Identification and comparison of factors affecting breast self-examination between professional nurses and non-nursing professional women

Sandra Christina Klimek
University of Nevada, Las Vegas

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Identification and comparison of factors affecting breast self-examination between professional nurses and non-nursing professional women

Klimek, Sandra Christina, M.S.N.

University of Nevada, Las Vegas, 1994

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IDENTIFICATION AND COMPARISON OF FACTORS AFFECTING
BREAST SELF-EXAMINATION BETWEEN PROFESSIONAL NURSES
AND NON-NURSING PROFESSIONAL WOMEN

by

Sandra C. Klimek

A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Science

in

Nursing

Department of Nursing
University of Nevada, Las Vegas
May, 1994
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ABSTRACT

The purpose of this study was to compare breast self-examination (BSE) behavior of professional nurses with non-nursing women alumni, and to describe the factors which influence regular adherence to BSE. The age range of the N = 549 women was 22 to 72 years. The factors of knowledge, self-esteem, attitudes, beliefs and demographics were examined. The conceptual framework was Betty Neuman's Health Care System Model. A sample of 439 professional nurses was compared to a sample of 110 women alumni. The survey questionnaire was made up of Champion's Health Belief and Knowledge tools, and the Rosenberg Self-esteem Scale. The analysis included a stepwise multiple regression for the independent variables and the demographic data. The study established that the professional nurses adhered to more frequent BSE practices than did the women alumni. Attitudes and knowledge were predictors for frequency; self-esteem was not. A small percentage of the variance was explained by demographic factors.
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CHAPTER I

INTRODUCTION

Breast cancer, the most common malignancy in women, was diagnosed in an estimated 150,000 American women in 1990 (American Cancer Society, 1990). A woman now has a 1 in 8 lifetime risk of developing breast cancer compared to a 1 in 10 lifetime risk just a few years ago (Swanson, 1993). The rates have increased about one percent per year since the early 1970’s. Women at greatest risk are those over the age of 50 years, and those with an immediate family history of breast cancer. Never having had children, having the first child after age 30, and obesity, with a body weight over 40% above normal, have been found to be associated with breast cancer (American Cancer Society, 1990). An estimated 44,000 deaths were attributed to breast cancer in 1990, second only to lung cancer as a cause of death due to malignancy in women. On the positive side, with improved screening and treatment modalities, the 5-year survival rate has risen from 78% in the 1940’s to 90% today (American Cancer Society, 1990).
The primary screening, monthly breast self-examinations (BSE), has been advocated as an effective method for early detection of breast cancer in all women 20 years and older since the mid-1960’s by both the American Cancer Society and the National Cancer Institute. Unfortunately, studies have repeatedly shown that only 12 - 36% of American women examine their breasts routinely, and the rate decreases as women grow older, when the rate for breast cancer increases (Champion, 1989; Lierman, Young, Kasprzyk & Benoliel, 1990; Olson & Mitchell, 1989). Yet it is well documented that from 78 - 90% of all breast abnormalities are discovered by women themselves (Ludwick, 1988; Welch, McCaffrey & Dodge, 1988), thus making poor adherence to routine BSE practice a major health concern.

The underlying question to the problem of women learning and adhering to routine BSE is relevant to the role of the professional nurse. Nurses comprise the largest number of professionals in the health care field, practice in various health care settings and are known for their supportive education role (Cretain, 1989). The professional nurse, equipped with the background understanding and exposure to breast cancer as well as other cancers has the onus of teaching about and influencing the attitudes of the populace towards more
preventive health care. One might question how nurses compare to other professional women in health care behavior, in this instance BSE behavior. By examining this question, researchers could further focus on knowledge and understanding as either being contributory or less influential than other factors, such as attitudes, or self-esteem, which have been correlated with positive health practices (Glenn & Moore, 1990; Lauver, 1987).

PROBLEM STATEMENT

A primary concern for the prevention of breast cancer is close adherence to monthly breast self-examinations.

PURPOSE OF THE STUDY

The purpose of this study was to compare adherence or nonadherence to regular BSE in a population of professional female nurses with a population of non-nursing female college graduates. This study explored the relationship between predictive variables of beliefs and attitudes, knowledge and self-esteem, and adherence to BSE practices in both groups.
SIGNIFICANCE OF THE STUDY

The nursing profession has assumed a responsibility for the teaching and promotion of health care. To be effective as health care promoters it is necessary to be aware of the factors that influence compliance and motivation to perform health promotion behaviors. Examining these factors in clients is important, but it is also important to examine them in nurses themselves. In this way the profession can understand its attitudes and beliefs as a group; and recognize its need either to develop an increased sensitivity to the beliefs, attitudes and needs of clients, and/or to develop inroads to change knowledge levels, attitudes, beliefs or self-esteem within the nursing profession. Role modeling has been widely accepted as one of the most effective teaching methods, yet role modeling by nurses cannot be assumed. Expecting nurses to be different from the populace may be unrealistic. However, in their role as educators and promoters of health for the general public, it is important to examine nurses’ behaviors and attitudes to determine factors which do contribute to positive role modeling--or which need to be improved upon.
THEORETICAL FRAMEWORK

This investigation is centered within the framework of the Betty Neuman Health Care Systems Model (1989). The model includes the holistic, dynamic, biopsychosocial perspective of the person and includes the influences of developmental, psychological, physiological, sociocultural, and spiritual factors on the individual’s experiences and everchanging, adaptation while constantly interfacing with the environment. It is the interrelationship of these factors which form the lines of defense.

These lines of defense (LOD) continue to change throughout one’s lifetime, and can be influenced by primary prevention as intervention. Concepts of Neuman’s model which are applicable to this proposed study are primary prevention, lines of defense, stressors, and impact of stressors on the core.

The model suggests that certain activities involving prevention will strengthen an individual’s lines of defense prior to the impact of a stressor(s). Primary prevention includes intervention before a stressor is encountered to help the individual avoid the encounter, or to reduce the intensity of the stressor once it is encountered (Neuman, 1989). In this study primary prevention is specifically manifested by health beliefs,
attitudes and information which contribute to the understanding and performance of routine BSE.

The normal and flexible lines of defense are conceptualized as concentric rings which protect and maintain system stability, protecting the lines of resistance and ultimately the core. The normal lines of defense are considered to constitute a level of health developed over time. Coping patterns, life-style behaviors and cultural factors influence normal lines of defense. Flexible lines of defense surround the normal lines of defense to protect against the invasion of stressor(s). Daily life patterns such as diet, sleep, exercise, and other health-related behaviors form the flexible LOD (Neuman, 1989). In this study the lines of defense will be indicated by the reported adherence to routine BSE practices.

Neuman (1989) views reactions to stressors to be influenced by core structures (those structures which make up the basic unique unit of life, which, if penetrated, could leave the individual vulnerable to death), the nature of the stressor, and the status of the lines of defense and lines of resistance. In this study the core structure is dependent upon the overall health of the individual. The stressor(s) is identified as the discovery of a mass through BSE. Stressor(s) are the
risk factors for breast cancer, i.e., over the age of 50, bearing no children, or having the first born child after age 30, or obesity greater than 40% above normal weight. The impact of the stressor can be the physical and psychosocial response to the discovery of a breast mass. Certainly, the physical and psychological stressors have the potential for a much more critical impact on the core if a breast mass is found to be malignant.

Neuman (1989) also addresses the variables of development, including age, motivational forces and personality, such as attitudes, as parts of the core. Accordingly, this study looked at the differences in primary prevention beliefs and attitudes, strengthened lines of defense, response to stressors, and increased susceptibility to stressors based on the age and personality of those individuals sampled.

Health Belief Model

The Health Belief Model (HBM), developed in the 1950's by Hochbaum, Leventhal, Kegeles and Rosenstock (Rosenstock, 1974), was utilized within the framework of Neuman's system model to examine the relationship between knowledge, attitudes and beliefs, and perception in influencing an individual's decision in determining health action. The model is frequently utilized in research related to BSE. The HBM is based on the premise
that an individual must be in a psychological state of readiness for action in reference to a health promotion behavior (Redecker, 1989). The HBM also posits that the individual is influenced more by one's current milieu than by the past (Lauver, 1987). Over the years, the HBM has evolved to include varying concepts based on ongoing research. Researchers who repeatedly use the theoretical model, or are instrumental in developing tools to measure the theory (Champion, 1984; 1985; 1987; 1989; and 1991) have redefined or added to the concepts as a result of their findings.

A large number of studies measuring health behavior, as explained by the HBM, relate to five concepts: perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, and health motivation and control. **Perceived threat** is how one views a potential or existing stressor(s). **Perceived benefit** relates to the effectiveness of particular behavior in reducing the threat of the stressor(s). **Perceived susceptibility** refers to an individual’s view of the probability of encountering a potentially harmful stressor(s). **Perceived seriousness** relates to how threatening a stressor(s) is to an individual. **Perceived barrier** relates to the negative characteristics of an anticipated health behavior, (i.e., with BSE, lack of
confidence, forgetfulness, fear of finding a lump, too busy, embarrassment, etc.). Health motivation refers to a generalized intent towards health-related practices which reflect one’s degree of interest and concern about health matters (Champion, 1984; Lauver, 1987). Health control, associated with health motivation, refers to the amount of power one perceives one has over one’s own health (Champion, 1984, 1989). Williams (1988) depicted the Health Belief Model concepts in relation to BSE frequency in a schematic diagram (Figure 1.).

The conception of susceptibility and severity supply the energy to react, whereas the difference between perceived benefits and barriers supplies the direction for action. Internal or external triggers for action are defined as cues, (e.g., external--media messages, knowing someone with breast cancer; internal--having symptoms) to influence health behavior. Demographics are thought to alter perceptions rather than behaviors (Lauver, 1987).

In essence, persons will pursue care or practice health promoting activities when they perceive themselves as potentially susceptible to a threatening condition, receive and react to certain cues to action; rationalize that the benefits outweigh the risks in reducing the health stressor (Williams,1988).
Figure 1. Diagram of Health Belief Model concepts and their relationship to frequency of breast self-examination.
The HBM was explored in this study in relation to one’s normal and flexible lines of defense. Five factors: perceived threat, perceived susceptibility, perceived seriousness, perceived benefits, and perceived barriers, in addition to motivation and control, may influence the state of one’s normal and flexible lines of defense. The lines of defense can be either strengthened or weakened, based on the individual’s perception of these factors. If an individual’s lines of defense can be strengthened by maintaining or changing to more positive health beliefs and attitudes, there is a much greater probability that the individual will respond with primary prevention behaviors such as regular BSE; and also strengthen the flexible lines of defense. Although one’s normal lines of defense are believed to be fairly well-developed early in one’s life the everchanging, dynamic, and holistic individual is capable of change over one’s lifetime (Neuman, 1989).

Neuman (1989) does not specifically define and explore self-esteem as part of personality. However, self-esteem closely interfaces and influences mental and social development over one’s lifetime. Self-esteem can be used to consciously affect one’s flexible lines of defense, and, perhaps less consciously, the normal lines of defense over time.
Acquisition of knowledge is another method which could influence the individual's lines of defense (Dickson, Parsons, Greaves, Jackson, Kronenfeld, Ward, & Ureda, 1986). Thus the acquisition of increased knowledge and self-esteem has the potential to impact primary prevention, and influence adherence to routine BSE practices.

RESEARCH QUESTIONS

The research questions for this study are:

I. Do professional nurses adhere to more regular practice of BSE than do non-nurse professional women?

II. What is the relationship of the factors of health belief and attitudes, knowledge, and self-esteem to the regular practice of BSE?

III. What is the relationship of the factors of age, race, marital status, religion, educational level, number of children, and family history of cancer, and specifically, breast cancer, to regular BSE practice?

CONCEPTUAL DEFINITION OF TERMS AND VARIABLES

Routine breast self-examination as established by the American Cancer Society (1990) is once monthly, or approximately 1 week following onset of each menses. Breast self-examination frequency refers to the time intervals in which individuals in a sample perform BSE.
The time intervals will be measured as: no practice; every 6 - 12 months; every 3 - 4 months; every 2 months; every month; more than once/month.

Knowledge is defined as an individual's understanding of breast cancer; need for BSE; and proper BSE technique. Proficiency guidelines developed by the American Cancer Society (1990) include: lying supine with ipsilateral arm of examined breast behind head; using finger pads of three middle fingers of opposite hand to press firmly, working in either a circular motion, up and down lines, or wedge pattern, covering all areas of the breast, nipple and axilla for lumps or densities. Proficiency includes examining both breasts similarly. It also includes examining breasts in the mirror for symmetry, skin changes, or changes in nipple appearance. Self-esteem refers to the perception an individual has of oneself.

Health beliefs and attitudes refers to how an individual perceives oneself in relation to the maintenance of or pursuit of a state of well-being. Professional nurse refers to a person who has graduated from a nursing school after having completed a minimum of a four-year college course, and has passed board examination for licensure as a registered nurse (Ayers, 1987).
ASSUMPTIONS

The assumptions for this study are reflective of the literature review, Neuman's System Model, the Health Belief Model, and clinical practice experiences.

1. The individual is a biopsychosocial being influenced by developmental, physiological, psychological, sociocultural and spiritual factors, who must constantly adapt to an everchanging environment.

2. There are multiple factors which influence one's health practices.

3. Factors which influence one’s health practices can be identified.

4. Self-esteem, knowledge, and beliefs and attitudes can be measured.

5. Cancer is perceived by most persons to be an extremely serious illness.

6. Health is highly valued by most individuals.

SUMMARY

This chapter has presented an overview of the importance of breast self-examinations as a treatment modality for breast cancer. The statement of the problem, the purpose of the proposed study, and the significance of the study were stated. Neuman's System Model and the Health Belief Model were discussed as a theoretical framework for the study. Finally, the
research questions, stated variables, definition of terms, and assumptions for the proposed study were stated.
CHAPTER II

REVIEW OF RELATED LITERATURE

The literature review includes related studies on breast self-examination (BSE) within the conceptual framework of the Health Belief Model (HBM). The review also includes research related to knowledge, self-esteem, the associated concept of self-efficacy as factors in BSE practice, and demographic variables which affect BSE behavior. Finally, studies examining the BSE behaviors of registered nurses were reviewed.

