BREAST SELF-EXAMINATION BEHAVIOR AMONG HIGH AND LOW RISK WOMEN

1986

BEVETT

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Abstract

Breast Self-Examination Behavior Among High and Low Risk Women

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Variables related to frequency of breast self-examination were examined in 73 women at average risk for breast cancer and 32 at high risk based on familial history. The goal was to survey whether factors found to be related to frequency and proficiency of practice in average risk women also apply to high risk women. Subjects completed a questionnaire which solicited demographic information, personal history of breast cancer and experienced breast symptomatology. Specific questions assessed the participant's knowledge of correct BSE technique, frequency and experience. Attitudes toward BSE were also measured.

One-way analyses of variance revealed that high risk women were significantly more knowledgeable about BSE, more proficient practicers and thought about breast cancer more than low risk women. However, both groups had low rates of practice. While embarrassment and BSE knowledge were additional predictors for the average risk women, the best predictor of BSE frequency in both groups was self confidence about performing BSE correctly.

BREAST SELF-EXAMINATION BEHAVIOR AMONG HIGH AND LOW RISK WOMEN

by

Jeanette Maria Bevett

Thesis submitted to the Faculty of the Department of Medical Psychology Graduate Program of the Uniformed Services University of the Health Sciences in partial fulfillment of the requirements for the degree of Master of Science
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Introduction

The thought of breast cancer produces at least transient anxiety in most women and there are good reasons for such concern. Breast cancer accounts for the majority of cancer mortalities among women in North America and most of Europe (Paige & Asire, 1985) and despite progress in its treatment, breast cancer at present cannot be prevented. When a diagnosis of breast cancer is made, the extent of disease, quantified as disease stage, is the most important factor in determining a prognosis, and survival rate very closely parallels stage. There are three stages: localized stage, where the cancer is confined to its primary site within the breast; regional stage, in which the cancer has spread to nearby lymph nodes or other tissue; and distant stage, which refers to cancer which has spread to other parts of the body (U.S. Department of Health and Human Services [USDHHS], 1984).

Although the five year survival rate for breast cancer at the localized stage has risen from 78% in the 1940's to 96% today, it is unclear just how much the survival rate for women with breast cancer at all three stages has increased from earlier estimates. What is clear is that with more advanced stages of disease, the five year survival rate drops significantly below 70 percent (American Cancer Society [ACS], 1985). Women are increasingly vulnerable to breast cancer after the relatively young age of 30, resulting in

breast cancer being the leading cause of all mortality in women 38-45, the number of deaths totaling approximately 38,000 annually.

The development of cancer is not an event that occurs randomly throughout the population; there is a group of women who have increased risk (Leis, 1979). Many factors have been investigated for their potential influence on the development of cancer including exposure to radiation, familial history, genetic predisposition, socioeconomic status, exposure to viruses, and exposure to diet and hormone-containing drugs. Paige and Asire (1985) in considering the role of risk factors concur with others (Leis, 1979; Kelly, 1983; Laughter, Kean, Drean, Esparza, Hortobagyi, Judkins, Levitt, Marcus and Silberg, 1981) that all risk factors are not equally predictive of breast cancer and that some merit particular attention. Familial history of breast cancer, along with gender, age, personal history of breast disease and child bearing history, is considered to be among the more robust risk factors and will be the focus of the present study. Family history is associated with an earlier age of onset of breast cancer (usually premenopausal) which tends to be both bilateral and multiple. In reference to breast cancer in the immediate family, Leis (1979) states that the increased risk reaches a ninefold level in women whose mother and sister had premenopausal bilateral breast cancer.

Since there is no known way to prevent breast cancer, the most effective approach to reducing mortality and morbidity has been one of secondary prevention focused on

educating women so that detection and treatment can occur in an early asymptomatic stage. Empirical evidence (e.g. Brown, 1978; Foster & Costanza, 1984) has linked tumor size and pathological stage of disease, that is, larger growths are associated with a higher probability of metastases to other locations (i.e. axillary lymph nodes) and increased risk of premature death. The goal of early detection is finding and treating breast cancer when tumor size is small and disease is at a less pathological stage. Early detection methods include: (a) clinical examination by a physician; (b) mammography, an x-ray of the breast using low levels of radiation; and (c) breast self-examination (BSE), inspection and palpation of one's own breasts.

Among these procedures, BSE has been widely promoted as a simple, efficient and inexpensive method of detection that can be used by all women. Most women discover their own cancers, very often by accident during bathing, dressing or sexual activity (United States Department of Health Services, 1980). If women systematically examine themselves, the rate of early cancer detection can be markedly increased.

BSE has been shown to be an effective means for women to detect growths. Studies that have examined the relationship between BSE and the pathological stage at diagnosis have found smaller growths in females who were BSE practicers compared to those who performed the procedure infrequently or not at all (Greenwald, Nasca, Lawrence, Horton, McGarrah, Gabriele & Carlton, 1978; Foster and Costanza, 1984; Huguley and Brown, 1981). By practicing BSE,

women become familiar with the geography of their own breasts and can spot changes and growths as small as 2 millimeters (Love, 1982; Hall, Adams, Stein, Stephenson, Goldstein, & Pennypacker 1980; Pennypacker, Goldstein & Stein, 1983).

Further, there is evidence from clinical populations that regular, proper performance of BSE could significantly increase the cancer survival rate. For example, in a recent study, Foster and Costanza (1984) reported that survival of women with newly diagnosed invasive breast cancer at five years was 75% for BSE performers, compared to 57% for nonperformers. In addition, more frequent BSE correlated with earlier clinical stage of disease and smaller tumors.

