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I am submitting herewith a thesis written by Margaret Ann Sawin Pierce entitled "The Influences of Educational Method, Health Beliefs and Health Behaviors on Compliance with Breast Self-Examination." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science in Nursing.

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THE INFLUENCES OF EDUCATIONAL METHOD, HEALTH BELIEFS AND HEALTH BEHAVIORS ON COMPLIANCE WITH BREAST SELF-EXAMINATION

A Thesis

Presented for the

Master of Science in Nursing

Degree

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ABSTRACT

This study investigated the relationship between health beliefs, health behaviors and conditions of learning breast self-examination (BSE) of 44 young adult college women and their compliance with BSE. Women included in the study were all students at a large southeastern university. Their age range was from 18 to 26 years.

Health beliefs, health behaviors, beliefs about breast cancer and BSE, and BSE compliance were measured by self-report surveys. Subjects were divided into three groups and were taught BSE using one of three teaching methods. All subjects heard a 15-20 minute lecture and viewed a film on BSE. Group B practiced BSE on a life-like model and group C recieved one-to-one teaching in a private setting using themselves as the model. Subjects were queried three months later concerning their BSE compliance and beliefs about breast cancer and BSE. Health beliefs, health behaviors, and breast cancer beliefs were correlated with BSE compliance.

Subjects who practiced BSE in small groups using the life-like models practiced BSE most appropriately. One-to-one teaching did not result in optimal compliance. Subjects who expressed the highest concern about their health were more likely to perform BSE appropriately. Nutritional health behaviors correlated with performance of BSE according to the recommended schedule but not with adequacy of the exam.

In order to maximize compliance with BSE nurses and other health professionals must identify more precisely the factors motivating or

deterring women from performing BSE. Strategies to overcome these barriers may then be developed.

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CHAPTER I

INTRODUCTION

Breast cancer is the leading cause of death by cancer among American women. Some 90,000 new cases are diagnosed annually. At current rates 1 of every 11 women alive today will develop breast cancer during her lifetime (ACS, 1981). If diagnosed prior to any lymph node involvement 85% to 90% of these women can be cured. If lymph nodes are involved the chance of cure drops to less than 50% (ACS, 1981). Early detection, therefore, is extremely important. Most early detection is accomplished by the women themselves. It has been estimated that 80% of the women who have breast cancer find the lump themselves, and that 60% of these women discover the lump "by accident" rather than by performing routine breast self-examination (ACS, Bullough, 1980).

Researchers and clinicians agree that breast self-examination (hereafter referred to as BSE) is a useful and important tool in the early detection by breast cancer. Researchers have estimated that breast mortality might be reduced by 18 to 24% if all adult women practiced regular monthly BSE (Greenwald, Nasca, Lawrence, Horton, McGarrah, Gabrielle & Carlton, 1978). Evidence based on the American Cancer Society Breast Cancer Detection Demonstration Projects showed that mammography combined with physical examination detected most breast cancers (Strax, 1977). While mammography can detect non-palpable tumors, it is not a practical mass screening tool due to cost and possible risks

of cumulative radiation exposure. Therefore, BSE remains the most effective tool for the early detection of breast cancer.

The American Cancer Society currently recommends that all women over the age of 20 should perform monthly BSE (ACS, 1980a). This procedure involves inspection and palpation of all breast tissue while in the upright and supine positions. BSE should be performed one to seven days following menses. This procedure should take approximately five minutes (ACS, 1975).

A 1974 Gallup Organization study revealed that only 23% of women claimed to perform monthly BSE. Adequacy of examination was not evaluated (Gallup, 1974). A survey sponsored by the American Cancer Society in 1978 revealed that 67% of women claimed to have performed BSE during the previous year. However only 27% reported having done BSE 12 times and another 5% 10 to 11 times. This study also examined time spent on BSE and steps included in the procedure. The data revealed that about one half of the women reported spending two minutes or less on BSE, and of five identified steps in the procedure the average number performed by the women was 2.3. Approximately three fourths of the women surveyed expressed a desire for more information on BSE in the form of demonstration (American Cancer Society, 1980b). Other studies have confirmed that women do not feel comfortable with their knowledge of and competence with BSE (Turnbull, 1978; Strax, 1977; Harlen, 1977).

It would appear that more effective teaching is necessary in order to maximize BSE compliance among women. Women are asking for more than

a pamphlet or a chance to view a film on BSE. At issue still, however, is how much more intervention is needed. Is discussion and opportunity to practice on a life-like model enough or do women need the opportunity to be taught BSE using their own hands on their own breasts? Are there other factors which influence whether or not a woman will adopt BSE as a regular health habit? These questions formed the basis for this study that looked at the influences of educational method, health beliefs, and health behaviors on compliance with breast self-examination.

Statement of the Problem

This study investigated the question "What is the relationship between the health beliefs, health behaviors and conditions of learning breast self-examination of young adult college women and their compliance with breast self-examination?"

Theoretical Framework

Health beliefs can be defined as a set of perceptions one has about one's present and future health status. The Health Belief Model proposed by Rosenstock asserts that individuals take action to prevent illness or detect it early based on the individual's perceptions of: (1) his or her susceptibility to the disease or condition: (2) the degree of severity or the consequences of the condition; (3) the extent to which a particular action is beneficial in reducing the threat; and (4) physical, psychological, financial or other barriers to initiating or maintaining the proposed action (Rosenstock, 1966).

Adapting the model to breast cancer the variables became the women's perceptions of (1) her susceptibility to breast cancer; (2) the severity of breast cancer; (3) the perceived benefits of breast self-examination (BSE); and (4) barriers to performance of breast self-exam (Figure 1). One's perceptions of severity of and susceptibility to breast cancer are equal to the perceived threat of the disease, minus perceived benefits of BSE in reducing the threat of the disease. Perceived benefits of BSE in reducing the threat of breast cancer minus the barriers to the recommended behavior should maximize the likelihood of a woman adopting BSE as a health action. External cues such as TV and radio campaigns, newspaper articles, occurrence of breast cancer in a family member or friend, or teaching by a health care professional may serve as cues which influence one's perceived threat and influence likelihood of action. Internal cues such as body state, personality factors, demographic and psychosocial variables also influence the likelihood of action by influencing perceptions of the major variables discussed above.

The Health Belief Model has been tested in a variety of preventive and early detection health behaviors including seeking dental checkups, pap smears, x-rays, and compliance with recommended therapeutice regimens for such conditions as obesity, hypertension, rheumatic fever, and otitis media to name a few (Becker, Haefner, Stanislav, Kirscht, Marman, Rosenstock, 1977). In general these studies have revealed that perception of susceptibility and perception of benefits are the most important predictors of health action. Trotta (1980) and Still-

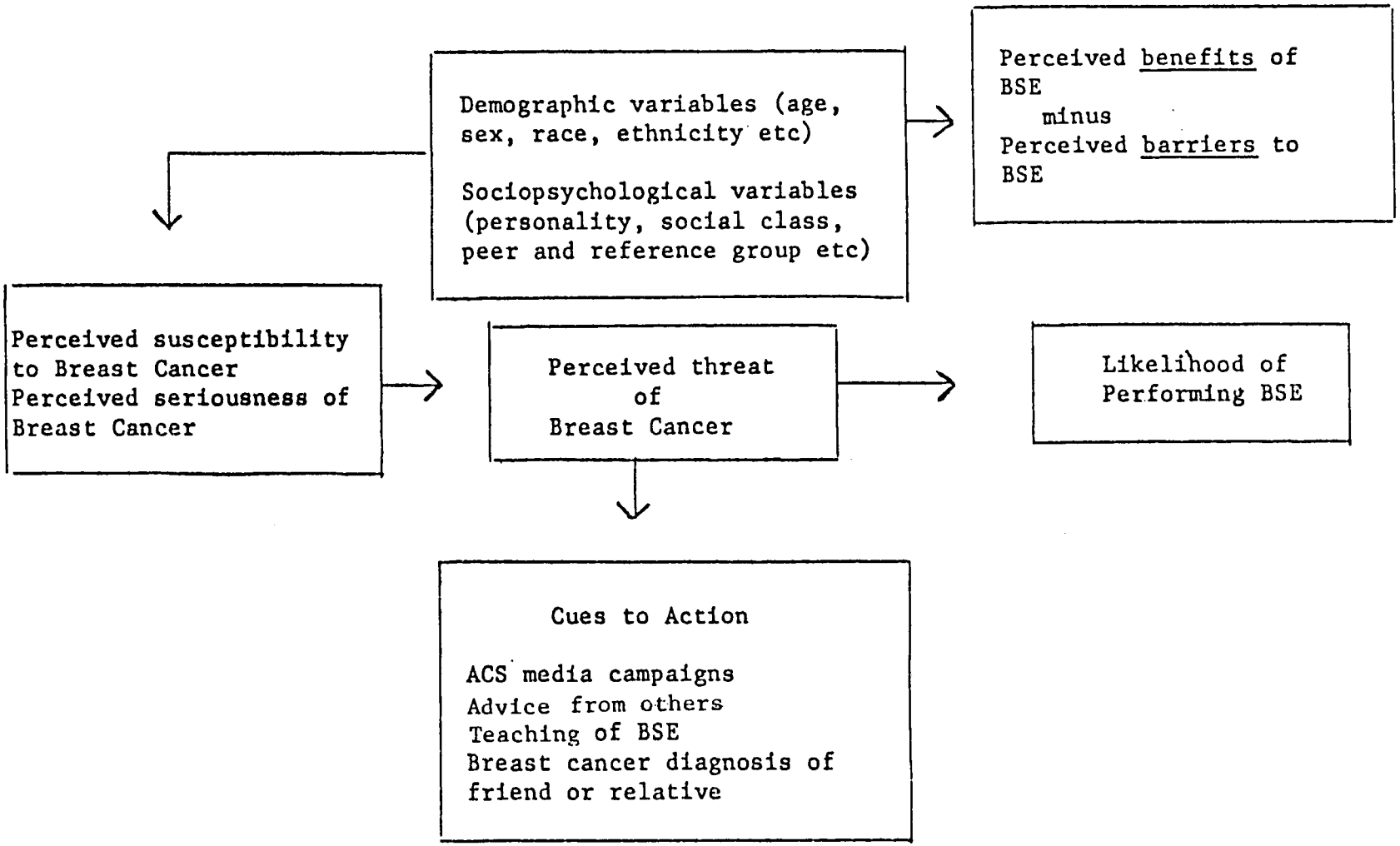


Figure 1. Adapted from Beckner et al "Patient Perceptions and Compliance: Recent Studies of the Health Belief Model" in Haynes et al (eds) Compliance In Health Care, 1979.

man (1977) looked at the Health Belief Model as it relates to BSE behavior. Trotta found that perception of susceptibility had no correlation with BSE behavior and perception of seriousness had a negative correlation with the behavior. Perceived benefits of BSE, however, correlated highly with performance and a high barrier score was negatively correlated with BSE. Stillman found that beliefs about benefits of BSE and susceptibility to breast cancer were high (87% and 97%) yet less than half of her sample did monthly BSE and 20 percent had high beliefs yet did not do BSE at all. No studies were found that examined the relationship between health beliefs and BSE behavior after the subjects were taught BSE. In this study the Health Belief Model was tested among subjects who were taught BSE during participation in the study.

Hypothesis Statement

Hypothesis I. Young adult college women who experience modeling and guiding practice in BSE will report higher frequency of BSE than women who experience lecture, discussion, film, and modeling only.

Hypothesis II. Health beliefs correlate positively with BSE compliance.

Hypothesis III. Young adult college women who report a high incidence of other preventive and early detection health behaviors will report a higher frequency of BSE than women who report few health behaviors.

Definition of Terms

Young adult women. A young adult college woman is defined as a female between the ages of 18 and 26 years who is enrolled as an undergraduate or graduate student at the University of Tennessee, at Knoxville.