BREAST SELF-EXAMINATION AND THE HEALTH BELIEF MODEL

The HBM is the framework most frequently used to explain and guide research on BSE behaviors. The HBM concepts and instruments to measure the concepts have varied somewhat and slowly evolved over the years as researchers refine the subscales of the HBM based on the results of studies and ongoing testing of the theory. In recent studies, the HBM framework has consistently demonstrated "perceived barriers", those factors which denote unpleasant association with BSE (i.e., fear of finding a lump, embarrassment or guilt about touching one's body) as being the most predominant variables
predicting BSE frequency. The negative correlation has been reported to account for a range of 18-67% of the variance as a predictor for BSE frequency (Champion, 1987; Lashley, 1987; Lauver & Angerame, 1988; Lierman, Young, Kasprzyk & Benoliel, 1990; Sheppard, Solomon, Atkins, Foster & Frankowski, 1990; and Williams, 1988). Normandeau (1988), using dependent variables of breast cancer detectors (BSE and mammography) and the HBM found "barriers" to be the best predictor of frequency and adherence to the practice of BSE. Lauver & Angerame (1988) and Williams (1988) addressed the range of barriers based on the discrimination of the barrier variables within the instrument used, and the ages of those sampled. Forgetting and lacking competence in the practice of BSE are barrier factors which repeatedly emerge in the literature (Champion, 1985; Heyman, Tynes, Phipps, Cave & Owen, 1991; Lauver & Angerame, 1988; & Lierman, et al., 1990). In contrast, Crooks (1989) found fear (of finding a mass) one of the greatest inhibitors. Shepperd, et al. (1990), using a perceived barrier index and regression analysis, found forgetting, exclusive reliance on medical personnel for breast exams, and low confidence in ability to perform BSE as the greatest predictor of BSE frequency accounting for 67% of the variance in two samples of
women of childbearing age--those of low income and low education; and those of high income and high education.

Sheppherd et al. (1990) found barriers to be a greater predictor in women with no health problems. Similar findings were obtained in a study by Champion (1988) measuring attitudinal variables relating to intention, frequency and proficiency using the HBM. Barriers accounted for the greatest variance for intent, with health motivation second. Barriers, health motivation and susceptibility were related to actual BSE frequency; whereas proficiency in performing thorough BSE was significantly predicted by health motivation, susceptibility and barriers. Health motivation accounted for the greatest variance, with barriers second, and susceptibility accounting for the third greatest variance. Gray (1990) found that women who scored high on health motivation and perceived fewer barriers to performing BSE were also more likely to have increased BSE frequency.

Nettles-Carlson, Field, Friedman, & Smith (1988) refined the role of barriers within the HBM by designing a study that explored the idea that perception of benefits minus perception of barriers results in the number of people who will perform routine BSE practices. Nettles, et al., also found that the main barriers to BSE
were forgetting, lack of confidence, and fear of finding an abnormality.

In an Australian study, Clark, Hill, Rassaby, White & Hirst (1991), used the same benefits minus perception concept as Nettles, et al. (1988), to define and evaluate BSE behavior in women over age 40 who had received personalized instruction. The instruction program increased frequency of BSE, and reduced the emotional barriers to BSE, but it did not increase the frequency to those levels advocated for adequate BSE protection. The failure to achieve those levels was attributed to the barriers of forgetting and to lack of perceived self-efficacy in BSE practice. Clark et al. (1991) organized barriers into 3 categories: practical, emotional, and cognitive—all requiring different approaches for professionals to consider in assisting others to overcome barriers to BSE. The regression analysis resulted in 27% of the variance explained by practical barriers, self-efficacy and cues to remembering to do BSE. However neither emotional nor cognitive barriers entered into the equation.

**RELATED HEALTH BELIEF MODEL FACTORS**

In addition to perceived barriers, an HBM factor previously discussed that most affects BSE frequency, the factors of perceived threat, perceived susceptibility,
perceived seriousness, perceived benefits, and health motivation and control have also reflected influence in predicting positive BSE practices.

Perceived benefits have been associated with BSE behaviors in numerous studies (Champion, 1987; Lashley, 1987; Lauver, 1987; Rutledge, 1987; & Williams, 1988). Champion (1987) also found perceived susceptibility to be related to BSE behavior, but Rutledge (1987) did not find it an important factor for BSE performance. Lauver (1987) cites similar negative correlation with perceived susceptibility and seriousness in older studies.

Lierman et al. (1990) found perceived threat and BSE frequency to be inconsistent. Their study indicated the three predictors of frequency to be 1) barriers to action 2) perceived severity and 3) cue to action. Lauver (1987) further elaborates that cues that serve as external reminders (e.g., media messages, professional examinations, or knowing others with cancer) tend to be influential on maintenance of BSE practice, however, internal cues have not yet been consistently identified.

In research by Champion (1987) on HBM attitudinal variables, results indicated the combination of susceptibility, seriousness, barriers, health motivation and control predicted intent to practice BSE. Additionally, frequency and total proficiency for BSE
were significantly predicted by health motivations, susceptibility and barriers, lending support of the HBM variables in predicting women's intention and actual BSE behavior. Health motivation showed the greatest variance for proficiency; barriers were second and susceptibility third.

In an experimental study Nettles-Carlson et al. (1988) found that the perceived benefit of BSE giving peace of mind predicted non-practicers most likely to change. A formula of perceived benefits minus perceived barriers determined the persons who would do exams. Although the researchers determined that practicers were motivated by physicians and nurses, teaching BSE to non-practicers resulted in only a 50/50 chance of success.

In a related study, Champion (1987) found that benefits and health motivation were correlated with BSE. However, in the total regression the variance accounted by these two variables was insignificant, as it shared with the construct of barriers and knowledge, which were significant. Susceptibility was also an important indicator of BSE frequency—those perceiving increased susceptibility had increased BSE frequency. In 1991, research by Champion indicated a relationship between BSE and attitudinal variables of health motivation, social
influence, susceptibility, barriers, confidence and knowledge.

Clark, et al. (1991) considered perceived severity to be a poor predictor of BSE behavior based on their earlier research. They attributed this to the almost universal acceptance among women that breast cancer is serious. The researchers also cited previous research indicating that health motivation was not a significant predictor of intention to do BSE. Champion (1987) reported that health motivation did not add significantly to the prediction of BSE practice nor did it discriminate between those who practiced BSE and those who did not when the variables of knowledge and barriers were partialled out. However, Williams (1988), using Champion’s HBM scale (1984) and stepwise multiple regression analysis with older women, found that health motivation accounted for the greatest influence at 18%, but no significant relationship existed between frequency of BSE and perceived seriousness.

Hill & Shugg (1989) compared practices and attitudes among breast cancer, benign breast disease, and general practice patients. Among the benign participants and the controls, no association was found between their subjective measure of susceptibility and BSE practice. The benign groups showed the highest frequency of BSE;
family history affected BSE practice only with cancer patients. However, attitudes, personal organization and history of either benign or malignant disease all predicted BSE intention. Stern (1989) found similar results.

KNOWLEDGE AS A FACTOR IN BREAST SELF-EXAMINATION

In addition to perceptions of barriers, benefits, susceptibility, seriousness, and health motivation and control, knowledge of breast cancer and BSE practice has been related to BSE frequency. Specifically, the Opinion Research Corporation found that younger and better educated women were more likely to practice BSE than older or less educated women (Opinion Research Corporation, 1980).

Champion (1987) found that knowledge and barriers could significantly predict BSE practice without the additional HBM variables. Women with more knowledge about BSE perceived greater benefits and less barriers than did women reflecting less knowledge. Normandeau (1988) and Bove (1987) found similar results. In contrast, a related study by Champion (1989) determined that knowledge correlated significantly with intent and proficiency, but not with frequency. In contrast, Williams (1988) found knowledge to be significantly related to frequency. However, Williams used a self-
developed knowledge tool that, by her own admission, needed further validity and reliability testing.

Gray (1990) using Champion's Knowledge Scale to study BSE practices in rural women indicated a significant positive relationship between the variables of BSE knowledge and BSE practice. Shepperd et al. (1990) found similar results.

Nemcek's (1989) study of factors influencing BSE practices in black women found that knowledge scores, although not significant, were essentially the same in women who had high frequency practices (at least once a month) as those who had low frequency practices (< every 6 months). Hill & Shugg (1989) noted that lack of knowledge was not among the factors limiting adherence to BSE frequency. Alagna, Morokoff, Bevett & Reddy (1987) found that women at high risk for breast cancer, despite being more knowledgeable about BSE, did not practice BSE more frequently than women at lower risk. In the low risk group, knowledge of BSE technique and breast cancer emerged as significant predictors. Beaman (1987) found that after giving subjects teaching on breast cancer and BSE, knowledge improved, but there was no significant change in BSE frequency.
SELF-ESTEEM AS A FACTOR FOR BSE PRACTICE

Self-esteem as an individual concept is infrequently studied in relation to preventive practices despite the evidence that it is the single-most important factor affecting behavior (Rutledge, 1987). Several studies, however, have related self-esteem to self-confidence in relation to women's perception of their self-efficacy in preventing breast cancer through BSE behaviors.

Much of the research focusing on confidence in performing BSE has been related to the self-efficacy concept of Bandura's Social Learning Theory. The theory poses that persons who have high expectations of their ability to exercise a behavior will have higher behavior outcomes than those who have less confidence in their ability (Bandura, 1977; Champion, 1989; Olson & Mitchell, 1989). Modeling and guided practice with feedback are important strategies to increase women's confidence (Cretain, 1989).

Research done by Banks (1989) Lauver & Angerame (1988) and Olson & Mitchell (1989) all indicated that perceived competence and confidence were consistently associated in a positive direction with BSE frequency. Champion (1989) found confidence to correlate significantly with intent, frequency and proficiency, but
not demographics. Confidence correlated only moderately with knowledge about breast cancer.

In related research Champion (1991) developed a 12-item confidence scale using Bandura’s self-efficacy theory concepts. Champion found that confidence, knowledge and barriers nearly equalled in predicting BSE behavior. Lauver & Angerame (1988) found that perceived confidence or competence consistently and positively associated with BSE frequency. Alagna, Morokoff, Bevett, & Reddy (1987), examining BSE behavior in women in both low and high risk groups for breast cancer, found that self-confidence about performing BSE was most strongly associated with BSE frequency in both groups. Gonzalez (1990), in a study of low-income Mexican-American women, found self-efficacy to be a predictor of BSE frequency more than did social support or barriers to health care (e.g., the English language barrier).

Shepperd et al. (1990), studying determinants of BSE among women of lower education and income, found that low confidence along with perceived barriers was the best predictor of BSE frequency. In a small sample, the researchers found that women with lower education were more likely to practice, but experienced less confidence.

In research to study the relationship of self-concept, health locus of control and knowledge of cancer
treatment options to BSE practice Glenn & Moore (1990) found that self-confidence in one’s ability was the greatest factor to affect BSE frequency. There was a weak correlation of knowledge to self-concept. Perceived risk, history of breast cancer, BSE demonstrations, or BSE handout information booklets did not affect frequency. Dickson et al. (1986) had similar findings in their study. Olson & Mitchell (1989) found that satisfaction with BSE ability and explanation of BSE technique significantly predicted BSE frequency. They suggested that clinicians can promote BSE frequency by helping women feel confident about their ability to perform BSE adequately.

Rutledge (1987) found positive self-concept to be directly related to BSE frequency. Examining factors related to BSE practice on women, Rutledge found high self-concept, low perceived barriers, and high perceived benefits to relate directly to BSE frequency. The researcher found that self-concept related directly to the intent for BSE practice, but not to health beliefs. She suggested that increased self-esteem could reflect a potential for increased coping in the event a lump was discovered. Rutledge summarized the importance of nurses assessing for clues to a woman’s self-concept while
teaching and to focus on low self-esteem and anxiety issues to promote successful adherence to BSE practice.

DEMOGRAPHICS AS FACTORS IN BREAST SELF-EXAMINATION PRACTICES

Several demographic factors have been considered in BSE research. Those most often incorporated are age, race, marital status, numbers of children, educational level, socio-economic status, religion, profession, and history of breast or other cancer in the family. Researchers have found varying influences of the aforementioned factors.

Champion (1987) reported that women who had personally experienced breast cancer, or had family members who had been treated for breast disease, had significantly increased BSE frequency. Conversely, Williams (1988), in a sample of older women, found personal or family history of breast cancer to not be predictive of BSE frequency.

Champion (1989) reported religion to be the only demographic variable which correlated with intent and frequency in a sample of randomly selected urban women over the age of 35 years. The correlation was not with choice of religion, but rather, degree of involvement in religious activities.
Gray (1990) indicated no association, or a very weak association between the demographic variables of age, race, marital status, religion, education, and personal experience with breast disease.

Straus, Solomon, Costanza, Worden & Foster (1987) found that women with greater susceptibility (a history of breast cancer) had increased frequency of BSE, but these women also perceived breast cancer to be less threatening than those who have no history of breast cancer. They also found that older women and women with a greater history of benign disease were more likely to practice BSE and that they were more informed about BSE. In this small sample, those with lower education exhibited a greater likelihood to practice BSE. However, Hill and Shugg (1989), found that women with benign breast disease had the highest BSE frequency. Those women who had a higher incidence of family history of breast cancer were not significantly related to perceived susceptibility, even though they tended towards that direction.

Shepperd, et al, (1990), compared BSE practices of Caucasian women of childbearing age in a lower income, lower education group to those of a higher income, higher education group, and found that there were no differences in mean BSE frequency or quality between the two samples.
However, there was a significant difference between income and education and never having practiced BSE (those with lower income and lower education had a greater proportion who never practiced).

Champion (1988) found that married women had increased intent, but marriage did not correlate with frequency or proficiency. Religion also correlated with intent but not frequency. However, Champion (1989) found that increased religious involvement correlated with both intent and frequency.

Gray (1990), examining demographics which affect BSE in rural women, found a weak or no correlation between BSE and the variables of age, race, marital status, religion, education, personal experience with breast disease, or knowing a friend with breast disease. Olson & Mitchell (1989) had similar findings.

