



The effect of silastic teaching models in a breast self-examination education program
by Jacquelyn Sue Bair Stankey

A thesis submitted in partial fulfillment of the requirements for the degree of MASTER OF NURSING
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Abstract:

Cancer of the breast has been identified as a major cause of death in women. Although Breast Self-Examination (BSE) has been shown to enhance the breast cancer, detection efforts of screening clinics and private physicians, few women practice it on the recommended monthly basis. The purpose of the investigation was to examine the various factors that have been suggested to affect the individual's performance of BSE and to investigate the effects of a program designed to answer the question: Does the use of silastic teaching models in a BSE education program increase the rate of BSE performance? A quasi-experimental research project based on Rosenstock's Health Belief Model and a Cancer Intervention Model designed by the author was proposed. A control group participating in a BSE education-project was compared to an experimental group receiving the same information with the additional opportunity of practicing examination skills on a silastic breast model. When determining program objectives, consideration was given to the content formats outlined by prior researchers.

Analysis of data failed to support the research hypothesis: there was no difference in rate of BSE between control and experimental groups. Participation in the education program significantly increased the total number of women practicing BSE. However, the number of women practicing BSE on a monthly basis remained relatively constant.

Neither demographic nor health-related variables appeared to influence the BSE practice behavior of the groups.

In summary, formal education programs designed to reduce fear and teach breast self-examination techniques increase compliance. While the use of the silastic breast model did not affect BSE practice significantly in this study, it is a valuable teaching tool, and further research which defines the most appropriate model to use and the environment in which to use it should be undertaken. Although the results of the research project did not specifically support Rosenstock's Health Belief Model, the findings did lend support to his hypothesis concerning unconscious psychological factors as motivators of BSE. An increase in BSE rate of performance and the expressed desire by the participants for further knowledge about cancer lent credence to the Cancer Intervention Model and the intervention by the nurse in the total self-care mode.

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THE EFFECT OF SILASTIC TEACHING MODELS IN
A BREAST SELF-EXAMINATION EDUCATION PROGRAM

by

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A thesis submitted in partial fulfillment
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ABSTRACT

Cancer of the breast has been identified as a major cause of death in women. Although Breast Self-Examination (BSE) has been shown to enhance the breast cancer detection efforts of screening clinics and private physicians, few women practice it on the recommended monthly basis. The purpose of the investigation was to examine the various factors that have been suggested to affect the individual's performance of BSE and to investigate the effects of a program designed to answer the question: Does the use of silastic teaching models in a BSE education program increase the rate of BSE performance?

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In summary, formal education programs designed to reduce fear and teach breast self-examination techniques increase compliance. While the use of the silastic breast model did not affect BSE practice significantly in this study, it is a valuable teaching tool, and further research which defines the most appropriate model to use and the environment in which to use it should be undertaken. Although the results of the research project did not specifically support Rosenstock's Health Belief Model, the findings did lend support to his hypothesis concerning unconscious psychological factors as motivators of BSE. An increase in BSE rate of performance and the expressed desire by the participants for further knowledge about cancer lent credence to the Cancer Intervention Model and the intervention by the nurse in the total self-care mode.

Chapter 1

INTRODUCTION, THEORETICAL FRAMEWORK, AND LITERATURE REVIEW

Today, according to statistics published by the Department of Health, Education and Welfare, cancer is the second most frequent cause of death in the United States (1974:2). The subject of this study is cancer of the breast, the most common cause of cancer death in women over the age of 30, and the leading cause of death in women aged 40-45 (Hudson, 1974).

"Present research data indicate that the majority of cases of five common forms of cancer (skin, lung, breast, cervical, and colon) can be prevented if each individual learns how to live healthily, receives a periodic physical examination, and seeks competent medical advice and treatment as soon as abnormal growth is detected" (New York University System, 1976:6). An alteration of lifestyle ("healthful living") has not been proven to decrease the incidence of breast malignancies, but early detection and treatment have been directly responsible for significantly altering mortality rates from this disease (Malasanos, 1978).

During the past 40 years, much publicity has been devoted to encouraging women to undergo regular physicals, to practice Breast Self Examination (BSE), and to seek medical intervention promptly when a lump is discovered in their breasts. Nevertheless, the mortality rate

for breast cancer has remained relatively constant (40/100,000 women). Over one-half of the women with breast cancer who come to the attention of physicians have, at least, microscopic metastases to the axillary lymph nodes. Studies have shown that a program of regular BSE results in the detection of tumors at an earlier stage, subsequently resulting in a decrease in the mortality rate from breast cancer (Greenwald, 1978; Foster, 1978).

Breast self-examination is an easily learned skill that has significant impact on detection of breast tumors. Ninety-five percent of all breast tumors are detected by the woman or her partner. The necessity for learning this skill has been well publicized, yet most women fail to practice it on a regular basis. In 1974, the American Cancer Society surveyed 1007 women about BSE practices and discovered that over 75% had heard of BSE, but only 18% performed the procedure on the recommended monthly basis (Hobbs, 1977). However, Hobbs (1977) has pointed out that women participating in the 1974 ACS survey were asked, "Have you heard of breast self-examination?", not, "Have you ever been instructed in breast self-examination?" This distinction is of consequence in light of information gleaned from other research indicating a significant increase in compliance with a regular BSE program when the individual is personally instructed in the correct procedure.

The purpose of the current investigation is to examine the various factors that have been suggested to affect the individual's performance

of BSE and to investigate the effects of a program designed to answer the question: Does the use of silastic teaching models in a BSE education program increase the rate of BSE performance?

Theoretical Framework

What motivates an individual to perform a preventive health behavior? Since 1960, researchers have attempted to isolate variables positively and negatively influencing health behavior. Irwin Rosenstock, a pioneer in the field, designed the Health Belief Model, which presented a diagram of variables he hypothesized influenced the health practices of individuals. The Health Belief Model provides a theoretical framework for a quasi-experimental research project designed to positively motivate the performance of BSE.

Health Belief Model

In order to develop a common frame of reference, we must first define health behavior. Kasl and Cobb (1966:246) define a health behavior as "any activity undertaken by a person believing himself to be healthy, for the purpose of preventing disease or detecting it in the asymptomatic stage." What factors motivate the individual to take this preventive health action or health behavior? Irwin Rosenstock delineated those variables he believed impacted on the performance of health behaviors by individuals. The major motivational variables were

adapted from Lewin's general psychosociological theory, in particular, the truism that "motivation is required for perception and action" (Rosenstock, 1966:98). Rosenstock contended that motivational variables dealing with health behavior must deal with the subjective world of the individual exhibiting the health behavior.

The Health Belief Model (Figure 1) reflects Rosenstock's belief that motives determine the way environment is perceived by the individual. Integral to the model are two classes of variables he hypothesized explained health behavior:

1. The psychological state of readiness to take a specific action, and
2. The extent to which a particular course of action is believed, on the whole, to be beneficial in reducing the threat (Rosenstock, 1966:98-99).

Readiness to act is viewed from the client's point of view of susceptibility to the disease and seriousness of the illness. Beliefs that define this readiness to act have both cognitive and emotional components. Rosenstock hypothesized that "underlying emotional aspects have greater value in accounting for behavior than do the cognitive elements" (1966:98). Subsequent research has supported this contention (Margery, 1977; Manfredi, 1977).

In the Health Belief Model, the perceived benefit of taking action depends on three interrelated components: the perceived susceptibility

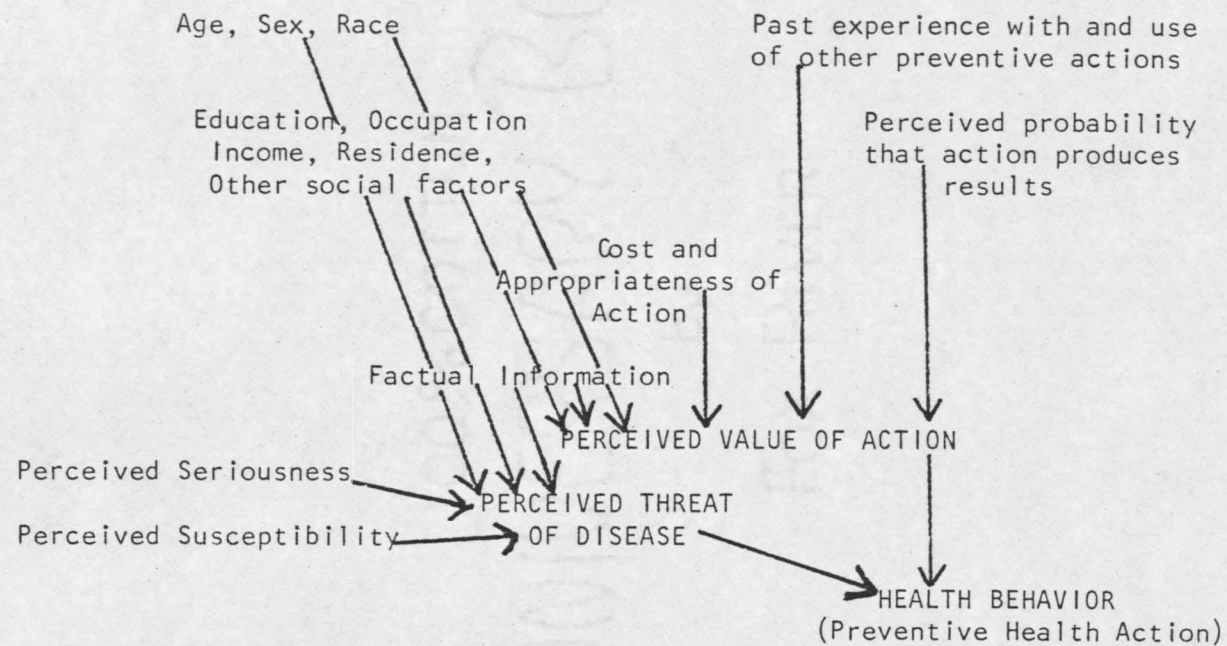


Figure 1. The Health Belief Model

source: Adaption of the Health Belief Model appearing in
Kasl and Cobb (1966:253)

of the individual to a condition, the perceived seriousness of the condition, and the perceived benefits of taking action and barriers to taking action. An individual who believes himself susceptible to a disease such as cancer, and further believes that cancer is a deadly disease for which there is no cure, may avoid taking any action that exposes him to cancer-causing agents. On the other hand, his level of fear of cancer may be so high that he feels any preventive or detection behavior is useless, and, therefore, he will avoid placing himself in situations (e.g., physical examinations) where he might discover there is "something wrong" with him.