Health beliefs. Health beliefs are defined as a set of perceptions one has about one's health outlook, health worry/concern, resistance-susceptibility and health locus of control. Health outlook is defined by responses to four questions about perceptions of how much one worries about one's health. Resistance-susceptibility is defined by responses to four questions concerning how apt one is to become ill (Ware, 1978). Health locus of control is operationally defined as responses to five questions concerning one's beliefs about the degree of control one has over her health status (Wallston, Wallston, Kaplan & Maides, 1978).

Health behaviors. Health behaviors are defined as any activities undertaken by a person believing herself to be healthy for the purpose of preventing disease or disability or detecting disease at an asymptomatic stage (Kasl & Cobb, 1967). A composite score ranging from 0 to 100 was obtained based on responses to questions concerning health behaviors in seven categories: dental health, seat belt use, exercise, nutrition, smoking, automobile safety and pedestrian safety.

Breast cancer beliefs. Breast cancer beliefs are defined as responses to 13 questions concerning one's beliefs about the seriousness of breast cancer, one's susceptibility to breast cancer, benefits of BSE and confidence in ability to do BSE. A composite score was totalled for each subject.

BSE behavior: frequency. Frequency of BSE behavior is defined as a score of 0 to 1 based on responses to two questions concerning frequency of BSE and number of times menses occurred within a given time frame. Those whose number of menses equaled frequency of BSE received a score of 1. Those with unequal frequency received a score of 0.

BSE behavior: completeness. Completeness of BSE behavior is defined as a score ranging from 7 to 28 representing responses to seven questions concerning the steps involved in performing BSE.

Educational method: lecture/film. The lecture and film educational method is defined as an instructional method used for the control group in which subjects were taught BSE by a lecturette and film review.

Educational method: modeling. The modeling educational method is defined as an instructional method in which subjects practiced BSE on a life-like plastic adult female chest model, Betsi Breast.

Educational method: guided practice. The guided practice educational method is defined as an instructional method in which subjects were taught BSE by practicing using themselves as the model in a one-to-one private setting with a registered nurse supervising the practice session.

CHAPTER II

REVIEW OF THE LITERATURE

Numerous studies have verified the assertion that early detection of breast cancer reduces mortality (Shapiro, Stax, Venet & Venet, 1973; Foster, Lang, Costanza, Worden, Haines & Yates, 1978) and organizations such as the American Cancer Society have spent huge amounts of money in an effort to educate and encourage adult women to do regular monthly breast self-examination. Yet recent studies continue to report that the majority of women are not performing regular monthly BSE. In 1974 a Gallup poll reported that only 18% of over 1000 women interviewed performed BSE monthly. A 1977 study by Stillman reported 48% did monthly BSE. A study conducted for the American Cancer Society in 1978 revealed that 67% of women reported that they had done BSE in the last year. However only a minority of women did it on a regular basis (ACS, 1980).

Most researchers and clinicians agree that BSE is a useful and important tool in the early detection of breast cancer. Yet it is not performed by the majority of adult American women. Some frequently cited reasons for non-performance are the woman's lack of knowledge about how to do BSE, lack of self-confidence in her ability to perform it and fear of possible findings. One author states "the problems of acceptability, compliance, and relative inefficiency make it unlikely that this method will make a major contribution to reduction in mortality from breast cancer" (Miller, 1978, p. 358).

It is perhaps helpful to look at the reasons for failure of BSE

in greater depth. Why do adult women have such limited knowledge of the technique of BSE? One author noted that many family practice physicians do not include breast examination as part of their physical examination on the assumption that it is in the realm of the gynecologist. Thus many women may never have their breasts examined by a health professional. Supporting this statement, in one nursing study of 160 graduate students (nursing and other majors) only 58 had had BSE demonstrated to them by a health professional and only 46 had had a breast exam performed in both the lying and sitting positions (Turnbull, 1978). Programs designed to teach BSE frequently use films and/or pamphlets as the sole teaching aides with no opportunity for women to practice on themselves or on a model.

The 1974 Gallup Poll surveyed women's attitudes toward breast cancer. Over 1000 women were interviewed. Cancer was named as the most serious medical problem facing women by 43%; 13% specifically named breast cancer. An astounding 77% knew at least one person with breast cancer and 41% knew three or more. Over half of the women exaggerated the incidence of breast cancer believing it to be twice as prevalent as it is. Thirty-eight percent stated that 50% of breast lumps are malignant. In reality approximately 10% are malignant. Only 18% performed BSE monthly and 46% said BSE made them worry unnecessarily.

A nursing study by Stillman (1977) looked at BSE behaviors and attitudes among 122 suburban women. Ninety-seven percent believed

BSE had distinct benefits and 87% felt that they were "highly susceptible" to breast cancer. Yet only 48% did monthly BSE and 20% who believed in the benefits and who felt themselves highly susceptible did not do BSE. Factors such as religious upbringing and embarrassment were noted as variables affecting this behavior. Although fear was not cited as a behavior modifier in this study it is certainly plausible that fear may have been another factor.

A study of those who participate in voluntary screening programs reported that persons with a college education who had a family doctor, who had been to a clinic within the past year, who perceived themselves to be healthy, who were concerned about having breast cancer, who were professional, who were under the age of 60, who were Jewish, and who lived fairly close to a health facility were most likely to participate in this kind of program (Fink, Shapiro, & Lewison, 1972). No study has demonstrated that these are the common variables among women who do BSE.

Lack of self-confidence in performing the procedure is the third most commonly reported factor negatively affecting BSE performance. One study reported interviewing 2,358 women six months after they had viewed a film on BSE. Only one fourth reported regular performance of BSE. In another study 129 women were interviewed 18 months after they had been given one-to-one instruction in BSE. Sixty-two percent reported performing BSE at monthly intervals (Strax, 1977). A program on BSE for high school and college-age women was initiated

and included a film, discussion and practice on the "Betsi" breast model. Forty-five percent of the high school and 55% of the college women wanted more information on how to assess their breasts (Harlen, 1977).

It appears that one-to-one teaching may be necessary to gain BSE compliance. There is a need for medical and nursing professionals to realize that pamphlets or movies are not enough. Strax states the basis of national reduction in the mortality from breast cancer must be BSE. Most women can be saved if (physicians) teach BSE and thoroughly examine breasts yearly, (1977).

Most teaching programs developed have been oriented toward the woman who is statistically at "high risk" for developing breast cancer. Risk factors vary according to different references but generally include the following:

High Risk

nulliparous or first pregnancy after age 25

decreased immunologic competence

previous irradiation to the chest

age over 40

history of endometrial cancer

history of a previous breast cancer

precancerous mastopathy

family history of breast cancer

caucasian race

Less High Risk

exogenous estrogen use

high dietary fat intake

stress

late menopause (Soini & Makama, 1978)

It should be noted however that 20% of breast cancers are diagnosed in women who would have been identified as "low risk" (Harlen, 1977).

Some would say that a yearly physical exam would pick up most early breast cancers. However, 10% of breast cancers develop within less than one year of having a negative physical exam (Strax, 1977). Mammography has been hailed as a most effective diagnostic tool. Evidence shows that mammography combined with physical exam will detect most breast cancers while either alone results in statistically significant numbers of false negative and false positive results. Newer mammographic equipment delivers minimal radiation (less than 0.1 rad) to the breast making it a safe diagnostic tool. However, it is not recommended for mass screening of low risk women. Currently mammography is recommended in the following instances: all women over age 50 who have symptoms and associated high-risk factors, with large breasts if over age 35, or any woman who desires it for her piece of mind (Strax, 1977).

Health Behaviors and BSE

While several factors have been identified that negatively influ-

ence whether or not one performs BSE few motivating factors have been identified. Several studies, however, have examined a variety of preventive health behaviors. One study looked at 13 preventive health behaviors in 3 sample groups and found that less than 30% of the possible correlation co-efficients were positive and significant (Williams & Wechsler, 1972). Langlie (1979) examined correlations among 11 health behaviors and found significant correlations between scores for driving behavior, pedestrian behavior, and personal hygiene ranging from 0.33 to 0.44. She also found that there were stronger relationships between health behaviors among subjects who were consistent in their health behaviors. She did not identify BSE as a specific health behavior in this study.

Kelly (1979) found that women who examined their breasts were aware of the benefits of early detection of breast cancer and saw themselves as susceptible to breast cancer. Of 99 women who reported performing BSE, 23% began doing BSE after noting some breast irregularity and 15% stated that the occurrence of cancer in a friend or relative influenced their self-examination behavior. Of the 54 non-examiners, 42% believed that they were not at risk for developing breast cancer.

Health Beliefs and BSE

Wallston (1978) and Ware (1978) have both examined peoples' beliefs about their health status and their ability to resist disease. Wallston et.al. developed the "Health Locus of Control Scale" to "pro-

vide specific information about the relationship between an individual's health behaviors and that person's belief about the locus of health control (p.154)." Test-retest correlations reported for this instrument ranged from 0.40 to 0.72.

Ware examined six variables to ascertain health perceptions. He included current health, prior health, health worry/concern, resistance-susceptibility and rejection of the sick role. Reliability of these subscales ranged from 0.45 to 0.92. This scale has been utilized in a health insurance study looking at health beliefs and health status but has not been reported in any studies concerning BSE behavior.

Significance of This Study

In this study the health perceptions and health locus of control were correlated with BSE behavior among young adult college women. These beliefs were also correlated with health behaviors in areas of dental, seat belt use, exercise, nutrition, smoking, automobile safety, and pedestrian safety. Beliefs concerning breast cancer and benefits of BSE were also correlated with BSE behavior among three groups of women who were taught BSE using three distinct teaching methods. No reported studies have examined the interrelationships of these variables.

CHAPTER III

METHODOLOGY

Sample Selection

The convenience sample was comprised of students residing in one of five residence halls or belonging to a women's sorority at the University of Tennessee, Knoxville. Prior to initiation of the teaching program the researcher determined the teaching method to be used in each facility based on availability of a private area for the one-to-one teaching. A total of 53 subjects attended a teaching session and completed the follow-up questionnaire from among 60 subjects who attended the original teaching sessions. Subjects who were over age 26, pregnant, or reported performing BSE monthly were eliminated from the study leaving a final sample of 44 women.

Letters inviting dormitory residents or sorority members to attend a program on BSE were distributed to all potential subjects (Appendix A). Resident advisors encouraged attendance at the sessions by reminding dormitory residents of the program. All subjects attended the programs voluntarily. At the beginning of the program the purpose of the study was described by the researcher and informed consent was obtained (Appendix B).

Confidentiality of subjects was maintained by separating all identifying information about each subject from the questionnaires after coding and grouping them according to teaching method. The researcher was the only one with access to the identifying information which was kept in a locked file drawer.

There were no anticipated risks to participants. A possible benefit was learning a health behavior that was believed to be of significant value in health maintenance.

Procedures

Subjects were assigned to a group based on which BSE program they attended. Six settings were used and participants from two settings were assigned to each group. Groups were assigned based on adequacy of facilities available for one-to-one teaching. All participants within each setting were assigned to one teaching method to minimize extraneous variables such as participants providing each other with additional information learned in separate sessions.

All subjects completed questionnaire #1 (Appendix C) prior to the BSE program. Group A was taught BSE using a film, lecturette, and discussion. They were also given a pamphlet describing BSE. Group B was taught as described above and practiced BSE on a life-like plastic female chest model, Betsi Breast. Group C was taught in the same manner as Group B with additional instruction in BSE by using themselves as the model in a private one-to-one setting. Female registered nurses assisted the project director by teaching subjects BSE in the one-to-one session and assisting groups B and C in the practice session with the breast model. These registered nurses participated in a training session prior to their participation as research assistants. They were taught to teach BSE using the same method and demonstrated the technique on the Betsi Breast model. They also correctly answered all questions

on a paper and pencil test designed by the American Cancer Society for people who will teach BSE classes (Appendix D).