Despite the potential of BSE to aid in the early detection of breast cancer, the literature indicates that most women do not practice the recommended frequency of once per month (Gallup, 1974; Turnbull, 1978). For example, a 1981 national survey conducted by the National Cancer Institute reported that although 96% of the women had heard of BSE, more than half did not perform it with any degree of regularity. Even the low rates reported may be an inflated estimate of actual practice frequency because most of this data was collected retrospectively, as is most data on BSE practice rates, and faulty recall or social desirability bias associated with claiming to engage in positive health practices may have artificially increased the reported BSE rates. Without the benefit of regular self-examination, many of these cancers have spread by the time they are discovered.

Our information about breast cancer has grown

impressively over the last decade. In particular we understand the vital role of early detection and how it influences both the prognosis and disease course of breast cancer. We have begun to investigate the effectiveness of the various detection procedures as well as women's reactions to them. In both areas BSE is being looked upon as a technique that has tremendous potential. However, it remains unclear who is likely to be a regular practicer of BSE and who is not. The picture becomes more cloudy when the objective is to focus on the BSE habits of women defined as having a greater than average chance of developing breast cancer. We do not have adequate information about this group.

The purpose of this paper is to investigate the BSE practices of women who are known to be at high risk. Because the majority of the more potent risk factors presented earlier are beyond our control, the greatest hope for decreasing morbidity and mortality lies in promoting and encouraging early detection. It is important that factors associated with frequent and infrequent practice, as well as quality of practice, be identified if strategies to encourage this behavior for women in general and those at greatest risk are to be successful.

Review of BSE Literature and Its Relevance to Women at High Risk

Predictors of BSE in Normal and Low Risk Women Most empirical studies have addressed factors related to frequency of performing BSE among women generally considered normal or low risk. This research has provided considerable information about variables related to increased awareness of BSE as a screening technique and rates of practice. A finding replicated in many studies is that most women are aware that BSE is a strategy for early detection of breast cancer. For example, Turnbull (1978), taking advantage of the mass media coverage of Mrs. Betty Ford's mastectomy in 1974, investigated two questions in a group of 160 women enrolled in masters degree programs (health oriented and non-health oriented majors). One was whether changes in BSE frequency could be observed subsequent to the above event (i.e. the impact of mass media on health behavior). The other concerned the possible association between utilization of BSE and the observance of six other "Basic Preventive Health Practices" (e.g. adequate rest, nutrition, exercise, etc.). Results showed that most women are aware of BSE and its use in cancer detection and that a positive relationship exists between BSE practice and the performance of other health behaviors (although this was true only in the case of women under 36). Results, based on retrospective self-reports, also showed that there was a significant increase in BSE frequency among women of all ages following

the publicized mastectomy. A more recent study (Bennett, Lawrence, Flishman, Gifford and Slack, 1983) based on interviews with 616 volunteers did not replicate Turnbull's (1978) relationship between preventive health activities and BSE but did not find that participants were more likely to practice BSE if they were living with their sex partners, had been shown how to do BSE and were confident in their BSE technique.

Stillman (1977) conducted a study in which she administered a number of scales including one derived from the Health Belief Model (HBM) (Rosenstock, 1966) and one derived from the theory of cognitive dissonance (Festinger, 1957). She evaluated the ability of these scales to predict BSE behavior. Together, these models suggest that a woman's recognition of cancer's severity, her own susceptibility and the benefits of taking action would motivate her to engage in appropriate preventive health behaviors such as BSE. Results only partially supported the model. While one third of the subjects had strong beliefs about the benefits of BSE and were regular practicers, one fourth reported similar strong beliefs but never practiced. In addition, 65% of those who perceived themselves as highly susceptible to breast cancer indicated that they practiced irregularly if at all. It was concluded that personal mediating variables such as embarassment, religious upbringing regarding the touching of one's breasts, or medical history (e.g. previous breast lump), among others factors could impede the translation of health beliefs into health behaviors. Such factors could

create a barrier which effectively prevents a woman from practicing properly.

Fear is another factor that has been reported to influence BSE practice. Several types of fears may influence a woman's decision to initiate BSE practice or to perform it with regularity. A woman may be fearful of finding a lump, fearful of learning that she has cancer, or she may fear that she does not know correct technique and may not detect a lump. As mentioned previously, some women may be reluctant and fearful of touching their own breasts because of their religious background. Bennett et al (1983) reported that their subjects feared that breast surgery would diminish their attractiveness and this fear correlated with infrequent practice. Bernay, Porrath, Golding-Mather and Murray (1982) observed that women failed to obtain mammography when it was recommended despite extensive indoctrination as to its purpose, ease and safety. They felt that these women were afraid to get a mammogram and that screening procedures in general have not had the desired effect because the effects of fear are not directly and openly addressed. They contend that fear can be overcome with information that is made more personally relevant, encouraging and reassuring. While the focus of this study was mammography as a breast cancer screen, it suggests that fear may affect women's performance of other detection behaviors such as BSE.

Confidence in ability to do BSE correctly may be another important factor in determining BSE practice. A number of studies have found that women are not sure of how

to do BSE correctly and lack confidence in their ability to identify lumps and abnormalities in their breasts (e.g. Stillman 1977). Results of a study by Howe (1980) in which a breast model was used to assess BSE technique did indicate a general lack of BSE proficiency. She advised that promotion of BSE ought to emphasize increasing competence as well as frequency of practice.