A number of researchers have attempted to study motivation from different theoretical frameworks. Stillman (1977:121), for example, based her research on Festinger's (1957) theory of cognitive dissonance. Cognitive dissonance theory hypothesizes that, "1. The existence of dissonance will motivate the person to reduce the dissonance and achieve consonance; and 2., When dissonance is present, the person will avoid situations which would likely increase the dissonance." Thus, if a woman is worried about a breast tumor, or if she knows that breast cancer is common in the women of her family, she may examine her breasts regularly to reassure herself that no lumps exist. On the other hand, if she is unsure about the anatomy of her breasts and mistakes any tissue with a lumpy texture for a tumor, examining her breasts may increase her dissonance and she will avoid it altogether. Cognitive dissonance

theory is congruent with Rosenstock's analysis of factors that influence health behaviors, inasmuch as he hypothesized the importance of conscious and unconscious factors creating pressure on the individual to take a specific action.

Studying the Health Belief Model more closely, one can see that many factors, both extrinsic and intrinsic, determine the course of action the individual takes. Stillman has argued that people are motivated to take specific preventive action if they feel themselves susceptible to certain diseases. This author believes that other psychological and cultural factors may impinge on the individual's health behavior, factors not considered in Rosenstock's model. Barriers such as the fear of disfigurement, fear of cancer, the experiences of relatives or friends with breast malignancies, or, in the case of BSE, taboos about touching the breast, are but a few such possible factors. In other words, the client may feel that if she were to take the preventive action of BSE, she might discover something she really doesn't want to know. If she doesn't find a lump, it won't be there--a type of magical belief.

This contention is supported by Margery, et al. (1977), who investigated women's reasons for delay in seeking treatment for breast lumps. As a result of their findings, they identified five independent psychological factors which determined the delay for seeking treatment, all of which were unconscious mental processes. These five factors were:

the marked use of the ego-defences of denial and suppression, the marked use of the ego-defence of intellectualization-isolation (negatively), self-reports of anxiety experienced before the interview (negatively), non-verbal signs of anxiety observed during the interview, and depression inferred from verbal responses by the women during the interview (1977:230).

Margery suggests health educators should design messages which take into account the impact of these unconscious factors and the client's individual style of coping with threat.

Leventhal (1971) hypothesized threat produces two levels of response--rational and irrational--and that the individual cannot take constructive action unless there is knowledge of the technique and belief that the proposed action will deal with the threat. Leventhal's hypothesis supports the cognitive element of Rosenstock's Health Belief Model. Manfredi, et al. (1977) tested the relationship between perceived truth and knowledge of BSE techniques, controlling for the presence or absence of health belief system. They reported their data "clearly indicate that belief in the effectiveness of the test and in the possibility of improved prognosis with early detection is associated with increased knowledgeability of the procedure at all levels of threat" (1977:437).

In 1963, Kirscht, et al. conducted a national health survey of health beliefs. Of particular significance was the information they garnered about people's beliefs related to the value of early detection. The authors hypothesized that belief in the benefits of early detection

was presumed to have three components:

1. A belief that prompt treatment of a diagnosed illness is more beneficial than delayed treatment;
2. A belief that medical tests or checkups are necessary in diagnosing the disease; and
3. A belief that in one's own case, such tests or checkups can detect the disease before the appearance of symptoms (Kirscht 1963:252).

However, they found that 50% of the respondents supported only two out of three of these health belief components in relation to themselves and specific diseases such as cancer. The lack of support for all of the components necessary to take a specific health action (in this case, a breast cancer detection program) clearly mandates intervention by health educators to encourage compliance.

Since the design of the Health Belief Model, both retrospective (data gathered about beliefs and behavior during the same interview) and prospective (beliefs measured at one point in time and behavior measured later) studies have been undertaken to test the model. Hazen (1975) summarized these studies (Figures 2 and 3) in her thesis dealing with the application of the Health Belief Model to preventive behaviors of rural women. She suggests that retrospective studies (Figure 2) do not clearly validate the model because respondents' health beliefs and behavior are measured at the same point in time. Rosenstock admits that these retrospective studies reviewed separately neither support nor negate the model. However, he contends that taken together, they

Principal Investigator	Independent Variables		Perceived Value	Dependent Variable	Important Findings
	Perceived Susceptibility	Perceived Seriousness			
Hochbaum, 1958	Interaction of perceived susc. and perceived benefits	Not signif.	Not signif. alone	Chest X-ray for TB	Importance of self-application
Kegeles, 1963a	Significant	Significant	Significant	Dental checkup	Found SES variables just as important
Heinzelman, 1962	Significant	Significant	Just measured knowledge - significant	Taking penicillin to prevent recurrence of rheumatic fever	Optimal when all three present
Kirscht, et al., 1966	Not signif.	Not signif.	Significant	Pap tests	Belief in general susc. not wide-spread
Gochman, 1972	Significant	Not measured	Significant (for those with health motivation only)	Dental checkup	Added importance of having a <u>health</u> motivation

Figure 2. Results of Retrospective Studies of the Health Belief Model (Hazen, 1975)

Principal Investigator	Independent Variables		Perceived Value	Dependent Variable	Important Findings
	Perceived Susceptibility	Perceived Seriousness			
Rosenstock, et al., 1957	Significant	Significant	Not measured	Flu vaccination	(Only 86 in sample)
Kegeles, 1963	Significant	Not signif.	Not signif. by itself, but was in combination with susc.	Dental checkup	Best single predictor of behavior was prior behavior
Kegeles, 1969	Precommunication: Not signif. Post-communic.: Significant	Not tested	Precomm.: Not signif. Post-comm.: Not signif.	Pap test	Failed to show direct communication belief change behavioral change causal chain
Haefner and Kirscht, 1970	Support, communication increased beliefs of susc. Signif. related to intentions and checkup, but not living habits	Support	Support (communication increased beliefs of value). Signif. related to intention/checkup--not living habits	Various preventive actions	Nonrepresentative sample (university employees)

Figure 3. Results of Prospective Studies of the Health Belief Model (Hazen, 1975)

provide "strong support" (1966:104).

Prospective studies (Figure 3) also lend some support to the model. Because the model deals with psychological and sociological variables, it has been extremely difficult to design measurement tools to test it accurately. Hazen believes there are several reasons the model is particularly suited to health education research and, therefore, deserves additional investigation. First, the model adequately accounts for major variables in groups in a variety of settings. Second, the model is composed of a small number of elements and is easily understood and applied. Third, the model is applicable to a wide variety of health actions; and last, the beliefs are, in principle, capable of change through education programs.

The Health Belief Model provides a general framework for assessment of health beliefs, for intervention by health providers to influence these beliefs, and to encourage preventive activities. However, the model does not appear to provide an integrated framework for intervention by the nurse at all points on the wellness-sickness continuum. The question is then asked, what type of model presents a framework for nursing intervention, not only when the client has entered the formal health care network, but, also, to maintain a level of wellness?

The Cancer Intervention Model

What role should the nurse assume in a cancer detection program in

general, and in a BSE program in particular? Existing nursing models do not appear to either address the complex needs of a cancer patient or adequately define the nurse's role and interaction of the local/regional cancer-care teams.

Montana is primarily a rural state with two or three urban areas that can be defined as regional health care centers. To address the issue of provision of cancer care to patients living in this rural environment, the author believed a need existed to design a model that would depict the responsibilities of the nurse providing care to clients representing the entire spectrum of health status. The responsibilities encompass maintenance of the status of the well client, at the one end of the health-illness continuum to nursing intervention with both the acutely and chronically ill, and enabling the terminally ill patient and his family to make informed choices concerning death and dying, at the opposite end of the continuum.

The first assumption of the model (Figure 4) is that the client with whom we are dealing is the patient and his family. Furthermore, the client is the prime decision-maker in the health care system, operating mainly in his/her local community and exiting from the local system only when it becomes necessary to obtain care not available to them locally. The view that the patient and his family are the client is taken from the Hospice definition of the client, which emphasizes treatment of the family unit (Markel, 1978:226). The family concept of

client will be used throughout the discussion of the model.