Immediately following the program all subjects completed a 13 item post-test measuring beliefs about breast cancer and BSE (Appendix E). Three months later subjects were sent questionnaire #2 (Appendix F) via United States or University of Tennessee Campus mail. Stamped return envelopes were provided where appropriate. Completed questionnaires were returned to the researcher by mail. One follow-up reminder letter (Appendix G) and copy of the questionnaire was sent to non-responders. Of 60 questionnaires 53 were completed and returned. One-to-one teaching was offered to all participants at the completion of the study.

The experimental design was as follows:

	Time Zero	3 1/2 Months
Group A	Q_1, BSE program, post-test	Q_2
Group B	Q_1, BSE program, practice with model post-test	Q_2
Group C	Q_1, BSE program practice with model, one-to-one teaching post-test	Q_2

Questionnaires

The questionnaires were designed by the researcher. The first questionnaire included 63 questions which were grouped into four categories. The categories were as follows: (1) demographic data; (2) health perceptions and beliefs about breast cancer and BSE: (3) health behaviors; (4) previous exposure to breast cancer and BSE information.

Demographic data included name, address, age, marital status, religion, college major and mother and father's occupations. A socio-economic status score was obtained from the parents' occupations.

The health perceptions and beliefs about breast cancer questions were compiled from Trotta (1980), Wallston (1978), and Ware (1978) and adapted by the researcher. Within the health perceptions scale several sub-scales were examined: health outlook, health worry/concern, resistance-susceptibility, and health locus of control. These scales are operationally defined in the definition of terms. The breast cancer and BSE beliefs were also broken down into sub-scales including perceived seriousness of breast cancer, susceptibility to breast cancer, BSE benefits and BSE confidence. These scales are also operationally defined in the definition of terms section of this report.

The health behaviors section included questions on health behaviors in the areas of dental care, seat belt use, exercise, nutrition, smoking, auto safety, and pedestrian safety. Questions were developed by

Langlie (1981). A total score as well as sub-scores were quantified.

Previous exposure to breast cancer or BSE information was ascertained by seven questions related to the following: family history of breast cancer, previous knowledge of BSE, previous teaching of BSE, previous practice of BSE, pre-menstrual swelling of their breasts, and previous diagnosis of cystic breast disease. These were factors identified in the literature that influence whether or not one does BSE.

The post-test included 13 questions examining beliefs about breast cancer and BSE. All of these questions were also asked in the first questionnaire.

Questionnaire #2 repeated the 13 questions asked concerning beliefs about breast cancer and BSE which were also asked in the first questionnaire and post-test. It also included a question asking how many times the subject performed BSE in the last three months, how many times menses had occurred during that time interval and frequency of inclusion of the seven steps identified by the American Cancer Society as part of the recommended BSE procedure.

Assumptions and Limitations

This study was predicated on the following assumptions:

1. BSE is a recommended health behavior for women 18-26 years of age.
2. Monthly BSE is a desirable health habit.
3. BSE compliance can be measured by a self-report survey.

4. Health beliefs can be measured by a self-report survey.
5. Health behaviors can be measured by a self-report survey.

Because this was a quasi-experimental non-randomized study the researcher was unable to generalize the findings to other populations. All analysis and conclusions were applicable only to the research population. Further research or replication of this study is necessary before more generalized conclusions can be asserted.

Presentation and Analysis of Data

Hypothesis I was tested by subjecting the data to a Mann-Whitney U test comparing BSE compliance between groups A and B, B and C, and A and C. An alpha level of 0.05 was required for acceptance of the hypothesis. Hypothesis II was tested by a Spearmans Rho rank correlation of health beliefs and BSE compliance. A Spearmans Rho rank correlation between health behaviors and BSE compliance was used to test Hypothesis III. A positive correlation and alpha level 0.05 was required for acceptance of these hypotheses.

Other variables were examined for possible influence on the study results. Comparison by Spearmans Rho intercorrelation anaylsis were made between groups on the following variables: attitudes about breast cancer on questionnaire #1, post-test, and questionnaire #2, sub-scores for categories of health beliefs and sub-scores for health behaviors. Correlations were calculated between BSE compliance and age, religion, college major, socio-economic status, health beliefs,

health behaviors, breast cancer beliefs, family history of breast cancer, previous knowledge of BSE, breast changes with menses and presence or absence of breast cysts. Positive correlations are discussed in the results section of this report.

CHAPTER IV

RESULTS

Demographic Characteristics of Sample

The mean age of the sample was 19.4 years (N = 44). The range in age was 18 to 26 years. As Table 1 reveals the mean age for each subgroup was very close to equal ranging from 19.1 to 19.8 years. The majority of subjects were protestant (65.9% N = 29) followed by Roman Catholic (15.9% N = 7). Table 1 also presents the data on religion of the subjects.

College major was widely distributed with no area of study predominating. This is to be expected in a sample of dormitory residents and sorority members on a large university campus. The largest groups were business administration majors (18.2% N = 8) and liberal arts (22.7% N = 10). The first table reveals the distribution of college majors represented in the total sample and in each sub-group.

The socio-economic status of the sample was quite homogeneous with 79.5% in the socio-economic groups 1 to 3. When subjects were re-grouped into two socio-economic groups these were called socio-economic status group 1.

Socio-economic status was quantified using the Revised Occupational Rating Scale from W.L. Warner, M. Meeker, and K. Eells' Index of Status Characteristics (Miller, 1977). Of four variables, occupation and class position produced the highest correlation (r = 0.91). Subjects were asked to list both parents' occupations in the questionnaire.

Table 1. Summary of demographic variables: frequencies and raw percentage

VARIABLES	ALL N	ALL %	GROUP A N	GROUP A %	GROUP B N	GROUP B %	GROUP C N	GROUP C %
Age								
18	16	36.4	4	25.0	4	30.8	8	53.3
19	13	29.5	6	37.5	5	38.5	2	13.3
20	8	18.2	2	12.5	3	23.1	3	20.0
21	3	6.8	2	12.5	-	-	1	6.7
22	1	2.3	-	-	1	7.7	-	-
23	2	4.5	1	6.3	-	-	1	6.7
26	1	2.3	1	6.3	-	-	-	-
Mean	19.4		19.8		19.2		19.1	
Religion								
Jewish	3	6.8	1	6.3	-	-	2	13.3
Catholic	7	15.9	2	12.5	1	7.7	4	26.7
Protestant	29	65.9	12	75.0	10	76.9	7	46.7
Christian	3	6.8	1	6.3	-	-	2	13.3
Other	2	4.5	-	-	2	15.4	-	
College Major								
Argiculture	4	9.1	3	18.8	1	7.7	-	-
Architecture	2	4.5	-	-	1	7.7	1	6.7
Business Administration	8	18.2	4	25.0	1	7.7	3	20.0
Communications	3	6.8	2	12.5	-	-	1	6.7
Education	3	6.8	-	-	2	15.4	1	6.7
Engineering	1	2.3	-	-	-	-	1	6.7
Home Economics	2	4.5	1	6.3	1	7.7	-	-
Liberal Arts	10	22.7	3	18.8	4	30.8	3	20.0
Nursing	5	11.4	1	6.3	2	15.4	2	13.3
Other	6	13.6	2	12.5	1	7.7	3	20.0
Socio-economic Status								
1	14	31.8	4	25.0	4	30.8	6	40.0
2	14	31.8	4	25.0	5	38.5	5	33.3
3	7	15.9	4	25.0	1	7.7	2	13.3
4	2	4.5	1	6.3	1	7.7	-	
5	2	4.5	2	12.5	-	-	-	
6	1	2.3	-	-	1	7.7	-	
7	1	2.3	-	-	-	-	1	6.7
Not Given	3	6.8	1	6.3	1	7.7	1	6.7

If an occupation was listed for one parent the subject was assigned to the socio-economic group represented by that occupation. If occupations were listed for both parents the subject was assigned to the group representing the higher occupational status. Because of the small sample size subjects were re-grouped. Occupations listed in categories 1 through 3 were assigned to socio-economic status group 1. Those listed in groups 4 through 7 were assigned to socio-economic status group 2. Three participants or 6.8% did not provide sufficient information for assigning a socio-economic status score.

Breast Cancer General Questions

In the initial questionnaire respondents were asked about several variables which were predicted to influence breast self-exam behavior. There were whether or not they had a family history of breast cancer, if they had heard of or been taught BSE before, if they had done BSE before, if they had premenstrual swelling of their breasts or if they had ever been told that they had cystic breasts. Table 2 summarizes this data.

Out of 44 subjects, four had a family history of breast cancer. All subjects had heard of BSE and 16 or 36.4% had been taught BSE in another setting. Teaching method most often cited was pamphlet with 18.2% (N = 8) reporting being taught this way. Physicians had taught five (11.4%). It is noteworthy that only two reported being taught by an R.N. Several subjects reported two or more teaching methods being used in their previous instruction.

Table 2. Variables related to prior awareness of breast cancer and breast self-examination

	N	%
Family History of Breast Cancer	4	9.1
1 person	2	4.5
2 people	2	4.5
Heard of BSE	44	100
Previously Taught BSE	16	36.4
Teaching Method		
Pamphlet	8	18.2
Article	3	6.8
TV/Radio	2	4.5
Film	2	4.5
Lecture	2	4.5
MD	5	11.4
RN	2	4.5
Family Member	1	2.3
Other	2	4.5
Previously Performed BSE		
Frequency	14	31.8
Occasionally (< 6/yr.)	14	0
Frequently (> 6/yr.)	0	0
Monthly		
Pre-menstrual Swelling	26	59.1
Cystic Breasts	3	6.8

Fourteen reported that they had done BSE prior to participation in this study. All reported only occasional BSE behavior. This was defined as less that six times in a year. Several wrote in comments such as "once or twice" or "tried" or "sort of" leading the researcher to believe that BSE had not become a regular health habit among these women.

Twenty-six subjects (59.1%) reported pre-menstrual swelling and/or discomfort of their breast just prior to menses and three (6.8%) reported that a physican had told them that they had "cystic breasts."

Breast Cancer Beliefs

Questions adapted from Trotta (1978) and the researcher made up the breast cancer beliefs scale. While no information was available concerning validity and reliability one purpose of the study was to determine whether or not the items included in the scale accurately measured one's beliefs about breast cancer. This will be discussed in the conclusions and recommendations sections.

Four subscales were included in the breast cancer beliefs scale: perceived seriousness of breast cancer, perceived susceptibility to breast cancer, perceived benefits of breast self-examination, and confidence with one's ability to perform breast self-examination. This scale was administered three times: before subjects were taught BSE, immediately after the program, and three months later in the follow-up questionnaire. Table 3 summarizes the data concerning breast cancer beliefs.

Table 3. Breast cancer beliefs.

VARIABLE		ALL		GROUP A		GROUP B		GROUP C	
	Possible Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range
Seriousness of breast cancer	1-6								
Prior to teaching		4.7	2-6	4.2	2-6	5.1	3-6	4.9	2-6
Immediately after teaching		5.2	2-6	5.1	3-6	5.5	5-6	5.1	2-6
3 months later		4.8	1-6	5.3	4-6	4.9	2-6	4.3	1-6
Susceptibility to breast cancer	4-24								
Prior to teaching		14.7	6-21	14.4	10-21	14.5	10-20	15.1	6-20
Immediately after teaching		15.2	10-22	14.6	10-20	14.4	10-21	16.3	12-22
3 months later		14.1	4-23	13.7	4-23	13.2	5-20	15.5	12-21
Benefits of breast self-examination	5-30								
Prior to teaching		24	19-30	23.4	20-26	24.3	23-26	24.3	19-30
Immediately after teaching		25.6	19-29	25.1	19-28	25.6	22-29	26.1	21-29
3 months later		24.6	10-18	24.1	20-28	24.4	17-27	25.3	16-29
Confidence in ability to perform breast self-examination	3-18								
Prior to teaching		9.7	3-14	9.3	3-13	10.4	6-14	9.5	7-13
Immediately after teaching		14.2	10-18	13.9	11-18	14.7	10-18	14.0	10-18
3 months later		14.1	10-18	13.7	11-17	15.4	12-18	13.4	10-18
Breast Cancer Beliefs Score	13-78								
Prior to teaching		52.4	40-61	50.9	42-59	53.3	45-61	53.3	40-59
Immediately after teaching		59.3	51-70	57.8	51-65	59.2	51-70	61.1	51-69
3 months later		57.4	40-66	56.8	49-66	57.5	40-63	58.0	42-66

The Breast cancer beliefs score was quantified by adding the scores for questions 4, 6, 10, 13, 16, 18, 20, 22, 24, 27, 28, 29, and 30. In the post-test and questionnaire #2 these questions were questions 1 thru 13. In order to compensate for negative wording, questions 4, 13, 18, 24, and 29 were recoded so that 6 = 1, 5 = 2, 4 = 3, 3 = 4, 2 = 5, and 1 = 6. The same recoding was done for questions 3, 4, 5, 7, and 12 on the post-test and questionnaire #2.