Nemcek (1989) found that older women practiced more frequently than younger women; and those knowing someone with breast cancer practiced more frequently than those who did not know someone.

**BREAST SELF-EXAMINATION PRACTICES OF REGISTERED NURSES**

The literature devoted to research on nurses' attitudes and practices has, to date, been limited. Despite the paucity of studies, insightful information
about nurses beliefs, attitudes and practices has become available.

In a Canadian study, Clarke & Sandler (1989) investigated medical-surgical nurses for their personal practice and teaching practices of BSE to clients. Of 105 nurses sampled, 82% stated they practiced BSE, and all of the nurses sampled over the age of 40 years practiced BSE. The demographics indicated a low-moderate risk for and belief of a susceptibility to cancer. None of the nurses sampled reported lack of confidence in performing BSE. Although the nurses agreed that BSE was a valuable tool for the prevention of death from cancer only 40% taught BSE to their clients.

In a similar Australian study Ellis, Slavis & Pinch (1990) reported that 62% of the nurses sampled performed BSE, but only 40% proficiently, and 22% acceptable, with lack of confidence being the major barrier. Sixty percent of the nurses felt inadequate to teach BSE to clients. In a related New Zealand study Willis (1988) found that of 250 nurses sampled, 81.6% performed their own BSE, and of those 81.6%, 95.8% taught BSE to their clients. Of those who didn't teach their clients, the major reason was inappropriate clinical setting (i.e., ICU, ER, OR, etc.).
In a study to ascertain the extent to which female nurses comply with the American Cancer Society guidelines, and to see if their rate of compliance is related to either age or education, McMillan (1990) sampled 3225 Florida nurses. Results indicated that only 28% of RNs sampled practiced BSE monthly. No significant relationship was found between cancer prevention and detection practices and age or educational level. Although younger nurses were more prone to BSE compliance, and nurses with lower education tended to be less compliant, McMillan concluded that nurses need to be better role models for clients.

Heyman, Tyner, Phipps, Cave & Owen (1991) focused on instructional programs designed to help nurses teach BSE to hospitalized patients. Knowledge, attitudes, self-practice and teaching practices of nurses were measured in those attending the program and those in a control group. Although the instructional program increased nurses' teaching of BSE, it did not affect their own self-practice. It was discerned that knowledge alone was not enough, and that attitude was more influential. The nurses sampled indicated low scores on an attitude scale for breast cancer. If cancer was thought to be curable, the nurses were more likely to practice routine BSE.
Researching a different focus, Edgar & Shamian (1987) and Shamian and Edgar (1987), found that women taught by nurses demonstrate greater knowledge, confidence and practice than those taught by any other source. Using the Orem self-care model, the researchers found that if nurses were encouraged to focus on their own feelings about health promotion activities, i.e., smoking, diet, exercise, BSE; and explored factors that influence BSE behavior (i.e., religion, upbringing, age, anxiety) thus clarifying their own belief systems, they could then be more sensitive to and collaborative with clients in making effective changes in BSE frequency.

An earlier but related study by Edgar, Shamian & Patterson (1984), using the Orem self-care model, compared knowledge, attitudes, confidence, and practice of BSE in a group of hospital-based nurses and non-nurses to determine which factors influence why nurses do not teach or practice BSE more frequently. The findings showed a significant difference in knowledge levels and confidence between the nurse and non-nurse group. However, there were no significant differences between the two groups in frequency of practice. Interestingly, confidence was noted in both nurse and non-nurse practices. The researchers suggested that knowledge is perceived as a necessary component of BSE, set within the
framework of confidence, which results from believing in one's ability to perform BSE correctly.

Another significant study on nurses and BSE (Cole & Gorman, 1984) found that nurses who were younger, better educated, and were cognizant about getting breast cancer themselves had increased frequency (30.1%). Those who were non-compliant (69.9%) were older (>35 years), were less educated, and tended to have greater risk factors. They were knowledgeable about risk factors, yet thought very little about their own susceptibility. The researchers concluded that the denial process as a coping mechanism for high anxiety was an area that needed further investigation. Furthermore, they found that the younger nurses, living in a health-conscious culture, found it easier to be motivated knowing their risk factors were less. They concluded that knowledge, beliefs and perceptions were not complete tenets from which to derive desired health behaviors. Hailey (1987) derived a similar conclusion in a study of BSE practices of college females.

**SUMMARY**

The literature search has brought forth studies which have examined related factors which tend to impact BSE practices. The Health Belief Model has been the framework for the majority of research on BSE behavior.
The Health Belief Model includes the factors of perceived threat, perceived susceptibility, perceived seriousness, perceived benefits, and health motivation and control.

Several studies relating knowledge to BSE frequency have indicated a positive correlation. However, other studies resulted in conflicting findings, indicating that the effects of knowledge on BSE frequency is not conclusive.

A paucity of research exists on the correlation of self-efficacy and self-esteem on BSE frequency despite the evidence of its importance in influencing behavior. All but one of the studies have indicated a positive correlation between self-confidence, self-esteem, and BSE frequency. The conflicting study found that women with lower education were more likely to practice BSE, but experienced less confidence.

Several studies have examined the effects of demographics on BSE frequency. The factors more often considered are age, race, marital status, number of children, educational level, socio-economic status, religion, profession, and history of breast or other cancer in the family. The influence of these factors on BSE frequency have been found to be varied and conflicting in the existing literature.
Finally, the few existing studies which explore BSE behaviors and attitudes of registered nurses were reviewed. The results of these studies were varied and conflicting. However, the bulk of the research indicated that nurses did not factor out any differently than did non-nurses in relation to knowledge, beliefs or confidence and BSE frequency.

With evidence of such little research with nurses in relation to BSE behaviors it seems timely and prudent to compare nurses to non-nurses with comparable educational background to study the differences, if any, between the two groups in relation to beliefs, knowledge and self-esteem. In view of the numerous studies done on BSE behavior of various populations of women, it would be appropriate to compare the behaviors of nurses to non-nurses to see if nurse’s education, knowledge, and exposures influence their attitudes, beliefs and behaviors significantly to consider what characteristics of nurses may or may not contribute to their successful influence on clients for BSE and other health prevention instructions.
CHAPTER III

METHODOLOGY

This chapter describes the research design, population, sample, setting, resources, instrumentation, analysis, and procedure for the purpose of identification and comparison of factors influencing breast self-examination (BSE) behaviors in professional nurses and other professional women.

DESIGN

The study used an ex post facto design, with a comparative/descriptive survey. The ex post facto design was chosen to examine and identify the BSE practices of two professional groups of women, one health-related, the other not. The comparative/descriptive strategy allowed the two groups to be compared and contrasted in relation to their BSE practices. It also allowed the identification and comparison of variables which might influence the BSE practices of the two groups.

The factors of knowledge, health beliefs and attitudes, and self-esteem have all been identified from the literature as affecting positive health practice. The questionnaire survey explored what influences these
factors have on the BSE practices of the professional nurses and the non-nursing professionals, and allowed for comparison of the two groups in relation to these factors. In addition, the demographic portion of the questionnaire identified demographic variables which the literature and model suggest might impact BSE practices in the two groups.

The design is related to the theoretical base of Neuman's Systems Model in that increased knowledge, positive health beliefs and attitudes, and self-esteem would strengthen lines of defense. The design deductively tested the theory with the premise that professional nurses, with increased knowledge and understanding of breast cancer and the benefits of BSE, would adhere more regularly to the routine practice of BSE than non-nurse professionals of the same age range. The variables of beliefs and attitudes, and self-esteem were measured to assess if and how they are related to knowledge about breast cancer and BSE practice.

**Internal and External Validity of Design**

The design of this study minimized the threat to the internal validity. Without using an experimental or control group, but rather a one-point-in-time investigative questionnaire, the threats of maturation and instrumentation were minimized.
The threat of history may have had some effect on the respondents' answers on the attitude questions. Increased publicity for health awareness may have predisposed respondents to answer as would be socially correct. The threat of mortality was assessed, and determined to be of minimal influence, based on the number of respondents in relation to the chosen sample size.

The threat to internal validity by participants was controlled by limiting the research question to apply to professional nurses (BSN or greater educational preparation). The Nevada State Board of Nurses could not limit their mailing lists to nurses with a baccalaureate degree or higher. Thus, the entire population of nurses residing in Clark County, Nevada were surveyed. However, the data were analyzed comparing only the nurses with a baccalaureate degree or higher with professional women who have graduated with a baccalaureate degree or higher from a university in southern Nevada, also aged 22-77 years. Both groups currently reside in the southern Nevada metropolitan area.

External validity could have been threatened by reactivity and novelty, particularly for the professional nurses. The professional nurses might have been compelled to answer on their attitude, self-esteem and frequency question in a more positive socially expected response.
rather than a more honest answer. The mechanisms for control of these threats were limited, thus the data needs to be interpreted bearing in mind these potential threats.

External validity of the design was also controlled by limiting the generalization to a comparative group of professional women nurses and non-nursing professional women in a southwestern urban area of 800,000 to 1 million population.

**SAMPLE**

The sample was chosen from the population of female professional nurses and female university alumni graduates in Clark County, Nevada.

As of February, 1991, there were approximately 951 registered professional nurses in Clark County, Nevada (Nevada State Board of Nursing, 1991). For this study, professional nurse is defined as one who has received a Bachelor of Science degree or higher in nursing. The 951 professional nurses were drawn from the total population of 4806 registered nurses in Clark County as of February, 1991 (Nevada State Board of Nursing, 1991).

The age range for study was 22 through 65 years. Twenty-two is the approximate minimum age one would most likely have attained a college degree. Sixty-five years is generally accepted as the most prevalent age for retirement currently in our nation, thus giving a terminal
parameter for the age range of a professional career. However, the Nevada State Board of Nursing did not have a mechanism to limit the sample age. As a result a small number of respondents (10) from the nurse group responded in the age range 66 to 77. The large overall sample size justified leaving their data in the analysis.

The comparison group was female graduate alumni from a southern Nevada public university. With the first graduating class 31 years ago, the alumni population included all female graduates from 1961 to the present to include the age range of 21-65 years. The alumni sample included only one person over 65 and was also included in the data, again justified by the sample size (Davenport, 1992).

The entire population of the 951 professional nurses in Clark County, Nevada were surveyed. Cohen's power analysis (1988) cited in Munro, Visintainer and Page (1986, pp. 56-59) was the criteria used to determine sample size based on effect size, significance level, and desired power. A small to medium effect size, .20 to .50, as expected for most nursing studies was chosen. A significance level of .05, a desired power level of .80, and a two-tailed t-test was used as guidelines to select sample size (Munro, et al., 1986, pp. 56-59).
A computer program to determine statistical power analysis based on the principles of Borenstein and Cohen (1988) was used to determine the appropriateness of the size sample obtained. With a survey response of approximately \( N = 550 \) (110 women alumni and 440 professional nurses) a two-tailed alpha set at .05, and a small effect size of .20, the resulting power is calculated very high at .997.

**Subjects Rights.** Approval was obtained for the study from the Department of Nursing at the University of Nevada, Las Vegas and the University of Nevada, Las Vegas Human Subjects Rights Committee (Appendix A). A cover letter was attached to each questionnaire (Appendix B) addressing:

1) Explanation of the purpose and procedure of the study,

2) Risks and benefits to the participants,

3) Participation in the study being strictly voluntary,

4) Assurance of confidentiality for each participant by posting no return address,

5) Availability of results of the study upon request, and
6) Accessability of the researcher to answer participant’s questions pertaining to the questionnaire or study.

In accordance with ethical practice and Human Subjects Rights requirements, the participants were informed through the cover letter of phone accessibility to the researcher, and of all aspects of the research that may influence their willingness to participate in the study (Appendix B).

SETTING

The setting was Southern Nevada, a setting reflective of a Southwestern urban area of the United States with a population of approximately 800,000 - 1,000,000 residents (The World Almanac, 1994). The university used to sample non-nurse professionals has a student population of approximately 20,000 students (LV Perspective, 1992).

INSTRUMENTS

The portion of the research question: what effect do the factors of health belief and attitudes have on influencing the regular practice of BSE, was pursued through the use of the Health Belief Model Instrument (HBMI). The HBMI instrument was developed by Victoria Champion, RN, DNS in 1984 to measure the constructs of the HBM: susceptibility, seriousness, benefits, barriers and
health motivation. Champion's HBMI has been used for several studies relating to BSE (Champion, 1985, 1987, 1989; Gray, 1989, Rutledge & Davis, 1988; and Williams, 1988). Written permission and guidance have been obtained from the developer of the Health Belief and Knowledge Instrument (Appendix C).

The HBMI is composed of 34 questions pertaining to perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, and health motivation and control. The instrument measures internal level data on a Likert scale with seven choices ranging from strongly disagree to strongly agree (Appendix D).

Content validity was originally established by Champion using a panel of judges made up of faculty and colleagues knowledgeable of the Health Belief Model (HBM). Construct validity was established by analyzing all the items using factor analysis and multiple regression (Champion, 1985), and factor analysis with varimax rotation (Champion, 1987).

Internal consistency reliability for the HBM was supported by Cronbach alphas ranging from .60 to .78, and test-retest reliability was Pearson r's of .47 to .62. Prior work had reported alphas of .47 to .86, with an explanation that less time between test-retest (2 weeks)
had resulted in higher alphas than when done at a one-month interval (Champion, 1985; and Champion, 1987).

In a study by Williams (1988), using Champion's HBMI, the Cronbach alpha reliability for the total scale ranged from .63 to .76, and at least .7 on four of the five scales. The benefit scale had the lowest correlation coefficient of .61. Construct validity of the HBMI was supported for the independence of the constructs through factor analysis and multiple regression. A multiple R of .51 (p = <.001) was obtained with 26% of the variance accounted for (Williams, 1988). Gray (1989) had similar results, showing a Cronbach alpha range of .60 to .78.

Content validity was established by review of the instrument by a convenience sample of nursing educators and graduate nursing students, available through personal contact at the University of Nevada, Las Vegas. Construct validity was supported by using factor analysis using Varimax rotation.