The importance of self confidence about one's ability to discover breast abnormalities using BSE is further highlighted in recent research which found it to be the single most important predictor of proficiency of BSE technique and ability to detect lesions in a breast model (Alagna and Reddy, 1984). Confidence was significantly more important in predicting ability to detect lesions than a number of other attitudinal and demographic factors including perceived susceptibility to breast cancer, perceived severity, fear or embarassment about performing BSE, age and education.

Further study is needed in order to determine more clearly how these variables and possible others affect proficiency and willingness to engage in BSE and to identify which are essential to effective BSE training programs. Just how well these variables predict the BSE behavior of women designated as high risk for breast cancer is even more uncertain at present, but is of potentially greater concern because of their increased vulnerability.

<u>BSE Among Women at High Risk for Breast Cancer</u> Although a

number of breast cancer risk factors have been identified, few studies have focused on the behaviors of women who have special risk.

Jensen (1982) argued from a cost-benefit perspective the merits of directing cancer screening efforts primarily toward high risk groups rather than toward the entire population. He emphasized the importance of substantiating the validity of factors used to determine risk, and suggests that the most reliable ones be used as a basis to individualize subsequent preventive screenings and diagnostic studies. For example, more frequent self and/or professional health screenings would be prescribed for an individual with a familial history of breast cancer.

Successfully identifying high risk women and motivating them to obtain screening requires that health care professionals understand attitudes, knowledge, beliefs and behaviors in the high risk population. It would be important to know how these attitudes might influence the extent to which the high risk women use available resources (such as pamphlets, media announcements, opportunities for health screenings, etc.) as well as their willingness to engage in a health practice such as BSE.

A question of initial interest is whether high risk women do practice BSE more frequently. Frequency of performing BSE has been examined by several researchers. Women with medical histories including breast lumps or cancer surgeries reported higher rates of BSE practice than the average risk participants in Stillman's 1977 investigation.

Howe (1981) defined high risk on the basis of sociodemographic factors and observed a greater tendency among the high risk group than the general population to practice BSE monthly. Bennett et al. (1983) surveyed a large number of women and reported that women with a maternal history of breast cancer, that is, having a mother with breast cancer, were more likely to report monthly practice of BSE than women with no breast cancer in their family history.

These studies suggest that high risk women do engage in appropriate BSE behavior more often than low risk women. However other information suggests that the picture might not be so optimistic. For example, Laughter et al. (1981) reported BSE rates that exceeded once per month for over half of the high risk subjects. Fewer than half of them even knew that the recommended frequency was once per month. Too frequent BSE is not desirable because when BSE is done more often than monthly, small breast changes are more difficult to detect. Therefore this study not only suggests that inappropriate BSE occurs among high risk women but also that the correct behavior, monthly BSE, may not be well known. Taylor, Lichtman, Wood, Bluming, Dorsek, Leibowitz (1984) reported that over 50% of the mastectomy patients they studied did not practice BSE even when advised to do so by their physician. In another study, Paticia Kelly (1980) interviewed women with a maternal history of breast cancer and found low rates of practice. Thus the literature is not clear about whether high risk women engage in more frequent BSE.

The participation of high risk women in preventive health programs and the effects of these programs on their BSE practices is important to study. Preventive health programs are designed to teach and encourage people to engage in positive health practices such as proper diet, exercise, BSE etc. It is anticipated that such practices will decrease the risk for certain diseases or at the very least individiuals will discover problems at an early stage. Grady, Keegles, Land, Wolk and Farber (1983) found that those with a "family history" of cancer were more likely than the average woman to participate in preventive health programs. In a study designed to investigate changes in beliefs about BSE as a result of participation in a preventive health program, Sullivan and Joyce (1981) found that high risk women with a family history of cancer were more receptive to the program and reported greater changes than the low risk women in the belief that regular BSE could provide reassurance regarding health status and decrease anxiety about finding a breast lump. Interestingly, the high risk women did not report any greater intentions to do BSE following the program than did the low risk women. This suggests that the high risk women's greater belief in the psychological benefits of BSE did not translate into a greater committment to doing BSE.

Confidence in the BSE technique or in one's ability to detect breast changes through BSE is especially important in the high risk group. For example, the high risk group studied by Stillman (1977) expressed greater confidence in

their ability to detect breast abnormalities than low risk women. In the same study, confidence was related to more frequent performance of BSE among the high risk women. Laughter et al. (1981), reported that confident high risk women performed slightly more steps in the BSE procedure than nonconfident women. However Kelly (1980) did not find this relationship. Her high risk subjects reported that they were unsure of their ability to detect a lump, and that they experienced "pervasive anxiety" regarding BSE. They also had great difficulty doing it. There is a lack of agreement about whether high risk women are more confident about BSE practice than other women.

Much of the previous research seems to suggest that as a group women at high risk are more frequent practicers of BSE, have more positive attitudes toward BSE, are more likely to participate voluntarily in health screenings, are more influenced by educational information and are more confident about their ability to perform BSE correctly. As noted, however, data has not been consistent.

<u>Methodological Issues</u> Inconsistent results found in this area may be produced by methodological problems. The first issue to be discussed here is that of measurement of BSE frequency. Typically, subjects are asked to rate the frequency with which they conduct a self-examination over an arbitrary time period. If subjects do not keep monthly records, the experimenter must rely on retrospective estimates. For example, the question may be asked, "How

often in the past x months did you practice BSE?"

