammograms (Given & Given, 1989; Rimer & Trock, 1992).

Furthermore, Rimer and Trock (1991); Schechter et al., (1991); and Vernon et al., (1991) have found that many women report that a physicians recommendation is important, and that a lack of physician recommendation is in fact a major barrier to mammography screening. Findings in this study, that explored women's perception of the importance of a physician recommendation to screening, were consistent with the literature. Study data revealed that 97.4% of respondents indicated that to them, a physician's opinion and recommendation to mammography were very important.

Conclusion #2: Discomforts related to the mammography procedure were not a barrier to screening.

The literature suggests that perceived discomforts related to the mammography procedure can be a barrier to mammography screening. Two of the studies reviewed (Lantz et al., 1990; Kurtz et al., 1994), concluded that many women have identified unpleasant reasons for non-compliance with mammography such as, pain, embarrassment and anxiety. In addition, Stein et al., (1992) found that elderly women report that embarrassment and nervousness are barriers related to the mammography procedure.

Findings from this study indicated that 62.6% of the participants did not agree with perceived discomforts related to mammography. Therefore, discomfort was not considered a barrier. However, while perceived discomfort was not considered a barrier to mammography for the majority of women in this study, it should be recognized that for 37.4% of women discomfort did represent a barrier. Therefore, these finding

of perceived discomfort reported by some women, may have clinical significance.

Conclusion #3: Cost related to mammography procedure was a barrier to screening. Inconvenience was not a barrier to mammography screening.

The literature review reveals that cost and inconvenience can be a deterrent to mammography. Past studies suggest that for many women mammograms are not accessible due to cost of the mammography procedure (Rimer and Trock et al., 1991; Schechter et al., 1990; Vernon & Vogel, 1991). Throughout the United States the cost of a mammogram varies and can be anywhere from \$25 to \$250 (JAMA, 1989). In the city of Lansing, Michigan, a mammogram can cost anywhere from \$67 to \$180 (Given, 1991). It is reasonable then to expect that for low income women the cost of mammography can be an very important issue.

Data from this study is consistent with the literature, since analysis of findings revealed that 79.3% of the participants indicated that mammograms were a hardship due to cost. Therefore, cost was a barrier to mammography screening in this study. Findings for this sample revealed that most of the women reported low incomes. Fifty percent of the sample had a total household income of \$15,000 or less. Although 67% of those sampled reported having insurance coverage, even for them cost was a factor. Since of those who reported having health insurance, 95% indicated that their insurance did not cover mammography screening.

Barriers related to inconvenience also were explored. Studies were reviewed which explored barriers related to the inconvenience of mammography. They indicated that, for some women, inconvenience related to both the hardship of arranging mammography, or the location of the

facility may be a barrier to mammography. For example, the Vernon and Vogel (1991) study revealed that 13% of women state that mammograms were inconvenient to arrange, and 15% reported that the inconvenience of the location of the mammography facility represented a barrier. In addition, the studies of Schechter and Vanchieri (1990) and Rimer and Trock (1991) also revealed that inconvenience related to location is a barrier to mammography for many women. In addition, Smith and Haynes (1991) report that women living in rural areas tend to get less screening than those living in urban areas.

Consequently, a hypothesis of this research was that women would perceive mammograms as inconvenient, and that inconvenience would be a barrier to mammography screening. However, contrary to the findings in the literature, data from this study does not corroborate, as expected, with findings from the literature. Data regarding inconvenience revealed that women did not find mammograms inconvenient to arrange, since 70.7% responded that this was not a problem.

In addition, inconvenience related to location was not a barrier. Only 6.1% of women in this study replied that mammograms were not available in their area. Therefore, it had to be concluded that inconvenience was not a barrier to screening. However, it is of clinical significance that 29.3% of the women found mammograms inconvenient to arrange.

In sum, it is evident that existing barriers are preventing women from obtaining mammograms. In this study cost was the only statistically significant barrier to mammography, since 71% of the subjects indicated that mammograms were a hardship due to cost. Therefore, findings for this study suggest that cost was the most

significant barrier, preventing the majority of women from complying with mammography. Other barriers which may be clinically, rather than statistically significant to mammography for the women in this sample were discomfort, inconvenience, and lack of physician recommendation. These barriers may be clinically significant, because data findings indicated that a small portion of the subjects indicated that they were barriers to mammography.

Limitations of the Study

It must be noted that the present study has some limitations. First, the study involved a homogeneous convenience sample consisting of 97% caucasian women. Only 3% of the women were minorities, and there were no African American women. Therefore, a possible sampling bias may have existed, since the sample for this study may not have been representative of the population of women living in the four counties involved in this study.

Data for this study revealed that discomfort related to the mammography procedure was not a barrier to mammography screening for the majority (63%) of the women. Findings in the literature suggest that some minority women have reported anxiety and embarrassment related to mammography (Richardson et al., 1987; Schechter et al., 1990). Since it is possible that women of different ethnic backgrounds have different perception of discomfort and that for some minority women perceptions of discomforts may be slightly different or even greater than the discomfort perceptions of caucasian women. It was concluded, that since the sample for this study consisted of 97% caucasian women, a possible sampling bias due to this convenience sample, may have existed.

Second, a limitation to this study may have been related to the average age of the women in the sample, which was 53.9 years. The majority of women were younger, with 45% age 40-49 and only 9% of the women were between age 70-79. Findings of this study indicated that the majority of women said that lack of physician recommendation was not a barrier to screening, and only 28% reported that lack of physician recommendation was a barrier. This finding was inconsistent with the literature that suggests that lack of physician recommendation is reported by women as one of the major barriers to screening (Lane & Burg, 1990).

Furthermore, the literature suggests that physicians screen elderly women less often than they do younger women (Weinberger et al., 1991). Consequently, since a large proportion of women in this study were younger, age may have been a factor leading to the findings in this study, which suggested that lack of physician recommendation was not a barrier to mammography screening.