As one can see Breast cancer beliefs changed significantly between the pre-teaching, post-teaching, and follow-up assessments. The highest scores were obtained in the assessment immediately after the teaching program. Subjects scores dropped significantly in all areas between the immediate post-teaching and three month follow-up assessments. However, they did not approach the pre-teaching scores.

Educational Method

At the end of three months all subjects were asked to complete a final questionnaire in which adoption of BSE as a regular health habit was measured. Subjects were asked how many times they had performed BSE, how many menstrual periods they had had, and how often they included each of seven steps recommended in the American Cancer Society brochure as part of the routine BSE procedure. Two scores were quantified: BSE behavior and BSE completeness. If subjects reported an equal number of menstrual periods and BSE performance they earned a behavior score of 1. If these numbers were unequal they earned a score

0.0. BSE completeness scores could range from 7 to 28.

As Table 4 reveals overall 36.4%of the subjects performed BSE the recommended number of times. In groups A and C BSE behavior scores were less optimal with 31.3% and 26.7% respectively reporting the appropriate number of times of performing BSE. Group B also had the highest mean score for BSE completeness with a mean score of 21.92.

A Mann-Whitney U test was used to determine whether or not there was any significant difference in BSE completeness among the three groups. As Table 5 reveals there was a significant difference in BSE completeness between groups A and B. Differences between A and C or B and C were not significant at the 0.05 level.

Chi-square analysis of BSE behavior between the groups revealed no significant differences. Because of the small groups, cell sizes were small making statistical analysis more difficult. In the chi-square table one cell had an observed frequency of 4. However, by hypothetically adding the same number of subjects to each cell no statistically significant differences became apparent suggesting that there were indeed no differences between the groups in BSE behavior.

Health Beliefs

The health beliefs score had a possible range of 17 to 102. In this study subjects scores ranged from 47 to 84 with a mean of 71.2. Groups were again similiar with the mean health perception score ranging from 70.7 to 72.4. There was no statistically significant difference between groups in health belief score. Table 6 presents this data.

Table 4. BSE behavior and BSE completeness at end of study.

BSE	ALL		GROUP A		GROUP B		GROUP C	
Behavior	N	%	N	%	N	%	N	%
0 (BSE ≠ Menses)	28	63.6	11	68.8	6	46.2	11	73.4
(BSE = Menses)	16	36.4	5	31.3	7	53.8	4	26.7
Completeness								
Mean Score of possible score 28	19.48		16.93		21.92		20.07	

Chi Square BSE Behavior not significant.

Table 5. Mann-Whitney analysis of group differences in BSE completeness

Groups Compared	U Value	W Value	Significance
A and B	49.5	249.5	0.01
A and C	80.0	280.0	N.S.
B and C	69.0	217.0	N.S.

Table 6. Health beliefs.

Variables		All		Group A		Group B		Group C	
	Possible Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range
Health Outlook	4-24	17.8	10-23	17.6	10-23	17.8	14-22	18.1	13-21
Health Worry/Concern	4-24	16.2	11-21	16.3	13-21	16.5	11-20	15.7	13-19
Resistance/Susceptibility	4-24	15.6	8-21	16.0	12-21	16.2	10-19	14.6	8-18
Loss of Control	5-30	21.8	13-28	21.2	13-27	21.8	16-25	22.4	18-28
Health Belief Score	17-102	71.2	47-84	70.7	47-84	72.4	62-83	70.7	53-81

Within the overall health belief scale several sub-scales were examined. Health outlook quantified " . . . the respondents prediction of things to come" (Ware, 1978, p.158). The possible range in score was 4 to 24. In this sample the range was 10-23 with a mean of 17.8. When groups were scored separately no difference was found in health outlook.

Another subscale health worry/concern quantified " . . . the extent to which the respondent is worried or concerned about his state of health" (Ware, 1976, p.158). The possible range in score was 4 to 24 with a sample range of 11 to 21. The mean score of this sample was 16.2. Health worry/concern scores did not differ significantly between groups.

Resistance-susceptibility measured " . . . The extent to which the respondent believes that (s)he is able to resist illness" (Ware, 1978, p.158). In the sample scores ranged from 8 to 21 with a possible range of 4 to 24. The mean score was 15.6 and no difference was found between groups. Health locus of control scale assessed . . . "the kind and extent of control a person thinks he (she) has over his (her) own state of health" (Wallston, 1976, p.54). Out of a possible range of 5 to 30, scores in this sample ranged from 13 to 28 with a mean of 21.8. Group means were similar with no significant difference noted.

The health beliefs score was quantified by adding the scores for questions 1, 2, 3, 5, 7, 8, 9, 11, 12, 14, 15, 17, 19, 23, 25, and 26 on questionnaire 1. Questions 1, 2, 3, 5, 7, 8, 11, 12, and 25 were

re-coded in order to result in the higher the score the stronger the health belief for each of the subscales.

Health Behavior

Health behavior was assessed by means of 17 questions dealing with behavior in seven different areas. Seven subscales and an overall health behavior average were quantified. The seven subscales were dental, seat belt use, exercise, nutrtion, smoking, traffic safety, and pedestrian safety. These were chosen from 11 behavior scales developed by Langlie (1979). Table 7 summarizes the data concerning health behavior.

For each of the seven health behavior scales the possible score ranged from 0 to 100. A higher score reflected more positive health behaviors. Each subscore was calculated by assigning a value of 0.0 for a response reflecting the least desirable answer. A score of 1, 2, or 3 was assigned to the other possible responses with a higher number reflecting a more positive response. Each subject's total subscore was then divided by the possible score and multiplied by 100 to obtain the health behavior scale. Scores for the seven health behavior scales were then averaged to obtain a mean health behavior score for each subject. Group means were obtained by averaging scores of each group member.

The mean health behavior score for all groups was 59 with a range of 35 to 78 out of a possible range of 0.0 to 100. As table 7 reveals, health behavior scores were generally similar between the sub-groups.

Table 7. Health behaviors.

Variable	Possible Range	All		Group 1		Group 2		Group 3	
		Mean	Range	Mean	Range	Mean	Range	Mean	Range
Dental	0 - 100	79.3	22 - 100	71.5	22 - 100	78.6	33 - 100	88.1	67 - 100
Seat belt	0 - 100	36.7	0 - 100	34.4	0 - 100	41.0	0 - 100	35.6	0 - 83
Exercise	0 - 100	52.7	0 - 100	52.1	17 - 83	46.2	0 - 100	58.9	17 - 100
Nutrition	0 - 100	46.6	0 - 100	44.8	0 - 100	51.3	0 - 100	44.4	0 - 100
Smoking	0 - 100	96.8	33 - 100	93.7	33 - 100	97.4	67 - 100	100	100
Traffic	0 - 100	75.4	25 - 100	70.8	25 - 100	81.4	42 - 100	75.0	50 - 92
Pedestrian	0 - 100	29.3	0 - 100	17.2	0 - 100	40.4	0 - 100	32.5	0 - 75
Health behavior score	0 - 100	59.	35 - 78	52.5	36 - 75	56.6	35 - 78	62.1	50 - 76

Scores for specific health behaviors were also similar between groups with no significant differences apparent.

Correlation Studies

Further analysis of the data by use of the Spearman Correlation coefficient revealed several additional findings. Looking at subjects in the three groups together several positive correlations between variables were identified. As Table 8 reveals, subjects with a family history of breast cancer had significantly higher breast cancer belief scores. Correlations were approximately equal for each time the breast cancer belief score was measured suggesting consistency in the relationship between a positive family history and beliefs about breast cancer. Family history did not correlate highly with any of the other variables included on Table 8. Family history appears to have had little correlation with health beliefs, health behaviors or BSE behaviors.

There was a significantly positive correlation between the health belief score and previous BSE teaching. That is subjects with a high belief score tended to have been taught BSE prior to involvement with this study. A high health belief score correlated strongly with frequency of BSE prior to the study and with breast cancer beliefs in the first questionnaire.

Subjects' socio-economic status correlated positively with frequency of BSE prior to the study. However, since 79.5% of the sample were in socio-economic status group 1 this may be an incidental find-

Table 8. Spearman correlation coefficients, all groups. Intercorrelations of 13 variables.

	Family History	Previously Taught	Frequency of BSE	Pre-menstrual Swelling	Cystic Breasts	Breast Cancer Beliefs Q_1	Breast Cancer Beliefs Post-test	Breast Cancer Beliefs Q_2	SES Group	Health Beliefs	Health Behaviors	BSE Behaviors
Previously taught	-0.0747											
Frequency of BSE	-0.0463	0.2376										
Premenstrual Swelling	-0.2193	0.1485	-0.0271									
Cystic Breasts	-0.0855	-0.0170	0.2024	0.2251								
Breast Cancer Beliefs Q_1	*0.2751	0.1223	0.1412	0.1038	*0.3357							
Breast Cancer Beliefs Post-test	*0.2690	0.0175	-0.0533	*0.3119	0.1515	*0.6013						
Breast Cancer Beliefs Q_2	*0.2653	0.1676	0.0634	0.2000	0.1217	*0.4899	*0.5079					
SES Group	0.0964	0.1153	*0.2839	0.0717	0.1487	0.1857	0.1776	0.1765				
Health Beliefs	0.1313	*0.3642	*0.3337	0.1681	-0.0036	*0.2614	0.1240	0.1040	-0.2022			
Health Behaviors	0.0125	0.0893	-0.0653	*0.3349	-0.0533	0.1644	0.1344	0.0335	0.2158	*0.2734		
BSE Behaviors	0.0411	0.2376	0.1650	0.1403	-0.0235	0.0660	0.0573	0.0968	0.579	*0.2872	0.2176	
BSE Completeness	0.0000	-0.1376	0.0681	0.1163	0.0382	0.1667	0.1939	*0.3282	0.2279	-0.0882	0.1563	0.2353

* = Significant at the 0.05 level

ing of little real significance.

Pre-menstrual swelling was reported by 26 subjects. While pre-menstrual swelling did not correlate strongly with breast cancer beliefs on the first questionnaire, it did correlate significantly with post-test breast cancer beliefs. This suggests that the teaching program influenced breast cancer beliefs among those women. After three months this significant correlation is lost. While pre-menstrual swelling did correlate strongly with health behaviors scores it did not have a significant correlate with BSE behavior after the teaching program.

Three women reported having been told by a physician that they had cystic breasts. A significantly positive correlation between cystic breasts and breast cancer beliefs if the first questionnaire was revealed by the data analysis. The correlation was not significant in the post-test or final questionnaire suggesting a change may have occurred during the teaching program.

Subjects with a high breast cancer belief score on the first questionnaire tended to continue to have a high score as evidenced by the strongly positive correlation with that score on the post-test and final questionnaire. However, again there was no significant correlation with BSE behavior or completeness. Those subjects with a high breast cancer belief score on the final questionnaire were most likely to perform BSE completely as evidenced by the significant correlation between these two variables.

Subjects with a high health belief score were most likely to have

high health behavior and BSE behavior scores as revealed by the significantly positive correlations of 0.2734 and 0.2872 respectively. Health behavior alone did not correlate strongly with BSE behavior and BSE behavior did not correlate significantly with how completely one performed BSE.