Howe (1981) attempted to extrapolate the frequency reported for the previous three months into an annual frequency. The validity of the derived value is questionable because sporadic BSE is not uncommon, and extrapolating from a few months practice to a yearly rate may inflate an individual's frequency of practice. Use of retrospective data can result in inaccuracies, therefore, we must be mindful of the factors that can influence recall. Stillman (1977) used a different approach, she asked participants to indicate how many months of the previous year they did BSE. This is still subject to bias, however.

A second methodological issue is conceptualization of the dependent variable. Perhaps as important as BSE frequency is BSE adequacy, which can be defined as the number of essential steps included in self-examination. Until recently, adequacy was rarely assessed and frequency was the variable most often measured in relation to BSE. Few attempts were made to determine accompanying skill and accuracy. Failure to assess adequacy weakens the significance of differences observed between high and average risk women's rates of BSE practice and can lead to an overestimation of the quality of BSE practice among high risk women. Frequent incorrect practice of BSE is probably less desirable than no practice, especially if it inspires false confidence in women at higher risk for breast cancer. Laughter et al. (1981) rated the BSE performance of high risk women using trained nurse evaluators. She found that

although BSE was conducted frequently, the quality of examination was very poor.

A third problem is that different risk categories (e.g., familial risk, age, history of breast disease) are frequently not differentiated from each other. Furthermore even within the same risk category definitions may vary. Both make it difficult to evaluate studies, identify consistencies, make predictions or compare results related to frequency of practice and adequacy. For example, Stillman (1977) described her risk group as those with a medical history of cancer or breast lumps. Being white, married, and of high socioeconomic status were descriptors of risk in Howe's 1981 study. In addition, she included women with a familial history of breast cancer. The population in the Laughter et al. (1981) study cited earlier consisted of newly diagnosed female patients who had experienced disorders such as benign breast disease, malignant breast disease and mastectomies.

The definition of risk is important because all risk factors are not equally significant in the assessment of breast cancer susceptibility. In the Stillman study cited above, the risk group included women with previous cancer and breast lumps. Previous cancer carries a five-fold risk of developing a second cancer while breast lumps are associated with a three times greater than normal risk. Familial history, a risk status which is associated with a two to nine-fold probability of developing the disease as well as those at risk by virtue of socioeconomic status comprised the

group in Howe's study above. Problems may be created when a single study contains a nonhomogenous grouping of women at risk for breast cancer.

A distinction must also be made between real and perceived risk. A woman may be high risk according to epidemiologic factors, such as age or family history, but not consider herself so or vice versa. How a woman perceives her risk or susceptibility is a potentially important psychological variable which can lead to different attitudinal, motivational, as well as behavioral outcomes with respect to BSE. For example, it is conceivable that women at risk based on socioeconomic characteristics, previous breast problems, or family history etc., may differ from one another in attitudes toward BSE. The uniformly poor BSE technique and excessive practice by Laughter et al.'s (1981) symptomatic high risk group (i.e. everyone had some form of breast disease) might be explained by factors which are salient to this type of risk group but are less important in a group with less obvious characteristics of risk such as epidemiologic criteria.

Previous research has treated all risk categories as essentially the same and has failed to determine if women in different risk categories perceive their risk differently and whether this affects BSE behavior. Along these lines, Kelly (1983) states that mere presentation of risk information is inadequate. Her comments further suggest that mediating variables such as fears and perceptions about BSE and/or cancer must be considered in light of the nature and

magnitude of a woman's risk.

Reports of greater confidence in doing BSE among the high risk women might also be influenced by the type of risk involved and women's perceptions of their risk status as discussed above. In addition, few studies have identified other factors that may affect confidence, such as correctness of BSE procedure or the source of a woman's BSE training etc.

The fourth criticism of studies that have addressed the beliefs and behaviors of high risk women is that the populations studied have most often been samples of convenience usually lacking adequate comparison groups. It would be desirable to make comparisons between different types of risk groups as well as between high and low risk groups.

Summary

The preceeding review of the literature provides evidence that greater research attention has been given to the identification of variables related to the BSE behaviors of low risk than high risk women. Only a few studies have systematically investigated factors which facilitate, hinder, or otherwise influence the frequency or quality of performance in women at high risk for breast cancer. Of these, methodological problems related to measurement of BSE frequency, adequacy of personal BSE, definitions of risk, and lack of adequate control groups, make it difficult to reconcile findings, describe or draw conclusions about BSE practice in these women. Available studies do not provide a

sufficient basis from which to develop an accurate profile of high risk women and are of even less value for developing differential profiles for specific risk groups.

How women at high risk think about the BSE procedure, their proficiency, attitudes, and notions about themselves could greatly influence their willingness to engage in this important cancer detection behavior. Such a profile could provide useful insights for determining how and at what point health professionals can intervene most effectively to enhance the BSE behavior of women at high risk, and how best to structure training programs and other communications to meet the BSE needs of these women.

The present study, which is both descriptive and comparative, examined factors which may be related to BSE frequency in two groups; one homogenously at high risk for breast cancer as a result of family history and the other at low risk. There were two major goals. The first was to survey factors related to BSE practice in a high risk subgroup and develop a useful profile. Secondly, this study investigated whether factors found to be related to frequency and proficiency of practice in low risk women also apply to those at high risk.

Methods

Subjects

Thirty-two women identified as high risk for breast cancer on the basis of family history from a cancer registry of the National Institutes of Health and 73 low risk female participants in a health promotion/screening program participated in the study. High risk for breast cancer was defined as having two female members of the immediate family with breast cancer (e.g., a mother and sister), or one female of the immediate family and a second generation female relative with the disease (e.g., a mother and aunt).