Overall, the first limitation related to minority and the second limitation related to the young age of the sample may have affected both the findings related to lack of physician recommendation and also findings related to discomfort of the procedure. Since the literature suggests that women who are older, generally are the ones who tend to complain of discomforts related to the mammography procedure (Weinberger et al., (1991). Also the literature suggests that minority women are screened less than caucasian women (Vernon & Vogel, 1991).

In addition, when looking at the findings of this study that relate to lack of physician recommendation, a possible limitation, or problem with this data was that verification was not made of whether the

women in the study had a primary care physician. Therefore, when the women were asked if their physician had discussed or recommended mammography to them, and the women responded to this item, it was assumed that respondents actually had a primary care physician.

Another possible limitation of this study, which relates to inconvenience, may be due to the location of the residence of some participants. Even though this study was a rural study and women who participated lived in designated rural communities, many of the women in the sample may have lived near the border of a rural area, and perhaps the location of their residence was close enough to a University Medical Center, or a hospital, where mammography facilities were more available to them than in other rural areas of this state. Therefore, the women in the study may have perceived access to adequate medical facilities.

Therefore, a possible limitation of this study may be due to the location of the residence of some of the subjects in the sample, since some women may not have lived in rural areas, and findings in this study may not be representative of other situations in which nearby mammography facilities may not be available for certain groups of women.

The adapted HBM proposed for this study was not completely supported by statistical findings in this study. The model for this study proposed that lack of physician recommendation, discomfort and inconvenience are barriers to mammography. However, study results indicated that the only barrier to screening was cost, since this was a barrier for a large proportion of women. Discomfort, lack of physician recommendation or inconvenience were not barriers to mammography screening, for the women in this study.

A possible reason why the model was not supported was because the study was a secondary analysis, the questions used in this study originated from an already established questionnaire, prepared for the original study and more questions could not be included. The definition of concepts in the original study may have had some variation, from the specific definition of variables used in this study.

However, this model should be kept and the study replicated. Since it is more reasonable to suspect that the findings in this study could have resulted from a sample bias, rather than a deficiency in the model. Consequently, the opinions of these women may not be representative of the rural population at large which includes, many women who are older and women from diverse ethnic backgrounds and women who live at a further distance from resources.

Implications for Advanced Nursing Practice

Even though mammography is a proven technology for diagnosing early, curable breast cancer and preventing deaths, and even though the ACS has recommended mammography screening guidelines for women age 40 and older, many women do not participate in screening and consequently many women are dying from breast cancer. Based on the literature, there is no doubt that the CNS working in primary care settings has a critical role in assisting women to overcome barriers to mammography.

In the primary care setting, the CNS can be an invaluable resource, not only in providing care, but also in referring and encouraging women to comply with breast cancer screening guidelines by participating in screening. The CNS practices at an advanced level that incorporates clinical judgement, decision making, theory and research into the nursing process. The CNS is responsible for assessing all

aspects related to barriers to mammography screening in a clinical setting. As information is gathered during the assessment process, the CNS should evaluate the client's knowledge about breast cancer.

Thereby, during the assessment process, CNS using the HBM as a guide, should ask the client if she is aware of breast cancer; if she feels the disease is serious; if she perceives it as a threat; if she is aware of mammography screening; if she believes in the efficacy of mammography; and if she perceived any barriers to obtaining mammography.

In the clinical setting, the CNS must evaluate all possible barriers to screening as perceived by each individual client. Specifically, the CNS should evaluate barriers related to cost, since it was concluded in this study that for the majority of women 70%, cost was a barrier to mammography. In addition to cost the CNS should explore other barriers such as those related to discomfort, lack of physician recommendation and inconvenience. Findings for this study indicated that some women may perceive other clinically significant barriers. For example, discomfort was a barrier for almost 35% of the women in the study; lack of physician recommendation was a barrier for 28% of the women; and inconvenience was a barrier for 29%. Therefore, even if in this study, only a small proportion of women reported barriers to screening, they do represent significant clinical findings for the CNS.

Since the literature suggests that there are many barriers to mammography, and some women did report barriers in this study, it is crucial that the CNS in the primary care setting explore all of the possible barriers to screening with each individual client, and offer each client an opportunity to discuss their personal concerns or fears related to mammography prior to making a mammography referral.

Exploration of the barriers to mammography should include specific questions related to past mammography referrals; discussion regarding perceived barriers related to the discomforts of the mammography procedure, such as pain, embarrassment, discomfort, anxiety and others; and inquiries whether the cost of the mammogram will be a barrier to screening, or whether such things as distance and transportation to facility will keep an individual from complying with the screening.

The goal of the CNS in the primary care setting should be to help women overcome barriers to mammography screening, and to assist them to comply with mammography guidelines. In the past, contracting for behavior change has been a successful strategy used by nurses to foster compliance (Steckel, 1982). The CNS first helps women set mammography goals as part of the overall health promotion plan and then measures outcomes. The CNS and client are partners in problem solving, but it is the client who has the principal responsibility for following through with the necessary behaviors required to comply with mammography screening.

Strategies to Overcome Barriers

Strategies to overcome cost barriers. Cost was the most significant barrier to mammography screening for women in this study. Therefore, in an effort to assist clients to overcome barriers related to cost, the CNS in order to have information available for clients and to make appropriate referrals should develop the following four-step strategy: first, explore the cost of mammography in community facilities; second, make a current listing of facilities which are certified; third, consult with community agencies to determine what low income criteria must be met to qualify for low-cost or free mammography;

fourth, refer low income clients to agencies who can assist them with obtaining mammography at low cost or no cost.