The second assumption is that there are three spheres of care: total self-care, assisted self-care, and institutional care. Each of these care modes represents unique client needs, but they are not mutually exclusive. Therefore, they are represented in the model as being overlapping.

Additionally, it is contended that each individual exists within one of these modes at any time, and moves from one mode to another, depending on complex interrelating physiological, psychological, and sociological factors. Furthermore, the greater portion of client needs must be met in the local community (represented by the rectangles) where the nurse must intervene to see that the transition is smoothly made, that identified outcomes are met, and to assess the situation to determine that level of care most appropriate for her/his client.

The third assumption is that because of the complexity of cancer care, the client who lives in a rural area often must leave the local community to receive care at a regional center. The center, represented by a triangle superimposed on the modes of care in the model, cannot be an entity apart. It must be an integral part of the care system, and care-givers must recognize the majority of the client's care will be undertaken at the local level. To reach identified outcomes of care, there must be a mechanism created for multiple paths of communication between the regional and local care-givers and the client.

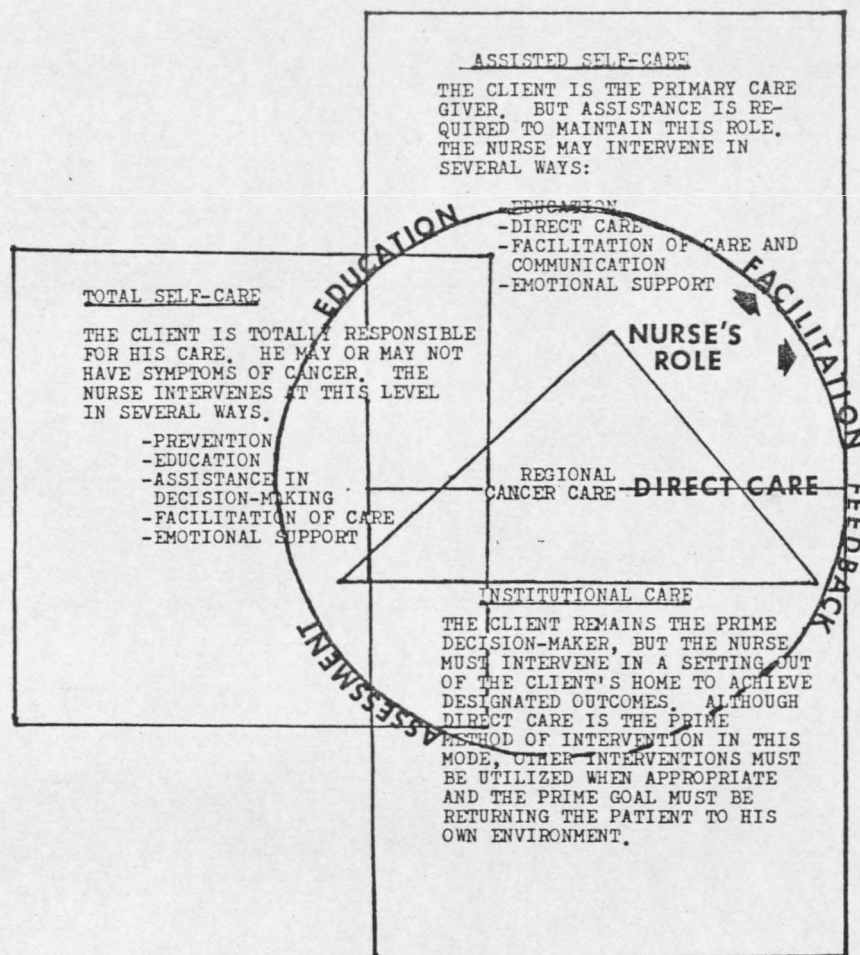


FIGURE 4

CANCER INTERVENTION MODEL

THE RECTANGLE: THE LOCAL ENVIRONMENT. PRIMARY RESPONSIBILITY OF THE LOCAL CARE GIVERS

THE TRIANGLE: REGIONAL CANCER CARE, ENCOMPASSES ALL MODES OF CARE. PRIMARY RESPONSIBILITY OF REGIONAL CARE GIVERS.

THE CIRCLE: THE NURSES' ROLE. COVERS ALL MODES OF CARE. FACILITATION OF CARE, FEEDBACK, EDUCATION, COMMUNICATION, ASSESSMENT, AND DIRECT CARE ARE ALL NURSING RESPONSIBILITIES.

THE SEGMENTS OF THIS MODEL ARE INTERLOCKING TO INDICATE THE MUTUALLY INTER-DEPENDENT NATURE OF CANCER CARE.

CLIENTS (DEFINED AS THE PATIENT AND HIS FAMILY) ARE CONSIDERED THE PRIME DECISION MAKERS AND CARE GIVERS. HEALTH CARE PROVIDERS INTERVENE TO ACHIEVE THE BEST POSSIBLE OUTCOMES WITHIN THE FRAME-WORK OF THESE DECISIONS.

The final assumption is that the nurse's role (represented by the circle) overlaps all modes of care. To intervene appropriately, she/he must perform several functions. Perhaps of principal importance are the processes of assessment and facilitation of communication. Even if she is primarily operating in the self-care mode with well clients, she must, for example, assess their needs for education about cancer and facilitate delivery of educational material. Of equal importance in the model are the nursing functions of facilitating communication/feedback, emotional support, and direct care. Within the framework of the model, health education of the well client concerning cancer prevention, cancer detection methods, and the importance of taking appropriate action in light of symptomatology are well within the province and responsibility of the nurse.

Summary

In summary, the Health Belief Model delineates variables thought to affect the performance of health behavior. Partial support for the model has been provided by researchers using retrospective and prospective studies. The Health Belief Model provides a framework for creation of health education programs designed to influence health behavior. A Cancer Intervention Model was designed to identify the nature of care that could ideally be provided by nurses working with patients at both ends of the wellness-sickness continuum.

Literature Review

The purpose of this section is to review research on the efficacy of BSE as well as research focusing on the content areas of BSE education programs. Based on the findings in the literature, an experimental program using silastic breast models was proposed and an experimental program testing the effectiveness of the model is outlined in Chapter 2.

Many researchers have studied the efficacy of various breast cancer screening procedures. The majority of the studies have been directed at measuring the rate of early detection success of breast tumors by health providers and by technical procedures (Schwartz, 1978; Mahoney, 1979; Fox, 1979). Comprehensive screening programs are designed to provide yearly examinations for the majority of women by health providers, more frequent examination of high-risk clients, and the use of mammographic and thermographic detection devices when indicated.

Advocates of mass screening clinics, while espousing their cause, admit there are several problems associated with this type of effort. First, there often is a long waiting period for entry into the screening program. Hudson (1974:72) reported women desiring screening appointments at the Kansas University Screening Clinic faced waits on an average of five months. Second, entry into the screening program usually demands self-selection by women. Because of the previously described conscious and unconscious factors, women often will not take the

initiative to enter the screening program. Third, breast cancer screening programs are expensive (Kirch, 1978:728). Large populations are required to adequately support full-service, on-going programs. Intermittent screening programs (e.g., held once or twice a year in a community) are less expensive, but also less effective because the resources are not readily available to the population. Fourth, even large, full-service, screening clinics do not have a 100% detection rate. A significant percentage of tumors are detected by the clients in the interval periods between screening (Kirch, 1978:728).

The problems existing in mass screening efforts are particularly apparent in rural areas. Problems of efficiency, scale of operations, unavailability of health resources, and lack of transportation mandate a different approach to breast cancer screening in rural environments.

In light of these difficulties with mass screening, it appears that BSE education, education of health providers, and utilization of existing facilities (e.g., planned parenthood, health department clinics, and private physicians) to provide additional screening services, offer the most workable solutions for breast cancer detection in rural areas. As recently reported in the March 31, 1980, issue of Time magazine, the American Cancer Society has recommended that women who have a history of normal breast examinations no longer need to obtain a yearly examination by health providers, the recommended interval now being "once every three years between ages 20 and 40, and annually thereafter"

(Time, 1980:65). The recommended increase in the length of time between breast examinations is possibly a reflection of findings by researchers that many breast malignancies are slow-growing. The American Cancer Society might have concluded women at low risk for breast cancer with a negative history of other breast disease would not be adversely affected by a greater interval between breast examinations. The recommendation for an increase in the interval between professional examinations was based on a premise that women practice self-care by means of awareness of cancer and monthly performance of BSE.

Few American studies attempting to determine the efficacy of using BSE to detect tumors have been reported. Greenwald (1978:271) and Foster (1978:268) investigated the relationship between BSE and breast cancer stage. Both researchers reported tumors discovered by women regularly practicing BSE tend to be detected at an earlier stage than those "accidentally" discovered. Furthermore, Greenwald reports he found "no statistically significant difference by stage between tumors detected through BSE and routine physical examination" (1978:271).

Stillman (1977) and Turnbull (1978) investigated factors that affected utilization of BSE. Turnbull studied the relationship between practice of six basic preventive health measures and the practice of BSE. She also investigated the effect of mass media coverage of Betty Ford's mastectomy in 1974 and the practice of BSE. (Betty Ford, wife

of Gerald Ford, was First Lady from 1974 until 1977.) Turnbull's sample included graduate students in the health-care professions and graduate students in the non-health-oriented professions. She reported the most significant positive factors influencing the practice of BSE in the non-health-oriented group were fear related to cancer, effect of the mass media, and guidance of a doctor. The health-oriented group indicated factors most influencing their practice of BSE were learning from health-related education programs, fears related to cancer, and work experiences. The findings suggest that publicity and dissemination of factual knowledge will positively influence the rate of BSE. The researcher was unable to locate studies describing when fear of cancer ceased to be a motivation for BSE and became reason for avoidance for those who did not choose to practice BSE.