In order to obtain the high risk subjects, a computer search was run on the Epidemiological Family Studies Log, a data base on cancer patients and their families. Entries are usually provided by the health organization or the physician who gives the diagnosis of cancer. A random sample of thirty-five families with five or more cases of breast cancer was drawn and contacted. The women in these families who met the familial risk criteria were invited to participate in a NCI clinical study on a voluntary basis. They were told that the study would involve a personal interview and having their plasma melatonin levels monitored for a 24-hour period. Transportation was provided by the Institute. The response rate was 100 per cent.

Low risk participants were recruited from women who were attending a preventive health fair (included screening

for potential health problems in the areas of vision, blood pressure, diabetes and others). They were informed that this study was one phase of a research project on breast self-examination and invited to participate. Seventy-three of the seventy-five asked, agreed to participate. All volunteers gave informed consent and the use of numerical codes assured anonymity in the recording of data.

Procedures

Subjects with a high risk for developing breast cancer because of family history had come to the National Institutes of Health to participate in an ongoing project being conducted by the National Cancer Institute. During an interview on the first day, the present study was explained to them. They were informed that this project was a part of a research program on breast self-examination. If they chose to participate, consent was obtained, instructions were given and they completed the questionnaire. In a similar manner, women participating in the preventive health screening were given an opportunity to participate. When health fair participants arrived at the study site, the perspective subject had the study explained to her. If she agreed to participate, written consent was obtained and she completed the Self-Report Questionnaire described below.

Questionnaire Measures

Subjects were asked to complete a questionnaire which included 10 questions each containing 2-22 items (see Appendix). General demographic information,

personal history on breast cancer in self and significant others and experienced breast symtomatology was solicited. In addition, a series of questions were included that related specifically to breast cancer knowledge and experience with BSE.

Knowledge of Correct BSE Technique. A woman's level of BSE knowledge was determined by having subjects select from a list which included both correct and incorrect behaviors those steps which are necessary for a proper exam (question 10 in Appendix). The necessary steps are; look at breasts in mirror, squeeze nipples, examine underarm and use circular motion. Each correct item was assigned a value of one and summed to create an overall knowledge score. This scale was a modified version of one used by the National Cancer Institute (USDHHS, 1984).

BSE Frequency. In this section, a subject was asked how often BSE had been done during the six months that preceded the study. This was scored directly with possible responses ranging from never to seven or more times.

BSE Experience. A subject's experience with BSE was assessed with questions such as: Have you ever been taught to do BSE? Have you ever done BSE? Information regarding the regularity of practice was also requested (Questions 1-4 in Appendix).

Attitudinal Variables in Relation to Breast Cancer

and BSE. This part of the questionnaire utilized measures modified from Grady, Kegeles, and Lund (1982) to assess attitudes toward breast cancer. For each item, subjects were asked to rate on a seven point Likert-type scale the degree of their concern or the intensity of their attitude. Seven on the scale (always) represented great concern or great intensity, while 1 was equated with very little concern or intensity (Question 8 in Appendix). Some attitudes were measured by a single question while others were measured by a score derived from combining several items as indicated below.

Preoccupation with breast cancer. A subject rated the level of her preoccupation with thoughts of breast cancer and how frequently it was discussed with family and friends. In the analysis only the first item, preoccupation etc. was used.

Perceived severity of breast cancer. Severity was conceptualized as a function of a woman's belief in the effectiveness of current treatment methods and her beliefs about her own prognosis should she develop cancer. Therefore a subject was asked how effective she thought current treatments for breast cancer are and how good their chances of survival would be if she had breast cancer. These two items were summed to create a score.

Self-confidence about performing BSE. A subject was asked how much confidence she had that small lumps or breast changes could be found by doing BSE, how confident she was that she knew correct BSE technique, and how certain she was that she could detect breast lesions on herself using BSE. Only the score for confidence that she knew correct technique was used in the analysis.

Barriers to BSE performance. Questions were designed to investigate potential impediments to adopting BSE practice, embarassment and fear. Embarassment was measured by asking subjects to rate: How **embarassing** do you feel breast self-exam is? Fear was measured by the subject's rating: How **frightening** do you think self breast exam is? Each was analyzed separately.

BSE Performance Proficiency. Subjects were asked to check the steps they included in their typical self-examination (question 5 in Appendix). The behaviors included (a) whether one or two hands was used; (b) the part(s) of the hand(s) used (e.g., flat pads of fingers vs. whole palm, tips of fingers, etc.); and (c) type of motion (e.g., circular vs. rubbing, or pinching, etc.). These behaviors were scored as correct and overall proficiency was the unweighted sum of the number of correct behaviors indicated.

Results

Comparison of High and Low Risk Women. The sample was heterogenous on most of the demographic measures taken with the exception of race and education. Approximately 90% of the respondents in both groups were white and over 50% in each had at least some college. The majority of women in both groups were married and the average age did not differ significantly between the groups (high risk $x = 30.6$, low risk $x = 34$).

Over 80% in each group reported that they had been taught BSE. Greater than two-thirds of the total had also tried it at least once. There were no differences among the two groups on these measures. Table 1 presents a more detailed picture of how the high risk women responded to these and other items that will be discussed subsequently.

Seven one-way analyses of variance were conducted to compare the high and low risk women on the following variables: knowledge of correct BSE technique, frequency of BSE practice in the previous six months, frequency of thinking about breast cancer, perceived severity of breast cancer, self-confidence in knowledge of correct BSE technique, embarassment about performing BSE, and fear of performing BSE.