In the Lansing area, women who verbalize barriers to mammography that are related to cost, or to inconvenience due to the location of the mammography facility, may be referred to the following seven agencies:

- 1) The Ingham County Health Department sponsors a Breast and Cervical Cancer Control program. The health department has clinics which offer women age 40 and older who are low income, breast examinations, referral for mammograms and follow up services after mammography, either free of charge or at cost based on a sliding scale. This services are available for women in Ingham, Eaton, Jackson or Clinton counties;
- 2) The Barry-Eaton District Health Department which offers free or low cost mammograms to women age 40 and older who qualify, depending on family income;
- 3) A new Women's Clinic, located in Lansing, offers economical medical care to low income women. A complete yearly exam including clinical breast exam and mammography referral is available for \$39.00;
- 4) The Michigan Capital Medical Center Breast Cancer Detection Center which has a mammography facility that accepts Medicaid payment;
- 5) The Delta-mammography in Lansing which offers mammography to women for a cost of \$90.00, which is slightly less than some of the other facilities;
- 6) Sparrow Hospital, which has a bi-monthly breast examination clinic. The cost to attend is \$5.00 per women. In this clinic women learn BSE, and receive a CBE and mammography referral. A physician is available during clinic hours for consultation and evaluation of breast problems. Sparrow Nurseline nurses are available to assist women who need assistance, overcome cost barriers by making appropriate community referrals to agencies offering free or low cost

mammography; and 7) The American Red Cross which sponsors the Medical Access Project, provides transportation to clients who are unable to reach the medical facility to obtain mammography.

In sum, cost is an important barrier to mammography, preventing many women from obtaining mammograms. Screening mammograms are recommended by the ACS for women age. Women must follow age specific recommendations to detect breast cancer early. CNS's not only must evaluate if their client cannot get a mammogram due to cost barriers at the time of the mammography referral. Also at a local, an national level, CNS's must be advocates for women, by uniting in their efforts to represent women, speaking nationally, and addressing the lack of insurance coverage for breast cancer screening, with insurance companies, legislators and policy makers. In an effort bring attention to this issue, and help change current insurance policies so that insurance cover breast cancer screening for all women.

Strategies to overcome discomfort barriers. Because the CNS in a primary care setting may encounter women who perceive barriers related to discomfort, the CNS can help patients overcome these discomfort barriers by providing encouragement and support for the client, and also by helping the client express her feelings and concerns about mammography screening.

Specific strategies to overcome barriers due to perceived discomfort may include the following: first, alleviate fears by openly discussing discomfort perceptions, such as anxiety, embarrassment, pain, and others; second, dispel client perceived myths about mammography; third, show pamphlets with pictures of mammography machines; fourth, explain that most of the mammography technicians are women, since this

may alleviate embarrassment, for some women; fifth, discuss the mammography procedure, explaining that some women may experience discomfort as the breast are compressed during the mammography procedure; and sixth, offer them an opportunity to view a movie about a woman obtaining a mammogram.

Furthermore, suggest to women that they schedule their mammogram at a time when the breast are less painful, not during the menstrual cycle. Also, plan educational programs involving mammography technicians, to discuss strategies that technicians can use to help women overcome fears related to discomfort, such as explaining the procedure, how the breast will be squeezed during mammography, offering women an opportunity to look at the mammography equipment, answering questions related to the mammogram procedure.

Strategies to overcome barriers related to lack of physician recommendation. The CNS needs to evaluate if a lack of physician recommendation has created a barrier in the past. Strategies that can be used to overcome this barrier include the following: 1) schedule mammography screening for the client as indicated; 2) increase the client's awareness of when screening should take place, by explaining and discussing age specific mammography guidelines as suggested by the ACS; 3) encourage the client to make a specific appointments once a year for CBE and mammography referral; and 4) send yearly cards to patients reminding them that it is time for breast cancer screening. Also, follow-up cards or calls for those patients who do not respond to the first card. Because researchers suggests that for many women the opinion of the physician is extremely important. The CNS should make certain that she verbalizes to the client the importance of early

detection of breast cancer via mammography screening throughout the visit, and strongly recommend that the client follow screening guidelines as recommended by the ACS. If the client verbalizes that there has been a lack of physician recommendation to mammography in the past, it is then very important that the CNS function as an advocate, and empower the client to take an active role in requesting a referral to mammography screening, and making yearly appointments for a CBE and mammography screening.

As a client advocate, the CNS must help empower women. This is an important strategy which the CNS must not overlook. As a client advocate the CNS's works to promote a transfer of responsibility to the client, so that the client is actively involved in personal health promotion and participates in activities to detect disease early, such as breast cancer screening. An empowered client may express positive expectation about her future by verbalizing short and long term goals related to mammography screening. These goals can include compliance with mammography, and following through on guidelines to obtain future mammograms as indicated. For example, a goal for a woman would be to obtain an annual mammogram if the woman is age 50 or older.

An empowered client will demonstrate initiative, self-direction and autonomy by taking an active, rather than passive role in her personal health maintenance. What this means is that the empowered client will: 1) seek mammography screening referral from her health care provider when needed; 2) openly discuss any perceived discomfort barriers related to mammography, such embarrassment, anxiety, pain or others with her health care provider and with the mammography technician who conducts the mammography; and 3) seek out necessary assistance from

community agencies when there are barriers related to cost of mammography, or hardships related to the inconvenience of obtaining the mammography screening.

The CNS has the advanced knowledge to understand the complexity of factors that contribute to compliance, and the barriers that may contribute to non-compliance. The CNS also has skills to apply theory using critical thinking, and nursing judgement to implement care and recommend mammography for their clients and assist clients to overcome barriers to screening.

Affecting and Changing Health Policy

CNS's who function within the extended nursing role, delivering care to clients in the primary care setting, are making a valuable contribution to the delivery of primary care. The CNS can become an advocate for women, speaking in an authoritative voice, and interceding for women to help make women's health a priority. CNS's are in a key position to participate in health care reform, they must be directly involved in all issues that affect women. The goal of the CNS is to help improve access to health care for women and to help women overcome barriers to mammography screening. The CNS can help women overcome barriers to mammography by participating in strategies at the individual level and also participating in strategies at the systems level, that relate to the health care system and national health policy.