Stillman tested Rosenstock's Health Belief Model by investigating the nature of health beliefs concerning BSE held by 122 women. The results of the study were that a statistically significant association between high beliefs in the benefits of BSE and/or the perceived susceptibility to cancer to the monthly practice of BSE was not found. Only 40% of the sample practiced BSE on a monthly basis despite a 97% segment with high scores in perceived benefits and 87% in perceived susceptibility (1977:126). The results lend support to studies suggesting unconscious factors as motivators of practice of BSE.

Hobbs (1977) from Great Britain evaluated the effectiveness of five content areas she considered mandatory in a BSE education program. The content areas included the following:

1. Stressing the greater likelihood of non-malignant than malignant causes for changes in the breast;
2. Making clear the advantages of treating cancer while in an early stage;
3. Explaining the 'lump' nature of the normal breast;
4. Seeking to teach established groups, so that group support is available for developing a regular health habit;
5. Offering personal counseling and follow-up, if needed (1977:251).

She found that women frequently consult others (peers, family, etc.) to validate their findings prior to entry into the health care system. Because such peer groups offer emotional and psychological support, teaching BSE within their framework and utilizing their well-developed communication networks was more satisfactory than individual instruction. Additionally, Hobbs emphasized the need to reduce cognitive dissonance by stressing the positive aspects of BSE (e.g., the likelihood of non-malignant causes for changes in the breast).

Hall (1977) also attempted to define content requirements of BSE education programs by reviewing and summarizing several evaluation studies of the BSE health education effort. She stated that:

...studies designed to evaluate BSE training have demonstrated that (1) women who are given some instruction in BSE report more frequent examinations after training than before training, (2) women who receive personal training report more examinations than those who merely view films on breast examinations, (3) film instruction does not ensure proper performance of the demonstrated search pattern, and (4) smaller tumors are found in women who report regular practice of BSE (1977:365).

Following a review of the findings, Hall and her colleagues concluded individuals learning BSE techniques must be given appropriate methods for practicing these techniques. The programs should include a method whereby the trainee is given positive feedback; i.e., that she is, in fact, capable of finding a lump. Because it is not possible in most BSE teaching sessions for the individual to practice on a partner and lumps are not readily available, a breast model containing realistic "tumors" would seem to offer the most appropriate method for providing positive feedback to the client that her technique is appropriate.

BSE is a motor skill and, like most motor skills, must be learned. Hall states, "Extensive research on the acquisition of motor skills regarding accuracy of performance produces the most rapid and efficient increase in proficiency" (1977:367). A logical deduction is that an increase in proficiency will result in an increase in tumor detection skills. Furthermore, Gold (1964) and Hobbs (1971), as cited in Stillman (1977), identified lack of tactile experience in examining

breasts and uncertainty of what to look for in lumpy breast tissue as two of the principal reasons women gave for not examining their breasts regularly.

A literature search for reports of evaluation of the use of silastic models in a BSE education program failed to locate any studies. Because the use of such models would provide an adjunct to the cognitive learning experiences of the trainee and would appear to reduce dissonance and the unconscious levels of fear that inhibit performance of BSE, it would seem appropriate to include them in a BSE education program.

Summary of the Literature Review

Researchers attempting to determine the most successful methods of detecting breast cancer have advocated mass screening clinics which combine the detection methods of physical examination, mammography, and thermography. Although detection success is improving in screening clinics, significant numbers of tumors continue to be found by women in the intervals between clinic appointments.

Because mass screening is not available to most women, and because of the high incidence of interval tumor occurrence, BSE remains a valuable tool in the effort to diagnose breast cancer. Researchers have identified content requirements for BSE education programs that are designed to reduce dissonance and allow women to perform BSE.

Chapter 2 presents the quasi-experimental research program designed to further refine the content of BSE education programs.

Chapter 2

METHODOLOGY

The study was a quasi-experimental research project designed to test the following hypothesis: The use of silastic breast models in a BSE education program will increase the rate of performance of BSE by the participants. To test the hypothesis, a control group participating in a BSE education project was compared to an experimental group receiving the same information, with the additional opportunity of practicing examination skills on a silastic breast model. When determining program objectives, consideration was given to the content format for teaching BSE outlined by Hall (1977) and Hobbs (1977).

Study Design

The quasi-experimental research project was a pretest-post-test control group design. A convenience sample was selected using pre-existing groups. In this instance, the quasi-experimental design differed from a true experimental design in one major way: participant assignment to groups was by convenience, rather than at random. Because participants in the BSE education project already maintained membership in a specific group, no attempt was made to reassign them to control and experimental groups. However, the pre-existing groups were randomly assigned in toto.

The following diagrams the research process:

	Program Presentation			
	Pretest	Control	Experimental	Post-test
Group 1 - N = 38	October 1979		October 1979	March 1980
Group 2 - N = 39	October 1979	October 1979		March 1980

Limitations of the Quasi-experiment

Characteristics of the quasi-experimental design pose threats to internal validity; i.e., because of uncontrollable factors, competing explanations for the obtained results exist (Polit, 1978:168). When a sample is selected by convenience, the differences between groups may influence its performance. When samples are randomly selected and divided, the chances are lessened that differences between the group will confound the results.

History, or events external to the treatment which take place concurrently with the treatment, may influence results (Polit, 1978:169). If samples are randomly selected, we can assume factors affecting one group are likely to equally affect both groups. When, as was the case in this situation, sampling is by convenience, the effect of outside events on either group must be considered.

Maturation, or changes that occur within the individual as a function of time, may also alter study results. The effect of changes in personal life or personal health history might particularly influence response to BSE education. The significance of change in personal-

status variables was calculated between groups. Individual awareness of participation in an experiment might alter performance. A quasi-experimental design that encompasses a pretest may sensitize respondents to issues they might perceive are important to the researcher, and thus alter future performance.

When composition of control and experimental groups is not randomly determined, loss of subjects through attrition might adversely influence results. Data analysis must include a method for determining the effect of loss of subjects on results.

Sample

A convenience sample of 75 women who are members of Beta Sigma Phi, a women's social sorority, was obtained. This group was selected for several reasons: (1) it was thought to be representative of a wide range of income, educational, and social levels, (2) it was composed of ten groups, and these groups were roughly divided by ages (e.g., group one women are approximately 18-22; group two, 22-30; etc.), (3) there were at least two groups in each age bracket which allowed the author to easily divide the sample into control and experimental groups, (4) they met regularly with a program at each meeting which allowed the author easy access for program presentation, and (5) the groups were pre-existing (i.e., they did not come together for the sole purpose of learning BSE) with well-developed support networks.

Two of the ten groups participated in BSE education programs in early 1979; these were eliminated from the study. Because they were groups that would have been paired in the experimental program, elimination was accomplished without difficulty. Two other groups chose not to participate in the program because of internal difficulties present in their groups at the time of the program. Six groups remained, providing the researcher with an N of 75. The groups were matched by age and then assigned to control and experimental programs by lot.

Variables

The hypothesis tested in the study was: The use of silastic breast models in a BSE education program will increase the rate of performance of BSE by the participants. The independent variable was the use of silastic breast models, and the dependent variable was the performance of BSE.

Several classes of extraneous variables were identified:

1. Demographic (organismic) variables
2. Health status variables
3. Family history of breast cancer
4. Close contact with a friend with breast cancer
5. Cognitive knowledge of breast cancer and BSE

6. History of preventive health behavior (e.g., prior BSE instruction, history of breast examinations)

Questions were designed to provide data about extraneous variables. Their influence on the dependent variable was controlled by including them in the design and testing them as independent variables.

Unconscious psychological factors were considered intervening variables in the study. An attempt was made to assess the effect of these factors on BSE by asking respondents to define reasons for non-performance. A more complete determination of the impact of unconscious factors on BSE was beyond the scope of the study.

Operational Definition of Variables

1. Silastic breast models: "... a life-like model of the human female breast, inserted with realistic tumors, variable in size, consistency, and location" (Hall, 1977:366), the Betsi Breast Model, manufactured by the educational division of Ortho-Pharmaceutical Laboratories was utilized.
2. Breast self-examination (BSE): "The examination of both breasts (or one, if one has been removed) by a woman in a systematic manner for the purpose of detecting an abnormality" (Stillman, 1977:123).
3. BSE education program: A coordinated series of events (specifically defined in the content section of this chapter)

designed to demonstrate correct BSE techniques, inform patients about breast cancer, and reduce fear by means of encouraging practice of BSE and supplying correct information.

4. Rate of performance: Frequency of practice of BSE by a woman who has participated in a BSE education program in the five-month interval between October 1979 and March 31, 1980.

Program Objectives

Program objectives included knowledge and performance objectives, both of which incorporated attitudinal components. Because unconscious fear has been determined to be a major deterrent to the practice of BSE, a prime goal of this project was fear reduction. It was the author's contention, supported by the literature, that fear reduction would occur by stressing the positive results of BSE and by demonstrating to the client that she is truly capable of performing BSE satisfactorily by means of her successful detection of lumps in the breast model.