A significant difference in preoccupation with breast cancer was found $F(1, 103) = 7.67$, $p < .007$ indicating that the high risk women thought about breast cancer to a greater

Table 1

The High Risk Group

Ever Done BSE	81%	Yes
	13%	No
	6%	Not sure
Ever Taught BSE	87%	Yes
	13%	No
How Long Ago Taught BSE	30%	three or fewer years ago
	26%	four to six years ago
	44%	more than six years ago
Think About Breast Cancer	16%	very infrequent
	50%	moderate frequency
	34%	very frequently
Discuss Breast Cancer	30%	very infrequent
	64%	moderate frequency
	7%	very frequently
Confidence In Physician Exam	59%	very confident that tumors and breast changes would be found by a physician
	38%	moderately confident
	3%	not at all confident

extent than low risk women (See Table 2 for means). Knowledge of correct BSE technique was also significantly different for the two groups, $F(1, 96) = 44.59$, $p<0.000$. Examination of the means revealed that the high risk women were about twice as knowledgeable as the low risk women.

No significant differences emerged in their ratings on the attitudinal variables concerning self-confidence in the performance of BSE, embarassment or perceived severity of breast cancer. Fear in fact, was the only attitudinal variable that tended to differentiate the groups. There was a trend for those in the high risk group to express greater fear about performing BSE $F(1, 103) = 2.67$, $p<.10$. Table 2 displays the means associated with the preceeding variables.

A central question of this study was whether the BSE practice frequency of high risk women differed from that of low risk women. The means for practice in the previous six months for the high and low risk groups were $x = 2.34$, and $x = 2.38$ respectively. The one-way ANOVA revealed that the two groups did not differ in their BSE frequency during the six months prior to the study. (See Table 2 for means.)

In addition, the two groups were divided into three categories (high, moderate, low) with respect to the frequency of BSE performed over the previous 6 months. The comparison, using X^2 revealed no significant differences between the groups in the percent which fall into each category (See Figure 1). Finally the two groups were compared on their responses to the question which asked if they performed BSE regularly (See Figure 2). A statistically

TABLE 2

Variables Means

	High		Low	
	X	S. D.	X	S. D.
Preoccupation	4.50	1.79	3.34	2.04
Self Confidence	4.69	2.02	4.07	2.12
Embarassment	1.56	1.29	1.95	1.61
Fear	3.28	2.23	2.52	2.18
Severity	4.03	1.79	3.34	2.04
Knowledge	4.03	.96	2.06	1.49
Frequency of BSE in past 6 months	2.34	2.04	2.388	2.10

* Subjects responded to a seven point Likert-type scale where 1 and 7 represented the low and high end points respectively.