The nation's CNS's should join the crusade to help improve access to care for all women. At an individual level, CNS's within their clinical practices need to participate yearly during October, in the National Breast Cancer Awareness Month, and promote the message to all women by urging women to "find it before they can feel it" (p.3) and by

making mammography referrals following ACS guidelines and encourage women to participate in mammograms (Tau, 1994).

In addition, the CNS is advanced practice needs to be active and participate in all community and national efforts to overcome barriers to mammography. CNS's need to develop strategies to change health care policy, in an effort to increase access to preventive care for women. CNS's need to organize and coordinate to achieve a common goal. CNS's have a valuable role to play in the design and delivery of a new and improved health care system. Thereby, CNS's need to develop strategies to enable them to participate in promoting the passage of health care reform to increase accessibility to mammography screening. A successful strategy, to change health care reform begins with the understanding that through, unity, numbers, coalitions and relationships power is obtained. If CNS's are going to actively participate to change health care reform to help increase access to screening services for low income women, then CNS's must start, by participating in task forces, joining professional organizations, community agencies, special interest groups and others who share this vision and want to affect social change to help increase access to mammography for women.

CNS's need to be active politically, and have an understanding of who participates in the delivery of primary care such as A) providers of services (public and private; local, state and federal; B) payers of services (medicare, medicaid and private insurance companies; and C) policy makers (the board of health, community governments, hospitals, and at the state level house and senate committees.

Furthermore, in order to actively participate in health care reform CNS's must understand how policy is changed. CNS's must monitor

all health care legislation, know how laws are changed and support legislators that promote the ANA and are capable of introducing bills that can help increase access to health care for women and thus overcome the some of the existing barriers to mammography screening such as non-compliance due to cost of the procedure.

Recommendations for Future Research

The goal of this research was to add to the existing knowledge by further exploring barriers to mammography screening. Barriers explored included lack of physician recommendation, discomfort of mammography, and the cost or inconvenience of mammograms. However, study results showed that the only barrier to screening was cost of the mammogram. Study data did not support the hypothesis that lack of physician recommendation, discomfort or inconvenience were barrier. However, the problem remains that mammography continues to be underused. If compliance with mammography is to increase, it will be necessary to continue to promote further nursing research related to barriers that prevent women from obtaining mammography.

It is suggested that this study be repeated, and that further research related to barriers be conducted, since this study may have had some limitations related to the fact that the sample was a convenience sample and since the demographics of the study indicated that there were 93% caucasian women and only a few minorities; and because 40% of the women were in the younger age group.

Future research should be more representative of the population at large, and it should consist of a random sample rather than a convenience sample and include a larger percentage of minorities, including black women, and a larger percentage of women who are elderly.

Results from this study reveal that discomfort was not a barrier to screening for a majority of women. Only about one-third of the women perceived discomforts related to mammography. Therefore it is recommended that future research be conducted further explore discomfort. Criteria for inclusion into this study involved women who had never had a mammogram, or who had not had a mammogram within 5 years prior to the study. It is interesting to note that many of these women reported perceived discomforts related to the procedure. It would be beneficial to explore where perceptions of discomfort originate. For example, are they pre-conceived by the women themselves, such as those involving feelings of embarrassment and anxiety about the procedure? Are the perceived discomforts due to rumors or exaggerations heard from friends or relatives who have undergone the procedure? Are these perceptions of discomfort only the result of subjective fears of the unknown? It is possible that a survey format using telephone interviews, may reveal more information regarding barriers.

Further research to explore discomfort also is suggested by forming focus groups of women who have had a mammogram, so that perceptions of discomfort such as pain, anxiety, unpleasantness, embarrassment and other concerns can be verbalized by women once the actual mammogram has been completed. Furthermore, women may be asked what they are going to tell other women who may not have had a mammogram about mammography.

Also, further research should be done to evaluate access barriers to mammography that are related to cost. As previously mentioned, many of the women in the sample revealed that their insurance did not cover screening mammography. Nursing research is needed to evaluate the

proportion of insurance companies currently providing coverage for screening mammography. If results indicate that insurance are not covering screening mammography, then CNS's could be advocates, for their clients. Through legislative interventions and networking with other providers, the CNS can attempt to change public policy and relevant legislation.

In addition, although this study reveals that inconvenience is not a barrier to mammography, there may have been limitations due to the location. Future research to continue to explore the inconvenience of mammography also is recommended, selecting women in rural communities and evaluating the distance to the nearest mammography facility. Also since inconvenience may involve more than distance therefore, more questions need to be asked relevant to what makes mammograms inconvenient.

Many studies in the literature suggest that lack of physician recommendation is a barrier to screening, specially among elderly women and minorities. Results of this study are inconsistent with the literature, since lack of physician recommendation was a barrier for only 28% of the sample. Among the possible explanations, it could be due to the fact that most of these women were younger, mostly were white, and only a few were minorities. In addition, although this research targeted rural communities, some of the women may have lived in urban areas near large universities where providers are more informed about ACS guidelines than in other areas.

Therefore, continued research related to lack of physician recommendation may be beneficial, and may provide more information related to this barrier. Also research related to provider referral may

be interesting, targeting advanced practice nurses in primary care settings, in an effort to evaluate their screening practices.

Summary of Study

This study was a secondary, descriptive analysis which used the HBM as a conceptual framework to explore barriers to mammography screening. Results of this study indicated that barriers to mammography screening related to cost prevent women from participating in mammography screening. In this study cost of the mammography procedure was a barrier for 70% of the participants. Study findings showed that women some women were uninsured or underinsured, since the women indicated that mammography was not covered by their insurance, and that many low income women are not able to afford screening mammograms. Cost is a barrier to mammography which is also well documented in the literature. Therefore, cost related barriers to mammography screening need to be further assessed and addressed.