It was determined that, following completion of the BSE education program, the client should be able to:

Knowledge Objectives

1. Identify risk factors for breast cancer and describe what action must be taken to reduce these risks,
2. Articulate fears concerning BSE and discuss these fears with

her peers,

3. Describe action she must take regarding early detection and treatment of breast lumps,
4. Describe the proper method of BSE.

Performance Objectives

1. Replicate the manual breast examination procedure shown in the film and by the group leader,
2. Identify lumps in the silastic breast model.

Program Content

To meet the program objectives, it was decided that both the control and experimental groups would be presented the following information, differing only in the use of the breast models by the experimental groups:

Pretest. The questionnaire (Appendix A) was designed to give the researcher baseline data concerning current BSE practices, knowledge, and demographic information. Because prior knowledge of BSE technique and family history of breast cancer have been identified as variables affecting performance and levels of fear, these items were also included in the questionnaire.

In order to develop a baseline of demographic data, respondents were asked questions about age, income, marital status, and education. Informants were asked to specify their exact age, education, and income;

these variables were later recoded to facilitate data analysis. Because some researchers had identified demographic variables as being confounders of BSE performance, cross-tabulation of BSE rate and demographic variables was planned. Because the sample included only white females, race and sex were not included as variables.

A prior history of breast cancer, breast disease, and a family history of breast cancer increase the risk of breast cancer. Prior consumer education efforts have presented information concerning risk factors of breast cancer. Because of this, the researcher hypothesized that women in high-risk categories would perform BSE more frequently. Therefore, respondents were asked, for example, "Have you ever had (or do you now have) any disease of the breast? If so, what kind of disease?" Questions about family history, contact with close friends with breast cancer, and the presence of breast cancer were phrased in a similar manner.

Questions were designed to ascertain the respondent's prior history of preventive health behavior in relation to breast cancer. Respondents were asked, "Have you ever had your breasts examined by a health professional? If yes, what type of professional performed the examination?", in order to develop a baseline of information concerning contact with health professionals and preventive health behavior. Frequency of examination was also considered an important extraneous variable because it was hypothesized that women having more frequent contact with

their physicians would perform BSE on a more regular basis.

Participants were queried about their prior contact with BSE education. First, they were asked if they had ever heard of BSE, and, second, had they ever been taught BSE; if so, by whom. Researchers have contended that BSE education programs by physicians positively influence the rate of BSE.

Women were asked specifically about their current practice of BSE. For example, they were asked, "Do you practice BSE at the current time? If yes, how often? If no, why not?" Data obtained from these questions were used as controls in determining the significance of the introduction of independent variable into the education process.

Finally, respondents were asked questions designed to measure their cognitive knowledge of BSE and breast cancer. Statements such as "Breast cancer is always fatal" were designed to measure general knowledge about breast cancer and required a true-false response. Information concerning more specific knowledge of BSE was elicited by true-false questions like, "It is abnormal to feel a ridge in the lower part of the breast."

Discussion of the anatomy, physiology, and pathology of the breast.

The discussion centered on normal breast structure. A major area of emphasis was that normal breast tissue has a lumpy, bumpy feeling, and that often such normal structures as ribs may be mistaken for pathology. Another important area of emphasis was that individuals cannot success-

fully detect changes in breast tissue unless they are aware of what their breasts normally feel like. The key to successful detection of lumps is early recognition of change. To do this, the individual must have developed a baseline of information that tells her what is normal for her.

Discussion of risk factors and the need for early detection. Presentation of the types of women at risk for breast cancer opened the avenue for discussion of the participants' feelings and level of knowledge about breast cancer. The presentation allowed the instructor to cope with those issues on which the participants may have been misinformed, thus further reducing the level of fear. Two facts were emphasized time and again throughout the teaching project in an effort to reduce dissonance:

1. Eighty percent of all lumps discovered are benign.
2. The cure rate of cancer of the breast, when discovered before metastases, is 80 percent, compared to 40 percent if not detected early.

Presentation of the film "Breast Self-Examination." The film visually demonstrated the accepted technique for performing BSE. Two major strengths of the film were the use of variously aged and sized women to demonstrate BSE, and the emphasis on the same fear-reducing information presented in other parts of the program.

Demonstration of BSE technique by the instructor. Information presented in the film was further reinforced by the instructor. During this demonstration, the instructor wore a T-shirt marked with the landmarks for BSE--again, to increase the visual information given to the participants. This proved to be a very well-accepted portion of the presentation, acting as a tension-reliever when the instructor took off her blouse to reveal a T-shirt, not the bare breast expected by the group!

Use of silastic model. The experimental group practiced with the "Betsi Breast" model at this point for a validation of knowledge and a self-evaluation of skills. Practice time and supervision of practice were limited by the size of the groups.

Discussion and questions by the participants. During this portion of the program, information was reviewed and clarified. Participants also used this period to discuss cancer treatment and types of cancers friends and relatives had had. Many participants expressed a desire to have another session at a future time for a question and answer session about health and disease.

Post-test. A post-test (Appendix B) was administered to all participants in March 1980. The purpose of the post-test was to obtain data about the respondents' current health status, BSE practice since the BSE education program, and attitude toward cancer.

Women were asked four questions at the time of the post-test. First, since a change in health status of some women might be anticipated, respondents were asked if they had developed breast cancer or breast disease since the program presentation. Second, because contact with family and/or friends with breast cancer was thought to be a confounder, participants were asked if any change in status of family or friends had occurred.

Information about the dependent variable, the rate of performance of BSE, was obtained. Respondents were asked, "Since you participated in the BSE education program, have you been practicing BSE? If yes, how often? If no, why not?" Responses would be cross-tabulated with data obtained at the time of the pre-test.

Finally, respondents were asked to check which of the following statements best expressed their feelings about cancer.

- a. ☐ It is a horrible disease that is always fatal.
- b. ☐ The cure is worse than the disease; I'd rather die than be mutilated.
- c. ☐ It's better not to know what is wrong with you when a symptom occurs.
- d. ☐ Early diagnosis can make a difference.
- e. ☐ Other (please explain)

Data were cross-tabulated with BSE performance to see if any significant pattern emerged.

Because frequencies had already been run for the variables of the pre-test, it was determined that further information concerning demographic variables, knowledge of BSE and breast cancer, and other preventive health behaviors was not required.

Program Presentation

The program was presented at a regularly scheduled group meeting. Total scheduled length was 30-45 minutes. Actual average program length was closer to one hour. This was due to the many questions about BSE and cancer in general asked by the participants.

Prior to administering the test, the author discussed the program purpose, program content, and measures taken to preserve confidentiality. Participants were not told the difference between control and experimental groups.

Pre-test questionnaire administration required about ten minutes. Content of the questionnaire was generally well-received with the exception of one group composed of women in their fifties and sixties. The women in this group questioned the need for data about income and for their names to appear on the questionnaires. They were assured of complete confidentiality, that names were only for the convenience of the researcher, and were told that any questions they found offensive could be deleted. All respondents subsequently included their names, and approximately 8% of the total sample did not respond to income questions.

Film presentation and demonstration of BSE required about 25 minutes. The film, which displayed partial nudity, did not appear to embarrass the participants. One group became very uneasy when they discovered the drapes weren't closed in the room being used for showing the film, even though the home was in a fairly isolated location. Some members of the group were unable to concentrate on the film until the drapes were closed.

Use of the "Betsi Breast" by the experimental group was limited by two factors. The size of the group limited the length of time each woman was able to practice on the model and the amount of time the leader was able to provide individual assistance to students. Additionally, because the program was part of a regularly scheduled meeting, participants were discouraged by time constraints from practicing until they reached the desired proficiency.

The post-test was administered to all groups in March 1980. Presidents of the groups were given the questionnaires, stamped envelopes addressed to the researcher, and instructions for administration of the test. It was hoped that administration of the post-test by a group member would help reduce the influence of the researcher on responses. The post-test required less than five minutes to complete. Five women did not complete the post-test because they had left the area in the period between pre- and post-tests.

Chapter 3

FINDINGS

The independent variable tested in the quasi-experimental research project was the effect of a teaching program using silastic breast models on the rate of BSE. Greenwald (1978:272) examined the effect of variables such as marital status, age, education, etc., on self-examination compliance and tumor discovery and found, "... there was no evidence that any of the variables examined was a confounder." Nevertheless, it was determined that data would be subject to testing to determine if relationships existed between these intervening variables and the rate of BSE.

Data were analyzed through use of a computer program, SPSS, and are displayed in frequency and cross-tabulation tables. Significance was calculated by the use of chi square, which is the standard test of statistical significance used throughout this report. Chi square provides a measure of the probability that the distribution of cell values is not random, as well as a method of overlooking the effect of sample size upon the distribution of values (Siegel, 1956).

Demographic Description of the Sample

Demographic data concerning education, age, income, and marital status were obtained from all respondents. Because the research project dealt with program presentation to pre-existing groups, division of the sample into control (did not use the breast model) and experimental

(used the breast model) groups could not be random and was dependent on the composition of each particular group the night of the program. Cross-tabulations were run to compare demographic compositions of the control and experimental groups.

Respondents were asked to reply to questions about education and age in precise terms (i.e., education: circle highest grade completed). These data were recoded to group the data to allow comparison with other research. Income was recoded to allow comparison of women whose income was at the mean (\$14,999/year) and below with women whose families had higher incomes. As can be seen in Table 1, 80 % of the experimental group and 76% of the control group had incomes higher than the national average. Stillman (1977) also found above-average incomes to be true of her sample, and hypothesized that a higher income may be characteristic of women who join groups.