Group A. When subjects were re-grouped by teaching method a few different significant correlations became evident. Group A was taught using lecture, film, discussion, and a pamphlet. In that group family history correlated highly with breast cancer beliefs in the first questionnaire as well as with socio-economic status group and health belief scores.

Previous learning of BSE correlated strongly with BSE frequency prior to the study. Again, a positive correlation between socio-economic status and previous exposure to BSE was apparent. Pre-menstrual swelling of the breasts correlated highly with the health behavior score (0.6161), BSE behavior (0.4495), and BSE completeness (0.5087). No subjects in group A reported a history of cystic breast.

Again, breast cancer belief scores in the first questionnaire correlated highly with breast cancer belief scores in the post-test (0.5659) and final questionnaire (0.5601). High breast cancer belief scores on both the post-test and the final questionnaire correlated strongly positively with completeness of BSE as evaluated in the final questionnaire. Health behavior scores also were highly correlated with the BSE completeness score. Data are presented in Table 9.

Table 9. Spearman correlation coefficients, group A. Intercorrelations of 13 variables.

	Family History	Previously Taught	Frequency of BSE	Premenstrual Swelling	Cystic Breasts	Breast Cancer Beliefs Q_1	Breast Cancer Beliefs Post-test	Breast Cancer Beliefs Q_2	SES Group	Health Beliefs	Health Behaviors	BSE Behaviors
Previously taught	0.2277											
Frequency of BSE	0.3333	*0.6831										
Premenstrual Swelling	-0.3333	0.0976	-0.20000									
Cystic Breasts	NA	NA	NA	NA								
Breast Cancer Beliefs Q_1	*0.4342	0.3101	-0.0492	-0.0985	NA							
Breast Cancer Beliefs Post-test	0.3971	0.2629	0.0284	0.1702	NA	*0.5659						
Breast Cancer Beliefs Q_2	0.3651	0.3838	0.2107	0.2809	NA	*0.5601	*0.5721					
SES Group	*0.5345	*0.4677	0.2722	-0.2722	NA	0.3679	0.3117	0.3675				
Health Beliefs	*0.4226	0.1787	0.3099	-0.0282	NA	0.2795	0.1513	0.1113	0.0777			
Health Behaviors	0.0280	0.1230	-0.3361	*0.6161	NA	0.3975	0.0983	0.3481	0.1543	0.0059		
BSE Behaviors	0.0899	0.2632	0.0449	*0.4495	NA	-0.0590	0.2247	-0.0237	0.0	0.3704	0.1935	
BSE Completeness	0.3411	0.1421	0.0	*0.5087	NA	0.2652	*0.4638	*0.5530	0.3249	0.0487	*0.5067	0.3599

* = Significant at 0.05 level

NA = Not applicable. No subjects reported cystic breasts.

Group B. Group B experienced the same teaching methods as group A with the addition of a practice session using the Betsi Breast model. Family history did not correlate strongly with any other variable among this group. In group B only 1 out of 13 subjects reported a positive family history of breast cancer.

Within group B a strongly positive correlation between previous learning of BSE and frequency of BSE prior to the study was revealed (0.8433). Previous exposure to BSE teaching also correlated strongly with health belief scores in this group.

Again pre-menstrual swelling correlated significantly with breast cancer belief scores on the post-test but did not correlate significantly with this variable as measured on the first or final questionnaire. None of the subjects in this group reported having cystic breasts.

Breast cancer belief scores on the first questionnaire correlated highly with breast cancer beliefs on the post-test (0.7438). This correlation was not sustained with the final questionnaire. The correlation coefficient dropped to 0.4385 and was no longer significant at the 0.05 level.

Breast cancer beliefs measured in the final questionnaire did correlate positively and significantly (0.6335) with health belief scores among subjects in group B. Socio-economic status and health behavior scores also correlated highly with the health beliefs scores. A strongly positive correlation between the health behavior score and

BSE behavior score was revealed by data analysis. Completeness of BSE was not highly correlated with any other variable included in this part of the data analysis. Table 10 presents the data concerning the correlation studies for group B.

Group C. Group C was taught BSE using all of the methods previously described with the addition of a one-to-one guided practice session with the subject practicing BSE on her own breasts in a private setting with supervision by a registered nurse. Among this group several different significant correlations were revealed that were not evident in groups A or B. These correlations are presented in Table 11.

A strongly positive correlation (0.5927) was revealed between family history and completeness of BSE as measured in the follow-up questionnaire. Of 15 subjects in group C, two reported a positive family history of breast cancer. Again, those who had been previously taught BSE were more likely to have done it prior to inclusion in this study as revealed by the strongly positive correlation coefficient of 0.5833. A history of cystic breasts also correlated strongly with prior BSE frequency (0.5833). Socio-economic status also correlated positively with BSE frequency reported before the teaching program.

Breast cancer beliefs in the first questionnaire correlated highly with reported pre-menstrual swelling and/or cystic breast but interestingly did not correlate with breast cancer belief scores on the post-test or final questionnaire. Correlations between pre-menstrual

Table 10. Spearman correlation coefficients, group B. Intercorrelations of 13 variables.

	Family History	Previously Taught	Frequency of BSE	Premenstrual Swelling	Cystic Breasts	Breast Cancer Beliefs Q_1	Breast Cancer Beliefs Post-test	Breast Cancer Beliefs Q_2	SES Group	Health Beliefs	Health Behaviors	BSE Behaviors
Previously taught	-0.1925											
Frequency of BSE	-0.2282	*0.8433										
Premenstrual Swelling	-0.2673	0.0514	-0.0976									
Cystic Breasts	NA	NA	NA	NA								
Breast Cancer Beliefs Q_1	0.4642	0.2457	0.4237	0.0414	NA							
Breast Cancer Beliefs Post-test	0.3084	0.3358	0.3358	*0.6089	NA	*0.7438						
Breast Cancer Beliefs Q_2	0.2324	0.0224	-0.1697	0.4348	NA	0.4385	0.4885					
SES Group	-0.1348	-0.3162	0.0756	0.0	NA	0.0975	0.1012	-0.1300				
Health Beliefs	0.0	*0.5831	0.4255	0.3945	NA	0.4383	*0.6335	0.3069	*-0.5555			
Health Behaviors	0.0	0.4454	0.3803	0.2062	NA	0.2369	0.2081	-0.0221	0.4534	*0.6058		
BSE Behaviors	0.1735	0.3005	0.3801	-0.2782	NA	0.1920	-0.1079	-0.0806	-0.1846	0.3110	*0.6424	
BSE Completeness	0.3062	-0.2792	-0.2821	0.0491	NA	0.1228	0.2494	0.1142	0.2615	-0.1254	-0.0210	0.0935

* = Significant of 0.05 level

NA = Not applicable. No subjects reported cystic breasts.

Table 11. Spearman correlations coefficients, group C. Intercorrelations of 13 variables.

	Family History	Previously Taught	Frequency of BSE	Premenstrual Swelling	Cystic Breasts	Breast Cancer Beliefs Q_1	Breast Cancer Beliefs Post-test	Breast Cancer Beliefs Q_2	SES Group	Health Beliefs	Health Behaviors	BSE Behaviors
Previously taught	-0.1961											
Frequency of BSE	-0.1961	*0.5833										
Premenstrual Swelling	-0.1387	0.3536	0.3536									
Cystic Breasts	-0.1961	0.1667	*0.5833	0.3536								
Breast Cancer Beliefs Q_1	-0.1142	0.0388	0.1553	*0.4611	*0.5629							
Breast Cancer Beliefs Post-test	0.2288	-0.1944	-0.4083	0.1815	0.0194	0.4121						
Breast Cancer Beliefs Q_2	0.1794	0.2819	0.2307	-0.0936	0.1093	0.2340	0.3899					
SES GRoup	-0.1132	-0.1448	*0.5311	0.2067	*0.5311	0.1387	0.0695	0.2350				
Health Beliefs	0.0000	0.4262	0.1162	0.3617	0.0000	0.2329	-0.0886	0.0323	-0.3805			
Health Behaviors	0.0000	-0.3086	-0.3858	0.0655	-0.2700	-0.2372	-0.2844	*-0.5584	-0.4472	0.1166		
BSE Behaviors	-0.2737	-0.0233	0.0233	0.2171	0.0930	0.3034	-0.1694	-0.0954	-0.2035	0.0043	0.1615	
BSE Completeness	*-0.5927	0.0581	0.1937	0.0493	0.0969	-0.0379	-0.1438	0.2838	0.1728	-0.1171	-0.0430	0.4067

* = Significant at 0.05 level

swelling or cystic breasts and breast cancer belief scores on the post-test and final questionnaire were not significant.

A significantly negative correlation (-0.5584) between health behaviors and breast cancer belief scores on the final questionnaire was revealed by the data analysis. Health behaviors did not correlate strongly with any other variables included in this part of the data analysis. As with the group A, BSE behavior was not strongly correlated with any other variables. Completeness of BSE was correlated highly only with a positve family history as previously mentioned.

Analysis of Subscore Relationships: Health Beliefs

By analyzing relationships between the subscores of the health belief scores BSE behavior and BSE completeness some additional significant Spearman correlation coefficients were revealed. All subjects in the study were analyzed as one group in this part of the data analysis. Sub-grouping of the subjects did not reveal additional significant data for acceptance or rejection of the research hypotheses. Table 12 reveals the health belief correlations data.

The overall health beliefs score correlated strongly positively with the BSE behavior score (0.2858). Hypothesis II is therefore accepted. However, the overall health belief score did not correlate significantly with BSE completeness (-0.0882). The subscore, health worry/concern produced the strongest correlation of all subscores BSE behavior. The subscores health outlook, resistance-susceptibility and locus of control did not correlate significantly at the 0.05 level with

Table 12. Spearman correlation coefficients, health beliefs subscores, BSE behavior, and BSE completeness in all groups.

	Health Beliefs	Health Outlook	Health Worry-Concern	Resistance/ susceptibility	Locus of Control	BSE Behavior
Health Outlook	*0.7778					
Health Worry-Concern	*0.3950	0.1810				
Resistance/ Susceptibility	*0.7061	*0.4345	0.1110			
Locus of Control	*0.3480	*0.3480	-0.0215	0.0166		
BSE Behavior	*0.2858	0.1837	*0.3021	0.0899	0.2453	
BSE Completeness	-0.0882	-0.0761	-0.0820	-0.1601	0.1347	0.0698

* = Significant at 0.05 level.

BSE behavior. However, the correlation was at the 0.1 level or less for locus of control and resistance-susceptibility with BSE behavior. The locus of control scale produced the highest correlation with the BSE completeness score and while not significant at 0.05 it was significant at the 0.1 level. The subscales all correlated highly with the overall health belief score supporting their use as measures of health beliefs.

Analysis of Subscore Relationships: Health Behaviors

Analysis of the health behavior subscores and their correlations with BSE behavior and BSE completeness were performed using Spearmans Rho rank correlation coefficients. Again all subjects in the study were evaluated as one group. Variations revealed by analyzing subgroups were small.

As Table 13 reveals, the overall health behavior score did not correlate significantly at the 0.05 level with BSE behavior or BSE completeness. Therefore Hypothesis III was rejected. However, the subscore measuring nutritional health behavior correlated significantly with BSE behavior. The nutrition health behavior score also correlated highly (0.5277) with the overall health behavior score. Automobile safety and exercise health behavior socres correlated highly with the BSE completeness score (0.3270 and 0.2655 respectively). Automobile safety correlated highly with the overall health behavior score (0.5114 $p \leq .001$). The correlation between the exercise health behavior score was weaker (0.2078 $p \leq 0.1$). Also note that in group B

Table 13. Spearman correlation coefficients, health behavior subscores, BSE behavior, and BSE completeness in all groups.