In addition, findings also indicated that other clinically significant barriers existed for a small portion of women. These barriers were related to discomfort, lack of physician recommendation, and inconvenience. Therefore, CNS's in the clinical setting, prior to making a mammography referral, need to assess and explore with each individual clients perceived barriers to mammography, and carefully evaluate to determine which barriers could affect compliance with mammography.

When barriers are encountered CNS's must actively participate in combination with clients to overcome barriers and to assist clients to participate in screening.

Furthermore, research related to mammography barriers must continue if health care providers and advance practice nurses are to overcome barriers and eliminate them. Rimer and Trock (1991) believe that without the strong intervention of all health care providers, the potential for mammography to reduce avoidable breast cancer will go unrealized.

Therefore, CNS's must all participate in the efforts to decrease barriers to mammography and increase referral rates, and continue to encourage women to comply with this technologically advanced, life-saving screening behavior.

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APPENDIX A
The Rural Breast Cancer Project

The Rural Breast Cancer Project

Methods for The Rural Breast Cancer Project

The Rural Breast Cancer Project was a project funded by a grant from the American Cancer Society-Michigan Division to provide breast cancer screening to women in Michigan. The Rural Breast Cancer Project was conducted by researchers B. Given and C.W. Given and co-sponsored by Michigan State University Breast Cancer Center, Ingham County Health Department, the Cooperative Extension Service, community hospitals and health care providers. Four counties were selected to begin the pilot program. These counties were: Ingham, Livingston, Shiawassee and Barry.

The study design for this project was a descriptive research using a convenience sample of low income women, living in rural regions of Michigan. The goal of the project was to provide screening services to under-served women living in rural populations and to recruit many women to participate in breast cancer screening and obtain screening mammography. Also this project served as a pilot study to establish a model for other breast cancer screening programs and then to serve as consultants for other communities wishing to use this model to establish their own breast cancer screening program.

Population

Promotional material for the Rural Breast Cancer Project was disseminated by the American Cancer Society, the Ingham county health department, the Cooperative Extension Service and primary care providers. Any woman who attended an educational event sponsored by any one of the above organizations or telephoned the Cooperative Services could choose to participate in the project. Women who were interested in participating in the project needed to fill out a registration form

and sign an informed consent form. They were then given a voucher to get a screening mammogram.

Population criteria for inclusion in the study specified that women must: 1) be 40 years old or older; 2) have never had a screening mammograms, or have not had a mammogram within the last 5 years; 3) have never had breast cancer; 4) not be pregnant or nursing; and 5) have no insurance which pays for screening mammograms.

Potential participants were any woman which met eligibility criteria, filled out the registration form, signed the consent form, filled out the questionnaire and obtained a voucher for screening mammography from one of the four research sites.

Sample

Target group for this project consisted of asymptomatic women age 40 and older who had not had a screening mammogram within the last 5 years. Sample for this research consisted of n=226 women who met study criteria and participated in the Rural Breast Cancer project by filling out the questionnaire and signing the consent form. The sample was mostly from Livingston with 58.4% (n=132) of participants, followed by Ingham 37.2% (n=84), Shiawassee 4.0% (n=9) and Barry 4% (n=1).

Field Procedure

The study was planned by the Rural Screening Task Force. The goal of the Rural Screening Task Force was to use community networks and community resources to provide screening services to under-served rural populations. The task force chose four counties for the initial program. They were: Barry, Ingham, Livingston, and Shiawassee. The project targeted rural women, at least 40 years of age who had not had a mammogram in the last year.

Women heard about the project through promotional material disseminated by the ACS, the Cooperative Extension Service, the health department and/or their health care providers, or women learned about the project by attending an educational event sponsored by one of these agencies.

Components of the Rural Breast Cancer Project included: 1) providing information and educational videotapes regarding breast cancer; 2) information about mammography and how to do BSE; and to those recruited, 3) distribution of questionnaires; 4) clinical breast exam; and 5) low cost mammography screening. At the educational event a project representative described the program to women who were interested in participating. To register for the program women who desired to participate filled out a registration and informed consent form. Those recruited as project participants were asked to complete a study questionnaire, which was designed to discover more about women's attitudes and practices regarding breast cancer screening. Questionnaires were collected by project representatives. Project participants then received a clinical breast exam, either in the health department or by their primary care provider. Once the breast exam was completed, the providers signed a mammography voucher indicating that a CBE had been completed. Project participants then scheduled an appointment to receive a reduced rate mammogram. The cost of the mammogram was \$55.00. Women who stated that they were unable to pay the low cost of the mammogram received a voucher for a free mammogram.

Description of Instrument

The instrument used for this study was a questionnaire entitled Rural Breast Cancer Screening Project modified by researchers B. Given

and C. W. Given from the original questionnaire entitled Health Care Practices: A worksite survey. The original questionnaire was initially used as a pretest to investigate attitudes, intentions and practices regarding breast cancer screening and was administered to women employees at diverse work sites.

The questionnaire Rural Breast Cancer Screening Project consists of a total of 13 pages and 37 questions. Questions vary to include questions with dichotomous yes-no answers, multiple choice or four-point Likert scale. The purpose of the instrument was to learn more about women's attitudes toward breast cancer screening (See Appendix C).

Data Collection Procedure

Data was collected from the self-administered questionnaires given to project participants at each of the four research sites. The questionnaire entitled Rural Breast Cancer Screening Project. After obtaining the client's written consent all subjects were asked to complete a self-administered structured questionnaire. The questionnaires were administered at the four research sites. Upon completion of questionnaire, project participants returned the instrument to project personnel for coding. The instruments were pre-coded with the date of completion, site and participant code number.

Human Subject Protection

The rights of the respondents were protected through adherence to standard criteria set forth by the Michigan State University Committee on Research Involving Human Subjects. At initial contact with the potential subject the program was described along with the dissemination of educational material regarding breast cancer and breast cancer screening. All project participants signed a registration-informed

consent form prior to participation in the program. Questionnaire given to participants gave a brief explanation of the purpose of the questionnaire. Confidentiality and anonymity were assured through the use of code numbers on the instrument used for data collection.