The portion of the research question: what effect does the factor of knowledge have on influencing the regular practice of BSE, was measured by the Knowledge Instrument. The Knowledge Instrument was also developed by Victoria Champion, RN, DNS in 1989. Knowledge was defined in terms of an individual's understanding of breast cancer and BSE drawn from questions from the

The sum of the 25-item questionnaire comprising the Knowledge Instrument was treated as interval-type data, with the item answers coded as either correct or incorrect. The knowledge variable measured relates to the optimal degree of primary prevention and strengthened flexible lines of defense from decision making based on one’s knowledge base. The obtained data reflected answers drawn from three to five choices for each question, with only one answer correct, reflecting knowledge.

The Knowledge Instrument, in two separate studies by Champion (1987 and 1989), had an internal consistency reliability determined by a Cronbach alpha of .56. Content validity was determined by consulting with nursing educators and graduate nursing students. The portion of the research question: what effect does the factor of self-esteem have on influencing the regular practice of BSE, was measured by the Rosenberg Self-Esteem Scale (REES). The REES was developed in 1965 and widely used to measure self-esteem (Breytspraak & George, 1982). It is a 10-item Likert scale with a four-choice range of answers from strongly agree to strongly
disagree (Appendix F). It reflected potential action for primary health prevention, such as BSE, based on one's self-concept, desire and motivation to take care of oneself. The self-esteem tool measured the self-concept of the professional nurses and the non-nursing professional women.

The REES has had validity and reliability established in prior studies. Breytspraak and George (1982) reported studies indicating a test-retest correlation of .85 for a two-week period, and a Cronbach alpha of .74 for internal consistency. In formal tests for validity, Breytspraak and George reported using factor analysis, with correlations ranging from .37 to .83.

Factor analysis has been used to confirm unidimensionality of the scale (Nelson, 1990). Content validity was established by reviewing the instrument with nursing educators and graduate nursing student colleagues.

The research question concerned with measuring the effect of demographic factors of age, race, marital status, number of children, educational level, religion, and family history of cancer, specifically, breast cancer on frequency of BSE was measured by a demographic questionnaire encompassing the aforementioned variables (Appendix G). The data obtained from these factors are those which the Neuman Systems Model suggest may affect
normal and flexible lines of defense, and primary prevention actions. A final question on the demographic questionnaire determined the frequency of BSE practice of the two professional groups. The ordinal level question gave a range of choices from never to greater than once-a-month frequency. It is a direct measure of an individual's primary prevention intervention for breast cancer and reflect one’s normal lines of defense against breast cancer. The demographic section was also reviewed for content validity by nurse educators and graduate nursing students.

In summary, the measurement of the variables of interest in this study were: the HBM components that addressed the research question of measuring the effect of health beliefs and attitudes on BSE behavior; the Knowledge Instrument that addressed the research question of measuring the effect of knowledge on BSE frequency; the REES that addressed the research question of measuring the effect of self-esteem on BSE frequency. Finally, the demographic questionnaire portion measured the effect of the variables age, race, marital status, number of children, educational level, religion, family history of cancer, and specifically, breast cancer on frequency of BSE.
The proposed instruments for this study have been well established as evidenced from the literature, with documented reliability and validity. Content validity has been established for all three components of the instrument used in this study. Criterion validity was assessed for the Knowledge Scale, construct validity for the HBM component, and unidimensionality of the REES. A Cronbach alpha measurement was established, with a minimum rating of .60 for each of the three scales. The Statistical Package for Social Service (SPSS) computer program was used in all data analysis. The tools were further assessed for use in this study by conferring with nurse educators and graduate nursing students for length, ease of reading, comprehension, and suitability for problem statement and conceptual framework.

OPERATIONAL DEFINITIONS

Routine breast self-examination - Considered to be once monthly, or approximately one week following onset of each menses, as established by the American Cancer Society (1990). It was based on a standard of proficiency established by the American Cancer Society to include supine positioning with ipsilateral arm extension behind the head for the breast to be examined. The three middle finger pads of the opposite hand are to be pressed firmly, using a circular, up and down line, or a wedge pattern to
completely examine the breast, nipple and axilla bilaterally. Proficiency in BSE also includes standing in front of a mirror, with arms pressed against the waist, to examine breast tissue for changes in symmetry, discoloration or changes in skin surface, or changes in the nipple, including redness or swelling.

**Breast self-examination frequency** - The time intervals in which individuals perform BSE; to be measured as: no practice; every 6 - 12 months; every 3 - 4 months; every 2 months; every month; and, more than once a month.

**Knowledge** - the concept of knowledge was measured by the Knowledge Instrument, a 25-point survey questionnaire (Champion, 1989). The questionnaire, based on the Opinion Research Corporation (1980) public information survey for American women, examines a woman’s knowledge about the proper technique and position for examining breasts; the recommended frequency and time to examine breasts; normal and abnormal anatomy; general information about breast cancer, including risk factors treatments, and prognosis for survival with early detection (Appendix E).

**Self-esteem** - The perception one has of oneself, was measured by the Rosenberg Self-Esteem Scale (Breytspraak & George, 1982). This 10-point survey questionnaire contains both positive and negative statements concerning one’s self-perceptions (Appendix F).
Health beliefs and attitudes - The concept of how an individual perceives oneself in relation to the maintenance of or pursuit of a state of well-being. In the study, health beliefs and attitudes were measured by Champion's Health Belief Instrument, a 34-point survey questionnaire measuring the six Health Belief Model constructs: susceptibility, seriousness, benefits, barriers, health motivation and control (Appendix D).

Demographics - The demographic information was obtained from a questionnaire included with the survey (Appendix G). It included the information of: age, race, marital status, number of children, highest level of education obtained, profession, religion, history of cancer in family, history of breast cancer in family, and frequency of breast self-examinations.

Professional nurse - For this study a professional nurse is a registered nurse who has graduated from a university with a minimum of a four-year coursework program of study, leading to a Baccalaureate degree.

Professional-non-nurse - A professional non-nurse for this study included individuals who had graduated from an accredited university with a minimum of a baccalaureate degree, excluding nursing or any other health science field.
STATISTICAL METHODS USED FOR DATA ANALYSIS

Descriptive statistics were used initially to analyze demographic information and frequency of BSE practice of the two professional groups. This information is displayed on frequency tables.

ANOVA was used to compare the frequency of BSE of nurses to non-nurses. Although the dependent variable data violates the assumption for being true interval level data, the ordinal data was treated as interval data for analysis. ANOVA is considered a robust test that can withstand the adjustment of the ordinal data (Munro, 1986, pp. 174-175).

To answer the research question as to what effect the factors of the HBMI, knowledge, and self-esteem have on influencing the regular practice of BSE, forward stepwise multiple regression was used. The multiple regression analysis described the extent, direction and strength of the relationship between the three independent variables (knowledge, beliefs and attitudes, and self-esteem), and the one dependent variable (BSE frequency). The dependent variable was at interval level measurement, and fell into a fairly normal distribution to meet assumptions (Woods & Catanzaro, 1988, p.420-424).

The independent variables were analyzed as a group to determine their relative influence on the dependent
variable, routine BSE practice. Stepwise multiple regression was chosen as it allowed an analysis of the hierarchal correlation in descending order of the influence of the three independent variables on the dependent variable, routine BSE practice. To control for the potential problem of multicollinearity between the independent variables, a bivariate correlation matrix was calculated prior to the stepwise regression analysis (Wilson, 1989, pp. 559-565).

A multiple regression was also run on the five subscales of the HBMI to determine which of the subscales were predictive of the regular practice of BSE. The subscales of beliefs, seriousness, benefits, consequences, and control were analyzed.

Finally, a stepwise multiple regression analysis of the demographic information was done to determine if any of the demographic variables were related to routine BSE practice. The nominal level variables were dummy coded to allow for analysis by this technique and a bivariate correlation matrix was calculated prior to the stepwise analysis to control for potential multicollinearity between the independent variables (Wilson, 1989, p.559-565).
PROCEDURE

Permission to access a mailing list for a sample of professional nurses in Clark County, Nevada was obtained from the Nevada State Board of Nurses. Permission has also been obtained from the UNLV Alumni Association to access a randomized mailing list of non-nursing professional women in Clark County, Nevada between the ages of 22 and 65 years (Appendix H).

The research protocol was reviewed and approval obtained by the UNLV Department of Nursing Human Rights Committee and the UNLV Human Subjects Rights Committee.

Prior to the actual study, the questionnaire was pilot tested by a convenience sample of university nurse educators, graduate nursing students, and non-nursing professionals.

The questionnaires were sent out to all potential participants with the cover letter explaining the research, voluntary participation, assurance of confidentiality, and cost/benefit ratio. A follow-up reminder card was sent two weeks later to encourage participation.
CHAPTER IV

RESULTS

SAMPLE DESCRIPTION

Of the total population of 4806 nurses in Clark County who were sent the questionnaire, 834 responded, approximately a 17% return. However, of the professional nurses who participated from a total population of 951, 439 responded, giving a 46.1% return rate of those having a baccalaureate degree or higher. Of the total sample of 579 female alumni surveyed, 110 responded, for approximately a 19% return. The women alumni listed a variety of occupations and professions, but were analyzed as a composite group.

The results of the nurses and alumni were analyzed separately to allow for a comparison of professional nurses to non-nursing professionals. Not all participants answered all the questions on the questionnaire. Subsequently, throughout the analysis, varying totals exist for each questionnaire and test result.

Of the 834 female nurses and 110 female alumni who responded, the age range was 22 to 77 years, with the mean age 43.83 years, with a SD = 10.462. An analysis of age
for the professional nurses resulted in a mean age of 43.966 with a SD = 10.096. The mean age of the 110 women alumni was 39.606 with a SD = 10.099. The comparison of the age profile of the professional nurses and the women alumni are shown in Table 1.

Both groups were similar in distribution, and comparable to the marital status profile of the general population. Only "separated" and "widowed" had dissimilar profiles. The professional nurses had 6 participants "separated", the women alumni had none. The professional nurses had 10 (2.3%) of the participants "widowed", whereas the women alumni had 4 (3.7). Refer to Table 2 for comparable demographic data on marital status between the professional nurses and women alumni.

Both the professional nurses and the women alumni were similar in retirement status. Approximately 6% of each group were retired.
Table 1

Comparative Age Distribution of Professional Nurses and Alumni

<table>
<thead>
<tr>
<th>Age Groupings (years)</th>
<th>Professional Nurses</th>
<th>Women Alumni</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%*</td>
</tr>
<tr>
<td>20 - 29</td>
<td>32</td>
<td>7.3</td>
</tr>
<tr>
<td>30 - 39</td>
<td>116</td>
<td>26.4</td>
</tr>
<tr>
<td>40 - 49</td>
<td>171</td>
<td>39.0</td>
</tr>
<tr>
<td>50 - 59</td>
<td>79</td>
<td>18.0</td>
</tr>
<tr>
<td>60 +</td>
<td>41</td>
<td>9.3</td>
</tr>
<tr>
<td>Missing Data</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>439</td>
<td>100</td>
</tr>
</tbody>
</table>

*Valid percent
Table 2

Comparative Data on Marital Status Between the Professional Nurses and the Women Alumni

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Professional Nurses</th>
<th>Women Alumni</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Single</td>
<td>39</td>
<td>8.9</td>
</tr>
<tr>
<td>Married</td>
<td>312</td>
<td>71.2</td>
</tr>
<tr>
<td>Divorced</td>
<td>70</td>
<td>15.9</td>
</tr>
<tr>
<td>Separated</td>
<td>6</td>
<td>.2</td>
</tr>
<tr>
<td>Widowed</td>
<td>10</td>
<td>2.3</td>
</tr>
<tr>
<td>Missing Data</td>
<td>1</td>
<td>Missing</td>
</tr>
<tr>
<td>Total</td>
<td>439</td>
<td>100</td>
</tr>
</tbody>
</table>

*Valid percent
Table 3 compares the demographic data for the number of children between the professional nurses and women alumni.

There was a notably greater number of women alumni who had no children (34.9%) compared to 26.7% for the professional nurses. The women alumni were also more inclined to have only one child (26.6%) compared to 18.9% for the professional nurses. The professional nurses overall tended to have larger families than did the women alumni. Both groups were similar in the percentages of children living in the household at the time of the survey. However, 22.1% of the women alumni had only one child at home, whereas 17.3% of the nurses had only one child at home.

Table 4 denotes the comparison between the professional nurses and women alumni in highest educational level attained.
Table 3

Comparative Data for Number of Children for Professional Nurses and Women Alumni

<table>
<thead>
<tr>
<th>Children</th>
<th>Professional Nurses</th>
<th>Women Alumni</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%*</td>
</tr>
<tr>
<td>None</td>
<td>117</td>
<td>26.7</td>
</tr>
<tr>
<td>One</td>
<td>83</td>
<td>18.9</td>
</tr>
<tr>
<td>Two</td>
<td>122</td>
<td>27.9</td>
</tr>
<tr>
<td>Three</td>
<td>76</td>
<td>17.4</td>
</tr>
<tr>
<td>Four</td>
<td>22</td>
<td>5.0</td>
</tr>
<tr>
<td>Five</td>
<td>13</td>
<td>3.0</td>
</tr>
<tr>
<td>Six or more</td>
<td>6</td>
<td>1.2</td>
</tr>
<tr>
<td>Missing Data</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>439</td>
<td>100</td>
</tr>
</tbody>
</table>

*Valid percent
Table 4

Comparative Data for Highest Educational Level Attained
Between Professional Nurses and Women Alumni

<table>
<thead>
<tr>
<th>Educational Level (Degree)</th>
<th>Professional Nurses</th>
<th>Women Alumni</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Associate*</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Baccalaureate</td>
<td>330</td>
<td>75.2</td>
</tr>
<tr>
<td>Masters</td>
<td>100</td>
<td>22.8</td>
</tr>
<tr>
<td>Doctoral</td>
<td>9</td>
<td>2.1</td>
</tr>
<tr>
<td>Total</td>
<td>439</td>
<td>100</td>
</tr>
</tbody>
</table>

*Eleven women alumni listed themselves as associate degree graduates
Ten percent of the women alumni reported their highest attained degree as Associate. Prior to 1985, Associate degree programs were offered through the University of Nevada, Las Vegas, which, up to that time, entitled the graduates the same privileges as all alumni. Due to the limited number of these persons, their data were included in the data analysis. Seventy-five percent of the professional nurses held a baccalaureate degree compared to 52% of the women alumni. In contrast, only 22.8% of the professional nurses held a Master’s degree, compared to 34.5% for the women alumni.