	Health Behavior	HB Dental	HB Seat Belt Use	HB Exercise	HB Nutrition	HB Smoking	HB Auto Safety	HB Pedestrian Safety	BSE Behavior
HB Dental	**0.3466								
HB Seat Belt Use	***0.5611	**0.2903							
HB Exercise	*0.2078	-0.0306	*0.2325						
HB Nutrition	***0.5277	0.0478	0.0035	*0.2254					
HB Smoking	0.1650	-0.1472	-0.1909	*0.2497	0.1131				
HB Auto Safety	***0.5114	0.0767	**0.3145	-0.0487	-0.0175	0.1413			
HB Pedestrian Safety	**0.3591	-0.0656	-0.0960	-0.1080	0.0538	-0.0390	0.1454		
BSE Behavior	*0.2140	-0.0614	0.1376	-0.0704	**0.2686	-0.1618	-0.0170	*0.2402	
BSE Completeness	0.1833	0.1258	0.1187	**-0.2665	-0.0139	*0.2495	**0.3270	0.0316	0.0698

* = Significant at 0.1 level.

** = Significant at 0.05 level.

*** = Significant at 0.001 level.

health behavior correlated strongly with BSE behavior. Group B also demonstrated the highest BSE behavior score.

Of the seven subscales used in measuring the overall health behavior score all except the exercise and smoking subscores correlated at or below the 0.05 level of significance. The exercise score correlated at the 0.1 level of significance and smoking behavior did not correlate at or below 0.1 level of significance. In this sample only three subjects reported that they smoked. One subject reported smoking one to two packages of cigarettes per day and two reported smoking less than one package per day. This lack of distribution of scores made smoking behavior a poor subscale for correlation with other behaviors that were more normally distributed.

Analysis of Subscores: Breast Cancer Beliefs

While not explicitly related to one of the hypothesis statements, this researcher was interested in examining the relationships between breast cancer beliefs, BSE behavior and BSE completeness in more detail in order to evaluate the degree to which Rosenstock's health belief model relates to BSE behavior. Therefore, Spearman correlation coefficients were calculated for each of the subscores of the breast cancer belief score as measured in the first questionnaire, the posttest and the final questionnaire. The relationship of each of these subscores to the BSE behavior and BSE completeness scores were examined.

As was noted in Table 3 (page 29) breast cancer belief scores increased significantly in all groups from the first questionnaire to

the post-test. Scores decreased from the post-test to the final questionnaire but remained significantly higher than the first scores. Group B reported a small increase in confidence in ability to perform BSE from the post-test to the final questionnaire. Group A and C reported increased confidence immediately after the teaching program but these scores decreased slightly but not significantly from the post-test to the final questionnaire. Group A reported a slight and insignificant increase in perception of the seriousness of breast cancer from the post-test to the final questionnaire. Groups B and C reported slight decreases in this subscore between the post-test and the final questionnaire.

Examination of relationships between subscores as presented in Table 14 revealed that the perceived seriousness of breast cancer was not highly correlated with perceived susceptibility to breast cancer, benefits of BSE, confidence in ability to do BSE, BSE behavior or BSE completeness.

Perceived susceptibility to breast cancer correlated negatively and significantly with confidence in BSE in all three questionnaires but did not correlate with BSE behavior on completeness scores. Benefits of BSE scores as perceived on the final questionnaire correlated highly with confidence in BSE as measured in all three questionnaires. BSE behavior did not correlate with any of the breast cancer belief subscores. A positive high correlation (0.3344 $p < 0.05$) was revealed between BSE completeness and perceived benefits of BSE as measured on the final questionnaire. BSE completeness also correlated

Table 14. Spearmans correlation coefficients, breast cancer beliefs subscores, BSE behaviors and BSE completeness.

	Seriousness			Susceptibility			Benefits of BSE			Confidence with BSE			BSE Behavior
	Q_1	Post-test	Q_2	Q_1	Post-test	Q_2	Q_1	Post-test	Q_2	Q_1	Post-test	Q_2	
Seriousness													
Post-test	*0.7205												
Q_2	0.2226	*0.4397											
Susceptibility													
Q_1	-0.0615	-0.1485	-0.1939										
Post-test	0.2107	0.0707	-0.1705	*0.6800									
Q_2	0.1403	-0.1282	-0.1939	*0.6484	*0.6711								
Benefits of BSE													
Q_1	0.0700	-0.0178	-0.0477	-0.0363	-0.0441	-0.0994							
Post-test	0.2275	0.1549	-0.0145	0.0404	-0.1386	0.0278	*0.2660						
Q_2	0.2409	0.2428	0.1164	0.0413	-0.2019	0.0113	0.1815	*0.3013					
Confidence with BSE													
Q_1	0.0031	0.1267	0.1194	*-0.2970	*-0.3483	*-0.3425	*0.5272	0.0329	*0.3103				
Post-test	0.1104	0.2191	0.0863	-0.1704	0.2167	*-0.3611	0.2519	0.1161	*0.2660	*0.5409			
Q_2	0.0036	0.1370	0.0959	-0.2377	*-0.4885	*-0.3200	0.1964	0.2339	*0.4361	*0.4696	*0.4410	*0.4410	
BSE Behavior	-0.0019	-0.2006	-0.0672	-0.0068	-0.0790	0.0227	0.1150	-0.0019	0.0395	0.0334	-0.0568	0.0563	
BSE Completeness	0.2544	0.0488	0.0312	0.1578	0.0621	0.1164	0.0601	0.1479	*0.3344	0.1138	0.1274	*0.3261	0.0698

* = Significant at 0.05 level

highly with confidence with BSE as measured on the final questionnaire.

There was a negative (-0.2006 $p < 0.1$) between perceived seriousness of breast cancer as measured on the post-test and BSE behavior. Thus subjects with high benefits and confidence scores performed BSE more completely when they did it but did not follow the recommended schedule.

CHAPTER V

DISCUSSION OF RESULTS

The purpose of this study was to identify factors influencing adoption of BSE as a regular health behavior among young adult women. Three major variables were identified for study; educational method, health beliefs, and health behaviors. Other variables such as demographic characteristics, breast cancer beliefs and previous exposure to breast cancer or BSE teaching were also examined in order to determine their influence on BSE behavior. Inter-correlations of these variables were analyzed and the relationship of this study to Rosenstock's health belief model was examined.

Demographic Characteristics

The sample population differed from the U.S. population of young adult women in several respects. The sample was selected solely from a population of college students at a large southeastern state university. Nearly 80% of the sample were from families with professional backgrounds. Neither of these characteristics are consistent with the entire population of young adult women where one would find a wider distribution of socio-economic, geographic and educational background. The majority of subjects were protestant and Baptist was the most common protestant religion named. In a normal population one would expect a wider distribution of religious background. The influence of religion and college major on BSE behavior were not significant in this study. Because of the sampling procedure generalization of the results

of this study is limited. The influence of socio-economic status should also be considered when evaluating the results of this study.

Prior Experience with Breast Cancer or BSE

Out of a final sample of 44 subjects, four reported a family history of breast cancer. No data are available to determine if this is representative of the U.S. population of women aged 18 to 26 years. All of the women in the sample had heard of BSE prior to participation in the study. With the number of newspaper and magazine articles devoted to this topic over the last few years one could reasonably assume that most adult women have heard of it. The over-representation of women from higher socio-economic backgrounds may have influenced this finding.

While all women in this study had heard of BSE only 16 had been taught BSE and only seven of them had learned to do BSE from a physician or nurse. Half of them had learned from reading a pamphlet. While several subjects reported being taught with more than one method, personalized instruction was not the norm. This finding supports that of Turnbull (1978) who found that only 58 out of 160 women had had BSE demonstrated to them by a health professional. It also lends credence to the 1974 Gallup poll which found that BSE was not routinely included in a physician's physical exam (ACS, 1974).

None of the subjects in this study had established BSE as a regular health habit. The 14 subjects who reported having previously performed BSE all reported sporadic performance. This study did not

determine how long ago subjects had been taught BSE. However, due to the young age (mean 19.4 years) of the subjects one could reasonably assume that their exposure to BSE was generally limited to one or two previous occasions. An additional nine subjects were deleted from the study sample because they reported performing BSE on a regular basis already. This means that nearly half of the women who voluntarily attended the BSE programs had been taught BSE before. One can only speculate as to why these women were motivated to attend another BSE teaching session and why so many others did not attend. Perhaps these women wished to be reassured in their ability to perform BSE. However, as noted in the results section, previous teaching did not correlate with appropriate BSE behavior. These women did have high health belief scores suggesting that they were quite concerned about their health but this concern did not seem to motivate them to do BSE.

Pre-menstrual swelling was quite common among the women in this sample while only three women reported being told by a physician that they had cystic breasts. This researcher speculated that women who had experienced any physical changes in their breasts would be more likely to perform BSE. While these women did report significantly higher breast cancer beliefs on the post-test their BSE behavior did not appear to be influenced.

Educational Method and BSE

At the end of the follow-up period 36.4% of the women reported that they had performed BSE an equal number of times as they had had a

menstrual period. The group taught by film, lecture, discussion, pamphlet, and practice with the Betsi Breast model received the highest score for both BSE behavior and BSE completeness. This was not the result expected by the researcher. Based on the findings of other researchers, guided practice in a one-to-one setting was predicted to result in optimal BSE compliance. Further study is indicated to determine why the subjects who had one-to-one teaching were not as compliant as those who practiced only on a model. Perhaps the subjects in group C were embarrassed by the one-to-one teaching session. Perhaps they believed that they did not need to do BSE monthly because they had been examined by a professional nurse. Perhaps some aspect of the teaching method influenced their BSE compliance. A study of non-compliers might provide answers to some of these questions.

Overall, in this study 36.4% of subjects practiced BSE according to the recommended schedule. The 1978 American Cancer Society study reported 32% of women queried did BSE more than 10 times in a year. Although statistical analysis was not done, it appears that the compliance rate is quite similar among subjects in both studies. It appears that they have yet to find the optimal way to motivate women to become regular examiners of their breasts. In this study educational method did not seem to motivate women as expected.

It is disappointing that more women did not adopt the BSE health habit. One must consider the possibility that overriding barriers to action were present among these women. Some of the possible barriers have been identified but further study is necessary to clearly identify

them. Nursing interventions to overcome these barriers can then be developed, tried and evaluated.

Health Beliefs and BSE

No significant differences were discovered in the health belief scores of subjects representing the three groups in this study. There were no substantially varying characteristics between the groups that would have led one to predict significant differences of this scale. Both the total health belief score and sub-scores were evaluated in relation to BSE behavior and completeness.

BSE behavior and health beliefs were significantly correlated and the strongest correlation was between health worry-concern and BSE behavior. Fink (1972) found that women who attended voluntary breast screening programs generally believed themselves to be healthy and were concerned about having breast cancer. In a study concerning exercise compliance in patients after coronary bypass surgery, Tirrell and Hart found that subjects who found themselves most susceptible to illness were least compliant (1980). The researchers also found that "those who worried less about health or who thought they had little influence on the health state were more compliant" (Terrell and Hart, 1980 p. 491). This finding contradicts the findings in the present study. This may be due to the fact that the Tirrell and Hart study examined a population with a known health problem while this study involved healthy subjects.

Completeness of BSE correlated most highly with a positive locus of control score. These subjects believed to a high degree that they

exercise some control over their health. This finding was not significant at the 0.05 level but was significant at the 0.1 level. This finding contradicts the assertions of Knowles (1972) and others who have stated that in general man believes that physicians and advances in scientific knowledge influence one's health status more than one's own actions (Alderman, 1980).

It is possible that these findings are indicative of a change in health beliefs among members of our society. However, further research is necessary before such a statement could be logically proclaimed.

Health Behaviors

Measured together health behaviors did not correlate with BSE behavior or BSE completeness resulting in a rejection of Hypothesis III. The subscore nutrition behavior did correlate positively and significantly with BSE behavior and automobile safety and exercise behaviors correlated positively with BSE completeness. Because of the small sample size this finding requires further investigation before any conclusions can be drawn.

Breast Cancer Beliefs

In order to evaluate the relationship of Rosenstock's health belief model to BSE behavior the researcher measured the subject's beliefs about breast cancer and the correlation between these beliefs and adoption of BSE as a health behavior.