Validity

Validity refers to the degree to which an instrument measures what it is intended and presumed to measure. Content validity is concerned with adequate sampling of content. There are no objective methods to confirm the adequacy of content coverage of an instrument. One way to establish validity is by relying on experts to determine if items are representative of the trait to be measured (Polit & Hungler, 1983). Content validity is concerned with establishing the degree to which the items comprising a scale represent the characteristics to be measured (Polit & Hungler, 1983).

The scales that were used in the Rural Breast Cancer Screening Project questionnaire were derived from scales developed from a literature review, and the expert knowledge and judgement of the principal investigators and research colleagues. Face validity, determined by items to see if the instrument contains important items to measure the variables related to barriers to mammography screening, was based on the expert opinion of the principal investigators and colleagues. The results from the factor analyses obtained by the original investigators in the pilot study were used to suggest ways to revise this instrument and so to improve the measures of the constructs.

Reliability

Measures of reliability, or internal consistency were conducted on the original instrument by principal co-investigators B. Given & C.W.

Given. Those results were used to improve the questions in revised questionnaire used in this study. Internal consistency refers to the extent to which all of the instruments items, or subscales, measure the same attribute consistently within the subjects (Polit & Hungler, 1983). A measure is reliable to the extent that application of the instrument produces the same results repeatedly (Rossi & Freeman). Reliability analysis was conducted on original instrument. The instrument contained separate scales for the different item constructs. Cronbach's Alpha yielded coefficients ranging from 0.78 to .91 for the instrument scales.

APPENDIX B
Study Questions

Study Questions**Barrier 1: Lack of physician recommendation**

Question 12v. My doctor has never suggested that I have a mammogram.

Strongly disagree (1) Disagree (2)

Agree (3) Strongly agree (4)

Question 22. Has your doctor advised or discussed
mammography with you?

Yes ____ No ____

Barrier 2: Discomfort related to mammography procedure

Question 12c. A mammogram is an unpleasant procedure

Strongly disagree (1) Disagree (2)

Agree (3) Strongly agree (4)

Question 12e. A mammogram is painful

Strongly disagree (1) Disagree (2)

Agree (3) Strongly agree (4)

Question 12b. A mammogram is an embarrassing procedure

Strongly disagree (1) Disagree (2)

Agree (3) Strongly agree (4)

Question 12f. A mammogram would make me feel anxious

Strongly disagree (1) Disagree (2)

Agree (3) Strongly agree (4)

Question 12i. A mammogram makes me feel uncomfortable

Strongly disagree (1) Disagree (2)

Agree (3) Strongly agree (4)

**Barrier 3: Cost and Inconvenience of mammography/Cost of obtaining a
mammogram.**

Question 12d. A mammogram is a hardship due to cost
Strongly disagree (1) Disagree (2)
Agree (3) Strongly agree (4)

Inconvenience of obtaining a mammogram

Question 12g. A mammogram is convenient to arrange
Strongly disagree (1) Disagree (2)
Agree (3) Strongly agree (4)

Question 12i. A mammogram is not available in my area
Strongly disagree (1) Disagree (2)
Agree (3) Strongly agree (4)

APPENDIX C
Rural Breast Cancer Screening
Project Questionnaire

**RURAL BREAST CANCER
SCREENING PROJECT**

**Michigan State University Comprehensive Breast
Cancer Center, American Cancer Society
Michigan Division, Community Hospitals, Health
Care Providers, & The Cooperative Extension Service**

Dear Participant. The following questions seek to learn more about women's attitudes towards breast cancer screening. We hope that you will consider each question carefully and that you will return the questionnaire, which should take 10-15 minutes to complete. All information will be kept strictly confidential. Thank you.

How did you hear about this screening project? (check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Television (a) | <input type="checkbox"/> Poster/Brochure (g) |
| <input type="checkbox"/> Friend (b) | <input type="checkbox"/> Health Fair (h) |
| <input type="checkbox"/> Family member (c) | <input type="checkbox"/> Hospital/Health Dept (i) |
| <input type="checkbox"/> Newspaper (d) | <input type="checkbox"/> American Cancer Society (j) |
| <input type="checkbox"/> Church (e) | <input type="checkbox"/> Cooperative Ext Service (k) |
| <input type="checkbox"/> Physician/Nurse (f) | <input type="checkbox"/> Other (l) specify _____ |

NAME _____
(Last) (First) (Middle)

ADDRESS _____

CITY _____

TELEPHONE (Day _____ (Evening) _____)

TODAY'S DATE _____

PERSONAL HISTORY

1. Please write in the date of your birth (WRITE IN)

____/____/____
mo. Date yr.

2. In the past five years, how many times have you had:

- a. Complete physical exam _____ (WRITE IN #)
b. Pap smear & pelvic exam _____ (WRITE IN #)

3. Have you ever used birth control pills? (Check one)

☐ Yes (1)
☐ No (2) (IF NO< GO TO QUESTION #4)

If YES, for approximately how many years have you taken
(or did you take) birth control pills?