Figure 1

Rates of Practice During Previous 6 Months

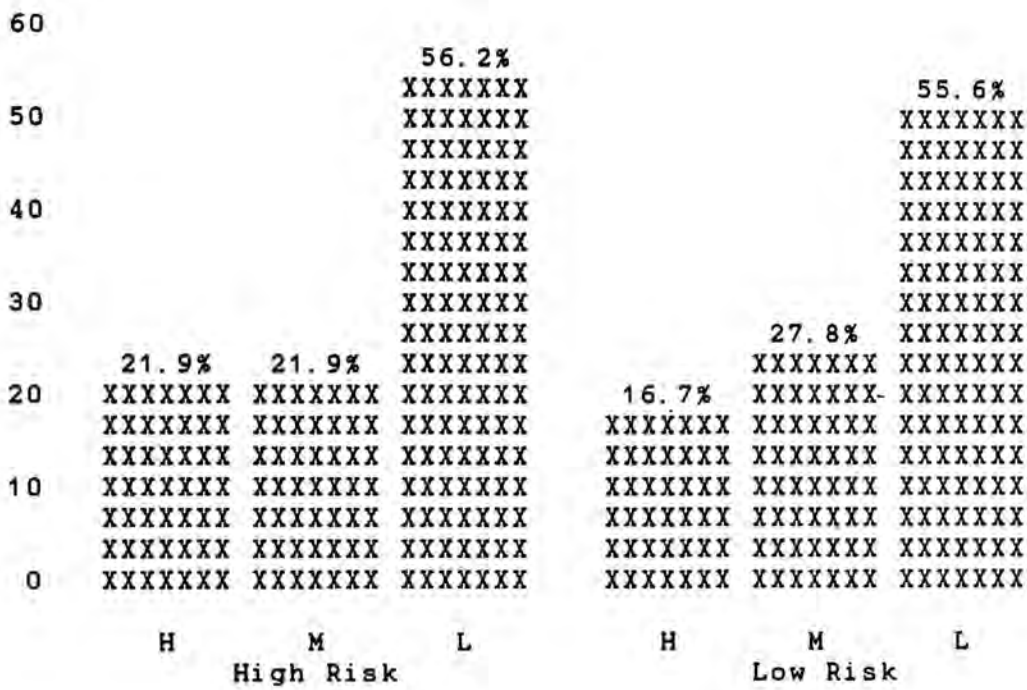

Figure 2

<u>Response to BSE Done Regularly</u>

```
 %

60

                                   52.8%
50                                 XXXXXXX
                          46.8%    XXXXXXX
      43.8%               XXXXXXX  XXXXXXX
40    XXXXXXX             XXXXXXX  XXXXXXX
      XXXXXXX             XXXXXXX  XXXXXXX
      XXXXXXX             XXXXXXX  XXXXXXX   30.6%
30    XXXXXXX             XXXXXXX  XXXXXXX  XXXXXXX
      XXXXXXX             XXXXXXX  XXXXXXX  XXXXXXX
      XXXXXXX             XXXXXXX  XXXXXXX  XXXXXXX
20    XXXXXXX             XXXXXXX  XXXXXXX  XXXXXXX
      XXXXXXX             XXXXXXX  XXXXXXX  XXXXXXX   16.7%
      XXXXXXX             XXXXXXX  XXXXXXX  XXXXXXX  XXXXXXX
10    XXXXXXX             XXXXXXX  XXXXXXX  XXXXXXX  XXXXXXX
      XXXXXXX    9.4%     XXXXXXX  XXXXXXX  XXXXXXX  XXXXXXX
      XXXXXXX  XXXXXXX    XXXXXXX  XXXXXXX  XXXXXXX  XXXXXXX
 0    XXXXXXX  XXXXXXX    XXXXXXX  XXXXXXX  XXXXXXX  XXXXXXX

        Y        M        N          Y        M        N
           High Risk                     Low Risk
```

* Y = Yes, M = Maybe, N = No

significant difference was noted. Approximately 47 percent of the high risk group accurately responded no, while only 16.7% of the low risk group did so. The majority of those in the low risk group (52.8%) incorrectly answered yes.

Overall proficiency (total number of correct steps in a typical breast self-exam) was compared between high and low risk women using a chi-square analysis. The typical practice reported by high risk women included more of the correct behaviors necessary to perform an adequate breast exam than that of low risk women. In addition, the percentage of women selecting each correct step was compared between the groups by chi-square analysis. Examination of underarm area, attained significance, $X^2 = 13.22$, $p<.01$. (See Table 3.)

Predictors of BSE Frequency in High and Low Risk Women. A stepwise multiple regression analysis was performed on the two groups separately to determine the relative importance of demographic and psychological variables as predictors of BSE frequency . BSE practice frequency was regressed on each of the following variables; preoccupation with thoughts about breast cancer, perceived severity of breast cancer, knowledge of correct BSE technique, self confidence about performing BSE, fear, embarassment, confidence in physician's breast exam, age and education.

In the regression for the low risk group, three variables contributed significantly to the variance in BSE frequency. A multiple $R = .79$ with an $F(3, 60) = 32.37$, $p<.001$ accounted for 62% of the variance. Self-confidence about performing BSE was most strongly associated with BSE

TABLE 3

Percent Responding Always or Most of the Time to Correct BSE Behaviors

Correct BSE Behaviors	High Risk	Low Risk
Lying down	57	48
Look at breasts in mirror	37	26
Use flat pads of fingers	86	63
Squeeze nipple	15	16
Examine underarms	44	34
Use circular motion	64	63

frequency, accounting for 49% of the variance by itself. Knowledge of correct BSE technique produced an R^2 change of .10 which was significant, $F(1, 62) = 14.83$, $p<.001$. Embarassment was the third variable to enter the equation producing an R^2 change of .03 which was also significant, $F(1, 62) = 4.52$, $p = .04$. (See Table 4 for zero order correlations.)

In the high risk group, the only factor that significantly predicted BSE frequency was self confidence about performing BSE ($r = .64$). This variable by itself accounted for 41% of the observed variance in self-reported practice.

Fisher's Z' Transformation (Cohen and Cohen, 1983) was performed on the zero order correlations between each independent variable and BSE frequency in order to test the significance of the differences in correlations between the two groups. The adjusted difference of the correlation between knowledge and BSE frequency for the two groups produced a z score of 2.0 which met the criteria for significance at the $p = .05$ level. This indicates that the correlation coefficients were significantly different, the relationship being stronger for low risk women than the high risk ones. That is, knowledge is a better predictor in the low risk group. (See Table 4.)

TABLE 4

Correlations Between BSE Frequency and Relevant Variables

	BSE Frequency					
	Low Risk	P	High Risk	P	Z'*	P
Self-confidence about performing BSE	.70	0.000	.62	0.000		
Knowledge about BSE	.63	0.000	.31	0.025	2.0	.05
Embarassment about performing BSE	-.31	0.004	-.11	0.270		

* Fisher's Z' Transformation for comparing independent rs.

Discussion

The major goals of this investigation were to identify factors associated with the BSE habits of women with increased risk for breast cancer based on family history and to compare these factors with those found to be important among women at normal or average risk.

In this study, a number of important relationships were found, a few of which appear to be common sense. Women at high risk rated themselves as thinking about breast cancer to a greater extent than those at low risk. This is not surprising since having close female relations with breast cancer is a salient reminder of one's own vulnerability (Kelly, 1980) and likely to encourage more frequent thoughts of breast cancer.

Similarly, high risk women were twice as knowledgeable as low risk women. Again, this makes sense since women with a family history would have more information about BSE, primarily because the possibility of breast cancer is a more salient concern to them.

No difference was found in BSE frequency between the high and low risk groups, although some aspects of the data lead one to anticipate more frequent BSE practice among high risk women. For example, both the knowledge scale and the BSE quality assessment revealed a higher rating for the high risk group. That is, both their score indicating what should be done during a proper exam and their score describing their

own behaviors during self examination revealed that they were superior in BSE knowledge and skill than low risk women. In previous research (Howe, 1981; Kelly, 1979; Turnbull, 1978) inadequate knowledge has been associated with decreased BSE practice. However, in this study, even though the high risk women were significantly more knowledgeable about BSE, possessed the expertise to perform BSE well and achieved higher performance scores for personal practice, they did not conduct self-examinations any more often than women in the low risk group.