Table 5 compares the demographics of race between the professional nurses and women alumni.
Table 5

Comparative Data on Race Demographics Between Professional Nurses and Women Alumni

<table>
<thead>
<tr>
<th>Race</th>
<th>Professional Nurses</th>
<th>Women Alumni</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>402</td>
<td>92.0</td>
</tr>
<tr>
<td>Afro-American</td>
<td>14</td>
<td>3.2</td>
</tr>
<tr>
<td>Asian</td>
<td>6</td>
<td>1.4</td>
</tr>
<tr>
<td>Hispanic</td>
<td>10</td>
<td>2.3</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>1.1</td>
</tr>
<tr>
<td>Missing Data</td>
<td>2</td>
<td>Missing</td>
</tr>
<tr>
<td>Total</td>
<td>439</td>
<td>100</td>
</tr>
</tbody>
</table>
Approximately 90% of both the professional nurses and women alumni were Caucasian. All of the other ethnic groups were comparably small in percentages, however, the women alumni group had 8.2% Afro-American representation, compared to only 3.2% of the professional nurses. All of the percentages are very comparable to that of the general population of the United States.

Table 6 compares the demographic data for religious affiliation between the professional nurses and women alumni.
Table 6

Comparative Demographic Data on Religious Affiliation
Between Professional Nurses and Women Alumni

<table>
<thead>
<tr>
<th>Religion</th>
<th>Professional Nurses</th>
<th>Women Alumni</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>None</td>
<td>37</td>
<td>8.4</td>
</tr>
<tr>
<td>Protestant</td>
<td>176</td>
<td>40.2</td>
</tr>
<tr>
<td>Catholic</td>
<td>156</td>
<td>35.6</td>
</tr>
<tr>
<td>Jewish</td>
<td>16</td>
<td>3.6</td>
</tr>
<tr>
<td>LDS/Mormon</td>
<td>23</td>
<td>5.3</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>6.8</td>
</tr>
<tr>
<td>Missing Data</td>
<td>1</td>
<td>Missing</td>
</tr>
<tr>
<td>Total</td>
<td>439</td>
<td>100</td>
</tr>
</tbody>
</table>
Tool Validation

Factor Analysis to Validate Health Belief Model Instrument (HBMI). Factor analysis with Varimax Rotation was implemented to validate the structure and quality of the instrument utilized to measure Health Belief Model attitudes.

The HBMI, developed by Champion (1984); designed to measure health beliefs and attitudes; is broken into the components of beliefs about breast cancer, the seriousness of breast cancer, the benefits of preventative BSE, the consequences of breast cancer, and one's sense of control over preventing breast cancer. All five subscales were tested in the analysis. A total of 34 individual items were used to measure the five components.

In the unrotated matrix, only the 5 "belief" questions, pertaining to one's beliefs about breast cancer, loaded onto one factor, at 0.76438 to 0.80128. The other items did not load as clearly. Consequently, the Varimax was run to elicit a clearer loading.

In the Varimax rotation, the "belief" subscale items loaded clearly onto Factor 2, with a range of 0.88373 to 0.93796. The "serious" subscale items loaded heavily onto Factor 3, with a range of 0.54231 to 0.74143. However, the last item of the "seriousness" subscale, relating to length of life after developing breast cancer, loaded
separately on Factor 7 at 0.74558. The "benefit" subscale items loaded heavily onto Factor of 1 with a range of 0.75153 to 0.81321. The subscale "consequences" items loaded heavily only onto Factor 5, except for two questions, one of which loaded heavier onto Factor 6, with a range of 0.55382 to 0.79401. The final subscale items, "control", with 10 questions split onto 4 different factors, with a range of 0.42733 to 0.87880.

**Factor Analysis to Validate the Self-Esteem Instrument**

On the unrotated factor matrix, only two factors were identified. For factor 1, the eigenvalue was 4.58731, with a percent of variance at 45.9. For factor 2, the eigenvalue was 1.27344, with 12.7 percent of variance.

On the Varimax rotation, the self-esteem scale items did not load consistently. Of the 10-scale items, the first two loaded heavily onto Factor 1, and the last 3 onto Factor 2. The other 5 questions were split between the 2 factors, with a range of 0.43808 to 0.66447. The items did not load clearly on Varimax rotation, thus the unrotated matrix, which loaded more clearly, was used.

**Reliability Analysis of Instruments**

A reliability analysis was run on the HBM instrument to see if the instrument consistently measured the concepts of belief or attitudes about breast cancer, the
seriousness of breast cancer, the benefits of BSE behaviors, the consequences of performing BSE, and the control one has over breast cancer. The reliability analysis of the 34 items indicated a Chronbach alpha of 0.8085. Champion (1988) reported a Chronbach alpha of .60 to .78 and (1987) a Chronbach alpha of .63 to .76 on the instrument. Gray (1990) reported a Chronbach alpha of .60 to .78. Williams (1988) reported a Chronbach alpha of .63 to .76.

The self-esteem instrument reflected a reliability coefficient, with a Chronbach alpha of .7073 and a standardized alpha of .7583.

A reliability analysis scale for the knowledge instrument reflected less reliability. The Chronbach alpha was .5883; the standardized alpha = .6250. Champion (1989) assessed the knowledge instrument for internal consistency reliability, reporting an alpha = .56. The results in both studies indicated that the knowledge instrument has less reliability than the other instruments used in this study.

In summary, of the three instruments used in the study, the HBMI had the strongest reliability factor with a standard alpha of .8322. This analysis was stronger than the reported Chronbach alpha of .63 to .78 in other studies. The self-esteem instrument also tested strong for reliability with a standard alpha of .7583. The
knowledge instrument was the weakest with an Chronbach alpha of .5883 and standard alpha of .6250, comparable to the alpha = .56 noted for reliability by the instrument's author (Champion, 1989).

The higher alpha score for reliability of the HBMI instruments in this study is overall higher than the Chronbach alpha scores reported in other studies.

Research Questions
1. Do Professional Nurses Adhere to More Regular Practice of BSE than do Non-Nurse Professional Women?

The ANOVA was calculated to answer this question. The professional nurses had a cell mean of 3.72, reflecting examination frequencies of just slightly over every two months. In comparison, the women alumni had a group mean of 2.97, or a frequency of BSE closer to every three to four months. The recommended frequency is every month. The ANOVA results were $F = 20.877; \text{df} = 1,544$, with a $p < .0001$. This supports a statistical difference between the nurses and the non-nurses. Refer to Table 7 for a summary of the ANOVA.

Mammograms are strongly encouraged to supplement BSE. Consequently, the professional nurses were compared to the women alumni for their behaviors in obtaining mammograms.
Table 7

Summary of ANOVA Results for Frequency Between the Professional Nurses and the Women Alumni

<table>
<thead>
<tr>
<th>Main Effects</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse/Alumni</td>
<td>1</td>
<td>48.558</td>
<td>20.877</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>544</td>
<td>2.326</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>545</td>
<td>2.411</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple R² .037

Multiple R .192
Table 8

Summary of Comparative Frequency of Mammograms Between Professional Nurses and Women Alumni

<table>
<thead>
<tr>
<th>Frequency of Mammograms</th>
<th>Professional Nurses</th>
<th>Women Alumni</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Never had one</td>
<td>102</td>
<td>23.2</td>
</tr>
<tr>
<td>Baseline mammogram</td>
<td>100</td>
<td>22.8</td>
</tr>
<tr>
<td>Annual mammogram</td>
<td>138</td>
<td>31.4</td>
</tr>
<tr>
<td>Every 2 years</td>
<td>54</td>
<td>12.3</td>
</tr>
<tr>
<td>Every 2 - 5 years</td>
<td>38</td>
<td>8.7</td>
</tr>
<tr>
<td>&gt; Every 5 years</td>
<td>7</td>
<td>1.6</td>
</tr>
<tr>
<td>Missing Data</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td>439</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 8 displays the data of the comparison of the frequency of mammograms between the professional nurses and women alumni. The results were similar for both groups, except for the "never had one" and the "baseline mammogram" differences. Proportionately less women alumni received baseline mammograms than did professional nurses. Overall the professional nurses received mammograms more frequently than did the women alumni.

An X² analysis was run to assess mammogram behavior by the grouped-age data for both groups. The results were X² (20, N = 549) = 296.95, p = .000. The findings support an association between age and frequency of mammograms in both the nurse and non-nurse groups.

Additional X² analyses were run to assess mammograms of the professional nurses and women alumni separately by age grouping. The professional nurses resulted in a X² (20, N = 439) = 246.48, p = .000. The non-nurse women alumni group resulted in a X² = (20, N = 110) = 53.33, p = .000. However, the recommended minimum n of 5 per cell was not met for the non-nurse alumni group. This violation of the assumptions for the X² test must be considered when interpreting the results of this analysis.

Further X² analyses were also done to identify if there was a relationship between BSE frequency and grouped
age. The nurses group BSE frequency by grouped age resulted in $X^2 (20, N = 439) = 30.965, p = .0556$. The women alumni group resulted in $X^2 (20, N = 110) = 16.1941, p = .7045$. The professional nurses and women alumni were then combined together to measure BSE frequency by group age. The $X^2 (20, N = 549) = 31.579, p = .0479$. In all three analyses, the only significant relationship, although small, was found between BSE frequency and age for all the respondents.

2. What Effect Do the Factors of HBM, Knowledge, and Self-Esteem Have on Influencing the Regular Practice of BSE?

Multiple regression analysis was completed to test the effects that the three independent variables: HBM, Knowledge, and Self-esteem have in predicting BSE frequency. Prior to the multiple regression analysis a correlation coefficient was run on the concepts. Total Self-esteem correlated with the Total HBM at $r = .1008, p = .01$. Total Knowledge correlated with Total HBM at $r = .1591, p = .01$. Total Self-esteem and Total Knowledge were not significant at a correlation of $r = .0092$.

An overall regression correlation coefficient was
obtained, and the interrelatedness of the three predictor variables was tested. HBM entered on step 1 and knowledge entered on step 2 with $p = <.0000$ and $R^2 = .4133$.

Refer to Table 9 for the results of the multiple regression analysis on the variables of the HBM, Knowledge and Self-esteem.
Table 9

Multiple Regression Analysis for Predicting Frequency on the Variables of the Health Belief Model, Knowledge and Self-esteem

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>T</th>
<th>Sig T</th>
<th>Mult R</th>
<th>R²</th>
<th>F</th>
<th>Sig F</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBM Total</td>
<td>.3701</td>
<td>9.413</td>
<td>.000</td>
<td>.3854</td>
<td>.1485</td>
<td>94.75</td>
<td>.0000</td>
</tr>
<tr>
<td>TotalKnow</td>
<td>.1499</td>
<td>3.814</td>
<td>3.814</td>
<td>.4133</td>
<td>.1708</td>
<td>55.83</td>
<td>.0000</td>
</tr>
</tbody>
</table>

Note: Total Self-esteem did not enter into the equation.
To further assess the HBM findings, multiple regression analysis was run on the five subscales to determine which of the subscales were predictive of the regular practice of BSE. The subscales of consequence, control and belief entered the equation with an $R^2 = .3730$. Refer to Table 10 for a summary of the results of the stepwise multiple regression analysis for the HBMI subscales predictive of BSE frequency.
Table 10

**Summary of Stepwise Multiple Regression Analysis for HBMI Subscales Predictive of BSE Frequency**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>T</th>
<th>Sig T</th>
<th>Mult R</th>
<th>R²</th>
<th>F</th>
<th>Sig F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step I:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Consequence</td>
<td>.5633</td>
<td>15.81</td>
<td>.0000</td>
<td>.5633</td>
<td>.3173</td>
<td>250.1</td>
<td>.0000</td>
</tr>
<tr>
<td><strong>Step II:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Control</td>
<td>.2248</td>
<td>5.884</td>
<td>.0000</td>
<td>.5989</td>
<td>.3587</td>
<td>150.1</td>
<td>.0000</td>
</tr>
<tr>
<td><strong>Step III:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Belief</td>
<td>-.1196</td>
<td>-3.493</td>
<td>.0005</td>
<td>.6107</td>
<td>.3730</td>
<td>106.2</td>
<td>.0000</td>
</tr>
</tbody>
</table>

"Total Seriousness" and "Total Benefits" did not enter into the equation.
To determine the effects of knowledge on the regular practice of BSE, the mean scores were determined for the professional nurses and the non-nurse women alumni. The professional nurses had a mean score of 18.85, and the women alumni had a mean score of 16.22. An ANOVA was run comparing the knowledge of nurses to non-nurses. The ANOVA resulted in $F = 85.662$, $p = <.000$, supporting a statistical difference between the two groups in knowledge about BSE. Refer to Table 11 for a summary of the ANOVA results comparing Total Knowledge scores between professional nurses and women alumni.
Table 11

Summary of ANOVA for Comparison to Total Knowledge Scores Between Professional Nurses and Women Alumni

<table>
<thead>
<tr>
<th>Main Effects</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse/Alumni</td>
<td>1</td>
<td>610.148</td>
<td>85.662</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>547</td>
<td>7.123</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>548</td>
<td>8.223</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. **What Effect do the Demographic Factors Have on Adherence to Regular BSE Practice?**

The Betty Newman Systems Model and the literature suggest the demographic variables of age, retirement status, marital status, educational background, religion, number of children, number of children remaining at home, and family history of cancer and specifically, breast cancer could affect BSE frequency. These variables were first correlated with BSE frequency, and the significantly correlated variables were then analyzed using stepwise multiple regression to determine those which influenced BSE behaviors. The nominal variables were dummy coded for analysis.