(WRITE IN TOTAL NUMBER OF YEARS)

4. Have you ever been pregnant? (CHECK ONE)

☐ Yes (1)
☐ No (2) (IF NO, GO TO QUESTION #5)

- a. If YES, How many pregnancies have you had?
(write in)
b. How many full-term deliveries (8-9 months) have you had?
(write in)
c. What was your age at the time of the delivery of your first
baby? (Write in your age)
-

5. Are you pregnant or nursing?

☐ Yes (1)
☐ No (2)

6. Do you have any nipple discharge that comes out by itself?

7. Have you reached menopause? (CHECK ONE)

☐ Yes (1)
☐ No (2)
☐ Don't Know (3)

- a. If YES, at what age did you begin menopause?
 (WRITE IN AGE)
-

8. Have you ever had a hysterectomy (uterus/womb removed)?
(CHECK ONE)

☐ No (1)
☐ Uterus only (2)
☐ Uterus and ovaries removed (3)
☐ Don't know (4)
☐ Other (5) (Please specify)

9. Have you ever been diagnosed with breast cancer?
(CHECK ONE)

☐ Yes (1)
☐ No (2)

10. Have you ever had a mammogram? (CHECK ONE)

- ☐ Yes (1)
☐ No (2) (GO TO QUESTION 10-B, PAGE 4)
☐ Don't Know (3) GO TO QUESTION 12, PAGE 5)

a. if YES, was this: (CHECK ONE)

- ☐ A screening mammogram
☐ For a diagnosis (GO TO QUESTION 11)

b. If NO, why have you never had a mammogram?
 (PLEASE WRITE IN)

 _____ (GO TO QUESTION #12)

11. If YES to Question 10, about how often do you have a mammogram? (CHECK ONE)

- ☐ More often than every year (1)
☐ Each year (2)
☐ Every two years (3)
☐ Every three years (4)
☐ Less often than every three years (5)

11a. When did you have your last mammogram? (WRITE IN)

_____/_____
 Month Year

11b. Which of the following best describes what prompted your most recent mammogram? (CHECK ALL THAT APPLY)

- ☐ To follow up a breast problem/something unusual (1)
☐ It was part of my routine check-up (2)
☐ A health care professional recommended it (3)
☐ A friend or relative was recently diagnosed with a breast problem (4)
☐ A relative or friend recommended that I have a mammogram (5)
☐ I asked my physician because I felt it was necessary (6)
☐ Other (7) (Please specify _____)

12. How much do you agree or disagree with each of the following statements about mammograms? (CIRCLE ONE RESPONSE FOR EACH)

STRONGLY STRONGLY
DISAGREE DISAGREE AGREE AGREE

A MAMMOGRAM:

1 2 3 4

- a. Is important to remain healthy
 b. Is an embarrassing procedure
 c. Is an unpleasant procedure
 d. Is a hardship due to cost

- e. Is painful
- f. Would make me feel anxious
- g. Is convenient to arrange
- h. Causes me to worry about my health
- i. Is not available in my area
- j. Doesn't seem necessary
- k. Is not worth the effort
- l. Makes me feel uncomfortable
- m. I don't know when I need a mammogram
- n. I have too many other worries to have a mammogram
- o. I'm afraid something abnormal would be found
- p. Improves my chances of early detection of an abnormality
- q. helps me keep control of my health
- r. I'm just too busy to have a mammogram
- s. I forget when I am supposed to have a mammogram
- t. I am confident the mammogram will be done correctly
- u. I want to be the first to know if something is wrong with my breasts
- v. My doctor has never suggested that I have a mammogram
- w. My health care professional has discouraged me from having a mammogram
- x. I am too old to have a mammogram
- y. Other comments about mammograms
(WRITE IN _____)

13. In the next year, how likely are you to have a mammogram?
(CHECK ONE)

☐ Definitely (1)
☐ Very likely (2)
☐ Somewhat likely (3)
☐ Not very likely (4)
☐ Not at all likely (5)

14. Have you ever had a Physical (Clinical) Breast Examination by a Health Care Professional? (CHECK ONE)

☐ Yes (1)
☐ No (2) (GO TO QUESTION 16)

- a. If YES, when was your last physical (clinical) breast examination by a health care professional?

_____/_____
 Month Year

15. In the NEXT YEAR, how likely are you to have a physical (Clinical) Breast Examination? (CHECK ONE)
- ☐ Definitely (1)
- ☐ Very likely (2)
- ☐ Somewhat likely (3)
- ☐ Not very likely (4)
- ☐ Not at all likely (5)
16. How much do you agree or disagree with the following statements about clinical breast exams? (CIRCLE ONE RESPONSE FOR EACH)

STRONGLY DISAGREE DISAGREE AGREE STRONGLY AGREE

A PHYSICAL (CLINICAL)

BREAST EXAMINATION:

1

2

3

4

- a. Is an embarrassing procedure
- b. Is an unpleasant procedure
- c. Is important to remain healthy
- d. Is a hardship due to cost
- e. Is painful or physically uncomfortable
- f. Would make me feel anxious
- g. Is convenient to arrange
- h. Doesn't seem necessary
- i. Is not worth the effort
- j. I don't know when I need exams
- k. I have too many other worries
- l. I'm afraid something would be found by clinical exam
- m. I want to improve my chances of early detection of an abnormality
- n. Helps me keep control of my health
- o. I'm just too busy to have an exam
- p. I forget when I am supposed to have exams
- q. I don't really know how to ask for an exam
- r. I am confident the exam will be done correctly
- s. My doctor has never suggested having an exam
- t. Other comments about clinical breast exams (WRITE IN

The following set of questions focus on early detection of breast cancer. Early detection means finding an abnormality in early stages. For breast cancer this means when the lump is small and has not spread to other areas of the body.