These results are contrary to the reasonable expectation that those who are at higher risk would be more likely to use available measures to control negative health outcomes which could result from their risk status. They are also contrary to some previous research that has reported more frequent BSE for high risk compared to low risk subjects (Stillman, 1977; Howe, 1980). Even the report of incorrect and excessive BSE practice observed by Laughter et al. (1981) among those at greater risk suggests greater BSE practice among these individuals. The Taylor et al study of mastectomies is one of the few studies that suggests that women at greater risk do not practice frequent BSE.

In the low risk group, it is possible that their lower susceptibility beliefs and fear may have been offset by their inferior levels of knowledge. However, this explanation cannot be applied to the low frequency of practice in the high risk group.

Are there other plausible explanations for the lack of

confluence between overall BSE proficiency and frequency of practice? An observation made by Kelly (1983) and others is that knowledge of risk is not necessarily sufficient to translate cognitions into appropriate preventive health activities. She argues that often women don't know how to process risk information or what to do about it. Also, she describes additional factors (e.g. fear, guilt, low self-esteem) that may determine whether or not BSE will be adopted by women with known familial risk.

Of the attitudinal variables compared between the groups, only fear approached statistical significance, the level of fear being greater among those at risk. This suggests that fear may have exerted a more negative effect on these women than indicated by the data. It may be that the measure used to assess fear was not as sensitive as would be desirable and that the conceptualization of fear requires further refinement.

Type or classification of risk may also be useful for explaining the practice rates observed in this study. Specifically, because risk classifications vary in their social and psychological impact on an individual, they may also exert different types of influence on the motivation to practice BSE. Most of the studies reporting higher rates of practice for high risk women have either defined risk differently or derived data from a mixed sample (i.e. Howe, 1981). Greater BSE frequency based on heterogeneous risk groups may not accurately represent the BSE behavior of women with familial risk. In this investigation, all the high risk

women share the common characteristic of familial risk. It is conceivable that women with less self-apparent risk might be less intimidated or avoidant of BSE practice than these women. The infrequent practice apparent in both groups here, regardless of risk may be a phenomenon which can only be observed when there is homogeneity within comparison groups.

On a question which asked whether or not the respondent performed BSE frequently a significant difference was noted. Almost half of the high risk group answered no, compared to less tha 20% of the low risk group. Both groups actually had low rates of practice. The main point is that the women in the high risk group correctly perceived that their practice rates were low, while those in the low risk group seemed unaware - 52% of them rating themselves as regular practicers. Because the risk of breast cancer increases with age, it is important that all women, regardless of other types of risk, know what constitutes regular practice and adopt it. More studies are needed that compare BSE and other health behaviors of women in different risk categories.

The regression analysis identified three predictors of BSE frequency in the low risk group (self-confidence, knowledge, embarassment) and one in the high risk group (self-confidence). That knowledge did not predict frequency in the high risk group is not surprising for there was little variance within the group. They were all well informed which was not the case in the group at lower risk.

Embarassment was significant for the low risk group

only. Heightened awareness of breast problems, family history and experience with cancer, conversations with family and friends, exposure of the body during frequent examinations or treatment may have decreased the saliency of this concern in the risk group.

It is revealing that there was essentially no difference in the confidence scores of the two groups. Neither had high mean levels of self confidence about performing BSE. What is more important is that in both groups, those women who scored higher in confidence did report greater BSE frequency. It is interesting that self-confidence emerges as the most powerful predictor in both groups, regardless of risk status, underscoring the importance of self confidence to all potential BSE practicers. Moreover, these results reaffirm the centrality of confidence when attempting to understand or change BSE behavior in a subgroup of women who are more likely to encounter the threat of breast cancer. These findings also demonstrate the importance of including among BSE program objectives, strategies designed to enhance this powerful attitudinal factor.

BSE efforts designed to increase know-how and information are not enough. If they were, then mass education programs conducted over the past 15 years would have been more successful in increasing the numbers of women who examine themselves monthly.

Although this study cannot be considered a true test of Rosenstock's 1974 Health Belief Model, some observations

are relevant. This model of health behavior purports that readiness to engage in health behaviors such as BSE is dependent upon perceptions of one's own susceptibility and the severity of the disease. Readiness is translated into behavior provided several conditions are met; an appropriate cue is available, there is belief in the benefits to be derived from taking actions designed to decrease the health threat, and there are no significant barriers to action. Several items from the HBM were included in the questionnaire. Those predictive of BSE frequency were confidence in ability to do BSE, knowledge of BSE, and embarassment. Cancer's severity, and belief in the benefits of taking action, showed no association with frequency of BSE.

An essential ingredient for producing effective BSE information and education programs is to base them on an understanding of the needs, wants and behaviors of the target audience. The results of this study add to our knowledge about the information and practices of women at genetic or familial risk for breast cancer. It also provides a comparison of this group with women who, in general, do not perceive themselves to be at any more than average risk for the disease.

Conclusions

Reliable information concerning the extent to which high risk women practice BSE and their attitudes toward BSE is severely lacking. The relatively few studies have generally concluded that high risk women are more positive toward BSE, practice it more frequently, and are much more confident about their BSE skills. Because previous research suffers from methodological problems related to the measurement of BSE frequency, quality of BSE practice, varying definitions of risk, and the lack of control groups this conclusion can be questioned. In this study, the high risk women, while considerably more knowledgeable about BSE than those at low risk, were no more confident nor did they perform BSE any more frequently. While confidence was the strongest predictor for the low risk comparison group, confidence was the <u>only</u> predictor of BSE frequency of practice for women at high risk.

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