Table 1

INCOME: "What is Your Yearly Income?"

Income	Experimental	Control
\$14,999 and below	20%	24.2%
\$15,000 and above	80%	75.8%
TOTAL: N = 63	100% (N = 30)	100% (N = 33)
Chi square = 0.1714 d.f. = 1 p = not significant at the 0.05 level		

Researchers have detected increases in the rate of BSE in groups with higher education. Grouping the data into high school graduates and below, and those with education beyond high school, enabled a comparison between groups. Education level of the total sample was also higher than the national average. Only one individual had not completed high school. Again, one may hypothesize that group characteristics mandate members with higher levels of education.

Table 2

EDUCATION: "Designate the Highest Grade Completed"

Education	Experimental	Control
High school and below	38.9%	48.6%
Beyond high school	61.1%	51.4%
TOTAL: N = 73	100% (N = 36)	100% (N = 37)
Corrected chi square = 0.3652 d.f. = 1 p = not significant at the 0.05 level		

An overwhelming majority of the total sample was married. This, too, is a reflection of the nature of the organization. Because Beta Sigma Phi is primarily a social organization, meetings are conducted at night and many couple events are held. Women who are divorced often find financial problems, the necessity of finding babysitters, and the lack

of an escort preclude participation in many activities. Because of these difficulties, a divorced woman may not continue her membership in the group.

Table 3
Marital Status

Marital Status	Experimental	Control
Single	5.3%	8.3%
Divorced	0.0%	5.6%
Married	92.1%	86.1%
Widowed	2.6%	0.0%
TOTAL N = 74	100% (N = 38)	100% (N = 36)

Chi square = 3.39085 d.f. = 3 p = not significant at the 0.05 level

Because women 40 and above have a higher incidence of breast cancer, women were grouped into two groups--39 and below, and 40 and above--to allow comparison. There was no significant difference in the distribution of the sample into control and experimental groups by age.

Table 4

"What is your Age?"

Age	Experimental	Control
39 and below	56.6%	62.2%
40 and above	47.4%	37.8%

TOTAL N = 75 100% (N = 38) 100% (N = 37)

Corrected chi square = 0.3610 d.f. = 1 p = not significant at the 0.05 level

As can be seen in Tables 1-4, the necessity of using a convenience sample appears to not have significantly disrupted the distribution of the sample into control and experimental groups by demographic characteristics. No significant differences in the size of the groups are apparent. A comparison of demographic characteristics and the rate of BSE will be presented later in the chapter.

Health History

A prior history of breast cancer or other breast disease increases the risk of developing breast cancer. Because of this, respondents were questioned about their personal history related to breast disease. One respondent had a history of breast cancer. She had been treated by radical mastectomy in 1973, had remained cancer-free since then, practiced BSE once per month, and was active in Reach to Recovery. Members

of her group were aware of her cancer history, and her conviction that early diagnosis saved her life. Nevertheless, BSE practices in this group were not significantly different from the other groups prior to the education program.

Nine members (12.3% of the 72 women responding to the question) had had breast disease other than cancer at some previous time. A cross-tabulation of breast disease by BSE prior to program presentation (Table 5) indicated that 67.7% of those with breast disease practiced BSE. However, further analysis indicated only 33% of the women practiced BSE on a monthly basis.

Table 5

Comparison of Occurrence of Breast Disease
by Practice of BSE at Time of Pre-test

Have you been diagnosed as having any type of breast disease?	Do you practice BSE?	
	Yes	No
Yes	16.7%	6.7%
No	83.3%	93.3%

TOTAL N = 72 100% (N = 42) 100% (N = 30)

Chi square = 1.5567 d.f. = 1 p = not significant at the 0.05 level

Knowledge of BSE

Ninety-seven percent of the sample stated they were aware of BSE. Several factors might contribute to this awareness. Media publicity about BSE has been extensive. For example, in the year prior to initiation of this project (February 1979), Good Housekeeping, a well-known women's magazine, published a supplement about breast disease and breast cancer. Additionally, the local newspaper frequently prints releases from the American Cancer Society about BSE and breast cancer on the women's page. Extensive media coverage might ensure that well-educated women have, at least, a passing acquaintance with BSE.

Perhaps of greatest influence, however, was the personal BSE instruction given to the women. Eighty-four percent of the respondents indicated they had received BSE instruction. Of this number, 68.2% had received instruction from either a physician alone, or a physician/nurse combination. Nurses accounted for a very small percentage of education efforts (1.3% alone, an additional 12% with physicians). The lack of involvement by nurses in the education effort is consistent with findings by other researchers (Stillman, 1977; Turnbull, 1977). Additionally, lack of RN involvement might reflect the high rate of breast examinations performed by private physicians who, in the community where this study was done, prefer to personally provide health education to their clients, and thus do not delegate the responsibility to staff.

Another interesting finding was that 72% of the women indicated they obtain yearly breast exams, and an additional 16% obtain examinations every two to three years. Two factors might account for this. The community where the respondents reside has a very high doctor-patient ratio (in 1978, there was one physician to every 442 residents) which makes it easier for women to make appointments for preventive health exams; and the participants' relatively high rate of income is consistent with an ability to regularly obtain preventive health care.

Respondents were asked 12 questions (Appendix A) designed to assess their knowledge of BSE and breast cancer. Questions designed to measure general knowledge of breast cancer received the highest correct response rate, averaging 95%. For example, breast cancer is almost always fatal. True or false? Questions designed to test specific knowledge about BSE showed a lower correct response rate (61.5%). For example, it is abnormal to feel a ridge in the lower part of the breast. True or false? In addition, a higher number of women did not respond to the specific questions. There was an average of six non-responses to specific questions regarding BSE compared to an average of 0.67 non-responses to general questions regarding breast cancer.

Results of the cognitive portion of the pre-test indicated that a high level of general knowledge about breast cancer existed. Although assessment of performance technique of BSE was beyond the scope of the study, it might be assumed from the results of the discriminate questions

concerning BSE that manual performance ability was not present at the level indicated by the high rate of BSE education claimed by the participants.

Breast Self-Examination Practice

Respondents who completed the pre-test were asked, "Do you practice breast self-examination at the current time?" As can be seen in Table 6, 56% replied "yes" and 40%, "no". Attempting to further refine the information, participants were asked, "If yes (you currently practice BSE), how often?" Results of this question are more revealing (Table 7). Only 25.3% of the sample indicated they practiced BSE at the recommended rate of once per month. The BSE habits of this population appear similar to BSE habits reported in the literature. The Gallup Survey in 1973 reported that 23% of the women surveyed throughout the United States performed BSE monthly. Foster, et al. (1978:268) reported similar findings in Vermont. However, Greenwald, et al. (1978:273) found that 51% of their sample reported monthly BSE, a significantly higher proportion, perhaps accounted for by the use of an interview, rather than questionnaire, process.

Table 6

"Do you practice BSE at the current time?"
(October 1979)

Practice BSE	Percent
Yes	56%
No	40%
Missing	4%
TOTAL N = 75	100%

Table 7

Frequency of BSE Practice Prior to Education Program

Frequency of Practice	Percent
Monthly	25.3%
Every 3-4 months	9.4%
When I remember	12.0%
Twice a month	1.3%
Missing*	52.0%
TOTAL N = 75	100%

*Missing values include 30 women who stated they did not practice BSE, three non-responses to either question, and six women who stated they practice BSE, but did not define how frequently.

Researchers have hypothesized lack of knowledge about BSE and low rates of BSE education of women by their personal physicians might account for low BSE compliance. However, the population studied here demonstrated (as discussed earlier in the chapter) fairly high knowledge of breast cancer and BSE, and reported a high (68%) rate of BSE education by their private physicians, leading us to hypothesize that those variables had little effect on the rate of practice of BSE.

In an attempt to determine why women don't practice BSE, respondents were asked, "Why don't you practice BSE?" The majority (60%) of women who stated they did not currently perform the procedure stated they forget. Another 6% admitted BSE "makes me nervous." Thirty percent stated lack of knowledge was their reason for BSE failure. The high proportion of respondents stating they don't practice because they forget lends credence to studies advancing unconscious psychological responses as reasons for failure to comply with BSE.

There appeared to be no significant relationship between demographic variables and the rate of practice of BSE. Statistics for this population support Greenwald's (1978) findings which suggest that demographic variables are not confounders of BSE compliance.

Five months after participation in the BSE education program, respondents completed a post-test (Appendix B) designed to measure changes in health status, BSE practice, and to determine their attitude

toward breast cancer. A statistical test relating the post-test rate of BSE with demographic variables continued to support the null hypothesis.

Post-test results indicated an increase in BSE practice. Seventy-nine percent of the population stated, at the time of the post-test, they had practiced BSE in the interval between the pre- and post-tests. McNemar's test for the significance of changes was calculated for the 68 women who responded to the question concerning BSE practice on both pre-test and post-test. Chi square, calculated in the usual manner, is inappropriate for those designs (as in this case). "in which each person is used as his own control, and in which measurement is in the strength of either a nominal or ordinal scale" (Siegel, 1956:63). The results of the test indicate the null hypothesis should be rejected, and the research hypothesis accepted: the increase in the rate of BSE was a result of the education project (Table 8).