Refer to Table 12 for a summary of the stepwise multiple regression results for demographic variables predictive of BSE frequency. The stepwise regression analysis resulted in religion, children at home, and cancer as the only demographic variables that were significant predictors of BSE. History of breast cancer in the family and breast cancer in aunt, although too small to enter into the multiple regression analysis, was close to entering at $p = .10$. 
Table 12

Summary of Stepwise Multiple Regression Analysis for Demographic Data Predictive of BSE Frequency

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>T</th>
<th>Sig T</th>
<th>Mult R</th>
<th>R²</th>
<th>F</th>
<th>Sig F</th>
</tr>
</thead>
<tbody>
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The four demographic variables, although significant, resulted in a very small explanation of variance. The total variance accounted for was only 4%. This may indeed represent an artifact of the numbers and must be interpreted with caution.

Although race was one of the questions asked on the questionnaire, it was not entered into the multiple regression equation, as nearly all participants (91.6%) were Caucasian. Background literature established that race could be a variable affecting BSE behaviors which reflect varying cultural norms, and may confound interpretation of the other demographic variables. Race and culture could be an area of followup study based on the results of this study.
CHAPTER V

DISCUSSION/CONCLUSIONS

RECOMMENDATIONS

Sample Demographics

Of the 951 professional nurses sampled 439 or 46.1% participated in the survey. The mean age was 43.966 years. This tends towards a middle-aged nurse who may be taking a keener focus on their health, considering the ramifications of breast disease, and even beginning to come to terms with the potential for their own morbidity and mortality for the first time in their lives.

The nurse at age 40 years would potentially be taking a greater interest in the world around them, with less distractions of the younger nurse. The nurses at the older end of the spectrum could already begin to be limited by morbidity or mortality attrition.

One could have a better sense of the sample age if the numbers of nurses in each age range could be identified by the Nevada State Board of Nursing. Unfortunately, this breakdown was not available for this study.

Of the total sample of 579 female alumni surveyed, 19% (n = 110) participated in the study. The mean age of
the alumni, 39.6, was just slightly younger than the professional nurses. This raises the question of the differences in the two groups in relation to the higher reported (30 - 40%) return rate for most research on nurses in comparison to the alumni. Even though the topic of BSE impacts all women, the health focus may reflect more interest from the nurses. Certainly, comparing the response rate to other female alumni studies would be of interest as well.

Both groups were fairly similar in marital status with comparable percentages in both groups. This was also comparable to the marital status profile of the general population. However, it is noticeable that 19.3% of the women alumni were single, while only 8.9% of the professional nurses were single, even though the women alumni participants were slightly younger in age. Perhaps women in other professions are less traditional in relation to marriage than are professional nurses.

The demographics for children and children at home also bore out noticeable differences. The women alumni were considerably more likely to have no children (34.9%) compared to 26.7% for the professional nurses, and more inclined to have only one child (26.6%) compared to 18.9% for the professional nurses. Although this could reflect the slightly younger age of the women alumni, it tends to
coincide with the increased number of women alumni who are single. It might also reflect that women who choose professions other than nursing may be less traditional. For many generations nursing was an "accepted" or "traditional" occupation along with teaching and secretarial occupations. Those women who have ventured forth in less traditional occupations may reflect less traditional values and life styles as well. The slightly older professional nurse population who reported having two or more children at a greater percentage than did the women alumni may also reflect a generation when two children were the norm, compared to a slightly younger generation which is more accepting of one child as a norm. Similarly, the two groups trended fairly close in the proportions of those who still had children at home. The slight difference of 22.1% of women alumni who still had one child at home, compared to 17.3% for the professional nurses could be attributed to the slightly younger alumni who may be following a more general cultural trend of having children at a later age.

Educational level comparisons between the two groups also reflected some interesting differences. The percentage of Masters prepared women alumni (34.5%) was considerable higher than the 22.8% for the professional nurses, whereas the professional nurses indicated 75% held
a baccalaureate degree as the highest level of education, compared to 52% for the women alumni. The slightly younger women alumni who also remained single and childless at a greater rate than did the professional nurses may be more motivated to pursue their careers at perhaps a more competitive level than may be found in the nursing profession. Certainly nursing is unique amongst many professions by having several entry levels of practice, and being much less competitive for positions requiring advanced degrees than there are in other professions, at least in the Southern Nevada area. Doctoral prepared participants were of very similar percentages in both groups, and reflective of the much smaller percent of Doctoral prepared individuals in our society.

Religious affiliation also reflected some differences between the two groups. Generally, the two groups were in similar proportions to the general population (LV Perspective, 1993). The women alumni, with 17.3% reporting no religious affiliation was closer to the general population profile of Clark County, Nevada, which reports 20% of the general population with no religious affiliation (LV Perspective, 1993). The professional nurses, however, reported only 8.4% to have no religious affiliation. Perhaps tradition, the personality of
individuals attracted to nursing, or the nature of the career experiences contributes to professional nurses aligning themselves more to a religious affiliation than do women of other professions. Of the religious affiliation choices, professional nurses were proportionately higher (40%) than the general population (31%) in their affiliation to the Protestant religion. The professional nurses also tended to be less inclined (6.8%) to affiliate with "other" religions than the general population (10%), which was more similar to the women alumni (12.7%) (LV Perspective, 1993).

Instrument Validation

HBMI Instrument. Factor analysis showed a strong validation on 4 of the 5 subscales of the HBMI. Only the subscale "control" split onto 4 different factors. These results indicated that the instrument had strength in measuring the constructs of health belief. In view of the frequency with which the HBMI has been utilized as a research tool, and the frequency with which it has been validated in research studies, it has repeatedly shown evidence of being a valid instrument to measure attitudes about one's health beliefs.

Self-Esteem Instrument. The Self-esteem Instrument clearly loaded on the unrotated factor analysis. The reliability results were consistent with Breytspraak and
George (1982), who reported a Chronbach alpha of .74 for internal consistency. The tool has been widely used since its development in 1965. The analysis in this study reaffirms its validity and reliability as a measurement of self-esteem.

Knowledge Instrument. The reliability analysis for the knowledge instrument resulted in an alpha of .6250. Champion (1989) reported an alpha = .56 for internal consistency reliability of the instrument. However, the instrument does not meet basic assumptions for factor analysis, as each of the multiple choice roots have variable numbers of stem choices, making it difficult to accurately validate. Although the content of the questions are relevant, the knowledge instrument needs reconstruction and further validation. Even though the instrument is a limitation for this study, a revision of the Knowledge Instrument to include the content but to reconstruct the items could result in a more valid and reliable instrument for future research.

Research Questions

1. Do Professional Nurses Adhere to More Regular Practice of BSE than do Non-Nurse Professional Women?

The ANOVA supports the position that there is a difference in the frequency of BSE between nurses and non-nurses. Nurses had a significantly greater mean BSE
frequency than did the non-nursing professional women. However, the $X^2$ analysis indicated that there was no relationship between BSE frequency and group age in either of the groups.

The significant results can be related to a multitude of factors. Certainly, increased exposure to the ravages of morbidity and mortality of breast cancer and other illnesses could be a subconscious motivator. An effort was made to examine and seek out the effects of "exposure" through the measurements of knowledge and attitudes, however, it is difficult to determine how much variance is related to professional exposure as opposed to variance affected by personal life experiences. Elliott, et al. (1990) reported nurses who practiced BSE were motivated by their work experiences or other health professionals.

Perhaps the development of an instrument to more specifically measure nurses attitudes in response to repeated exposure to morbidity and mortality could provide relevance to nurses' health behaviors based on professional experiences as opposed to personal influences.

The difference in frequency of obtaining mammograms between the professional nurses and women alumni was most noted at the "never had one" response. The women alumni reported a much higher percentage (39%) who had never
obtained a mammogram compared to 23% of the professional nurses. This could certainly be related to the slight mean difference in ages between the two groups. The difference of a mean age of 43 years for the professional nurses and 39 years for the women alumni is significant when one considers that the recommended first baseline is by age 40 years. The $X^2$ analysis indicated that age was related to obtaining mammograms in both groups. However, the small number of women alumni for the $X^2$ cells must be considered as a violation for the assumptions for the analysis, and must be considered when interpreting the results.

Overall, however, professional nurses still tended to obtain mammograms more often than did women alumni. Since the measurement of knowledge in this study had limitations, one could suggest that the attitudes and beliefs measured by the HBMI may influence professional nurses behaviors based on their practice experiences which may give more exposure to the morbidity and mortality of breast cancer than may be experienced by other non-nurse professionals.
2. **What Effect Do the Factors of the HBMI, Knowledge and Self-Esteem Have on Influencing the Regular Practice of BSE?**

HBMI. The Total HBMI, represented by the five subscales and Total Knowledge were the only two variables that entered into the stepwise multiple regression analysis equation. Total Self-esteem did not enter into the equation. Total Self-esteem correlated with Total HBM at p = <.01. Self-esteem and Knowledge, however, did not correlate.

To more fully understand the impact of attitudes and beliefs measured by the HBMI, it was necessary to also do a stepwise multiple regression analysis for the five subscales of the HBMI to see which were predictive of BSE frequency. Of the five subscales of the HBMI: beliefs, seriousness, benefits, consequences, and control; only "consequences", "control" and "beliefs" entered the equation. Analysis of the questions for each of the five subscales suggests that benefits and seriousness do not hold as great an impact on actions as do the questions relating to "consequences" and "control", which prompt decisive action and more sobering thought. Certainly "beliefs" could influence one’s perspective of "consequences" and/or "control". Or the alternative,
one's "beliefs" could be altered by how one perceives "consequences" and "control".

However, Champion (1984), in the original HBMI validation, found the benefit subscale weak, and insignificant for predicting BSE. In a similar study, Calnan & Rutter (1986) found "beliefs" to be a weak predictor, and "control" a strong predictor of behavior in a sample of over 2000 women. Williams (1988) found "benefit" to account for only 1% of the variance in predicting BSE. However, the sample size was limited to only 253 women for the study.

Knowledge. The knowledge component entered the multiple regression equation in the second step. Several factors need to be considered in evaluating knowledge as a predictor of BSE frequency.

Knowledge could certainly be explained as a predictor for BSE behavior in relation to the increased number of professional nurses who performed regular BSE in comparison to non-nurse women alumni. The knowledge of nurses can be related to their basic nursing education as well as their increased general exposure to the morbidity and mortality of breast cancer in the health care profession.

One must not confuse knowledge with education as a predictor for BSE. Despite the results clearly indicating
nurses performed more regular BSE than did women alumni, knowledge of breast cancer and BSE technique is a specific component which must be examined independently of educational level. A separate study comparing the BSE and breast cancer knowledge component of nurses of all educational levels could be an application of the collected data for future research analysis.

Champion (1989) found that knowledge correlated significantly with intent to practice and with proficiency. Knowledge was also found to correlate significantly with confidence and social influence for performing BSE. In her study, Champion cited older research in which knowledge also was associated positively with BSE. Dickson, et al. (1986) also found knowledge to be a predictor with confidence for the practice of BSE.

In contrast, Nemcek (1989) found overall knowledge to be uniformly low, which correlated with older studies cited by Nemcek. Nemcek also found knowledge to be no higher in women who practiced regular BSE than those who did not.

As a caution to interpreting the analysis in this study, one must consider that the knowledge instrument could not be tested for validity. The reliability reading was low, with a Chronbach alpha of .5883, standard alpha of .6250 which was not as high as one would like,
particularly in view of the fact that basic assumptions for factor analysis were violated by the nature of the questions each having varying numbers of answer choices. A followup study using a different or more refined knowledge instrument may provide a more accurate measure of knowledge as a predictor of BSE.

Self-Esteem. The variable self-esteem did not enter into the equation as a predictor for BSE frequency. Despite the fairly strong validity and reliability of the Self-esteem tool, the HBMI subscales of "consequences", "control", "benefits" and knowledge were stronger predictors of BSE behaviors than was self-esteem. Although one may predict that increased knowledge and education would increase one's self-esteem and sense of "control" over one's destiny, the study results did not confirm this outcome.

Although a paucity of studies exist on self-concept and preventative health behaviors, Rutledge (1987), using the Tennessee Self-Concept Scale found that self concept and benefits/barriers directly related to regular practice of BSE. However, Rutledge did not find self-concept to contribute significantly to explain variance in her study. Rutledge attributed this to the intercorrelation of self-concept with threat at an r = .260. When the proportion of variance attributed to the two variables was removed,
the effects of self-concept by itself were diminished. Furthermore, Rutledge found that self-concept related directly to the likelihood of practicing BSE, but not to health beliefs. In the present study, Self-esteem correlated with the HBM at $r = .1008$, $p < .01$ prior to the stepwise multiple regression, but self-esteem did not enter into the equation as a predictor for BSE frequency. Rutledge cited only one other study where self-concept was related to BSE frequency.

Because of the paucity of studies done with self-concept and BSE behaviors, it would be a recommendation for followup studies, perhaps consistently using the same instrument, using another self-esteem instrument and/or narrowing the foci of independent variables to reaffirm self-concept as not a predictor for BSE frequency.

3. What Effects do the Demographic Factors Have on Adherence to Regular BSE Practice?

Of the demographic variables: age, retirement status, marital status, educational background, religion, number of children, number of children at home, family history of cancer and specifically, breast cancer, only religion, children at home and family history of cancer correlated with frequency at a level appropriate to enter into the stepwise multiple regression analysis. The LDS/Mormon religion was the first variable to enter the equation,
family history of cancer second, children at home third, and the Jewish religion fourth.

Champion (1989) reported the degree of involvement in religion to correlate with intent and frequency of BSE, but not with a specific religious affiliation. The other reviewed literature also reported either no correlation or a very weak correlation between religion and frequency.

The LDS/Mormon religion correlation offers some rather interesting observations when one considers that the religion only represented 5% of the professional nurse sample, and 9% of the women alumni. LDS/Mormon women are frequently very actively involved with their religious beliefs and customs. Perhaps the results of this research would correlate with the involvement found by Champion (1989). One could suggest that the LDS/Mormon practice of having large families could provide more interfacing with health care professionals during prenatal and postpartum care who might be reinforcing BSE practices more regularly. Also, perhaps the sense of responsibility of having several dependent children may motivate LDS/Mormon women to take precautions to detect breast cancer in its earliest stages.