As expected those subjects who reported a family history of breast cancer had high breast cancer belief scores and these scores were con-

sistent each time they were measured. Breast cancer beliefs increased immediately after the teaching program among women who reported pre-menstrual swelling. During the teaching program pre-menstrual swelling was mentioned only in relation to timing of BSE after one's menstrual period. At the time of the follow-up questionnaire breast cancer beliefs no longer correlated with pre-menstrual swelling or cystic breasts suggesting the change in breast cancer beliefs was not lasting.

The mean breast cancer belief score for all subjects did sustain a significant increase after the teaching session and through the follow-up period. However it appears from that data that high breast cancer beliefs did not motivate subjects to perform BSE. This suggests that high beliefs about breast cancer may have had some deterrant effect on BSE. Further study is needed to identify if one or more variable in the breast cancer belief score negatively influenced BSE behavior.

Those subjects who performed BSE most completely obtained higher benefits of BSE and confidence in BSE subscores. This finding supports the health belief model. Knowledge would increase confidence and belief that BSE is beneficial would both stimulate one to adopt BSE and to do it accurately.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Summary

While breast self-examination has been the topic of much discussion and research for many years, health professionals have failed to motivate the majority of American women to adopt this health behavior. Numerous factors promoting or inhibiting this behavior have been identified. This study examined the relationship of three major independent variables and their effect on BSE behavior in a sample of young adult women at a large Southeastern University. Subjects' health beliefs concerning their general health and those beliefs concerning breast cancer were measured. Health behaviors in seven preventive health areas were assessed, and subjects were divided into three groups for BSE teaching sessions. Differences among the three subgroups were analyzed for each of the independent variables. Correlations between variables were also examined.

Results of this study demonstrated that among the studied population one-to-one teaching was no more effective that lecture and film presentations alone. The opportunity to practice on a life-like model in a small group appears to have stimulated the most compliant BSE behavior. Health beliefs, especially worry or concern about one's health correlated significantly with BSE behavior. Health behaviors did not correlate significantly with BSE behavior.

Conclusions

Based on the results of this study the following can be concluded for the sample population.

1. Teaching method may not be a crucial factor in motivating women to perform regular, complete BSE.
2. Barriers to BSE compliance have not been adequately identified.
3. Women who express higher concern about their health are more likely to adopt BSE as a regular health habit than women who express little concern about their health.
4. As the number of times a woman is taught BSE increases her likelihood of adopting it as a regular health habit increases.
5. Women with high awareness and belief concerning the benefits of BSE and confidence in their ability to perform BSE are likely to perform BSE completely. However, they do not necessarily follow the recommended schedule for performing BSE.
6. Women who have good nutritional health habits are more likely to perform BSE according to the recommended schedule than women with high health behaviors in the other areas studied.
7. Women with high exercise and automobile safety health behavior scores are likely to be more complete in their BSE procedure.

8. Women who perceive breast cancer to be serious or view themselves as at risk of developing breast cancer were not motivated to perform BSE regularly or completely.

Limitations

Conclusions from this study are limited by several factors. The sample was a convenience sample and not random. Sample size was relatively small with a total sample size of 44 subjects divided among three groups. The demographic characteristics of the sample did not represent those of the general population of young adult women in the United States. The instruments relied on self-report as a reliable measurement method. Because of the scaling of the health belief and breast cancer belief scales a subject could not respond neutrally to a question.

In the data analysis the major limitation was most likely due to the sample size. Several correlations were significant but the quantitative value of the correlations was generally relatively small. Some statistical analysis such as the chi-square test looking at BSE behavior may have been skewed because of the sample size.

The instruments used in this study were from a variety of sources and some of them had been more thoroughly tested for their validity and reliability than others. The health beliefs instrument had been developed by another researcher and some data were available concerning its validity. The instrument measuring breast cancer beliefs and BSE behaviors were adapted from several sources and had not been tested

other than for face validity. When evaluating the results of this study one should bear in mind these identified limitations.

Implications for Research

Because of the small sample size the results of this study should be verified by replication in order to allow more general conclusions to be drawn. Additional research further identifying factors motivating or deterring women from performing BSE must be completed. Methods of overcoming barriers to BSE compliance must be identified.

BSE compliance must be measured accurately and while this researcher assumed that self-report of this behavior was reliable, a return demonstration might have been a more accurate method of assessing BSE behavior.

Further examination of health behaviors as a method of predicting BSE compliance would assist health professionals in determining the groups of people who may need additional stimuli in order to adopt BSE as a regular health habit.

Health beliefs as a predictor of BSE compliance should also be further examined. While this study appears to support Rosenstock's health belief model as a predictor of BSE the scope of this study does not allow the model to be conclusively accepted.

Implications For Nursing

Based on the results of this study it appears that multiple factors influence the adoption or rejection of BSE as a regular health habit. Nurses must examine not only clients' behaviors but also the

underlying factors motivating behavior. This study would indicate that repetition of teaching is an important factor in gaining client compliance with BSE. In this study subjects who had been taught BSE previously but who had not begun doing it regularly were more likely to begin regular BSE after participation in the study. Factors that made women more aware of their breasts and their possible risk of breast cancer did not seem to influence BSE behavior.

Nurses must be concerned about the apparent lack of compliance of young women with BSE. With breast cancer incidence apparently rising it is imperative that we determine methods of motivating women to perform this important health behavior. Repetition and emphasis on the positive outcomes of regular BSE appear to be crucial to gaining compliance. Nurses should include BSE teaching in their plan of care whenever the opportunity arises and must not assume that because a woman has been taught BSE before that she would not benefit from repetition. We must begin teaching BSE to younger women in order to increase the likelihood of them adopting this health behavior as adults.

It is imperative that nurses, physicians and other health care providers take advantage of each opportunity to inform adolescent and adult women of the benefits of regular BSE. We must accept the responsibility of teaching BSE to individuals and to groups of women in a wide variety of settings and must promote the idea of self-responsibility for one's health and well-being as an important motivator of this health behavior. Most importantly, we must continue to

support research efforts to determine the most effective teaching methods. Nurses can and should be a major force in continued promotion of BSE as a health behavior for all women.

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APPENDIXES

APPENDIX A

The University of Tennessee, Knoxville
College of Nursing
1200 Volunteer Boulevard
Knoxville, Tennessee 37916
Telephone (615) 974-4151

February 4, 1981

Dear Student:

As a faculty member in the College of Nursing and a graduate student I am interested in studying how women learn about breast self-examination (BSE). This is a health behavior recommended for all adult women. We know that approximately 110,000 women will be diagnosed with breast cancer in the U.S. this year. Most of them will find a lump themselves "by accident" not while performing BSE. If done routinely BSE can help women detect breast cancer earlier. Most breast lumps are not cancer. But women who do develop cancer of the breast will have a better chance of cure if diagnosed early. BSE can help. The American Cancer Society recommends that all women over age 18 should do monthly breast self-examination. In order to find out how women learn about BSE I am teaching it in several different ways to women on this campus.

I would like to invite you to collaborate in this research by agreeing to attend a class on BSE and fill out two questionnaires approximately three months apart. By participating you will learn a recommended preventive health behavior and you will be helping me learn if one way of teaching BSE is superior.

I expect that the total time involved in participating in this study will be 1 1/2 hours. The first questionnaire will take about 20 minutes to complete, the class about 1 hour, and the second questionnaire about 10 minutes. Participation may involve examination of your breasts in a private setting with a professional nurse the only other person in attendance.

I will be teaching a class on BSE in your dorm on February , 1981 at p.m. in . I hope you will come. Thank you.

Sincerely,

Peggy Pierce
PP/sb

APPENDIX B

Informed Consent Form

Your signature at the bottom of this form will indicate your consent to participate in a study being conducted at the University of Tennessee by Margaret Pierce, R.N. The purpose of this study is to look at ways of teaching breast self-examination. There are no known risks involved in the study, and your participation will enable you to learn a health behavior that is recommended for all adult women.

The study will include your participation in a class on breast self-examination, possibly attending an additional 10-15 minute session immediately following the class, and the completion of two brief questionnaires. The first questionnaire will be completed at the class prior to instruction. The second will be completed three months after the class. Participation in the study may involve examination of your breasts in a private setting with a female professional nurse the only other person in attendance. Total time involved for the participant will be approximately one and one half (1 1/2) hours.

At no time will names of participants be used in any reports of this study. Name and demographic data will be used only for grouping of data for analysis. You have the right to withdraw from this study at any time. Withdrawal from the study will in no way affect your standing at U.T.K. If you would like a summary of the results of the study you may leave your address with the project director and a report will be sent to you.

☐ Yes I would like to know the results of this study. Please send a report to me at this address.

_____

_____

_____

☐ No, I do not want a report.

If you have questions or concerns regarding the study, feel free to call Ms. Pierce at 974-8125 (office) or 577-8480 (home).

_____
signature

_____
witness

_____
date

APPENDIX C

Questionnaire #1

Demographic Data

Name _____

Address _____

_____

Age _____

Marital Status _____

Religion _____

College Major _____

Father's Occupation _____

Mother's Occupation _____

1. Do you have any major health problems for which you are presently being treated? yes _____ no _____

2. Menstrual History

   age began menstruating _____

   my periods occur every _____ days and last _____ days

Please read the following statements and then circle one of the numbers on each line to indicate the degree with which you agree or disagree with the statement for you. There are no right or wrong answers. Please circle only one number. This is a measure of your personal beliefs.

		strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree
1.	I seem to get sick a little easier than other people.	6	5	4	3	2	1
2.	I will probably be sick a lot in the future.	6	5	4	3	2	1
3.	I never worry about my health.	6	5	4	3	2	1
4.	It's easy to forget to do breast self-examination.	6	5	4	3	2	1
5.	Most people get sick a little easier than I do.	6	5	4	3	2	1
6.	Breast self examination is a good way to reassure myself that all is well with my breasts.	6	5	4	3	2	1
7.	I think my health will be worse in the future than it is now.	6	5	4	3	2	1
8.	When there is something going around, I usually catch it.	6	5	4	3	2	1
9.	In the future, I expect to have better health than other people I know.	6	5	4	3	2	1
10.	I feel confident that I could detect a lump in my own breasts.	6	5	4	3	2	1
11.	There are so many strange diseases around that you can never know how or when you might pick one up.	6	5	4	3	2	1
12.	I worry about my health more than other people worry about their health.	6	5	4	3	2	1
13.	I feel uncomfortable when I touch my breasts.	6	5	4	3	2	1
14.	My health is a concern in my life.	6	5	4	3	2	1
15.	My body seems to resist illness very well.	6	5	4	3	2	1
16.	I think all adult women should be taught and encouraged to do monthly breast self examination.	6	5	4	3	2	1
17.	I am directly responsible for my own health.	6	5	4	3	2	1
18.	I need more information on breast self examination.	6	5	4	3	2	1
19.	When I feel ill, I know it is because I have not been getting the proper exercise or eating right.	6	5	4	3	2	1
20.	I view myself as atrisk for developing breast cancer.	6	5	4	3	2	1

		strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree
21.	I expect to have a very healthy life.	6	5	4	3	2	1
22.	I'm afraid I'll find something wrong when I examine my breasts.	6	5	4	3	2	1
23.	If I take care of myself, I can avoid illness.	6	5	4	3	2	1
24.	Breast self-examination is a waste of my time.	6	5	4	3	2	1
25.	No matter what I do, if I am going to get sick I will get sick.	6	5	4	3	2	1
26.	Others seem more concerned about their health than I am about mine.	6	5	4	3	2	1
27.	I worry about getting breast cancer.	6	5	4	3	2	1
28.	I believe that I have a good chance of cure if I find a lump early by breast self-examination.	6	5	4	3	2	1
29.	I cannot believe I will ever get breast cancer.	6	5	4	3	2	1
30.	Breast cancer is one of the most serious cancers a woman could have.	6	5	4	3	2	1

PLEASE CIRCLE ONE ANSWER FOR EACH QUESTION BELOW

31. About how often do you go to the dentist?

    a. check up every six months.
    b. annual checkup
    c. biannual checkup
    d. only when something is wrong or never