Table 8

Comparison of the BSE Practice Before and
After the Education Program

Before the BSE Education Program	After the BSE Education Program	
	No (did not practice)	Yes (did practice)
Yes (did practice)	18.2%	66.7%
No (did not practice)	81.8%	33.3%

TOTAL N = 68 (7 missing
cases)

100% (N = 11)

100% (N = 57)

Chi square (calculated using McNemar's test) = 12.190

d.f. = 1

p = significant at the 0.05 level

Because the research project was designed to test the significance of the use of silastic models in a BSE education program, model use was cross-tabulated by BSE practice reported on the pre-test controlling for post-test reported BSE practice.

Table 9 presents a cross-tabulation of only those 57 women who stated they practiced BSE at some time in the interval between October 1979 and March 1980. (Women who did not practice BSE at either time are not included in the table.)

Table 9

Comparison of Practice of BSE in Control and Experimental Groups in March 1980 Controlling for BSE Practice in October 1979

	Practiced BSE Before and After	Initiated BSE After the Program
With model (experimental)	50.0%	57.9%
Without model (control)	50.0%	42.1%

TOTAL N = 57

100% (N = 38)

100% (N = 19)

Chi square = 0.2823

d.f. = 1

p = not significant at the 0.05 level

It can be seen in the experimental group that 19 women practiced BSE in October 1979 and continued to do so. Eleven women did not practice BSE originally, but did so in the interval between tests. The control group exhibited approximately the same type of behavior: 19 women practicing in both October and March, and eight initiating BSE practice following participation in the program. Statistical testing of the significance of the differences between the control and experimental groups supported the null hypothesis. A significant increase in the number of women practicing could be attributed to the BSE education program, but no relationship between the increase in rate of practice and use of the models could be supported.

Although the total number of women practicing BSE increased significantly, the proportion performing the procedure on a monthly basis remained relatively constant. Of the total sample, 19 women stated they practiced BSE on a monthly basis prior to the program, and 20 replied affirmatively at the time of the post-test.

It was believed the presence of breast disease, a family history of breast cancer, or contact with a close friend with breast cancer might increase the rate of BSE. Comparison of the rate of BSE for women without the presence of any of these variables with women with the presence of the variables revealed no significant difference in the groups (chi square = 0.9707, d.f. = 1). Comparison of groups controlling for the rate of monthly practice of BSE also resulted in support of the null hypothesis (chi square = 0.6092, d.f. = 1, p = not significant at the 0.05 level).

At the time of the post-test, respondents were asked to indicate which of five responses most accurately described their feelings about cancer. Table 10 represents a frequency distribution of the responses. Eighty-one percent of the respondents stated they felt "early diagnosis can make a difference." Yet, the great majority continued to practice BSE spasmodically, at best. It might be assumed that although participants cognitively accept the need for BSE, unconscious factors continue to hinder monthly BSE practice. Of interest were the comments written

by those who selected "other" as their response. Almost all of these women had had contact with friends and relatives who had breast cancer, and wrote lengthy responses describing their very ambivalent feelings about breast cancer treatment. One woman stated, "If BSE means I find a lump and can be treated with chemotherapy and surgery like my sister, I'd just as soon not know anything is wrong!" It might be beneficial for nurses to spend time counseling friends and relatives of cancer patients in order to reduce fear.

Table 10

How do you feel about cancer?

How do you feel about cancer?	Percent
1. It is a horrible disease that is always fatal.	1.3%
2. The cure is worse than the disease; I'd rather die than be mutilated.	2.7%
3. It is better not to know what is wrong with you when a symptom occurs.	0.0%
4. Early diagnosis can make a difference.	81.3%
5. Other	8.0%
6. Missing	6.7%
TOTAL N = 75	100%

Summary of the Data Analysis

Analysis of data failed to support the research hypothesis which stated the use of silastic breast models in a BSE education program would increase the rate of BSE practiced. Participation in the education program significantly increased the total number of women practicing BSE. However, the number of women practicing BSE on a monthly basis remained relatively constant. Neither demographic nor health-related variables appeared to influence the BSE practice behavior of the groups. Women who did not practice the procedure at all, and many women who only practiced irregularly, cited "I forget" as the reason for practice failure. While it was beyond the scope of the research project to determine unconscious psychological factors as determinants of behavior, it can be hypothesized (based on prior research) these factors might be responsible for a large measure of performance failure.

Chapter 4

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Cancer of the breast has been identified as a major cause of death in women. Although BSE has been shown to enhance the breast cancer detection efforts of screening clinics and private physicians, few women practice it on the recommended monthly basis. The research project discussed here was designed to test the efficacy of those variables identified in prior research to positively effect the accomplishment of the health behavior of BSE.

The Health Belief Model, designed by Rosenstock and discussed in Chapter 1, defines variables thought to affect an individual's ability to perform a designated health behavior. Rosenstock grouped the variables into two main classes--the state of readiness to take action and the extent to which a course of action is believed beneficial in reducing the threat. Additionally, Rosenstock hypothesized that underlying emotions have more influence on health behavior than cognitive elements. The Health Belief Model has been validated, in part, by other researchers. Specific support for his hypothesis that unconscious psychological factors influence health behavior has been presented by researchers investigating motivational factors for BSE and treatment delay.

The Cancer Intervention model assumes all individuals exist in one of the three care modes (total self-care, assisted self-care, or institutional care) at any one point in time, moving from one mode to another as warranted by a change in health status. Because of the complexity of cancer care, an individual might be required to move from the local community to a regional cancer care center for care. The Cancer Intervention model views the nurse's role as being one of assessment, facilitation of communication/feedback, emotional support, and direct care. Education about BSE and breast cancer is viewed as being within the province of the nurse who is mandated to extend her role to the total self-care mode in order to assist her client to maintain a high level of wellness.

In order to educate an individual in self-care techniques and to positively reinforce the health behavior of BSE, a BSE education program was designed and executed. Following a review of the literature, fear-reducing components (such as emphasizing 80% of all breast lumps are benign) were incorporated into the education program. Because researchers (notably Hall and Stillman) had hypothesized an increase in tactile education and immediate reinforcement of lump detection ability would increase women's confidence in their detection abilities and thus decrease their fear level, it was decided to test the hypothesis: the use of silastic breast models will increase the rate of BSE compliance.

Limitations of the Study

Several factors limited the study: participant selection could not be random, BSE compliance was self-reported, a relatively short period (five months) existed between initiation and termination of the program, the type of breast model used, and the characteristics of the group. Because the membership of a previously existing organization was used for the study, participants could not be randomly divided into control and experimental groups. Selection of a convenience sample jeopardized the equality of the groups. Although demographic data indicated no significant difference between control and experimental groups, it was impossible to assess the effect of established intra-group relationships on the study.

A participant's rate of BSE practice must be self-reported. A reliable self-reporting method of BSE practice has not yet been designed. Poor memory and the desire to please may influence reporting. Specifically, personal acquaintance with the researcher and the knowledge that they were participating in a research project might have prompted an inflated report of compliance in this research project.

Because the organization (Beta Sigma Phi) did not meet in the summer, it was impossible to initiate the program prior to October of 1979. In order to complete the thesis, interval data concerning BSE practice was required by March 31, 1980; thus, only five months elapsed between initiation and termination of the project. Compliance rates

might have been inflated immediately following the program. A more accurate assessment of BSE performance would have been provided by allowing at least a year to elapse following the education project.

The "Betsi Breast" model used in the program does not feel like real breast tissue; the skin is too "plastic" and the "tissue" does not give with the same resiliency as other models. Lumps in the model feel too much like normal anatomical structures, and thus do not adequately validate the accuracy of breast examination technique. Other models (e.g., the silicone breast forms manufactured by Spenco Corporation of Waco, Texas) have been designed to provide better tactile stimulation. Unfortunately, these more realistic models were not available to the researcher. The lack of a realistic model and the practice-time constraints created by a group presentation might have adversely affected the outcome of the research project.

As discussed in Chapter 3, the total sample was better educated and had significantly higher incomes than the average. These factors, coupled with the pre-existing high rate of physician contact, significantly limit generalizability of these results to the whole population. Because we were dealing with well-established groups, we were also dealing with individuals who had established relationships and support networks within the group. It is possible that support given by group members to one another may act as a fear-reducing mechanism. It was beyond the scope of the study to measure this effect.

Conclusions

As discussed in the literature review and methods sections, an attempt was made to present a program that would assist participants in overcoming their fear of cancer to the extent that they would practice monthly BSE. As a result of the study, several conclusions have been reached.

Previous research findings which described a relationship between BSE non-compliance and unconscious psychological fears were indirectly supported. Data analysis indicated 87.1% of the sample chose the response "Early detection makes a difference" when asked to identify the statement most nearly describing their feelings about breast cancer. Furthermore, questions designed to test knowledge revealed 65.3% knew prior to participating in the program that BSE is a successful method of tumor detection, yet only 31% of the women practiced monthly BSE at the termination of the program.

Women who did not practice BSE at all or only on an irregular basis most often listed "I forget" as the reason for non-compliance. "Forgetting," however, does not necessarily mean that the teaching project was totally unsuccessful in reducing fear, be it conscious or unconscious. The substantial increase in the number of women who performed BSE at least once following the program suggests that at least a moderate level of fear reduction may have occurred. It might be

suggested that fear was reduced enough to allow a measure of compliance, but not enough to allow monthly practice.