Family history of breast cancer or cancer in general was not reported in the literature as correlating with BSE frequency. Straus, Solomon, Costanza, Worden & Foster
(1987) found that women who themselves had a history of breast cancer or benign breast tumors were more likely to practice BSE more regularly. Champion (1987) and Hill & Shugg (1989) reported similar results. Williams (1988), however, found family or personal history of breast cancer not a predictor. Nemcek (1989) reported women who knew someone with breast cancer practiced BSE more frequently, however Nemcek did not specify if that acquaintance was a family member.

Although in principle the Neuman Systems Model could suggest that family history of cancer might be a motivator to strengthen one’s lines of defense, certainly further research with families having strong histories of cancer would be of value to see if members take precautions to prevent other types of cancer.

"Children at home" was not found in the literature as a predictor of BSE frequency. One could suggest that, as suggested with LDS/Mormon religion, the sense of being responsible for dependent children may motivate women to take responsibility for their health through more frequent BSE. Also, having children at home generally reflects women of a younger age who may be having more recent reinforcement of the preventative BSE teaching including "consequences", "control" and "benefits" related to
preventative behaviors during postpartum gynecological exams.

Heyman, Tyner, Phipps, Cave & Owen (1991) and Cole & Gorman (1984) found younger nurses more compliant with regular BSE exams than older nurses. This predictor could reflect the habits of younger mothers with children at home as well, particularly amongst the professional nurses. Further research on age and having younger children still at home would be warranted to clarify the factors which influence women's motivations for more regular practice of BSE in these groups.

Affiliation with the Jewish religion bears similar observation to that of the LDS/Mormon women. The Jewish religion was also a very small percentage of the participants, with only 3.6% of both groups represented by Jewish women. However, those who are may be deeply involved with their religion and thus correlate with the research findings of Champion (1989). Another observation that would warrant further research is the reflection that Jewish women are considered to be less inhibited about their bodies and sexuality than are women of other ethnic and religious backgrounds, thus regular BSE practices may be more accepted by this group of women.

Overall, the rather weak predictors of demographic factors on BSE frequency correlates with other
researchers. Gray (1990) and Olson & Mitchell (1989) found demographic variables to have very weak correlation with the BSE frequency. Ongoing research on BSE frequency, including demographic variables, could provide further insight into demographic effects. Certainly consideration for the effects of HBM attitudes of "consequences", "control" and "benefits" need to analyzed in conjunction with the religious influences.

Summary

This study identified and compared the beliefs and attitudes which influence the adherence to regular BSE in professional women nurses and professional women alumni in nonnursing professions. Included with the factors beliefs and attitudes were the factors of knowledge and self-esteem.

The study found that professional nurses performed BSE more frequently than did non-nursing professional women. The study also found that the HBMI subscales of "consequences", "control" and "benefits" were predictors of BSE frequency. Knowledge, although found to be a weak predictor of BSE frequency, must be cautiously interpreted due to the use of an instrument which could not be appropriately validated. Self-esteem was not found to be predictive of BSE frequency.
The demographic factors of religious affiliation to the LDS/Mormon religion, family history of cancer, children at home, and religious affiliation to the Jewish religion were all predictive of BSE frequency. However, they accounted for a relatively small account of variance.

Based on the research results, one could conclude that the attitude of nurses are affected by their exposure, either in the education process or the clinical setting, to the consequences of breast cancer, and either recognize that they can control or want to control the effects of the disease process, and realize the benefits of preventative behaviors. Certainly, one would think many nurses enter nursing with a desire and belief that disease processes can be controlled, as an innate sense of reward. Without that sense, it is difficult to imagine one would have much attraction to enter the profession to help people succumb to disease processes.

Self-esteem did not weigh as a predictive variable. At best, one could conclude that any effects of self-esteem may be associated with a sense of "control" one has over one's destiny and/or beliefs. This coincided with the conclusions of two other studies examining self-esteem and BSE behaviors.
Limitations

This study was limited to only one metropolitan area in the Southwest, with very unique social and cultural factors which impact which persons choose to live in the area, and/or impact the behaviors of those who do live in the area. The small sample size of the women alumni must be considered a limitation for the interpretation of the results of that group.

Another limitation seen for this study were the instruments used. The knowledge instrument could not be validated. Although the content of the instrument was adequate, the format of the instrument could be improved upon to obtain clearer findings.

Although the self-esteem instrument was validated, it would be enlightening to measure self-concept with the Tennessee Self-Concept Instrument to compare the findings to those of Nemceck (1989).

Recommendations

As a result of this study, several recommendations can be made. First, another study in a metropolitan area in another region of the nation, or in another metropolitan area of the Southwest with different cultural and social influences than Clark County, Nevada norms could offer beneficial comparative information to
determine the potential limitations of one specific metropolitan setting.

Second, further research with a larger sample of the non-nursing professional women would be appropriate to give more credibility to the results. In addition, a comparative study of non-professional women and/or nurses with professional women and/or nurses would provide data comparing the behaviors of those two groups to also add credibility to this study and the variable of education.

Third, to validate the research, further studies would be recommended following revision of the Knowledge Instrument to more reliably measure the concept of knowledge.

Fourth, with the paucity of research on the effects of self-esteem on BSE behaviors, it would be beneficial to study self-esteem as an individual concept, perhaps using other instruments, to test for similarities or differences in self-esteem as a predictor for BSE frequency in and of itself, or as a covariable.

Fifth, continued testing on the HBMI on BSE frequency and behaviors is contributing to a substantial collection of research to repeatedly test the HBM as an understanding and perspective of the influences of health behavior. Although the HBM continues to evolve with ongoing research, at this point, it would be enlightening to see
if "consequences", "control" and "benefits" continue to be prominent predictors of BSE and/or other health prevention behaviors.

In addition to recommendations for future research, other practical clinical recommendations can be made as a result of this study. Although the scores of the variables of Total HBM and Total Knowledge as predictors for BSE frequency were significant, their scores were relatively low for clinical relevance. However, with the significance that was obtained, nurses and other health care professionals might begin to focus their preventive teaching on areas of "consequences", "control" and "benefits". Perhaps by incorporating these three constructs of the HBM into instructional approaches, the attitudes and beliefs of clients might also be changed to internalize more compliance with regular BSE. Ideally, nurses could use this information to focus their approach in teaching other health preventative behaviors in other fields, i.e., cardiac, diabetes, weight control, as well. This approach may indicate in future research that the constructs have become stronger predictors of health preventive behaviors than they currently indicate.
References


Bandura, A. Self-efficacy: toward a unifying theory of behavioral change. Psychological Review. 84, 2, 191-215.


Oncology Nursing Forum, 17, 5, 721-727.


Cancer Nursing, 12, 6, 339-343.


APPENDIX A: APPROVAL OF DEPARTMENT OF NURSING, UNIVERSITY OF NEVADA, LAS VEGAS AND UNIVERSITY OF NEVADA, LAS VEGAS HUMAN SUBJECTS RIGHTS COMMITTEE
January 14, 1993

Sandra Klimek, RN BSN
4493 Lomita
Las Vegas, NV 89121

Dear Sandy:

The Department of Nursing Human Subjects Rights Committee met on
your proposal "Identification and comparison of factors affecting
breast self-examination between professional nurses and non-nurse
professional women". The Committee has the following request:

1. In the cover letter make questionnaire plural.
2. Consider adding "major" in you demographics.

The Committee approved your proposal and the signed protocol form
approval sheet is attached.

If you have any questions or if there are any changes in your plan
please inform the committee.

Sincerely,

Margaret Louis, RN PhD
Chairperson
Department of Nursing Human Subjects Rights Committee
University of Nevada, Las Vegas
TO: Sandra Klimek
FROM: Dr. William E. Schulze, Director, Research Administration
DATE: 15 January 1993
RE: Status of human subject protocol entitled:
"Identification and Comparison of Factors Affecting Breast Self-Examination"

The protocol for the project referenced above has been reviewed by the Office of Research Administration, and it has been determined that it meets the criteria for exemption from full review by the UNLV human subjects committee. Except for any required conditions or modifications noted below, this protocol is approved for a period of one year from the date of this notification, and work on the project may proceed.

Should the use of human subjects described in this protocol continue beyond one year from the date of this notification, it will be necessary to request an extension.

If you have any questions or require any assistance, please give us a call.

Required conditions/modifications: None
SUBMIT TO OFFICE OF THE GRADUATE DEAN: Original and 11 copies of the Protocol Form (pp. 1-3) plus one copy of the entire research proposal.

UNIVERSITY OF NEVADA, LAS VEGAS

PROTOCOL FORM
FOR RESEARCH INVOLVING HUMAN SUBJECTS

INVESTIGATORS: List person principally responsible for the investigation on line a). If principal investigator is a student, list faculty advisor on line b).

Investigator       Department       Phone
a) Sandra C. Klimek       Nursing       451-5136
b) Margaret A. Louis, PhD, RN  Nursing       739-3360
c) d)

UNLV status of Principal Investigator (circle): Faculty/Post-doctoral/Graduate/Undergraduate/Other

TITLE OF PROJECT: COMPARATIVE FACTORS AFFECTING BREAST SELF-EXAMINATION PRACTICES BETWEEN PROFESSIONAL NURSES AND TEACHERS

AND ADDRESS of sponsoring agency or foundation (if other than UNLV)

CONTRACT OR GRANT NUMBER (if known)

DURATION OF STUDY (Protocols must be renewed annually) 6/1/92 Start 5/1/93 Conclude

TYPE OF SUBMISSION: x New       Renewal (attach progress report)       Modification
                       Continuation       Previous Log # (if any)

LOCATION(S) OR FACILITIES where study will take place Researcher residence--

4493 Lomita Street Las Vegas, Nevada 89121; randomly selected schools throughout Clark County School District (approximately 20)

Principal Investigator's Signature

Date

Department Chair or Unit Head's Signature

Date

Faculty Advisor's Signature (if warranted)

Page 1 of 3
SUBJECTS: (Please estimate numbers)

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PROCEDURES: (ATTACH relevant materials, such as questionnaires, interview schedules, written test instruments, etc.)

- [X] Survey, questionnaire(s)
- [ ] Interview: phone/in-person
- [ ] Medical or other personal records
- [ ] Filming, taping, recording
- [ ] Observation
- [ ] Participant observation
- [ ] Anthropological fieldwork
- [ ] Psychological intervention
- [ ] Incomplete disclosure of purpose
- [ ] Payment of subjects
- [ ] Costs to subject/third parties

**Brief Explanation of Procedures:**

- [ ] Investigational Drug*
- [ ] Approved Drug, New Use*
- [ ] Investigational Device (attach relevant info)
- [ ] Placebo
- [ ] Ionizing Radiation (attach CURRENT approval)
- [ ] Surgery
- [ ] In vitro fertilization
- [ ] Venipuncture
- [ ] Other body fluids, excreta
- [ ] Abortus, placenta, excess tissue
- [ ] Other (please specify)

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Page 2 of 3
UNIVERSITY OF NEVADA, LAS VEGAS

PROTOCOL FORM APPROVAL SHEET

FOR RESEARCH INVOLVING HUMAN SUBJECTS

Log Number: ______________________

Title or Project: COMPARATIVE FACTORS AFFECTING BREAST SELF EXAMINATION PRACTICES BETWEEN PROFESSIONAL NURSES AND TEACHERS

Investigator: Sandra C. Klimek

After reviewing this proposal, the members of the Review Committee have indicated below their approval/disapproval of this proposal.

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The above named project is hereby approved/disapproved (circle one)

Date: ________________

Committee Chairman's Signature
RESEARCH ABSTRACT

1. **SUBJECTS:** Nine hundred and fifty-one professional nurses will be selected from a mailing list of all Clark County registered nurses obtained from the Nevada State Board of Nursing.

   Six hundred non-nursing professional women will be selected from a population of 10,000 total women university alumni residing in Clark County, Nevada, excluding women graduates of the College of Health Sciences, which includes nursing. The non-nursing professional women will be randomly selected based on a Table of Random Numbers.

   Subject participation is strictly voluntary. No subject will be paid for participation.

2. **PURPOSE, METHODS, PROCEDURES:** Refer to attached contract proposal for relevant portions.

3. **RISKS:** This proposed study has no or minimal inherent or potential risks, either physical, psychological, social, or legal. Participation is strictly voluntary. With the remote chance that any questionnaire items would cause psychological or emotional stress, the cover letter will include instructions to omit answering any question which precipitates uncomfortable feelings or stress.
Anonymity will be assured by the anonymous questionnaires. The subjects will be instructed in the cover letter that anonymity can be assured by not posting a return address.

Only the principal researcher will have access to the raw data, which will be kept in a locked file. Information obtained will not be made available to others except in the form of pooled data.

4. **BENEFITS:** There is little immediate benefit to the participants from this research except in knowing that it is contributing to a body of knowledge for future nursing application. The long-term benefits of the research will be to determine if knowledge and understanding of the risks and course of breast cancer, and understanding the methods and benefits of breast self-examination (BSE) is any different in nurses than other professional women.

5. **RISK-BENEFIT RATIO:** The aforementioned benefits of this proposed research far outweigh the minute chance that any emotional or psychological stress will result from the questionnaire survey.

6. **COST TO SUBJECTS:** The only expenditure to the subjects will be approximately 15-20 minutes of their time to fill out the questionnaire and return it in the pre-postaged self-addressed envelope.

7. **INFORMED CONSENT:** Informed consent will be obtained from the participants in the form of a cover letter
explaining the purposes, procedures, risks and benefits addressed. Voluntary participation in the study will infer consent.
APPENDIX B: COVER LETTER FOR QUESTIONNAIRE
March 21, 1993

Dear Participant:

As a graduate student in the Department of Nursing at the University of Nevada, Las Vegas, I am conducting a study comparing the Breast Self-Examination (BSE) practices of professional nurses with those of non-nursing professionals. Your participation in this study would be helpful in providing nurses with greater insight into the factors which contribute to adherence to regular BSE practice. The knowledge obtained from this study may contribute to the focus nurses must take to promote positive health behaviors.

Participation is strictly voluntary, and you are in no way obligated to complete the questionnaire. Anonymity can be assured by posting no return address on the envelope. Any participant identity will remain confidential. Any data obtained will be reported as pooled data in relation to this study.