32. How many times did you brush your teeth in the last 24 hours?

    a. 3 or more
    b. 2
    c. 1
    d. 0

33. When was the last time you went to a dentist for a routine dental checkup?

    a. within past year
    b. 1 to 2 years ago
    c. 2 to 5 years ago
    d. more than 5 years ago or never

34. Yesterday did you use your seat belt (or last day you went any place in a car)?

    a. everytime
    b. at least once
    c. not at all or no seat belts

35. How often do you use seat belts when traveling in a car on a highway?

    a. always or usually
    b. often or sometimes
    c. never

36. How often do you use seat belts when traveling in town?

    a. always or usually
    b. often or sometimes
    c. never

37. During the past week how many times have you participated in a strenuous sport (eg. basketball, volleyball, swimming)

    a. not at all
    b. once
    c. twice
    d. more than twice

38. How often do you walk to the third floor of a building when you have the choice, rather than take the elevator?

a. always or usually
b. often
c. sometimes
d. never

39. How many soft drinks have you consumed in the last week?

a. none
b. 1-2
c. 3-4
d. more than 4

40. How many servings of fresh fruit or vegetables have you consumed in the last 24 hours?

a. none
b. 1
c. 2
d. more than 2

41. Do you smoke?

a. do not smoke
b. less than 1 pack of cigarettes per day
c. 1 to 2 packs per day
d. more than 2 packs per day

42. Have you ever been ticketed for a moving traffic violation (for example: speeding, for going through a red light, for bumping into another car, etc.)?

a. none
b. 1
c. 2
d. 3 or more

43. How often do you drink one or more alcoholic beverages (beer, wine, cocktails) within an hour of driving a car some place?

a. never
b. a few times a year
c. every week or so or more often

44. How often do you drive a few miles over the speed limit on the highway where the posted limit is 55 miles per hour?

a. never
b. sometimes
c. often
d. usually or always

45. How often do you signal when changing lanes in traffic?

a. always
b. usually
c. often
d. sometimes or never

46. How often do you cross the street against the stop lights?

a. never
b. a few times a year
c. couple times a month
d. every week or so
e. several times a week

47. How often do you cross a relatively busy street in the middle of the block?

a. never
b. a few times a year
c. couple times a month
d. every week or so
e. several times a week

(Please check the appropriate blank)

1. My mother, sister, maternal grandmother or maternal aunt has had breast cancer. yes ____ no ____

   If yes, list who _____

   _____

   _____

   _____

2. I have heard of breast self examination. yes ____ no ____

3. I have been taught breast self-examination. yes ____ no ____

   If yes, by (Check any that apply)

   - pamphlet ____
   - magazine or newspaper article ____
   - T.V./radio show ____
   - film ____
   - lecture ____
   - person (check which)
     - Doctor ____
     - Nurse ____
     - Mother or family member ____
     - friend ____
     - other (specify) ____

4. I have done breast self examination. yes ____ no ____

   if yes
   - occasionally (less than 6x/year) ____
   - frequently (more than 6x/year) ____
   - every month ____

5. My breasts generally become tender and/or swollen just before my period. yes ____ no ____

6. I have been told by a doctor that I have "cystic" breasts. yes ____ no ____

APPENDIX D

a BSE quiz for volunteer program leader

1. State the rationale for BSE.
2. Most breast lumps are: (Check one)
   ___benign
   ___malignant
3. Most breast lumps are found by: (Check one)
   ___doctors
   ___nurses
   ___women themselves
4. List three advantages of BSE.
   a.
   b.
   c.
5. State three reasons why only one woman in five examines her breasts regularly.
   a.
   b.
   c.
6. List five abnormalities that can be detected during inspection.
   a.
   b.
   c.
   d.
   e.
7. List three abnormalities that can be detected during palpation.
   a.
   b.
   c.
8. Describe three positions a woman should assume to examine her breasts.
   a.
   b.
   c.
9. A. Describe briefly how a woman should examine her nipples.
   B. What is she looking for?
10. Describe two techniques which flatten the breast when a woman is lying down.
11. Indicate whether the following statements are true (T) or false (F).
    a. A woman should use the flat part of several fingers to palpate her breasts.
    b. If a woman notices skin dimpling while inspecting her breasts, she should be careful to avoid palpating that area of the breast.
12. State an advantage of doing BSE in the bathtub or shower.
13. Describe briefly why women should examine their breasts after, not before, their monthly period.
14. When should the following women examine their breasts?
    a. women who are menstruating regularly.
    b. post-menopausal women.
    c. women who have had hysterectomies.
    d. pregnant women.

(From "Teaching Breast Self-Examination" by the American Cancer Society 77-No.2015-LE.

answers to "a BSE quiz"

1. Breast self-examination leads to earlier discovery of breast cancer when chances for cure are best.

2. Benign

3. Women themselves

4. Patient convenience
   No cost
   Learn what's normal for you
   Monthly protection between regular physician's exam

5. Lack of confidence in ability to do exam correctly
   Not enough information on how to do it
   Never had physician do breast exam or recommend
   Fear and anxiety

6. Noticeable change in size
   Change in shape
   Sores or scaling on the nipple
   Puckering of the skin
   Redness or swelling on breast
   Change in nipple position
   Nipple discharge

7. Definite lump or thickening
   Area of tenderness
   Changes you feel that are different from previous exam

8. Standing in shower
   Standing or sitting in front of mirror
   Lying down

9. Gently squeeze each nipple between thumb and finger
   This will check for discharge or bleeding

10. Be sure to place pillow beneath shoulder
    Then place hand behind head to flatten breast muscle further

11. a. T

    b. F

12. When the skin is slippery, it is easier to feel lumps and thickenings in the breast that lie near the surface

13. After the monthly period, breasts are less likely to feel engorged or nodular, and are less sensitive.

14. a. When menstrual period ends
    b. First day of the month or a date easy to remember
    c. As advised by their physician
    d. First day of the month or a date easy to remember

(From "Teaching Breast Self-Examination" by the American Cancer Society 77-No.2015-LE.)

APPENDIX E

Post Test

Name _____

Post Test

		strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree
1.	Breast self examination is a good way to reassure myself that all is well with my breasts.	6	5	4	3	2	1
2.	I feel confident that I could detect a lump in my own breasts.	6	5	4	3	2	1
3.	I feel uncomfortable when I touch my breasts.	6	5	4	3	2	1
4.	I need more information on breast self examination.	6	5	4	3	2	1
5.	It is easy to forget to do breast self-examination.	6	5	4	3	2	1
6.	I am afraid I'll find something wrong when I examine my breasts.	6	5	4	3	2	1
7.	Breast self-examination is a waste of my time.	6	5	4	3	2	1
8.	I think all adult women should be taught and encouraged to do monthly breast self examination.	6	5	4	3	2	1
9.	I worry about getting breast cancer.	6	5	4	3	2	1
10.	I view myself as at risk for developing breast cancer.	6	5	4	3	2	1
11.	I believe that I have a good chance of cure if I find a lump early by breast self examination.	6	5	4	3	2	1
12.	I cannot believe I will ever get breast cancer.	6	5	4	3	2	1
13.	Breast cancer is one of the most serious cancers a woman could have.	6	5	4	3	2	1

APPENDIX F

The University of Tennessee, Knoxville
College of Nursing
1200 Volunteer Boulevard
Knoxville, Tennessee 37916
Telephone (615) 974-4151

May 18, 1981

Dear

In February you attended a program on Breast Self Examination and agreed to participate in my study by filling out questionnaires. It's now time to complete the final questionnaire of the study. This should take no more than five minutes.

Please complete the questionnaire, place it in the envelope provided and drop it in the campus mail box at the front desk of your dorm. I have put your name on the questionnaire solely for grouping of responders according to program attended. Once returned your name will be detached from the questionnaire and your confidentiality preserved.

Thank you for your willingness to participate in my study both in February and now. If you did not request a report of the results of this study but would like one please enclose your name and home address on a separate sheet of paper. I expect to have the data analyzed this summer.

Please return this questionnaire by May 30, 1981. Thank you. If you have any questions you may call me at 974-8125 or 577-8480.

Sincerely,

Peggy Pierce
Graduate Student
College of Nursing

PP/sb

Questionnaire #2

Name _____

		strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree
1.	Breast self examination is a good way to reassure myself that all is well with my breasts.	6	5	4	3	2	1
2.	I feel confident that I could detect a lump in my own breasts.	6	5	4	3	2	1
3.	I feel uncomfortable when I touch my breasts.	6	5	4	3	2	1
4.	I need more information on breast self examination.	6	5	4	3	2	1
5.	It is easy to forget to do breast self-examination.	6	5	4	3	2	1
6.	I am afraid I'll find something wrong when I examine my breasts.	6	5	4	3	2	1
7.	Breast self-examination is a waste of my time.	6	5	4	3	2	1
8.	I think all adult women should be taught and encouraged to do monthly breast self examination.	6	5	4	3	2	1
9.	I worry about getting breast cancer.	6	5	4	3	2	1
10.	I view myself as at risk for developing breast cancer.	6	5	4	3	2	1
11.	I believe that I have a good chance of cure if I find a lump early by breast self examination.	6	5	4	3	2	1
12.	I cannot believe I will ever get breast cancer.	6	5	4	3	2	1
13.	Breast cancer is one of the most serious cancers a woman could have.	6	5	4	3	2	1

When I do breast self exam, I include the following:

	always	usually	sometimes	never
1. feel all parts of each breast while in the bath or shower.	4	3	2	1
2. examine left breast with right hand and right breast with left hand.	4	3	2	1
3. stand before mirror with arms at sides, raise arms looking for changes in contour of breasts.	4	3	2	1
4. rest palms on hips, press down firmly to flex chest looking again for contour changes.	4	3	2	1
5. lying down with pillow under shoulder with fingers flat press gently in small circular motions around an imaginary clock.	4	3	2	1
6. move in 1 inch and repeat step 5 until all breast tissue is felt.	4	3	2	1
7. gently squeeze the nipple between thumb and index finger.	4	3	2	1
8. Are there any other steps you include when doing breast self-examination? If so please describe them.				

Thank you for your participation in this study.

Since February 15, 1981, I have done breast self-examination.

A. not at all

B. 1 time

C. 2 times

D. 3 times

E. more than 3 times

Since February 15, 1981, I have had my menstrual period

A. not at all

B. 1 time

C. 2 times

D. 3 times

E. more than 3 times

APPENDIX G

The University of Tennessee, Knoxville
College of Nursing
1200 Volunteer Boulevard
Knoxville, Tennessee 37916
Telephone (615) 974-4151

June 1, 1981

Dear

On May 18, 1981, I sent you the final questionnaire for my study on Breast Self Examination. It is very important that I have 100% response in order to complete my study.

I know what a busy time of the quarter this is and you may have mislaid the questionnaire in the rush of final exams, packing, etc. Therefore, I am enclosing another copy of the questionnaire. Please take a few minutes to fill it out and return it to me in the enclosed envelope. If you do it now, you won't forget or lose it.

Thank you.

Sincerely,

Peggy Pierce
Graduate Student
College of Nursing
PP/sb

enclosure

VITA

Margaret Ann Sawin Pierce was born in Northville, Michigan on July 26, 1948. She lived in New Hampshire and New Jersey graduating from high school in Madison, New Jersey in 1966. She attended the University of Michigan from 1966 to 1970 graduating with a Bachelor of Science in Nursing degree.

In September 1972 she entered the Graduate School of The University of Tennessee, Knoxville, and received the Master of Public Health degree in August 1973. In September 1977 she began study toward a Master of Science in Nursing degree at The University of Tennessee, Knoxville. This degree was awarded in August 1982.

The author is a member of Sigma Theta Tau and Phi Kappa Phi honor societies.

She is employed at The University of Tennessee, Knoxville, College of Nursing.

She is married to Carl Arthur Pierce and has two children, Emily Suzanne and Kathryn Elizabeth.