There was no significant difference between the control and experimental groups. The null hypothesis, that the use of silastic models will not increase the rate of BSE performance, was supported. It is difficult to conclude, however, that the use of such models is not a valuable teaching tool. The study should be replicated using a more life-like model.

Rosenstock identified certain demographic variables as being determinants affecting the perception of disease and preventive actions. The demographic variables tested here (income, age, marital status, education) had no significant impact on the rate of BSE and, thus, did not support the Health Belief Model.

Past experience and the past use of preventive actions were also identified as determinants of health behavior. As previously discussed, the sample reported a high yearly breast exam compliance rate, yet there appeared to be no association between physical exams and BSE performance. It might be hypothesized a woman receiving a breast exam by her physician reduces her level of fear by delegating the decision-making process to him; she visits once a year, he confirms everything is fine, and she can put it out of her mind the rest of the year. Past experience with breast cancer victims, either family or close friends,

also appeared to not significantly affect the rate of BSE performance. There appeared to be no significant BSE compliance differences between women who had had close contact with breast cancer and those who had not.

Although other researchers have reported education by physicians increasing compliance, the findings in this study did not support such a relationship. A high rate of respondents reported having received BSE education by their physicians, yet they did not practice BSE. It would seem appropriate to observe BSE education given by physicians to determine the content of their education efforts prior to reaching conclusions about their failure to increase compliance. It was impossible to assess the completeness of physician education programs from the questionnaire.

Data analysis indicated a coordinated BSE education program will increase the rate of BSE performance. Although the rate of monthly performance of BSE did not change appreciably, the total number of women reporting partial compliance did increase significantly. Other fear-reducing techniques and education methods should be explored in an attempt to further increase BSE compliance.

The increase in the total rate of BSE supports the appropriateness of nurses intervening in the realm of self-care. Nurses, however, cannot limit their efforts to formal education programs. A well-rounded cancer education program must create a network of health-care

providers to follow clients and provide medical intervention when required. Information about cancer beyond the scope of the BSE program was desired by participants. They expressed interest in cancer physiology, treatment, and prevention as well as detection. Addressing the identified need for further cancer information would be an appropriate function of the nurse and might decrease fear and allow women to practice detection and prevention methods.

In summary, formal education programs designed to reduce fear and teach breast self-examination techniques increase compliance. While use of the silastic breast model did not affect BSE practice significantly in this study, it is a valuable teaching tool and further research which defines the most appropriate model to use and the environment in which to use it should be undertaken. Although the results of the research project did not specifically support Rosenstock's Health Belief Model, the data did lend support to his hypothesis concerning unconscious psychological factors as motivators of BSE. An increase in BSE rate of performance and the expressed desire for further knowledge about cancer lend credence to the Cancer Intervention model and the intervention by the nurse in the total self-care mode.

Recommendations for Further Study

Several recommendations for further research were defined as a result of the study:

1. The study should be replicated using a more realistic model, and presenting the program content on an individual, rather than a group, basis.
2. Because of the low rate of BSE compliance by patients obtaining regular physicals, an assessment of BSE teaching techniques of physicians should be initiated. If appropriate, a research project using identified teaching skills should be conducted in physician offices.
3. Programs providing general cancer information should be made available to groups.
4. The BSE education program should be presented to a group at one-year intervals to see if re-emphasis of the information reduces fear and allows those who are practicing BSE on an irregular basis to move to monthly performance.

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APPENDICES

APPENDIX A

PRE-PROGRAM QUESTIONNAIRE ON BREAST SELF-EXAMINATION

The following questionnaire is designed to help me learn about your knowledge about, and experience with, the self-care skill of breast self-examination. The time you take to complete this questionnaire will enable us to design more effective programs to assist you and other women to maintain their state of health at the highest possible level.

1. Name _____
2. Address _____
3. Age _____
4. Marital Status:

single divorced married widowed
5. Education: Circle highest grade completed:

8 9 10 11 12 13 14 15 16 17 and above
6. Income

() \$0 to \$4,999
 () \$5,000 to \$9,999
 () \$10,000 to \$14,999
 () \$15,000 to \$19,999
 () \$20,000 to \$24,999
 () \$25,000 to \$29,999
 () \$30,000 and above
7. Have you ever had cancer of the breast?

Yes _____ No _____

7. a. If yes, when? _____
8. Have you ever had (or do you now have) any other diseases of the breast? Yes _____ No _____

8. a. If yes, what kind of disease? _____

9. Is there a history of breast cancer in your immediate family (that is, mother, aunt, sister, daughter, or grandmother)?
Yes _____ No _____
10. Is there a history of breast cancer in your husband's family?
Yes _____ No _____
11. Do you have now, or have you had, a close friend who had breast cancer? Yes _____ No _____
12. Had you ever heard of breast self-examination before tonight?
Yes _____ No _____
13. Have you ever had your breasts examined by a health professional (e.g., MD, nurse, etc.)? Yes _____ No _____
13. a. If yes, what type of professional performed the examination? _____
13. b. How often have you had your breasts examined?
() Once
() Yearly
() Every 2-3 years
() Every 5 years
13. c. If you have never been examined, why not? _____
14. Have you ever received instruction in breast self-examination technique? Yes _____ No _____
14. a. If yes, from whom?
() Physician
() Nurse
() Volunteer health worker
() Friend
() Relative
() Pamphlets or other literature
() Other

14. b. How long ago? _____
15. How often should breast self-examination be done?
- | | |
|--|---|
| ☐ Every 2 weeks | ☐ Every week |
| ☐ Once a month | ☐ Every 3 months |
16. Do you practice breast self-examination at the current time?
- Yes _____ No _____
16. a. If yes, how often? _____
16. b. If no, why not?
- | |
|--|
| ☐ Forget |
| ☐ Makes me nervous |
| ☐ Am afraid I'll find "something" |
| ☐ Takes too much time |
| ☐ It isn't important |
| ☐ Lack of knowledge--don't know how |
| ☐ Other _____ |
17. How confident do you feel about your ability to do breast self-examination?
- | |
|---|
| ☐ Very confident |
| ☐ Confident |
| ☐ Not at all confident |
18. Do you know what a breast lump would feel like?
- Yes _____ No _____
19. Have you ever practiced breast self-examination on a regular basis?
- Yes _____ No _____

This page will assist you in knowing what points to look for in tonight's presentation. Additionally, it will enable me to determine which areas should be emphasized in future programs.

Please circle the correct answer.

1. Almost all breast changes are cancerous. True False
2. It is abnormal to feel a ridge in the lower part of the breast. True False
3. Breast cancer is almost always fatal. True False
4. Heredity and/or other factors may influence the likelihood of any woman's developing breast cancer. True False
5. Why should you look at yourself in the mirror as part of the BSE process?
 - a. To be sure you're doing it properly
 - b. Some abnormalities can be seen
 - c. To check your muscular development
6. A breast biopsy is the removal of a breast. True False
7. The results of almost all biopsies indicate cancer. True False
8. A woman whose doctor examines her breasts every year does not need to do BSE. True False
9. What part of the breast is most frequently the site of cancer?
 - a.
 - b.
 - c.
10. What is palpation?
 - a. Rapid heart beat
 - b. Touching
 - c. Butterflies in your stomach

11. The cure rate for breast cancer detected in its earliest stage is no different than breast cancer found in a more advanced stage.

True False

12. In 95% of all breast cancer cases, the woman discovers her own lesion.

True False

APPENDIX B.

Name _____

Breast Self-Examination - Follow-up Questionnaire

This questionnaire is designed to provide me with more information about the BSE education program that was presented to you last year. I have requested that you include your name for information purposes only, so that I can obtain an accurate assessment of the number of participants. Although it is vital that I have your name, no use will be made of it beyond my initial record-keeping. Please answer each question as accurately and completely as possible. Thank you. Jackie Stankey

1. Since you participated in the BSE education program, have you been diagnosed as having any type of breast disease? ____ Yes ____ No

1. a. If yes, what type?

- a. ____ Cancer
- b. ____ Benign tumor (non-cancerous lump)
- c. ____ Cystic disease
- d. ____ Mastitis
- e. ____ Other (please explain) _____

2. Since you participated in the BSE program, has anyone close to you been diagnosed as having cancer of the breast? ____ Yes ____ No

2. a. If yes, was it:

- a. ____ Your mother
- b. ____ Your sister
- c. ____ One of your other relatives
- d. ____ Relative of your husband
- e. ____ Close friend

3. Since you participated in the BSE education program, have you been practicing BSE? ____ Yes ____ No

3. a. If yes, how often?

- a. ____ Monthly

- b. ☐ 2 or 3 times
- c. ☐ When I remember
- d. ☐ Once since I was instructed

3. b. If no, why not?

- a. ☐ Afraid
- b. ☐ Forget
- c. ☐ Don't know how
- d. ☐ Don't believe it is important
- e. ☐ Other (please explain) _____

4. How do you feel about cancer? Please check the choice that most nearly describes your feelings. Feel free to write on the back, if you desire.

- a. ☐ It is a horrible disease that is always fatal.
- b. ☐ The cure is worse than the disease; I'd rather die than be mutilated.
- c. ☐ It's better not to know what is wrong with you when a symptom occurs.
- d. ☐ Early diagnosis can make a difference.
- e. ☐ Other (please explain) _____



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