There are no anticipated risks to participants in this study. Should any of the questions pose concerns or stresses, you are not necessary to respond to the item.

Your completion of the attached questionnaire indicates your consent to participate in the study. The questionnaire will take approximately 15 minutes to complete. Please fold the completed questionnaire and return in the self-addressed postage paid envelope by April 1, 1993. If you participated in the pilot study of this survey, please indicate on the front of the questionnaire and return. If you have any questions or concerns, or are interested in obtaining a summary of the results of the study, you may contact me at 369-7690.

Thank you,

Sandra C. Klimek, R.N., B.S.N.
Principal Researcher
Department of Nursing
University of Nevada, Las Vegas
4505 South Maryland Parkway
Las Vegas, Nevada 89154
APPENDIX C: WRITTEN PERMISSION FOR USE OF HEALTH BELIEF AND KNOWLEDGE INSTRUMENT
April 3, 1991

Sandra C. Klimek, RN, BSN
4493 Lomita Street
Las Vegas, Nevada 89121

Dear Ms. Klimek,

I have enclosed instruments to measure attitudes, teaching, confidence and social influence. I am also returning your check as it is not necessary for you to cover postage. All I request is that you send me a copy of your completed results and cite me as a reference in your work. Thank you for your interest and if I may be of further help, please do not hesitate to call.

Sincerely,

Victoria Lee Champion
Victoria Champion, DNS, RN, FAAN
Professor

Enclosure
APPENDIX D: HEALTH BELIEF MODEL INSTRUMENT
SURVEY OF PROFESSIONAL WOMEN

ATTITUDES AND BEHAVIORS OF BREAST SELF-EXAMINATIONS

A Research Study

by

Sandra C. Kilmek
Department of Nursing
College of Health Sciences
University of Nevada, Las Vegas

March 1993
I am interested in your beliefs about breast self-examination and breast cancer. There are no "right" answers. Everyone has different experiences which will influence how they feel. I need the answer which best explains how you feel. Please tell me how much you agree or disagree with the following statements.

Answer each question with: 7 = Strongly Agree; 6 = Moderately Agree; 5 = Slightly Agree; 4 = Neutral; 3 = Slightly Disagree; 2 = Moderately Disagree; 1 = Strongly Disagree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am most likely to develop breast cancer sometime during my life</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. I feel that I will get breast cancer in the future</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. There is a good probability that I will get breast cancer</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. My chances of getting breast cancer are great</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. I am more likely than the average woman to get breast cancer</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
This group of questions concerns what you believe about the seriousness of breast cancer. In answering the following questions, you should assume that no breast self-examination behavior occurs and the discovering of breast cancer occurs by chance.

Answer each question with: 7 = Strongly Agree; 6 = Moderately Agree; 5 = Slightly Agree; 4 = Neutral; 3 = Slightly Disagree; 2 = Moderately Disagree; 1 = Strongly Disagree.

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Moderately Agree</th>
<th>Slightly Agree</th>
<th>Neutral</th>
<th>Slightly Disagree</th>
<th>Moderately Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. The thought of breast cancer, if not treated promptly, scares me</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>7. Feelings about myself would change if I got breast cancer and it were not treated promptly</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>8. When I think about breast cancer which is not treated promptly my heart beats faster</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>9. I am afraid to even think about breast cancer if it is not treated promptly</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>10. Problems I would experience from breast cancer which was not treated promptly would last a long time</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>11. Breast cancer which was not treated promptly would endanger my relationship with my boyfriend or husband</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>12. If I had breast cancer which was not treated promptly my whole life would change</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>13. If I developed breast cancer and it was treated promptly, I would not live longer than 5 years</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
The next group of questions concerns what you believe are the benefits of performing breast self-examination. In answering these questions you are to assume that you perform breast self-examination on a monthly basis during the next year.

Answer each question with: 7 = Strongly Agree; 6 = Moderately Agree; 5 = Slightly Agree; 4 = Neutral; 3 = Slightly Disagree; 2 = Moderately Disagree; 1 = Strongly Disagree.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Moderately Agree</th>
<th>Slightly Agree</th>
<th>Neutral</th>
<th>Slightly Disagree</th>
<th>Moderately Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Performing breast self-examination on a monthly basis during the next year will allow me to detect breast lumps early</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>15. Performing breast self-examination on a monthly basis during the next year will reduce my chance of dying of breast cancer</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>16. Performing breast self-examination will reduce my chance of requiring radical or disfiguring surgery for breast cancer</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>17. Performing monthly breast self-examination will help me find a lump before it is discovered by a nurse or a doctor</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
The next group of questions concern what you believe are consequences resulting from performing breast self-examination. In answering these questions, consider that you would be performing breast self-examination on a monthly basis during the next year.

Answer each question with: 7 = Strongly Agree; 6 = Moderately Agree; 5 = Slightly Agree; 4 = Neutral; 3 = Slightly Disagree; 2 = Moderately Disagree; 1 = Strongly Disagree.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Moderately Agree</th>
<th>Slightly Agree</th>
<th>Neutral</th>
<th>Slightly Disagree</th>
<th>Moderately Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Performing breast self-examination on a monthly basis during the next year will make me worry about breast cancer</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>19. Performing breast self-examination will be embarrassing to me</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>20. Performing breast self-examination will take too much time</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>21. Performing breast self-examination will not be pleasant</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>22. I will not be able to find a lump in my breast with breast self-examination</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>23. Performing breast self-examination will be hard to remember</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>24. It is difficult for me to do breast self-examination</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
The following questions ask about your health behavior and about how well you feel you can control breast cancer.

Answer each question with: 7 = Strongly Agree; 6 = Moderately Agree; 5 = Slightly Agree; 4 = Neutral; 3 = Slightly Disagree; 2 = Moderately Disagree; 1 = Strongly Disagree.

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Moderately Agree</th>
<th>Slightly Agree</th>
<th>Neutral</th>
<th>Slightly Disagree</th>
<th>Moderately Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>25. Maintaining good health is extremely important to me</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>26. I search for new information related to my health</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>27. I frequently do things to improve my health</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>28. I eat a well-balanced diet</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>29. I exercise at least three times a week</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>30. I will do breast self-examination in the future</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>31. I work hard to discover breast cancer early</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>32. I can control the effects of breast cancer by discovering lumps at an early stage through monthly breast self-examination</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>33. The effects of breast cancer can be controlled through my efforts of early detection by breast self-examination</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>34. I can control the effects of breast cancer by getting help from professionals</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
APPENDIX E: KNOWLEDGE INSTRUMENT
Instructions: For each of the following items, circle the letter which corresponds to the answer that best reflects your knowledge about breast cancer and breast self-examinations.

1. The best time to examine the breast during a menstrual cycle is:
   a. One week before your period
   b. During your period
   c. One week after your period
   d. Two weeks after your period
   e. Don't know

2. Checking your breast while in the shower may result in:
   a. Missing lumps
   b. Finding lumps as they are easier to find in the shower
   c. Don't know

3. A woman's right and left breasts are the same size.
   a. Yes, if the woman is fully developed, the breasts are the same size
   b. No, variation in size is normal
   c. Don't know

4. The appropriate action if a woman finds a firm ridge in the lower curve of her breast is to:
   a. See a doctor
   b. Seeing a doctor is not necessary
   c. Don't know

5. The appropriate action if a woman should accidentally hit her breasts, is to:
   a. See a doctor
   b. Seeing a doctor is not necessary
   c. Don't know

6. Should a woman see her doctor if she noticed a discharge from her nipple which is not milk?
   a. Yes  b. No  c. Don't know
7. The best method to examine your breast is while lying on your side.
   a. Yes  b. No  c. Don't know

8. It is recommended that breasts be examined twice a month.
   a. Yes  b. No  c. Don't know

9. Proper techniques for examining the breasts include movement in a clockwise manner, circling at least three times.
   a. Yes  b. No  c. Don't know

10. When completing a thorough breast exam, a woman should look at her breasts in the mirror with her hands above her head?
    a. Yes  b. No  c. Don't know

11. Early detection of breast cancer has a bearing on the chance for recovery.
    a. Yes  b. No  c. Don't know

12. Lumps in the breast are one possible sign of breast cancer. Out of every 10 breast lumps that occur, how many do you think would turn out to be cancer?
    a. 1 - 2  b. 3 - 4  c. 5 - 6  d. Don't know

13. On the average, how many women will get breast cancer sometime during their life?
    a. One woman out of 5  
    b. One woman out of 10  
    c. One woman out of 25  
    d. Don't know

14. Is a change in the color or texture of the skin around the breast a sign of breast cancer?
    a. Yes  b. No  c. Sometimes  d. Don't know
15. Who do you think is more likely to get breast cancer?
   a. White women
   b. Black women
   c. No difference
   d. Don't know

16. Who do you think is more likely to get breast cancer?
   a. Women over 35 years
   b. Women under 35 years
   c. No difference
   d. Don't know

17. Who do you think is more likely to get breast cancer?
   a. Women who have 1st child before age 20 are more likely
   b. Women who have 1st child after age 20 are more likely
   c. No difference
   d. Don't know

18. Who do you think is more likely to get breast cancer?
   a. Women whose mothers and sister have had breast cancer are more likely
   b. Women whose mothers and sisters have not had breast cancer are more likely
   c. No difference
   d. Don't know

19. Bumping or bruising the breast can cause breast cancer.
   a. Yes  b. No  c. Don't know

20. Fondling or caressing the breast can cause breast cancer.
   a. Yes  b. No  c. Don't know

21. What is a mastectomy?
   a. A test  b. A treatment  c. Don't know
22. What is a biopsy?
   a. A test  b. A treatment  c. Don’t know

23. Can plastic surgery ever be done to replace or reconstruct a breast that has been surgically removed?
   a. Yes, sometimes  b. No, never  c. Don’t know

24. What is a mammogram?
   a. An x-ray of the breast
   b. A kind of radiation therapy for breast cancer
   c. A chemical test for cancer
   d. Don’t know

25. Who is most likely to find lumps in the breasts?
   a. The woman herself
   b. A nurse
   c. A physician
   d. Other persons, such as husband
APPENDIX F: ROSENBERG SELF-ESTEEM SCALE
Read each of the following 10 statements. Mark the blank which most accurately reflects your agreement with each statement.

1. I feel that I'm a person of worth, at least on an equal plane with others.
   __Strongly Agree   __Agree   __Disagree   __Strongly Disagree

2. I feel that I have a number of good qualities.
   __Strongly Agree   __Agree   __Disagree   __Strongly Disagree

3. All in all, I am inclined to feel that I am a failure.
   __Strongly Agree   __Agree   __Disagree   __Strongly Disagree

4. I am able to do things as well as most other people.
   __Strongly Agree   __Agree   __Disagree   __Strongly Disagree

5. I feel I do not have much to be proud of.
   __Strongly Agree   __Agree   __Disagree   __Strongly Disagree

6. I take a positive attitude toward myself.
   __Strongly Agree   __Agree   __Disagree   __Strongly Disagree

7. On the whole, I am satisfied with myself.
   __Strongly Agree   __Agree   __Disagree   __Strongly Disagree

8. I wish I could have more respect for myself.
   __Strongly Agree   __Agree   __Disagree   __Strongly Disagree

9. I certainly feel useless at times.
   __Strongly Agree   __Agree   __Disagree   __Strongly Disagree

10. At times I think I am no good at all.
    __Strongly Agree   __Agree   __Disagree   __Strongly Disagree
APPENDIX G: DEMOGRAPHIC QUESTIONNAIRE
DEMOGRAPHICS

Instructions: Please mark the item or fill in the blank with the correct answer.

1. AGE: _______years

2. GENDER: ___________________________

3. RACE: _____________________________

4. MAJOR IN COLLEGE: _____________________________

5. OCCUPATION _____________________________

6. RETIRED: Yes______________ No__________

7. MARITAL STATUS:
   _____ Single unmarried
   _____ Married
   _____ Separated
   _____ Widowed
   _____ Divorced

8. NUMBER OF CHILDREN: _________(In household)_________

9. HIGHEST LEVEL OF EDUCATION OBTAINED__________

10. RELIGION:
    _____ None
    _____ Protestant
    _____ Catholic
    _____ Jewish
    _____ LDS/Mormon
    _____ Other (please specify)
HISTORY AND PRACTICES

Instructions: Please mark the item or fill in the blank with the correct answer.

1. Do you have any history of cancer in your family?
   No____  Yes____
   (please specify family member)__________________________
   Please specify type of cancer___________________________

2. Do you have any history of breast cancer in your family?
   No____  Yes____
   (please specify member, including self)___________________

3. How often do you conduct breast self-examinations?
   Do not do self-examinations___________________________
   Once every 6-12 months_______________________________
   Once every 3-4 months_______________________________
   Once every 2 months_______________________________
   Once every month_________________________________
   More than once/month______________________________

4. Do you get routine mammogram?
   Have never had one____  One baseline mammogram____
   1 every year____
   1 every other year____
   1 every 2-5 years____
   1 less often than every 5 years____
APPENDIX H: PERMISSION TO ACCESS UNIVERSITY OF NEVADA, LAS VEGAS ALUMNI
October 23, 1992

Mr. Fred Albrecht, Director
Alumni Association
University of Nevada, Las Vegas
Las Vegas, Nevada 89154-1010

Dear Mr. Albrecht,

I would like to express my appreciation to you and the Board members for granting me access to the Alumni Association listing of UNLV women graduates to conduct my thesis for the College of Nursing.

It is my understanding from a phone conversation with your staff that I could access 600 randomized names of women from the complete women alumni roster, eliminating graduates from the College of Health Sciences, including the Department of Nursing. This list would be limited to those women alumni residing in Clark County, Nevada, between the ages of 22 and 65 years. It is also my understanding that I could get this randomized sample in the form of mailing labels for the cost of $40.00.

As I am not currently at the stage of collecting data, I would like this letter to be a confirmation of intent. If this is contrary to your intent, I may be reached at 451-5136 or 369-7690.

Thank you very much for your assistance in this endeavor.

Sincerely,

Sandra C. Klimek
4493 Lomita Street
Las Vegas, Nevada 89121