17. If found early enough, breast cancer can be cured. (CHECK ONE)
☐ Strongly Disagree (1)
☐ Disagree (2)
☐ Agree (3)
☐ Strongly Agree (4)
☐ Don't know (5)
18. Unless she has symptoms, a woman doesn't need a mammogram. (CHECK ONE)
☐ Strongly Disagree (1)
☐ Disagree (2)
☐ Agree (3)
☐ Strongly Agree (4)
☐ Don't know (5)
19. Mammograms can detect early abnormalities likely to be breast cancer. (CHECK ONE)
☐ Strongly Disagree (1)
☐ Disagree (2)
☐ Agree (3)
☐ Strongly Agree (4)
☐ Don't know (5)
20. Once a person develops cancer, it is usually too late to do anything about it. (CHECK ONE)
☐ Strongly Disagree (1)
☐ Disagree (2)
☐ Agree (3)
☐ Strongly Agree (4)
☐ Don't know (5)
21. Early detection would improve one's chances for cure of breast cancer. (CHECK ONE)
☐ Strongly Disagree (1)
☐ Disagree (2)
☐ Agree (3)
☐ Strongly Agree (4)
☐ Don't know (5)

Have any of the following persons advised or discussed clinical breast examinations (performed by a health care professional) or mammography with you? (CHECK ONE FOR EACH)

	PHYSICAL (CLINICAL)			
	<u>BREAST EXAM</u>		<u>MAMMOGRAPHY</u>	
DISCUSSED:	YES	NO	YES	NO
Doctor	___	___	___	___
Nurse	___	___	___	___
Family	___	___	___	___
Friend	___	___	___	___
Other (Specify _____)	___	___	___	___

23. With regard to breast cancer screening practices, how important to you is the opinion and advice of each of the following sources for you to have a clinical breast examination and mammography? (CHECK ONE FOR EACH)

	Very Important	Somewhat Important	Not at all Important
Doctor			
Nurse			
Family			
Friend			
Co-Worker			
Radio/TV			
Literature/ Pamphlets			
American Cancer Society			
Magazines			
Experiences of well known persons (Nancy Reagan, Ann Jullian)			

24. As compared with other women of your age, what do you think are the chances that you will develop breast cancer in the next five years? (CHECK ONE)
- ☐ Much less than other women (1)
 - ☐ Somewhat less than other women (2)
 - ☐ About the same as other women (3)
 - ☐ Somewhat higher than other women (4)
 - ☐ Much higher than other women (5)
25. What do you think are the chances that any woman in the USA will have breast cancer some day? (CHECK ONE)
- ☐ About 1 in 5 (1)
 - ☐ About 1 in 10 (2)
 - ☐ About 1 in 25 (3)
 - ☐ About 1 in 50 (4)
 - ☐ Less than 1 in 50 (5)

26. What do you think is more likely to get breast cancer?
(CHECK ONE)
- ☐ Women under age 50 (1)
 - ☐ Women over age 50 (2)
 - ☐ Age makes no difference (3)
 - ☐ Don't know (4)
27. If you were to develop breast cancer, how likely do you think it is that it would have spread before it was discovered? (CHECK ONE)
- ☐ Not at all probable (1)
 - ☐ Somewhat probable (2)
 - ☐ Very probable (3)
 - ☐ Extremely probable (4)
 - ☐ Can't predict (5)
28. Finally, please tell us what one or two things would help you to get mammograms regularly?
1. _____
- _____
2. _____
- _____

BACKGROUND

This final series of questions asks for background information about you, including your employment and occupation. We remind you that all the information you provide will be held in strictest confidence and will not be linked to you as an individual.

1. What is your current employment status? (CHECK ONE)
- ☐ Work full-time (1)
 - ☐ Work part-time (2)
 - ☐ Volunteer (non-salaried) (3)
 - ☐ Retired (4)
 - ☐ On leave or disability (5)
 - ☐ Other (6) (Please specify _____)
2. How long have you been employed with your present company or organization?
- a. Please WRITE IN number of years employed: _____
- b. Please WRITE IN the title of your position: _____
3. Do you have health insurance? (CHECK ONE)
- ☐ Yes (1)
 - ☐ No (2)

Is your insurance coverage provided by: (CHECK ALL THAT APPLY)

- ☐ Your employer
- ☐ Your spouse
- ☐ Other family member's employer
- ☐ Self pay
- ☐ Medicaid
- ☐ Medicare
- ☐ Not insured
- ☐ Other (please specify _____)

4. Does your health insurance pay for screening physical breast exams by health care professionals? (CHECK ONE)

- ☐ Yes (1)
- ☐ No (2)
- ☐ Don't Know (3)

5. What does your health insurance pay for screening mammograms? (CHECK ALL THAT APPLY)

- ☐ Routine mammography, when no known problem exists (1)
- ☐ Only for referral mammographies, to rule out suspected abnormality (2)
- ☐ Follow-up for known abnormalities (3)
- ☐ Don't know (4)

6. What is your race or ethnic background? (CHECK ONE)

- ☐ White (1)
- ☐ Black (2)
- ☐ Hispanic (3)
- ☐ American Indian/Alaskan Native (4)
- ☐ Chinese (5)
- ☐ Japanese (6)
- ☐ Filipino, Hawaiian, Korean, Vietnamese (7)
- ☐ Other (8) (Please specify _____)

7. What is your marital status? Are you: (CHECK ONE)

- ☐ Single-never married (1)
- ☐ Widowed (2)
- ☐ Married or living as married (3)
- ☐ Separated (4)
- ☐ Divorced (5)
- ☐ Other (6) (Specify _____)

8. What is the highest grade (or level) of education that you have completed? (CHECK ONE)

- ☐ Less than 8th grade (1)
- ☐ 8th grade to 11th grade (2)
- ☐ High school graduate/GED (3)
- ☐ Post high school, trade or technical school (4)
- ☐ One to three years of college (5)
- ☐ College graduate (6)
- ☐ Graduate and/or professional school (7)

9. Which category best describes your total combined household income before taxes last year (from all adult sources living in your household (CHECK ONE-OPTIONAL)

☐ Less than \$15,000 (1)
☐ \$15,000-\$20,000 (2)
☐ \$21,000-\$25,000 (3)
☐ \$26,000-\$30,000 (4)
☐ \$31,000-\$35,000 (5)
☐ \$36,000-\$40,000 (6)
☐ \$41,000-\$45,000 (7)
☐ \$46,000-\$50,000 (8)
☐ More than \$50,000 (9)

Thank you again for your time and interest in completing these questions.

If you have any additional comments about experiences with breast cancer, screening, or the factors which you feel influence women's breast cancer screening practices, please feel free to note these below.

THANK YOU!

MICHIGAN STATE UNIV



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